



**Report of the Sixth Session of the  
Working Party  
on  
Data Collection and Statistics**

Victoria, Seychelles November 26-27, 2009

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## 1. OPENING OF THE MEETING AND ADOPTION OF THE AGENDA

1. The 6th meeting of the Working Party of Data Collection and Statistics (WPDCS) opened on November 26th 2009 in Mahé by the Executive Secretary of the IOTC, Mr. Alejandro Anganuzzi, who welcomed the participants (Appendix I). It was noted that the WPDCS had been discontinued in 2003 and, for a period of five years, all data collection and statistics issues had been taken care of by the IOTC Working Parties and Scientific Committee. In 2009, following a recommendation from the IOTC Performance Review Panel (February 2009) for the WPDCS to be reinstated, the IOTC Secretariat initiated a consultation process, involving the Chairman of the IOTC Scientific Committee and other IOTC scientists, and it was agreed to reconvene a meeting of the WPDCS the week before the meeting of the IOTC Scientific Committee.
2. The participants noted that a significant number of recommendations on data and statistics issues are issued every year by the IOTC Working Parties agreeing that one of the roles of the WPDCS should be to integrate this information in order to facilitate the work of the IOTC Scientific Committee, in particular concerning the availability and quality of the information that is used for the assessments of IOTC stocks and related species.
3. The participants agreed that the meeting be chaired by Mr Miguel Herrera. The Agenda for the Meeting was adopted as listed in Appendix II. The documents available for discussion are listed in Appendix III. Renaud Pianet and Alain Fonteneau acted as rapporteurs.

## 2. PROGRESS REPORT OF THE SECRETARIAT ON DATA RELATED ISSUES

4. Document IOTC-2009-WPDCS-04, which included sections about the availability of IOTC statistics for 2008 and the general status of the databases held at the IOTC, was presented by the Secretariat. The following sections summarize this progress report.

### Data Collection

#### Availability of IOTC statistics for 2008

5. **Timeliness of reporting:** IOTC statistics were available for 15 countries before the deadline of June 30 (cf. 15 in 2008). Partial statistics were provided in most cases. Requests were sent to over fifty countries<sup>1</sup> in March-April 2009. The amount of data available before the deadline was similar than that in 2008.
6. **Completeness of statistical data:** Table 1 shows the extent to which 2008 statistics were available in the IOTC database by the deadline for data submission (30 June) and before the WPDCS Meeting (November 2009). 32% of the catch was available by 30 June and 77% of the catch was available by November. The proportion of statistics available for 2007 is shown for comparison. Levels of reporting were moderate in 2009, especially for nominal catch and catch-and-effort data.

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<sup>1</sup> Note that separate requests were sent to EC countries having vessels known to operate in the IOTC Area (France, Italy, Portugal, Spain and the UK)

**Table 1.** Proportion of the NC, CE and SF statistics available at the IOTC Secretariat compared to the total catches estimated for 2008 (as of 15th November 2009).

Statistics available for 2008	Estim. Catch	NC		CE		SF	
		BD	WP	BD	WP	BD	WP
IOTC species (x1,000 t)	1361	441	1047	416	701	313	440
% Available for 2008		32	77	31	52	23	32
% Available for 2007		36	71	24	49	29	50
Tropical tunas (x1,000 t)	838	355	721	336	595	293	410
Temperate tunas (x1,000 t)	41	27	36	23	32	9	10
Billfish (x1,000 t)	58	21	44	18	23	11	12
Neritic tunas (x1,000 t)	425	38	246	38	52	0	8

**Estim. Catch:** Total catches estimated

**NC:** Amount of catch available

**CE:** Amount of catch for which catches and effort are available

**SF:** Amount of catch for which size frequency data are available

Available before the deadline for data submission (**BD**, 30<sup>th</sup> June) and at the time of the Working Party on Data Collection and Statistics Meeting (**WP**)

7. Tables i-v (Appendix IV) list the fleets for which the Secretariat received or estimated catches for the year 2008. The fleets are listed according to the size of their most recent catches. The standing of the catch, effort, size frequency and craft statistics information received is indicated using colours. Timeliness of reporting and data source are also shown. The availability and standing of statistics for tropical tunas (i), temperate tunas (ii), billfish (iii), neritic tunas (iv) and sharks, seabirds and sea turtles (v) are presented separately. The availability of statistics on fishing crafts operating for each fleet is also presented in a separate table (vi).
8. **IOTC Species (i-v):** Nominal catches and catch-and-effort data are usually available before the deadline for the main industrial purse seine and longline fleets, reported as final statistics or preliminary statistics, respectively. However, the completeness of statistics is compromised by the lack of information for some important fleets, including India (purse seine and longline), Indonesia (purse seine and artisanal), Yemen (artisanal) and Pakistan (oceanic gillnets and other gears). On the other hand, the amount of size frequency statistics that are available for the previous year both before the deadline and at the time of the working parties is usually low, with statistics not available for important industrial longline fisheries, in particular longline fisheries of Taiwan, China, Japan and India. Japan and Taiwan, China usually provide size statistics to the IOTC two years after the year in which the data was collected. The availability of size frequency statistics from artisanal fisheries is, in general, very low. At present, only Sri Lanka and Australia have provided size data for their artisanal fisheries for the year 2008.
9. **By-catch levels (v):** Australia, the EC, France and South Africa provided estimates of total bycatch levels for their fisheries for 2008, including bycatch levels for sharks, seabirds and marine turtles. In spite of the better reporting levels recorded for bycatch data during 2009, few statistics are still available for sharks, seabirds and sea turtles (and other non-IOTC species caught by fleets targeting tunas and/or tuna-like species); for this reason, the quality of the data available is still poor. The statistics are seldom available by species and refer usually to the shark carcasses that are retained on board, not including the amounts of sharks that are discarded. Almost no statistics are available for other shark products, such as shark fins.
10. **Discards levels:** Discard levels are only available for Australia, EC (France), South Africa, Sri Lanka (nil discards) and the UK (nil discards) in 2008. Discard rates are believed to be high for fisheries using longlines and oceanic gillnets (Iran, Pakistan) and moderate for purse seine sets on logs (FADs).
11. **Fishing craft statistics (vi):** The number of vessels fishing for IOTC species in the Indian Ocean is thought to be more accurate in recent years thanks to the information collected after the implementation of new IOTC Resolutions that called for countries to report yearly lists of active vessels that operated under their flag and lists of the foreign fishing vessels that operated within their territory. Fishing craft statistics are generally available for industrial fleets whose catches are available. Craft statistics are not available, incomplete or inaccurate for many artisanal fleets. The number of non-reporting vessels

operating in the Indian Ocean was re-estimated this year from new information collected through the IOTC Sampling Programs and new vessel records.

## Status of the IOTC databases

### Main progress achieved during 2009

12. The Secretariat informed the Working Party on the progress achieved during 2009 in collection, validation and verification of catch, effort and fishing craft data in the IOTC databases.

13. **New datasets** were obtained in 2009 from:

- **Oman:** In 2009 the IOTC-OFCF Project provided support to the Ministry of Fish Wealth of Oman for the collection of length frequency data in two landing sites, to cover yellowfin tuna, longtail tuna and narrow-barred Spanish mackerel specimens caught by the gillnet and hand line fisheries in Oman. In addition, Oman provided a complete catch-and-effort series for its artisanal fisheries, including data for 1984-2008.
- **Sri Lanka:** Sri Lanka provided during 2009 new catch figures for the years 2007 and 2008, the new catches provided being significantly lower than those provided in the past.
- **Kenya:** Kenya has continued the collection of data from the sport fisheries in the country since 2007, after the end of the IOTC-OFCF co-operation.
- **Seychelles: In 2009** Seychelles provided a complete set of size frequency statistics for its deep-freezing longline fleet, covering 2007 and 2008.

14. **Changes to data in the IOTC databases:** The following reviews conducted during 2009 led to changes in the data in the IOTC databases:

- **India:** The secretariat assigned the catches by year and species for years in which the catches were recorded aggregated using the information existing in recent years for India, where catches are available by gear and species. This review affected mostly the catches of neritic tuna species for the entire catch series (1950-2008).
- **NEI fleets:** The Secretariat revised the catches of non-reporting longliners for 2004-08 using the new information available, especially third country reports. Most of the catches refer now to Indonesian and Malaysia vessels based in countries other than the flag country. The catches of longliners from India were also estimated using the number of vessels active (on the assumption that all authorized vessels were active during the year in which they were authorized) and average catches by vessel from a proxy fleet. Other than Indonesia, Malaysia and India, in recent years, around 20 longliners have been operating in the Indian Ocean under the flags of non-reporting countries. The Secretariat estimated the catches of these vessels as for India.
- **Indonesia:** The DGCF of Indonesia reported numbers of Indonesian deep-freezing longliners operating in the Indian Ocean during 2001-08. The Secretariat estimated the catches of these vessels basing on the numbers reported and average catches by species by vessel for Taiwanese longliners during the same period.
- **Bycatch levels:** The Secretariat estimated catches of sharks for some fisheries by using catch rates from other fisheries or other information available.
- **The validation and verification of data** in the IOTC databases continued during 2009. Codes indicating poor quality were assigned where inconsistencies were found in specific records or complete series of catches or sizes.
- **Fishing Craft statistics:** In 2009, the Secretariat participated in a Study to assess input-fishing capacity for the important fleets operating in the Indian Ocean. The number of active fishing vessels in the Indian Ocean was updated for some of the fleets using the new information compiled. The fishing craft statistics database is thought almost complete as refers the industrial fleets (purse seine and longline) in recent years.

### Problem Areas Identified

15. Despite improvements in the data held by IOTC, the Secretariat identified several problem areas undermining the completeness, quality and timeliness of the information stored for IOTC species:

16. **Statistics not available:** Non-reporting can be because the fisheries are not monitored or statistics are produced but not reported to IOTC. Estimates from alternative sources are more or less complete depending on the information available. The following fleets account for the majority of the catches within this category:

1. Complete lack of statistics from the industrial longline fishery of **India**.
2. Complete lack of statistics from the artisanal fisheries in **Yemen**.
3. Complete lack of statistics from industrial longliners operating under flags of **non-reporting countries**.
4. Lack of catch-and-effort and size frequency data for the fresh-tuna longline fisheries of **Taiwan, China**.
5. Lack of statistics from industrial longliners of **Indonesia** and **Malaysia** not based in their territories.
6. Lack of catch-and-effort data and detailed size frequency data for the oceanic gillnet fisheries of **Pakistan** and **Iran** and the gillnet/longline fishery of **Sri Lanka**.
7. Lack of catch-and-effort and size frequency data for the artisanal fisheries of **India**.
8. Complete lack of statistics from the artisanal fisheries of **Madagascar** and **Comoros**.

17. **Statistics incomplete:** Incomplete reporting can be because the fisheries are not fully monitored, statistical systems cannot produce reliable estimates of catches or statistics are produced but not reported to IOTC according to the standards in place. The following fleets account for the majority of the catches within this category:

1. Insufficient time-area coverage for size sampling data for important longline fleets, in particular **Japan**.
2. Catches not fully by species and/or gear for large-scale and medium-scale purse seine fisheries of **Indonesia, Malaysia** and **Thailand** and for the gillnet/longline fishery of **Sri Lanka**.
3. Size frequency statistics not reported by IOTC standards for the fisheries of **Japan, Taiwan, China, Indonesia** and **Malaysia**.

### **General Discussion on data collection**

18. The WPDCS commended the Secretariat for its dedication to improving the quality of the data available in the IOTC databases, noting that the report from the Secretariat facilitates the work of the WPDCS in identifying the main progress and issues outstanding concerning the statistics available at the Secretariat.

19. The WPDCS agreed that the method used by the IOTC Secretariat to display the presumed quality of the statistics available at the IOTC was a good approach, making it easier for the WPDCS to assess the presumed quality of the datasets available at the IOTC. However, the WPDCS noted that the evaluation presented in document IOTC-2009-WPDCS-04 covers only nominal catches, agreeing on the need to extend the analysis to incorporate other datasets that are important for the assessments of IOTC species, in particular catch-and-effort and length frequency data. As an example, the WPDCS noted that, although the quality of nominal catches for gillnet fisheries may be fair at present, the overall quality of the statistics available for these fisheries is thought poor due to the general lack of catch-and-effort and size frequency data and the likely miss-labelling of bigeye tuna catches as yellowfin tuna.

20. In light of the above, the WPDCS requested the Secretariat to prepare new data quality diagrams, by fishery and country, for the next meeting of the WPDCS. The WPDCS agreed that this study shall include all the datasets that are important for the assessments of IOTC species. However, the WPDCS noted that the levels of resolution that would be acceptable for catch-and-effort and size frequency data may be different depending on the type of fishery, with higher resolution required for fleets that operate outside the EEZ of their flag countries. Notwithstanding this, the WPDCS requested the Secretariat to use the following categories to present the results of the evaluation:

- **Statistics of presumed good quality (Green coded statistics):** All data reported as per IOTC standards, including estimates of retained catches and discards by species, and datasets of catch-and-

effort data and size frequency data including levels of coverage and raising procedures; documents describing data collection, processing and estimation procedures available.

- **Statistics of presumed poor quality (Red coded statistics):** Data not reported at all or not reported by IOTC standards, e.g. catches not reported by gear or species, discard levels not reported where they are considered to be significant, catch-and-effort data or size frequency data insufficient due to low coverage, poor time-area resolution or lack of information concerning levels of coverage and raising procedures; documents describing data collection, processing and estimation procedures not available.
- **Statistics of intermediate quality (Orange coded statistics):** Data not fully reported or not fully reported by IOTC standards, e.g. catches not fully reported by gear or species, discard levels not fully reported where they are considered to be significant, catch-and-effort data or size frequency data incomplete due to low coverage, poor time-area resolution or lack of information concerning levels of coverage and raising procedures; documents describing data collection, processing and estimation procedures incomplete.

21. The WPDCS noted that, since 2002, the IOTC Secretariat has used a procedure for the verification of data in the IOTC databases, using a system of codes to label the individual data items, including the data source and the estimation procedure that was used in each case. The WPDCS agreed that the existing system could be further developed into a scoring system that will allow classifying the IOTC statistics according to the above criteria, requesting the IOTC Secretariat to prepare a proposal to be considered at the next meeting of the WPDCS.

### 3. MAIN DATA ISSUES OUTSTANDING, BY SPECIES GROUP

#### **Main issues outstanding by species group**

22. The WPDCS revised the latest recommendations relating to data and statistics as issued by the IOTC Working Parties on Billfish, Ecosystems and Bycatch, Tropical Tunas and Fishing Capacity in 2009 and by the Working Party on Temperate Tunas (on Albacore) and Scientific Committee (on Neritic Tunas) in 2008. The WPDCS noted that, in addition, the IOTC Secretariat had prepared two documents on the current status of IOTC databases for albacore (IOTC-2009-WPDCS-05) and neritic tunas (IOTC-2009-WPDCS-06).

23. Overall, the WPDCS identified around one hundred recommendations concerning data and statistics issues, noting that there was a significant level of overlapping, with the same recommendation sometimes issued by two or more working parties, depending on the fishery or species concerned. In order to facilitate the work of the IOTC Scientific Committee, the WPDCS agreed that it was required to identify the main issues affecting the quality of the IOTC statistics and classify the recommendations existing under the agreed categories. In this regard, the WPDCS noted that a specific section of the report will cover the recommendations from the WPDCS, agreeing to further look into these issues under Agenda Item 5.

#### **Species composition of the catches of oceanic gillnet and pole-and-line vessels**

24. Document IOTC-2009-WPDCS-08 reviews the current status of the various gillnet fisheries in the Indian Ocean and the status of the statistics available from these fisheries. For the last ten years, the gillnet fisheries of Iran and Pakistan have been reporting catch levels of tropical tunas at around 140,000 tons, with catches of bigeye tuna amounting to only 142 tons by year. The document indicates that a significant proportion of the gillnet fishery of Iran has been operating on the high seas in recent years, exploiting the same fishing grounds as the industrial purse seine fleets, in areas where the purse seine fishery catch significant amounts of juvenile bigeye tuna associated with fish aggregating devices (FADs). A range of likely unreported bigeye tuna catches is estimated basing on presumed levels of activity of gillnet vessels and average catches of bigeye tuna reported by purse seiners over the total catches of tropical tunas, on the assumption that the catches of both gears contain similar proportions of bigeye tuna. The results of the study tend to suggest that the catches of bigeye tuna under oceanic gillnets have been highly underestimated in recent years. The document further indicates that the widespread use of oceanic gillnets in recent years may have led to significant increases in the amounts of billfish and other bycatch, including sharks, billfish, turtles and dolphins. The document notes that the issues raised

above require immediate attention as they are likely to compromise the assessments of IOTC and associated species in the Indian Ocean, in particular bigeye tuna.

25. The WP agreed that the information provided tend to indicate that the catches of bigeye tuna by oceanic gillnet fisheries have been underestimated in recent years, noting that this may compromise the quality of the catches estimated for tropical tunas, especially bigeye tuna, and recommended that Iran, Pakistan and Sri Lanka make every possible effort to improve species identification, including strengthening of port sampling and implementation of logbook systems on their fleets and reporting of catch-and-effort data to the IOTC, routinely.
26. The WP noted that Maldives has made the necessary arrangements in its statistical system to incorporate all IOTC species, noting that this will allow future reporting of catch and length frequency data for the bigeye tuna.

#### 4. UPDATE ON VARIOUS NATIONAL STATISTICAL SYSTEMS

##### **Questionnaires on data collection, data management and data dissemination**

27. The Secretariat informed the WPDCS that it had send a Questionnaire on data collection, data management and data dissemination to countries having fisheries in the IOTC Region. Such questionnaire has been prepared by the Secretariat to improve on the information available about the data collection, processing and dissemination systems existing in countries having fisheries in the IOTC Region. The Secretariat indicated that the information provided will be used to:

- Complete the documentation of the data gathered in the databases at the IOTC Secretariat
- Identify the type of issues that could potentially affect the quality of the data gathered by the IOTC, by type of fishery and fleet
- Assess the type of actions that may be undertaken to address the issues unveiled above

And a report presented to the WPDCS including the results of this exercise.

28. The Secretariat noted that, to date, Questionnaires had been received from Australia, China, EC-France, Japan, Oman, South Africa and the United Kingdom (Overseas Territories).
29. The WPDCS thanked the Secretariat for this initiative encouraging other countries to complete the questionnaires and send them to the Secretariat, and requested the Secretariat to report progress to the next meeting of the WPDCS.

##### **Size and species sampling of catches taken by purse seiners**

30. Document IOTC-2009- WPDCS-INF01 contains the report of the international Working Group on “Tuna purse seine and baitboat catch species composition derived from observer and port sampler data”, organized by the “Institute de Recherche pour le Développement” (IRD, France) in 2009 (Sète, France, June 15-19<sup>th</sup> 2009). The main objectives of the Working Group were to: (i) examine the functioning of the various species sampling schemes existing for surface fisheries in the three oceans, (ii) discuss their statistical validity and potential problems, (iii) recommend actions to improve sampling design, data collection or data processing, when required. Scientists from the 3 oceans (from Secretariat for the Pacific Community, Inter-American Tropical Tuna Commission, Indian Ocean Tuna Commission and International Commission for the Conservation of Atlantic Tunas) attended the meeting.

31. The main results from the Working Group are summarized below:

- Need to document all sampling strategies and estimation procedures: The Working Group agreed that there is insufficient documentation existing, in particular at the tuna-RFMOs, concerning the sampling and catch-at-size estimation procedures that are used by the institutions responsible for the monitoring of industrial tuna purse seine and baitboat fleets. This lack of information makes it difficult to assess if changes in the species composition of the catches for a particular fleet over time are the consequence of changes in fishing behaviour or, to the contrary, issue from changes to the sampling design or estimation procedure that were implemented at the time the change occurred. Notwithstanding the above, the Working Group provided a unique opportunity to exchange

information regarding the type of sampling schemes and estimation procedures that are used in each ocean.

- Need to maximize the use of the information collected from purse seiners, in particular logbooks, well maps (or fish storage plans), landing statistics, canning factory records and port or at-sea sampling data. This information was considered of key importance for the verification of existing data and the estimation of catch, effort and catch-at-size data.
- Need to revise the catches by species for some fleets and periods: The logbooks collected from purse seine and baitboat vessels contain catches by species. However, sampling in port or at sea has demonstrated that the catches in the logbooks are not precise and the species composition need to be adjusted, especially in the case of catches of juvenile bigeye tuna and yellowfin tuna, which tend to be recorded aggregated in the logbooks, usually mislabelled as yellowfin tuna.
- Need to revise current sampling strategies: The Working Group reviewed the existing sampling schemes for species composition and length frequency and identified some issues that may represent a potential source for sampling bias, recommending that these issues be further explored. (e.g. likely bias in the collection of samples at sea from purse seine sets that contain large and small specimens.)
- Need to revise current estimation procedures: The Working Group noted that the current procedures used for the estimation of catch, effort and catch-at-size need to be revised, agreeing to further discuss these matters under the Scientific Bodies of the T-RFMOs concerned.
- Need to organize a follow-up international Working Group to assess the progress achieved on the above recommendations and review the results of the statistical analysis undertaken on purse seiners of the EC.

32. The WPDCS thanked the IRD for organizing this Working Group, agreeing on the need for the parties concerned to implement, as soon as possible, the recommendations issuing from the Working Group, in particular:

- To conduct an in-depth statistical analysis of the existing sampling and catch estimation procedures with a view to improving sampling design and/or estimation procedures, when required.
- To strengthen the sampling for biological parameters for skipjack tuna, yellowfin tuna, bigeye tuna and albacore, in order to improve the precision of catch-at-size data estimated for purse seine fleets.
- To convene a 2<sup>nd</sup> international Working Group, including participation of experts from the Tuna-RFMOs concerned, to assess the results of the statistical analysis conducted by the EC on its purse seine fleet and implementation of other recommendations issued by the Working Group. In this regard, the WPDCS noted that the latest Joint Meeting of the Tuna-RFMO (San Sebastián, 2009) had agreed to organize a series of joint technical meetings before 2011, including a meeting to cover Science issues at the Tuna-RFMOs. The WPDCS noted that the next meeting of the Working Group could be organized as a component of the T-RFMO Science Meeting, recommending that this proposal is further explored.

#### **Uncertainties in the species composition of free schools catches taken by purse seiners**

33. Document IOTC-2009- WPDCS-INF01 reviews also the estimation of catches on purse seiners of the EC, stressing the need to revise the procedure for the estimation of catches by species on free-school sets containing large specimens, as the catches by species currently estimated are not fully precise. It was noted that the estimation procedure currently in use leads to a slight overestimation of bigeye tuna catches and underestimation of albacore catches. The paper concludes that, although the catches by species for the EC fleet are not likely to change significantly, the estimation procedure need to be adjusted and the catch data series for purse seiners of the EC re-estimated and reported to the RFMO concerned.

34. The WPDCS recommended that the estimation procedure used for purse seiners of the EC be revised and new catches by species estimated and submitted as soon as possible.

#### **Statistics of industrial purse seiners of Thailand**

35. Document IOTC-2009-WPDCS-07 reviews the statistics of industrial tuna purse seiners from Thailand. Between four and six Thai purse seiners have been operating in the Indian Ocean since 2005, especially in waters off Somalia catching tuna schools associated with Fish Aggregating Devices (FADs). Logbook,

port sampling and interview data have been collected from these vessels, routinely. The total catches estimated for this fleet amounted to 12,216 t in 2005 and 23,161 t in 2006.

36. The WPDCS was also informed that the Seychelles Fishing Authority (SFA) has collected logbooks from Thai purse seiners calling to Port Victoria. It was noted that the catches of these vessels had not been sampled by the SFA.
37. The WPDCS noted that, although EC, Seychelles and Thai purse seiners have been operating in the same areas in recent years, the species composition for the two fleets is somewhat different. For this reason, the WPDCS requested that the parties concerned look further into these issues and report the results of this study to the next meeting of the WPDCS.

### **Statistics of foreign vessels unloading in Thailand**

38. Document IOTC 2009 WPDCS 08 reviews data collection on fresh-tuna longliners of various flags and purse seiners of Japan unloading in Thailand during 2003-08. During this period, the Andaman Sea Fisheries Research and Development Centre of Thailand (AFRDEC) collected catch-and-effort data, catch market value, and samples to determine the species and size composition of the catches. Between one and four Japanese purse seiners have been unloading in Thailand in recent years. In addition, Thai scientists have also monitored the activities of fresh-tuna longliners from China, Taiwan, China, Indonesia and other flags that unloaded catches in Phuket in recent years. As much as 7,000 t were unloaded in Phuket in 2008, especially yellowfin tuna (70%) and, to a lesser extent, bigeye tuna (20%).
39. The WPDCS noted that the IOTC Secretariat uses the information collected by AFRDEC to complete the catches of fleets when they are not reported by their flag countries, as it is the case with Indonesia. In addition, AFRDEC has been a major source for size frequency data for fresh-tuna longliners operating in the eastern Indian Ocean. The WPDCS thank AFRDEC for providing this information and encouraged AFRDEC scientists to maintain these activities. The WPDCS further noted that, to date, no catch-and-effort data are available from fresh-tuna longliners of Indonesia and Taiwan, China stressing the need for these countries to implement logbook systems on their fleets and report catch-and-effort data to the IOTC.
40. In this regard, scientists from Taiwan, China informed the WPDCS that they are currently implementing a logbook system on Taiwanese fresh-tuna longliners, indicating that 20% of the longline trips are covered at present. Taiwan, China also informed that it has plans to initiate a programme in cooperation with the AFRDEC of Thailand for the implementation of port sampling, including catch and length frequency sampling, for Taiwanese fresh-tuna longliners based in Phuket.

### **Deployment of scientific observers on purse seiners of the EC**

41. Concerning the observer programme on EU purse seiners, it was mentioned that all activities have ceased since July 2009 as a consequence of the development of piracy activities in the south-west Indian Ocean that required the presence of military personnel on board the vessels for protection. It is not known when it will be resumed.

## **5. RECOMMENDATIONS TO IMPROVE THE QUALITY OF THE STATISTICS AT THE IOTC**

### **Considerations concerning IOTC measures relating to data and statistics**

#### **Regional Scientific Observer Programmes (IOTC Resolution 09/04 on a regional observer scheme)**

42. The WPDCS noted that IOTC Resolution 09/04 contains provisions for both industrial and artisanal fisheries and that the term “scientific observer” is used for both scientific observers aboard fishing vessels and field samplers (or enumerators) at the landing place. It was noted that paragraph 4 of such Resolution states that “*The number of the artisanal fishing vessels landings shall also be monitored at port by observers. The indicative level of the coverage of the artisanal fishing vessels should progressively increase towards 5% of the total landings.*”

43. The WPDCS noted that as a general rule the use of the term “scientific observer” applies to staff that collect scientific samples at-sea, on board fishing or collector vessels, and is never used for staff that collect scientific samples at the landing place. It was agreed that, for the sake of clarity the term field sampler or enumerator should apply to staff that collects samples at the landing place (in port or at any other landing location).
44. The WPDCS further noted that IOTC Resolution 09/04 establishes levels of coverage for artisanal fisheries on the basis of total landings. It was noted that the term “total landings” usually refers to the total catches unloaded which, in the case of artisanal fisheries, is not a known quantity but estimated through sampling. The WPDCS agreed that in the case of artisanal fisheries it would be more appropriate to set the levels of coverage using a measure of effort as this information is usually available at the time the samples are collected. (e.g. the total number of vessel fishing, total number of fishing trips, total number of vessel unloadings.)
45. Finally, the WPDCS noted that the term “artisanal fishing vessel” is not properly defined in Resolution 09/04 noting that the classification of fishing vessels into industrial and artisanal may vary depending on the country. It was agreed that, for the sake of clarity, Resolution 09/04 should specify the type of vessels that fall within the category artisanal.
46. In light of the above issues, the WPDCS agreed that it would be more appropriate to set separate measures for industrial fleets and artisanal fleets, agreeing to defer further consideration of the above issues to the IOTC Scientific Committee.

**Guidelines for the collection of size data (IOTC Resolution 08/01 on mandatory statistical requirements for IOTC members and cooperating non-contracting parties (CPC’s))**

47. Paragraph 4 of IOTC Resolution 08/01 states that “*Size data shall be provided for all gears and for all species covered by the IOTC mandate according to the guidelines set out by the IOTC Scientific Committee. Size sampling shall be run under strict and well described random sampling schemes which are necessary to provide unbiased figures of the sizes taken. Length data by species, including the total number of fish measured, shall be submitted by a 5° grid area by month, by gear and fishing mode (e.g. free swimming schools or schools in association with floating objects for the purse seiners)*”.
48. Precise guidelines have never been developed by the IOTC Scientific Committee, other than the requirement that results have to be submitted by a 5° grid area by month, by gear and fishing mode, including the total number of fish measured. Particularly, there is no mention of a minimum level of sampling.
49. The experience shows that this size sampling, when it was actually conducted, has been often very low, even for important fisheries, especially for longline and gillnet fleets. Such a minimum level should be specified, and the ratio of at least 1 fish measured fish by unloaded ton (commonly used in others organizations) was recommended for the main species. It was also mentioned that this sampling should be representative of the fishery on a spatio-temporal basis (e.g. proportional to the catch), and that this information should be available as it is of crucial importance for stock assessment analysis. These sampling programmes should be run on a routine basis, and a clear description of the procedures used presented to the IOTC. Total raised catch-at-size should be reported separately to allow estimation of sample sizes.

**Supply vessels and the use of Fish Aggregating Devices (FAD) (IOTC Resolution 08/01 on mandatory statistical requirements for IOTC members and cooperating non-contracting parties (CPC’s))**

50. Paragraph 5(c) of IOTC Resolution 08/01 states that the following data shall be provided concerning Fish Aggregating Devices (FADs): “*The total number and type of FADs set by the supply vessel and purse seine fleet per quarter. ...*”, by type of FAD.
51. The WPDCS discussed on the value and potential utility of this information which is still not in use presently, and some participants considered that this requirement (still not implemented) was unclear and difficult to implement. It was understood that the objective was to estimate an average number of FADs deployed by day, as well as their period of operation. It was suggested that the best solution would be to incorporate this information in the logbook, including a record for each deployed FAD, similar to what is done for the sets. This might need a modification of the IOTC logbook.

## Recommendations on data and statistics issuing from the IOTC Working Parties

52. The WPDCS revised the latest recommendations relating to data and statistics as issued by the IOTC Working Parties on Billfish, Ecosystems and Bycatch, Tropical Tunas and Fishing Capacity in 2009 and by the Working Party on Temperate Tunas (on Albacore) and Scientific Committee (on Neritic Tunas) in 2008. Overall, the WPDCS identified 96 recommendations.

53. The WPDCS noted that there is a significant level of overlapping, with the same recommendation sometimes issued by two or more working parties. In order to facilitate the work of the IOTC Scientific Committee, the WPDCS agreed that it was required to identify the main issues affecting the quality of the IOTC statistics and classify the recommendations existing under the agreed categories. Table 2 below shows the type of statistics identified by the WPDCS and the main problem areas under which the recommendations from the IOTC working parties have been classified:

Table 2. Type of statistics used by the WPDCS to classify the recommendations issuing from the IOTC technical bodies and main problem areas identified under each type.

Type of statistics	Problem areas
<i>Catch and effort statistics</i>	<p>Statistics not reported</p> <p>Statistics incomplete: Data not reported by IOTC standards (no logbooks, catches not by species and/or gear, low time-area resolution, etc. )</p> <p>Statistics inconsistent</p> <p>Lack of documentation: Coverage rate of the fisheries and/or levels of precision not reported</p> <p>Incomplete historic catch series</p>
<i>Size frequency statistics</i>	<p>Statistics not reported</p> <p>Statistics incomplete: Data not reported by IOTC standards (low sample sizes, insufficient time-area coverage, low time-area resolution, etc.)</p> <p>Lack of documentation: Coverage rate of the fisheries and/or levels of precision not reported</p>
<i>Bycatch and discard levels</i>	<p>Incomplete historic catch series</p> <p>Logbook/Observer programmes insufficient (e.g. not implemented or poor coverage)</p> <p>Lack of documentation: Coverage rate of the fisheries and/or levels of precision not reported</p>
<i>Biological data</i>	<p>Insufficient morphometry and conversion relationships</p> <p>Insufficient data on sex ratio</p>
<i>Fishing crafts statistics</i>	<p>Statistics not reported</p> <p>Statistics incomplete: incomplete ship identification, dimensions, levels of activity, target species, etc.</p>

54. Table 3, on the next page, represents a first attempt to classify the recommendations on data and statistics. It contains one section for each type of statistics, as defined in Table 2 above. Under each section, the recommendations are classified according to the major problem areas that pertain to each type of statistics, as defined in Table 2 above, and the type of fishery concerned, including surface fisheries, longline fisheries and coastal fisheries. These fisheries are defined in IOTC Resolution 08/01 which contains the IOTC mandatory data requirements. The fleets concerned are recorded under the corresponding fisheries, sorted by recommendation. A reference to the original recommendation has been added in each case and the complete set of recommendations is listed in Appendix V. Finally, the main species concerned by each recommendation are also recorded, where required.

55. The WPDCS noted that, in the future Table 3 should include also the following information:

- The year in which each recommendation was adopted
- The agency responsible for the implementation of the recommendation

- The implementation status of each recommendation, e.g. using four different codes to indicate no information, not addressed, work in progress, or fully implemented
- The importance of each recommendation or to which extent the statistics for the fishery or species concerned would improve if the recommendation concerned were fully implemented, in particular from the point of view of stock assessment

Table 3. Data and statistics recommendations issued by the IOTC Working Parties and Scientific Committee classified according to the criteria defined in Table 2 (previous page)		
<b>Recommendations</b>	<b>Fisheries concerned</b>	<b>Species</b>
<b>Catch-and-Effort statistics</b>		
<u>Statistics not reported:</u> Countries which do not to collect or provide catch and effort data are requested to implement data collection and/or report these data to the IOTC	<p><b>Coastal</b>  India (gillnet and hand lines), WPB2  Yemen, Comoros, Madagascar, WPTT1  Yemen, Madagascar, WPNe1  Mozambique, Myanmar, WPNe2  India, Indonesia, Iran and Pakistan (artisanal fisheries), WPNe4</p> <p><b>Longline</b>  India (longline fishery), WPB7  EC-Spain (longline), WPB11  India, Indonesia, Malaysia, Philippines, Oman (longliners), Taiwan,China (fresh-tuna longliners), WPTT7, WPTT8  India, WGTe1</p> <p><b>Surface (purse seine, gillnet, longline and gillnet combination)</b>  Iran (purse seiners) , WPTT7, WPTT8</p> <p><b>Sport fisheries</b>  All countries having sport fisheries, WPB5</p>	<p>Billfish</p> <p>Neritic tunas  Neritic tunas  Neritic tunas</p> <p>Billfish  Billfish</p> <p>logbooks  All species</p> <p>Most species</p> <p>Billfish</p>
<u>Statistics incomplete:</u> Countries which do not provide catch-and-effort data as per IOTC standards are requested to strengthen their data collection system in order to fulfil IOTC data requirements	<p><b>Coastal</b>  Maldives (pole-and-line and hand line fisheries), WPTT4  Sri Lanka, Indonesia, India, Oman, Thailand and Malaysia (species and gear breakdown), WPNe3</p> <p><b>Longline</b>  EC-Portugal (longliners), WPB13  Taiwan,China, Indonesia, Japan, China, Seychelles, Malaysia, Oman, South Korea and India (fresh-tuna and/or deep-freezing longliners), WPEB1  Indonesia and Malaysia (fresh tuna and/or deep-freezing longline, including those not based in Indonesia), WGTe3  Taiwan,China (fresh tuna longline) WGTe4  All countries, WPB6, WGTe5, WGTe6, WGTe7</p> <p><b>Surface (purse seine, gillnet, longline and gillnet combination)</b>  Indonesia, Iran, Maldives, Pakistan, and Sri Lanka (gillnet, pole-and-line and hand line), WPTT3  All countries, WPB6, WGTe5, WGTe6, WGTe7</p>	<p>Bigeye tuna  Neritic tunas</p>
<u>Lack of documentation:</u> Countries to increase sampling coverage to obtain acceptable levels of precision (CV to be initially set at less than 20%) in their catch and effort statistics, and to include	<p><b>Coastal</b>  Sri Lanka, India and Indonesia, WPB1, WPTT2, WPNe5  All members, WPB3, WPTT6</p>	

Table 3. Data and statistics recommendations issued by the IOTC Working Parties and Scientific Committee classified according to the criteria defined in Table 2 (previous page)		
<b>Recommendations</b>	<b>Fisheries concerned</b>	<b>Species</b>
levels of precision in their reports of catches and effort.	<b>Longline</b> Indonesia and Taiwan,China (fresh-tuna and deep-freezing longliners), WPB9, WGTe2 All members, WPB15, WPTT9	All species
	<b>Surface (purse seine, gillnets, longline and gillnet combination)</b> All members, WPB15, WPTT9	
<u>Incomplete historic catch series</u> : In order to produce the best possible set of catch statistics for their fisheries, countries are encouraged to revise their historical data series when possible	<b>Coastal</b> Sri Lanka, Pakistan, Iran, Indonesia, Yemen (Artisanal fisheries with large catches of pelagic sharks, WPEB3 India and Sri Lanka, WPTT5	
	<b>Longline</b> Korea, WPB8 Spain and Seychelles (longliners) , WPEB2	Swordfish
	<b>Surface (purse seine, gillnets, longline and gillnet combination)</b>	
<b>Size frequency statistics</b>		
<u>Statistics not reported</u> : Countries which do not to collect or provide size data are requested to implement sampling programmes and/or report their data to IOTC	<b>Coastal</b> Iran, India and Pakistan (gillnet and hand line), WPB2 Comoros, India, Indonesia, Pakistan, Yemen (gillnet, handline and troll), WPTT11, WPNe8 Pakistan, Indonesia, Thailand, Malaysia, Oman and Yemen (coastal purse seine, gillnet, handline and troll line), WPNe9	Billfish All species Neritic tunas Neritic tunas
	<b>Longline</b> India (longline), WPB7 Taiwan,China (fresh tuna longliners), WPB10 EC-Spain (longline), WPB11 EC-Portugal, EC-UK, Kenya, Guinea, Senegal and Tanzania (longline), WPB12 Taiwan,China (fresh tuna longliners), WPTT14, WGTe9 India, Indonesia, Malaysia, Philippines and Oman (longliners, including those based outside their flag states), WPTT15 Indonesia and Malaysia (longline), WGTe10 China, Philippines, Seychelles and South Korea (longline) , WGTe11	Billfish Billfish Billfish Billfish  Albacore Albacore
	<b>Surface (purse seine, gillnet, longline and gillnet combination)</b> Thailand and Iran (industrial purse seine) , WPTT13, WGTe8 Pakistan, Iran and Sri Lanka (gillnet), WPNe7	Neritic tunas
	<b>Coastal</b> Maldives (breakdown by gear and atoll), WPTT12	
<u>Statistics incomplete</u> : Countries which do not provide size data as per IOTC standards are requested to modify and/or strengthen		

Table 3. Data and statistics recommendations issued by the IOTC Working Parties and Scientific Committee classified according to the criteria defined in Table 2 (previous page)		
<b>Recommendations</b>	<b>Fisheries concerned</b>	<b>Species</b>
their data collection system (including from observers at sea) in order to fulfill IOTC standards. They are encouraged to include information about data source, type of measurement, actual sample sizes, sampling coverage and precision of the estimates by fishery and species, and to report them to the Secretariat routinely	Maldives and Sri Lanka (breakdown by gear) , WPNe10	
	<b>Longline</b> Japan (longline), WPB14, WGTe12 Seychelles, Iran, Japan and Thailand (longline), WPNe6 All countries, WGTe13, WPNe12	Billfishes, Temperate and neritic tunas
	<b>Surface (purse seine, gillnet, longline and gillnet combination)</b> EC, Seychelles, Iran, Japan and Thailand (observers), WPNe11 All countries, WGTe13, , WPNe12	Neritic tunas
<u>Lack of documentation:</u> The WPB to address a request to the next meeting of the WPDCS to establish the levels of precision that are adequate for catch and size data for billfish species caught by artisanal fisheries.	<b>All fleets</b> , WPB4, WPB17	
<b>Bycatch and Discard levels</b>		
<u>Incomplete historic catch series:</u> In order to produce the best possible set of catch and size statistics for their fisheries, countries are encouraged to revise and report all their historical data series when possible for all concerned species.	<b>Longline</b> Taiwan,China, Indonesia, Japan, South Korea (fresh-tuna and/or deep-freezing longliners), WPEB4 All fleets using sharks for their fins, WPEB9 All industrial fleets, Taiwan,China, Japan, Indonesia, Spain, Portugal and South Korea (Industrial longline fisheries operating south of 25°S) , WPEB17 All fleets using sharks for their fins, WPEB9 All industrial fleets, WPEB10, WPEB11, WPEB12	All discarded species, seabirds
	<b>Surface (purse seine, gillnet, longline and gillnet combination)</b> EC and the Seychelles, WPEB5 All industrial fleets, WPEB10	All discarded species, seabirds
<u>Logbook/Observer programmes insufficient:</u> Countries are encouraged to implement a logbook coverage and level of observers such as they can produce acceptable levels of precision (CV to be initially set at less than 20%) in the catch-and-effort statistics for the main species of sharks as well as for other discards	<b>All industrial fleets</b> , WPEB6, WPEB8	Sharks
Countries with observer programmes to analyse the data collected to estimate discards of billfish species and the precision of these estimates. The Secretariat to request countries to provide estimates of discard levels of billfish species, including levels of precision for these estimates.	<b>All fleets</b> , WPB16, WPTT10	

Table 3. Data and statistics recommendations issued by the IOTC Working Parties and Scientific Committee classified according to the criteria defined in Table 2 (previous page)		
<b>Recommendations</b>	<b>Fisheries concerned</b>	<b>Species</b>
Lack of documentation: Countries to increase sampling coverage to obtain acceptable levels of precision (CV to be initially set at less than 20%) in their catch and effort statistics, and to include levels of precision in their reports of catches and effort.	<b>Coastal</b> Yemen and Oman (Gillnet), WPEB21	
	<b>Longline</b> Taiwan, China, Japan, Indonesia and South Korea (Industrial longline fisheries operating south of 25°S); WPEB18	Seabird, sea turtles
	<b>Surface (purse seine, gillnet, longline and gillnet combination)</b> Spain, France, Seychelles, Iran, Japan and Thailand (purse seine), WPEB22 Pakistan, Sri Lanka, Iran (Gillnet / gillnet-longline), WPEB21	Sea turtles
<b>Biological data</b>		
<u>Insufficient morphometry and conversion relationships</u> : Countries to provide the basic data that would be used to establish length-weight keys, ratios of fin-to-body weight, non-standard measurements-fork length keys and processed weight-live weight keys for these species	<b>All fleets</b> , WPB18, WPTT16, WPEB13, WGTe14, WPNe13	All species
Countries are encouraged to run research on shark biology in order to identify shark species from fins, processed body parts, or DNA techniques, as well as the use of shark fins to derive length frequencies by species	<b>All fleets</b> , WPB20, WPEB7, WPEB14, WPEB15, WPEB16, WPTe16, WPTe15	Sharks, albacore, swordfish and marlins
<u>Insufficient data on sex ratio</u> : Countries having important fisheries for billfish to collect and provide sex ratio information by size and area.	<b>All fleets</b> catching billfishes, WPB19	Billfish
<b>Fishing craft statistics</b>		
<u>Statistics not reported</u> : The WPFC noted that improvements in certain areas are required in order to obtain more precise estimates of input fishing capacity on the present collection scheme	All countries having large- and medium-scale vessels (particularly India, Indonesia, Iran, Malaysia, Maldives, Pakistan, Sri Lanka), WPFC3	
<u>Statistics incomplete</u> : The WPFC agreed that to understand the total fishing pressure directed at tuna resources, estimates of fishing capacity needs a more precise estimate on the fishing fleets (specially for vessels less than 24 m), and a more detailed information of their characteristics (identification, gears used, levels of activity and target species) for each individual vessel for the fleets under consideration	All concerned countries, WPFC4, WPFC5, WPFC6	

56. The WPDCS noted that some of the recommendations existing have been in place for a number of years and are still to be addressed, agreeing on the need to promote the implementation of each recommendation and assess progress as much as possible. In this regard, the WPDCS considered that it was probably its role to monitor the implementation of the recommendations on data and statistics, agreeing to defer consideration of this matter to the IOTC Scientific Committee.
57. The WPDCS noted that the issues listed on paragraphs 16 and 17 of the WPDCS Report represent a first attempt to identify the main problems existing at present, recommending that these issues be addressed as a matter of priority.

## **6. MAIN ACTIVITIES OF THE IOTC-OFCE PROJECT**

58. The IOTC-OFCE Project reported the major activities during 2009. The Project carried out size data collection in Oman. A total of 16,022 fish (2,125 for yellowfin tuna, 11,130 for longtail tuna, and 2,767 for narrow-barred Spanish mackerel) have been measured from two sampling sites by the end of August 2009. The Project held an international workshop to assist in the implementation of a new logbook system for the tuna and tuna-like fisheries of Indonesia in May 18-20, 2009. The workshop concentrated its efforts in the design of logbook forms for the tuna fisheries in Indonesia, and devoting time to assessing the scope of the logbook programme. The workshop agreed that the implementation of three different logbook forms for the fisheries of Indonesia. Regarding historical information collection from Yemen, the Project continued to discuss on cooperation with the Ministry of Fish Wealth in the collection of historical data from the government and private sectors. Unfortunately, the Project could not be able to agree on a Memorandum of Understanding to establish cooperation with the Ministry last September. The Project will send a mission to Comoros in December 2009 to assess the current situation in Comoros concerning data collection and processing systems for tuna fisheries. Concerning future activities of the IOTC-OFCE Project in 2010, IOTC and OFCE have not yet discussed fully about the future program.
59. Scientists from Kenya, Maldives, Mauritius, Oman, Seychelles and Thailand thanked the IOTC-OFCE Project for the support provided to data collection and management concerning their fisheries.
60. Scientists from Kenya, Maldives and Thailand indicated that their administration had maintained the programmes initiated by the IOTC-OFCE Project and scientists from Oman indicated that arrangements were being made to maintain the length frequency sampling in 2010.
61. Full recognition was given by the WPDCS of the efficient work conducted in various countries under the IOTC-OFCE Project. The significant progress observed in the statistics of several of the concerned countries was noted as being a very positive factor. The WPDCS made a firm recommendation that this statistical support by the IOTC, targeting the improvement of tuna fisheries statistics in selected coastal countries, be maintained in the future using OFCE funding as in the past or alternative sources of funding. The WPDCS also recommended that countries that benefitted from activities under the IOTC-OFCE Project make every possible effort to maintain these activities once the IOTC-OFCE support is finalized.

## **7. DISTRIBUTION OF THE IOTC DATA AND DOCUMENTS**

### **Data for the IOTC Meetings and the general public**

62. The IOTC Secretariat informed the WPDCS about the procedures used at the Secretariat for the preparation and dissemination of data for the Commission, Scientific Committee and Working Parties, including maintenance of datasets at the IOTC website and distribution of information following specific requests from the Commission or the general public. During 2009 the Secretariat prepared datasets for the assessments of tropical tuna and billfish species and participated in a study to determine current levels of fishing capacity in the Indian Ocean.

### **Progress on the development of a new IOTC Data Summary**

63. The IOTC Secretariat informed the WPDCS of its plans to resume publication of the IOTC Data Summary. The Secretariat noted that it was its plan to extend the IOTC Data Summary to include new information, in particular maps of catches, effort, tagging data and other information. In addition to this, the Secretariat informed that the new IOTC website, currently under construction, will incorporate a front-end application that will contain querying and other services so as users can make full use of the information available. However, the Secretariat indicated that, due to the current lack of time and resources, it is unlikely that this work will be finalized within the next year.
64. The WPDCS thanked the Secretariat for this information, indicating that the preparation of a Data Summary shall be considered a priority as this type of documents are widely used. In this regard, the WPDCS agreed on the need for more resources to be devoted to the preparation of the Data Summary, recommending that the Secretariat assess the costs involved, including printing costs of a reasonable number of documents, and incorporates this in its next budget proposal for the consideration of the Commission.

### **Development of an IOTC Field Manual**

65. The Secretariat informed the WPDCS on the progress concerning the preparation of the IOTC Field Manual. Several sections of the manual have already been completed but were still in draft form. The Secretariat noted that it will require a significant amount of time to complete this work, something that is beyond its capacity for to the reasons referred to above.
66. In this regard, the Secretariat presented document IOTC-2009-WPDCS-INF02 “Draft Guidelines for the reporting of Fisheries Statistics to the IOTC” and a new set of forms that the Secretariat has produced to facilitate the reporting of statistics to the IOTC. The Secretariat indicated that it was its plan to finalize this work early next year.
67. The WPDCS thanked the Secretariat for preparing these Guidelines and the forms for the provision of data to the IOTC noting that this will help countries to put together the information to be provided, requesting the Secretariat to make this information available as soon as possible.

## **8. OTHER MATTERS**

### **Cooperation between IOTC and SWIOFP**

68. The Regional Executive Secretary of the South West Indian Ocean Fisheries Project gave a brief introduction on the project principally the programme for the pelagic component. This component will look at the small pelagic resources, harmonisation of sampling strategies, experimental longline survey looking at habitat and behaviour of large pelagics, acoustic tagging of fish around FADs, bycatch and discard in the longline and purse seine fisheries, and capacity building. The project also intends to produce data atlases for the pelagic resources would be done jointly with the IOTC and other partners.
69. The Secretariat brief the WPDCS on projects that incorporate components related directly related to data collection activities. The largest of such projects is from the Commission de l’Océan Indien, that includes, among its objectives, the strengthening of data collection in the countries of the western Indian Ocean. There is a possibility that the COI will partner again with IOTC, to execute this component and compliance-related activities of the project. In such case, the World Bank has indicated that they would be interested in co-financing these activities. These projects are in the final stages of planning and the activities are expected to begin before the end of 2010
70. The WPDCS noted the information and welcomed the involvement of the Secretariat in these activities, recommending that other avenues for similar cooperation be explored for the eastern Indian Ocean, most notable cooperation with the Bay of Bengal Large Marine Ecosystem project. It also recommended that a coordinating mechanisms be implemented among all initiatives, to avoid duplication of efforts.

### **IRD Atlas**

71. The WPDCS was informed that the IRD is now finalizing its project to publish an Indian Ocean tuna atlas, with 300 maps and figures, describing the history of the various tuna fisheries in the Indian Ocean. A similar tuna atlas has been recently published by IRD in cooperation with ICCAT on Atlantic tuna fisheries. This book has been prepared in full cooperation with the IOTC secretariat and it will be published with an IOTC logo and with a foreword written by Alejandro Anganuzzi. It will soon be available on a printed version and also on an interactive Web facility handled by IRD.

72. The WPDCS thanked the IRD for this initiative noting that other institutions in the region have produced or intend to produce similar products, in particular the OFCF and the Southwest Indian Ocean Fisheries Project (SWIOFP).

## **9. ADOPTION OF THE REPORT**

73. The report of the WPDCS was adopted on 27-11-2009.

## Appendix I

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## **Appendix II WPDCS Agenda**

- 1. PROGRESS REPORT OF THE SECRETARIAT ON DATA RELATED ISSUES**
- 2. MAIN DATA ISSUES OUTSTANDING, BY SPECIES GROUP**
- 3. UPDATE ON NATIONAL STATISTICAL SYSTEMS**
- 4. RECOMMENDATIONS TO IMPROVE THE QUALITY OF THE STATISTICS AT THE IOTC**
- 5. MAIN ACTIVITIES OF THE IOTC-OFCE PROJECT**
- 6. DISSEMINATION OF THE IOTC DATA AND DOCUMENTS**
- 7. OTHER BUSINESS**
- 8. ADOPTION OF THE REPORT**

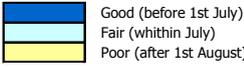
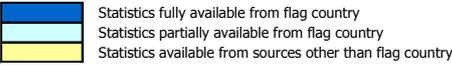
### Appendix III List of Documents

Document	Title
IOTC-2009-WPDCS-01	Draft agenda of the Working Party on Data Collection and Statistics
IOTC-2009- WPDCS-02	WPDCS List of documents
IOTC-2009- WPDCS-03	Note upon difficulties, uncertainties and potential bias in the multispecies sampling and data processing of large tunas (yellowfin, bigeye and albacore) sampled in free schools by the Indian Ocean and Atlantic purse seiners. <i>A. Fonteneau, A. Hervé, R. Pianet, A. Delgado de Molina and V. Nordstrom.</i>
IOTC-2009-WPDCS-04	Report on IOTC data collection and statistics. <i>M. Herrera, L. Pierre and J. Million</i>
IOTC-2009-WPDCS-05	Status of IOTC Databases for Albacore. <i>M. Herrera and L. Pierre</i>
IOTC-2009-WPDCS-06	Status of databases for Neritic Tunas. <i>M. Herrera and L. Pierre</i>
IOTC-2009-WPDCS-07	Systematic of Data Collection and Status of Thai Industrial Tuna Purse Seine in the Indian Ocean. <i>P. Nootmorn, S. Petchpirom and K. Maeroh</i>
IOTC-2009-WPDCS-08	Tunas Unloading in Phuket, Thailand During 1995-2009. <i>P. Nootmorn, S. Rodpradit, N. Nakosiri, T. Chaiyen and S. Panjarat.</i>
IOTC-2009-WPDCS-09	On the statistical uncertainties of the Indian Ocean drift net fisheries? The Iranian case. <i>A. Fonteneau</i>
IOTC-2009- WPDCS-INF01	Report of the International Working Group on tuna purse sein and baitboard catch species composition derived from observer and port sampler data. <i>ICCAT SCRS/09/131</i>
IOTC-2009- WPDCS-INF02	Guidelines for the reporting of fisheries statistics to the IOTC. <i>IOTC Secretariat</i>

## Appendix IV

### Availability of IOTC statistics for the year 2008

#### Key Tables i - vi

<b>Gear</b> Industrial purse seine (PS), industrial longline (LL) and artisanal gears (ART) <b>Catch</b> Recent catches amounting to (thousands of tonnes)	<b>NC</b> Nominal Catch <b>CE</b> Catch and Effort <b>SF</b> Size Frequency	
<b>TI</b> Timeliness 	<b>SO</b> Data Source 	

#### i – Tropical tunas (YFT, BET, SKJ)

Gear	Fleet	Availability of statistics					TI	SO	Comments
		Catch	Sps	NC	CE	SF			
P S	EUROPEAN COMMUNITY	204.9	SY						Effort from supply vessels/no.FADs set not available
	SEYCHELLES	56.1	SY						Effort from supply vessels/no.FADs set not available
	FRANCE-TERRITORIES	10.1	SY						Number of.FADs set by quarter not available
	THAILAND	9.4	SB						Effort from supply vessels/no.FADs set not available
	JAPAN	5.4	SY						Number of.FADs set by quarter not available
	IRAN I R	2.2	Y						Iran reported total yearly effort for 2008
	AUSTRALIA	Conf	S						Data confidential
	MALAYSIA	0.3	S						
	INDIA								Catch combined with that for other fleets
	INDONESIA								Catch combined with that for other fleets
L L	CHINA	5.9	B						
	TAIWAN, CHINA	41.0	BY						CE data does not cover the complete year 2008
	JAPAN	25.3	BY						
	INDONESIA	18.8	BY						Statistics not available for longliners not based in Indonesia
	INDIA	8.5	BY						
	OMAN	5.3	Y						
	SEYCHELLES	5.1	B						
	PHILIPPINES	2.7	B						
	MALAYSIA	2.5	BY						Statistics not available for longliners not based in Malaysia
	KOREA REP	1.5	Y						
	EUROPEAN COMMUNITY	1.1	BY						CE data not available from all EC vessels (EC-Spain)
	SOUTH AFRICA	0.3	BY						
	BELIZE	0.2	B						
	THAILAND	0.2	YB						
	MAURITIUS	0.1	Y						SF not available per 5 degrees area
	MADAGASCAR	0.0	Y						
	AUSTRALIA	Conf	B						Data confidential
	TANZANIA	0.0	Y						
KENYA	0.0	Y							
GUINEA	0.0	Y							
SENEGAL	0.0	Y							
NEI-FRESH <sup>2</sup>	12.5	YB							
NEI-FROZEN <sup>1</sup>	1.8	B							
O t h e r f l e e t s	SRI LANKA	112.2	SY						CE/SF not available per 5 degrees area
	MALDIVES	110.0	SY						CE not available per 5 degrees area
	IRAN I R	59.8	SY						
	INDONESIA	52.2	SY						
	INDIA	26.1	SY						
	OMAN	19.2	Y						SF data available for 2009 (MFW / IOTC-OFCE Sampling)
	YEMEN AR RP	15.9	Y						
	COMOROS	9.4	YS						
	PAKISTAN	9.2	SY						
	FRANCE-TERRITORIES	0.8	SY						
	EUROPEAN COMMUNITY	0.1	Y						
	TANZANIA	0.1	Y						
	MAURITIUS	0.1	Y						
	KENYA	0.1	Y						
	JORDAN	0.0	S						
	SOUTH AFRICA	0.0	Y						
	EAST TIMOR	0.0	Y						
	UK-TERRITORIES	0.0	Y						
AUSTRALIA	0.0	Y						CE confidential	
SEYCHELLES	0.0	Y							

**Sps** Yellowfin tuna (Y), bigeye tuna (B) and skipjack tuna (S)

**Gear** Industrial purse seine (PS), industrial longline (LL) or other gears (pole-and-line; small purse seines, large and small gillnets, and small lines)

**Conf** Catches confidential (included in NEI)

1 Freezing longliners whose catches are not reported by the flag states concerned

2 Fresh-tuna longliners whose catches are not reported by the flag states concerned

## ii – Temperate tunas (ALB, SBF)

Gear	Fleet	Availability of statistics					TI	SO	Comments
		Catch	Sps	NC	CE	SF			
P S	AUSTRALIA	4.4	S						CE confidential
	EUROPEAN COMMUNITY	1.3	A						Effort from supply vessels/no.FADs set not available
	SEYCHELLES	0.1	A						Effort from supply vessels/no.FADs set not available
	FRANCE-TERRITORIES	0.0	A						Number of.FADs set by quarter not available
L L	CHINA	0.2	A						
	TAIWAN,CHINA	15.3	A						CE data does not cover the complete year 2008
	JAPAN	7.1	AS						
	INDONESIA	3.4	AS						Statistics not available for longliners not based in Indonesia
	INDIA	2.1	A						
	EUROPEAN COMMUNITY	0.8	A						CE data not available from all EC vessels (EC-Spain)
	SEYCHELLES	0.8	A						
	KOREA REP	0.8	A						
	BELIZE	0.3	A						
	MALAYSIA	0.3	A						Statistics not available for longliners not based in Malaysia
	PHILIPPINES	0.1	A						
	TANZANIA	0.1	A						
	THAILAND	0.1	AS						
	SOUTH AFRICA	0.0	A						
	MADAGASCAR	0.0	A						
	MAURITIUS	0.0	A						SF not available per 5 degrees area
NEI-FROZEN <sup>1</sup>	0.5	A							
NEI-FRESH <sup>2</sup>	1.7	A							
O T H	INDIA	1.1	A						
	EUROPEAN COMMUNITY	0.0	A						
	SOUTH AFRICA	0.0	A						
	SRI LANKA	0.0	A						CE/SF not available per 5 degrees area

**Sps** Southern bluefin tuna (S) and albacore (A)  
**Gear** Industrial purse seine (PS), industrial longline (LL) or other gears (OTH: pole-and-line; small purse seines, large and small gillnets, and small lines)  
**1** Freezing longliners whose catches are not reported by the flag states concerned  
**2** Fresh-tuna longliners whose catches are not reported by the flag states concerned

## iii – Billfish (SWO, MARL, sFA, SSP)

Gear	Fleet	Availability of statistics					TI	SO	Comments
		Catch	Sps	NC	CE	SF			
L L	CHINA	0.6	S						
	TAIWAN,CHINA	9.1	SM						CE data does not cover the complete year 2008
	EUROPEAN COMMUNITY	6.6	S						CE/SF data not available from all EC vessels
	INDONESIA	3.5	S						Statistics not available for longliners not based in Indonesia
	JAPAN	3.2	S						
	INDIA	2.0	S						
	SEYCHELLES	0.9	S						
	GUINEA	0.8	S						
	OMAN	0.5	MF						
	TANZANIA	0.5	S						
	MALAYSIA	0.4	SM						Statistics not available for longliners not based in Malaysia
	PHILIPPINES	0.3	S						
	MAURITIUS	0.3	S						SF not available per 5 degrees area
	KOREA REP	0.3	M						
	SOUTH AFRICA	0.3	S						
	KENYA	0.2	S						
	AUSTRALIA	Conf	S						Data confidential
	SENEGAL	0.1	S						
	BELIZE	0.1	S						
THAILAND	0.1	S							
MADAGASCAR	0.0	S							
NEI-FROZEN <sup>1</sup>	0.5	S							
NEI-FRESH <sup>2</sup>	2.3	SM							
O t h e r f i l e t s	INDIA	6.1	FM						
	IRAN I R	5.6	F						
	SRI LANKA	5.3	FM						
	PAKISTAN	3.4	M						
	INDONESIA	1.7	FM						
	TANZANIA	0.9	M						
	YEMEN AR RP	0.6	F						
	OMAN	0.5	F						
	COMOROS	0.5	F						
	MAURITIUS	0.3	M						
	KENYA	0.2	F						
	UN ARAB EMIRATES	0.1	M						
	EUROPEAN COMMUNITY	0.0	M						
FRANCE-TERRITORIES	0.0	M							
UK-TERRITORIES	0.0	F							
SEYCHELLES	0.0	F							

**Sps** Swordfish (S), blue marlin and/or black marlin and/or striped marlin (M), Indo-Pacific sailfish (F) and short-billed spearfish (P)  
**Gear** Industrial purse seine (PS), industrial longline (LL) or other gears (pole-and-line; small purse seines, large and small gillnets, and small lines)  
**Conf** Catches confidential (included in NEI)  
**1** Freezing longliners whose catches are not reported by the flag states concerned  
**2** Fresh-tuna longliners whose catches are not reported by the flag states concerned

## iv – Neritic tunas (FRZ, LOT, KAW, COM, GUT)

Gear	Fleet	Availability of statistics					TI	SO	Comments
		Catch	Sps	NC	CE	SF			
P S	IRAN I R	2.7	L						Iran reported total yearly effort for 2008
	THAILAND	0.2							CE not fully by species; refers mostly to discards
	SEYCHELLES	0.2	F						CE/SF Statistics incomplete; refers mostly to discards
	EUROPEAN COMMUNITY	0.1	F						CE/SF Statistics incomplete; refers mostly to discards
	INDIA								Catch combined with that for other fleets
	INDONESIA								Catch combined with that for other fleets
L L	EUROPEAN COMMUNITY	0.0	W						Refers mostly to discards
	CHINA	0.0							Refers mostly to discards
	TAIWAN,CHINA	0.0	W						Refers mostly to discards
	MADAGASCAR	0.0	W						Refers mostly to discards
	INDIA	0.0	W						Refers mostly to discards
	TANZANIA	0.0	W						Refers mostly to discards
	SOUTH AFRICA	0.0	W						Refers mostly to discards
NEI-FRESH <sup>2</sup>	0.0	W						Refers mostly to discards	
O t h e r f l e e t s	INDONESIA	117.6	KL						
	INDIA	105.0	CK						
	IRAN I R	73.4	KL						
	THAILAND	18.8	KL						
	MALAYSIA	18.6	KL						
	PAKISTAN	14.5	CL						
	OMAN	12.8	LC						
	MADAGASCAR	12.0	C						
	YEMEN AR RP	11.2	LK						
	SAUDI ARABIA	9.0	CK						
	UN ARAB EMIRATES	7.7	CK						
	SRI LANKA	7.4	CK						CE/SF not available per 5 degrees area
	MALDIVES	6.2	K						CE not available per 5 degrees area
	QATAR	1.8	C						
	KENYA	1.2	CK						
	EGYPT	1.0	KC						NC not by species or gear
	TANZANIA	1.0	C						
	COMOROS	0.8	C						
	ERITREA	0.4	C						
	AUSTRALIA	0.3	C						CE confidential
	BAHRAIN	0.2	C						
	SEYCHELLES	0.1	K						
	KUWAIT	0.1	C						
BANGLADESH	0.1								
DJIBOUTI	0.1								
JORDAN	0.1								
EUROPEAN COMMUNITY	0.0	K							
SUDAN	0.0	W							
SOUTH AFRICA	0.0	C						CE not by species	
UK-TERRITORIES	0.0	W							

**Sps** Longtail tuna (L), frigate tuna and/or bullet tuna (F), kawakawa (K), narrow-barred Spanish mackerel (C), Indo-Pacific king mackerel (G)

**Gear** Industrial purse seine (PS), industrial longline (LL) or other gears (pole-and-line; small purse seines, large and small gillnets, and small lines)

**1** Freezing longliners whose catches are not reported by the flag states concerned

**2** Fresh-tuna longliners whose catches are not reported by the flag states concerned

v – Sharks seabirds and sea turtles

Gear	Fleet	Species					Comments
		Sharks			Sea Birds	Sea Turtles	
		NC	CE	SF			
P S	EUROPEAN COMMUNITY				n/a		
	SEYCHELLES				n/a		NC catches presumed to be low
	THAILAND				n/a		NC catches presumed to be low
	IRAN I R				n/a		NC catches presumed to be low
	AUSTRALIA	n/a			n/a	n/a	
	FRANCE-TERRITORIES				n/a		
	JAPAN				n/a		NC catches presumed to be low
	MALAYSIA				n/a		NC refers to retained catches and is not by species
	INDIA				n/a		NC catches presumed to be low
	INDONESIA				n/a		NC catches presumed to be low
L L	CHINA						NC/CE refer to retained catches and is not by species
	TAIWAN, CHINA						NC/CE refer to retained catches and is not by species
	JAPAN						
	INDONESIA						NC refers to retained catches and is not by species
	EUROPEAN COMMUNITY						CE not available for all fleets (EC-Spain)
	SEYCHELLES						NC/CE refer to retained catches and is not by species
	KOREA REP						NC/CE refer to retained catches and is not by species
	OMAN						
	PHILIPPINES						
	MALAYSIA						NC/CE refer to retained catches and is not by species
	BELIZE						NC/CE refer to retained catches and is not by species
	MAURITIUS						NC/CE refer to retained catches and is not by species
	GUINEA						
	THAILAND						
	SOUTH AFRICA						
	AUSTRALIA						
	KENYA						
	SENEGAL						
	INDIA						
	MADAGASCAR						
NEI-FROZEN <sup>1</sup>							
NEI-FRESH <sup>2</sup>							
A r t i s a n a l	IRAN I R				n/a		NC catches presumed to be high
	MALDIVES				n/a		NC catches presumed to be low
	INDONESIA				n/a		NC catches presumed to be high
	INDIA				n/a		NC catches presumed to be high
	SRI LANKA				?		NC/CE Not by species
	OMAN				n/a		NC Not by species
	YEMEN AR RP				n/a		NC catches presumed to be high
	PAKISTAN				n/a		NC catches presumed to be high
	MALAYSIA				n/a		NC/CE Not by species
	THAILAND				n/a		NC catches presumed to be low
	MADAGASCAR				n/a		NC catch levels unknown
	COMOROS				n/a		NC catch levels unknown
	UN ARAB EMIRATES				n/a		NC catches presumed to be low
	SAUDI ARABIA				n/a		NC catch levels unknown
	QATAR				n/a		NC catches presumed to be low
	TANZANIA				n/a		NC catches presumed to be low
	KENYA				n/a		NC catches presumed to be low
	EGYPT				n/a		NC catches presumed to be low
	FRANCE-TERRITORIES				n/a		NC catch levels unknown
	SEYCHELLES				n/a		NC/CE Not by species
	EUROPEAN COMMUNITY				n/a		NC catches presumed to be low
	MAURITIUS				n/a		NC catches presumed to be low
	AUSTRALIA						
	KUWAIT				n/a		NC catches presumed to be low
	ERITREA				n/a		NC catches presumed to be low
	JORDAN				n/a		NC catches presumed to be low
	BANGLADESH				n/a		NC catches presumed to be low
	BAHRAIN				n/a		NC catches presumed to be low
	DJIBOUTI				n/a		NC catches presumed to be low
	SUDAN				n/a		NC catches presumed to be low
UK-TERRITORIES				n/a		NC/CE Not by species	
SOUTH AFRICA				n/a			
EAST TIMOR				n/a		NC catches presumed to be low	

Catches of seabirds are not likely to occur (n/a) or may occur (?)

- 1 Freezing longliners whose catches are not reported by the flag states concerned
- 2 Fresh-tuna longliners whose catches are not reported by the flag states concerned

## vi – Fishing craft statistics and list of active vessels

<b>Gear</b>	Industrial purse seine (PS), industrial longline (LL) and artisanal gears (ART)	<b>Availability</b>		Fully available
<b>Catch</b>	Recent catches amounting to (thousands of tonnes)			Partially available
<b>Craft</b>	Number of craft operated (2006) (blank if unknown)	<b>SO</b> Data Source		Statistics fully available from flag country
<b>FC</b>	Fishing craft			Statistics partially available from flag country
<b>AV</b>	List of active vessels			Statistics available from sources other than flag country

Gear	Fleet	Availability				SO	Comments
		Catch	Craft	FC	AV		
P S	EUROPEAN COMMUNITY	206.2	35				
	SEYCHELLES	56.4	12				
	FRANCE-TERRITORIES	10.1	2				
	THAILAND	9.6	4				
	JAPAN	5.4	5				
	AUSTRALIA	5.3	10				
	IRAN I R	4.9	8				
	MALAYSIA	0.3	1				
	INDIA		5				
	INDONESIA		3				
SUPPLY VESSELS-NEI		11				Vessels Authorized (activity presumed); catch aggregated to other Vessels Authorized (activity presumed); catch aggregated to other Names and characteristics of supply vessels not fully available	
L L	CHINA	6.6	69				
	TAIWAN,CHINA	65.4	783				
	JAPAN	35.7	207				
	INDONESIA	25.6	907				Data refers to authorized vessels (presumed to be active)
	INDIA	12.6	133				Data refers to authorized vessels (presumed to be active)
	EUROPEAN COMMUNITY	8.5	76				
	SEYCHELLES	6.8	34				
	OMAN	5.8	36				
	MALAYSIA	3.3	69				Catch data only available for 28 vessels
	PHILIPPINES	3.2	17				
	KOREA REP	2.6	24				
	GUINEA	0.9	3				Data refers to authorized vessels (presumed to be active)
	BELIZE	0.6	9				
	SOUTH AFRICA	0.6	20				Data refers to authorized vessels (presumed to be active)
	TANZANIA	0.5	3				
	MAURITIUS	0.4	8				
	THAILAND	0.3	6				Catch data only available for 2 vessels
	KENYA	0.2	2				
	AUSTRALIA	0.2	5				
	MADAGASCAR	0.1	2				
SENEGAL	0.1	3				Data refers to authorized vessels (presumed to be active)	
SRI LANKA	0.0	2				Personnal communication	
NEI-FRESH <sup>2</sup>	16.5	23				Number of vessels uncertain (reports from third parties)	
NEI-FROZEN <sup>1</sup>	2.9	14				Number of vessels uncertain (reports from third parties)	
O t h e r  O f f s h o r e  &  C o a s t a l	INDONESIA	171.6					Catch combined with industrial purse seine catch (3 vessels)
	IRAN I R	138.8	6,759				Catch combined for offshore and coastal vessels (752 offshore crafts)
	INDIA	138.2					Catch combined with industrial purse seine catch (5 vessels)
	SRI LANKA	124.9	41,733				Catch combined for offshore and coastal vessels (2809 offshore crafts)
	MALDIVES	116.2	965				Includes large scale baitboats; catches combined
	OMAN	32.5	14,794				
	YEMEN AR RP	27.7					
	PAKISTAN	27.1					
	THAILAND	18.8	870				Catch combined for offshore and coastal vessels (2308 offshore crafts)
	MALAYSIA	18.6					
	MADAGASCAR	12.0					
	COMOROS	10.7					
	SAUDI ARABIA	9.0					
	UN ARAB EMIRATES	7.9					
	TANZANIA	2.0					
	QATAR	1.8					
	KENYA	1.5					
	EGYPT	1.0					
	FRANCE-TERRITORIES	0.8					
	ERITREA	0.4					
	MAURITIUS	0.4					
	AUSTRALIA	0.3	56				Does not include vessels operating between 140 East and 150 East
	EUROPEAN COMMUNITY	0.2					
	BAHRAIN	0.2	63				
	SEYCHELLES	0.1					
	KUWAIT	0.1					
	JORDAN	0.1					
	BANGLADESH	0.1					
	DJIBOUTI	0.1					
	SUDAN	0.0					
SOUTH AFRICA	0.0	15					
UK-TERRITORIES	0.0	47					
EAST TIMOR	0.0						

1 Freezing longliners whose catches are not reported by the flag states concerned

2 Fresh-tuna longliners whose catches are not reported by the flag states concerned

## Appendix V

### Compilation of Recommendations on Statistics from the Working Parties 2008/2009 (96 recs)

#### 1. WP Billfishes (WPB), IOTC-2009-WPB-R[E]

- WPB1 Sri Lanka to increase sampling coverage to 2005-06 levels in order to improve its collection and reporting of species and gear information.
- WPB2 Iran, India and Pakistan to provide catch and effort and size data for their artisanal fisheries, notably gillnet and hand line, including catches of billfish disaggregated by species.
- WPB3 Members to increase sampling coverage to obtain acceptable levels of precision (CV to be initially set at less than 20%) in their catch and effort statistics. The Secretariat to request countries to include levels of precision in their reports of catches and effort for billfish species.
- WPB4 The WPB to address a request to the next meeting of the WPDCS to establish the levels of precision that are adequate for catch and size data for billfish species caught by artisanal fisheries.
- WPB5 The Secretariat to coordinate catch-and-effort and size data collection from major sports fishing bodies in the Indian Ocean and analysis of the information retrieved (CPUE and size data).
- WPB6 Members having industrial fisheries for swordfish, marlins and sailfish to use the standard IOTC logbooks to collect catch-and-effort data by species. This should include tools to assist fishers and data collectors to correctly identify billfish species. The Secretariat to urge countries that do not collect logbook data as per the IOTC standards to implement the IOTC standard logbooks as soon as possible.
- WPB7 India to report catch-and-effort and size data for billfish species for its commercial longline fishery. The WPB to address this issue to the IOTC SC.
- WPB8 The Republic of Korea to revise its catch-and-effort data series as soon as possible; the WPB to address this issue to the IOTC SC.
- WPB9 The IOTC Secretariat to follow-up on the logbook programmes initiated by Indonesia and Taiwan,China for the collection of catch-and-effort data from their fresh tuna longliner fleets.
- WPB10 Taiwan,China to collect and provide size data from its fresh tuna longliners.
- WPB11 The EC-Spain longline to provide catches and size data of marlins and sailfish by time and area strata. The WPB to address this issue to the IOTC SC.
- WPB12 The EC-Portugal, EC-UK, Kenya, Guinea, Senegal and Tanzania to collect and report size data for billfish species for its longline fleets.
- WPB13 The Secretariat to request EC-Portugal to provide more information on the activities of longliners under its flag, especially concerning the limited fishing area covered by year.
- WPB14 Japan to increase size sampling coverage (to cover a minimum of 10% of the catch (in number) by quarter by 10° latitude - 20° longitude area) from its longline fleet. The WPB to address this issue to the IOTC SC.
- WPB15 Members ensuring that logbook coverage is appropriate to produce acceptable levels of precision (CV to be initially set at less than 20%) in their catch and effort statistics for billfish species. The Secretariat to request countries to include levels of precision in their reports of catches and effort for billfish species.
- WPB16 Members with observer programmes to analyse the data collected to estimate discards of billfish species and the precision of these estimates. The Secretariat to request countries to provide estimates of discard levels of billfish species, including levels of precision for these estimates.
- WPB17 The WPB to address a request to the next meeting of the WPDCS to establish the levels of precision that are adequate for catches and size data of billfish by species, fishery and time-area strata.
- WPB18 Conversion relationships: The Secretariat to request CPC's having important fisheries for billfish to collect and provide the basic data that would be used to establish length-age keys and non-standard measurements to standard measurements keys (eg. length-weight keys, processed weight-live weight keys, non-standard length measurements-fork length measurements) for billfish species, by sex and area.

- WPB19 The Secretariat to request CPC's having important fisheries for billfish to collect and provide sex ratio information by size and area.
- WPB20 Japan and Taiwan,China to analyze the size samples collected from their longline fisheries for swordfish and marlins in order to verify if the length frequencies derived from such samples are representative of their fisheries.

## 2. WP on Ecosystems and By-catches (WPEB), IOTC-2009-WPEB-R[E]

- WPEB1 Historical catch and effort information for fresh-tuna and/or deep-freezing longliners (Taiwan,China, Indonesia, Japan, China, Seychelles, Malaysia, Oman, South Korea and India).
- WPEB2 Historical catch and effort information for longliners targeting swordfish (Spain, Seychelles)
- WPEB3 Historical catch and effort information for artisanal fisheries with large catches of pelagic sharks (Sri Lanka, Pakistan, Iran, Indonesia, Yemen)
- WPEB3 Historical catch and effort information for artisanal fisheries with large catches of pelagic sharks (Sri Lanka, Pakistan, Iran, Indonesia, Yemen)
- WPEB4 Historical catch level estimates by species and year for fresh-tuna and/or deep-freezing longliners (Taiwan,China, Indonesia, Japan, South Korea)
- WPEB5 Historical catch level estimates by species and year for Purse seine (EC and the Seychelles)
- WPEB6 Logbook coverage set to produce acceptable levels of precision (CV to be initially set at less than 20%) in the catch-and-effort statistics for the main species of sharks (All industrial fleets)
- WPEB7 Research on how to identify shark species from fins and processed body parts (All fleets)
- WPEB8 Implementing levels of observer coverage that will produce acceptable levels of precision in estimates of discards (All industrial fleets)
- WPEB9 Estimating levels of discards for sharks, at least by large species groups or if possible, by species (All fleets using sharks for their fins)
- WPEB10 Estimates of historical discard levels for sharks by species and year (All industrial fleets)
- WPEB11 Collecting and reporting size frequency information for the main shark species caught by their fisheries, including all historical data available (All industrial fleets, notably longline fleets and Industrial fleets monitored through observers)
- WPEB12 Observers collecting size frequency data for main shark species, including discards (All industrial fleets)
- WPEB13 Collecting data that can be used to derive length-weight keys, ratios of fin-to-body weight, non-standard measurements-fork length keys and processed weight-live weight keys (All fleets)
- WPEB14 Identification of sharks through fins validated by using DNA techniques (All fleets)
- WPEB15 The use of shark fins to derive catch estimates in weight by species/species group and fishery (All fleets).
- WPEB16 The use of shark fins to derive length frequencies by species (All fleets)
- WPEB17 Provision of historical data on incidental catches of seabirds, by species and fishing area, indicating the type of mitigation measure/s used in each case (Industrial longline fisheries operating south of 25°S: Taiwan,China, Japan, Indonesia, Spain, Portugal and South Korea)
- WPEB18 Detailed estimation of seabird bycatch, by species and year, including the precision of such estimates (Industrial longline fisheries operating south of 25°S: Taiwan,China, Japan, Indonesia and South Korea)
- WPEB19 Research on the effect of seabird bycatch mitigation measures. Industrial longline fisheries operating south of 25°S (Taiwan,China, Japan, Indonesia and South Korea)
- WPEB20 Collect data on incidental catches of sea turtles, by species and fishing area, including the condition of the marine turtle at release (Countries having industrial longline fisheries: Taiwan,China, Indonesia and Japan)
- WPEB21 Collect data on incidental catches of sea turtles, by species and fishing area, including the condition of the marine turtle at release (Gillnet / gillnet-longline: Gillnet fisheries operating in the Arabian Sea (Pakistan, Sri Lanka and Iran) and the gillnet/longline fisheries of Sri Lanka, Yemen and Oman)
- WPEB22 Collect data on incidental catches of sea turtles, by species and fishing area, including the condition of the marine turtle at release (Industrial purse seine fleets: Spain, France, Seychelles, Iran, Japan and Thailand)

- WPEB23 Research on interactions between Fish Aggregating Devices (FADs) and marine turtles, including mortality rates by species, area and type of FAD used (Industrial purse seine fleets: Spain, France)
- WPEB24 Research on marine turtle bycatch mitigation measures for longline fisheries, e.g. examination of setting techniques and hook types (Countries having industrial longline fisheries: Taiwan,China, Indonesia and Japan)
- WPEB25 Research on marine turtle bycatch monitoring and mitigation measures for gillnet fisheries (Countries having gillnet fisheries: Iran, Pakistan and Sri Lanka)

### 3. WP on Tropical Tunas (WPTT), IOTC-2009-WPTT-R[E]

- WPTT1 Yemen, Comoros and Madagascar implementing fisheries statistical collection and reporting systems.
- WPTT2 Sri Lanka to increase sampling coverage to 2005-06 levels in order to improve estimates of catches for its fisheries, especially species and gear breakdown.
- WPTT3 Indonesia, Iran, Maldives, Pakistan, and Sri Lanka providing catch-and-effort data as per IOTC standards for their artisanal fisheries, notably gillnet, pole-and-line and hand line.
- WPTT4 Maldives modifying its data collection system to allow for the catches of bigeye tuna to be estimated, especially for its pole-and-line and hand line fisheries.
- WPTT5 Fisheries data collection agencies in India and Sri Lanka collaborating to produce the best possible set of catch statistics for their fisheries, revising their historical data series basing on the results of this analysis.
- WPTT6 Countries to increase sampling coverage to obtain acceptable levels of precision (CV to be initially set at less than 20%) in their catch-and-effort statistics and to report this information to the Secretariat, routinely.
- WPTT7 Countries having industrial fisheries for tropical tunas to use the standard IOTC logbooks to collect catch and effort data by species (Longliners from India, Indonesia, Malaysia, Philippines, and Oman, including those vessels based outside their flag states, Fresh-tuna longliners from Taiwan,China, Industrial purse seiners from Iran)
- WPTT8 The above logbooks should include tools to assist fishers and data collectors to correctly identify tropical tunas, especially juvenile tunas.
- WPTT9 Countries ensuring that logbook coverage is appropriate to produce acceptable levels of precision (CV to be initially set at less than 20%) in their catch-and-effort statistics and to report this information to the Secretariat, routinely.
- WPTT10 Countries with observer programmes to analyse the data collected to estimate discards of tropical tuna species and the precision of these estimates, and to report this information to the Secretariat, routinely.
- WPTT11 Comoros, India, Indonesia, Pakistan, and Yemen collecting and providing size data for tropical tunas taken by artisanal fisheries, especially gillnet, handline and troll fisheries.
- WPTT12 Maldives providing size frequency data by atoll and gear
- WPTT13 Thailand and Iran collecting and providing size data for their industrial purse seine fleets
- WPTT14 Taiwan,China collecting and providing size data from their fresh tuna longliners.
- WPTT15 India, Indonesia, Malaysia, Philippines and Oman collecting and providing size data for their longline vessels, including those based outside their flag states
- WPTT16 Conversion relationships: Countries catching significant amounts of tropical tunas collecting, preferably through observer programmes, and providing the basic data that would be used to establish length-weight keys, non-standard measurements-fork length keys, processed weight-live weight keys for these species.

### 4. WP Temperate Tunas (WPTe), IOTC-2008-WPTe-R[E]

- WPTe1 India reporting catches for its commercial longline fleet.
- WPTe2 Indonesia increasing sampling coverage on by-catch unloaded by fresh-tuna and deep-freezing longliners operating under its flag.
- WPTe3 Indonesia and Malaysia collecting catch-and-effort information for their fresh tuna and/or deep-freezing longline fleets, including those not based in Indonesia.
- WPTe4 Taiwan,China collecting and providing catch-and-effort data for their fresh tuna longline fleets.

- WPTe5 Countries having industrial fleets ensuring that logbook coverage is appropriate to produce acceptable levels of precision in their catch and effort statistics.
- WPTe6 Countries having industrial fleets implementing or increasing coverage of existing Vessel Monitoring Systems in order to be able to validate data collected through logbooks.
- WPTe7 Countries having industrial fleets providing information on the activities of vessels presumed to be from non-reporting fleets.
- WPTe8 Thailand and Iran to collect and provide size data for their industrial purse seine fleets
- WPTe9 Taiwan,China collecting and providing size data from their fresh tuna longliners.
- WPTe10 Indonesia and Malaysia collecting and providing size data for their longline vessels based in other countries
- WPTe11 China, Philippines, Seychelles and South Korea providing size data from their longline fleets.
- WPTe12 Japan increasing size sampling coverage from its longline fleet.
- WPTe13 Countries catching significant amounts of temperate tunas reviewing their existing sampling schemes to ascertain that the data collected are representative of their fisheries.
- WPTe14 Conversion relationships: Countries catching significant amounts of albacore providing the basic data that would be used to establish length-weight keys, nonstandard measurements-fork length keys, processed weight-live weight keys and length-age keys for these species.
- WPTe15 Countries collecting biological information on albacore caught in their fisheries, preferably through observer programmes, and providing this information (including the raw data) to the Secretariat.
- WPTe16 Countries conducting studies on growth of Albacore in the Indian Ocean.

#### **5. WP on Neritic Tunas (WPNe), IOTC-2009-WPDCS-06 Status of databases for neritic tunas**

- WPNe1 Yemen and Madagascar implementing fisheries statistical collection and reporting systems.
- WPNe2 Mozambique and Myanmar providing complete series of catches and effort for fisheries catching neritic tuna species.
- WPNe3 Sri Lanka, Indonesia, India, Oman, Thailand and Malaysia strengthening their data collection systems to improving species and gear breakdown.
- WPNe4 India, Indonesia, Iran and Pakistan providing catch-and-effort data for its artisanal fleets.
- WPNe5 Countries, in particular India and Indonesia, to increase sampling coverage to obtain acceptable levels of precision (CV to be initially set at less than 20%) in their catch-and-effort statistics and to report this information to the Secretariat, routinely.
- WPNe6 Countries having industrial purse seiners, notably Seychelles, Iran, Japan and Thailand, increasing sampling coverage, through observers and/or other means, to obtain acceptable levels of precision in their catch-and-effort statistics (CV to be initially set at less than 20%), including estimates of the amounts of neritic tunas discarded.
- WPNe7 Pakistan, Iran and Sri Lanka to provide catch-and-effort data for their oceanic gillnet fisheries.
- WPNe8 India providing their size data available for neritic tunas.
- WPNe9 Pakistan, Indonesia, Thailand, Malaysia, Oman and Yemen to collect and provide size data for neritic tunas taken by artisanal fisheries, especially coastal purse seine, gillnet, handline and troll line fisheries.
- WPNe10 Maldives and Sri Lanka to provide size frequency data by gear.
- WPNe11 Countries having industrial purse seiners, notably the EC, Seychelles, Iran, Japan and Thailand, to collect, through observers and/or other means, and provide the Secretariat with size data for neritic tunas taken by their fisheries, including the sizes of neritic tunas discarded and precision of these estimates.
- WPNe12 Countries reporting size data to the Secretariat to include information about data source (e.g. data from port sampling, observer programme, etc.), type of measurement, actual sample sizes, sampling coverage and precision of the estimates by fishery and species, routinely.
- WPNe13 Conversion relationships: Countries catching significant amounts of neritic tunas providing the basic data that would be used to establish length-weight keys, non-standard measurements-fork length keys and processed weight-live weight keys for these species

WPNe13 Conversion relationships: Countries catching significant amounts of neritic tunas providing the basic data that would be used to establish length-weight keys, non-standard measurements-fork length keys and processed weight-live weight keys for these species

#### **6. WP on Fishing Capacity (WPFC), IOTC-2009-WPFC-R[E]**

- WPFC1 The WPFC agreed that ICCAT had undertaken several sensible initiatives to address the issue of capacity estimation, and that this could be the model followed in the IOTC with modifications to address issues specific to the IOTC
- WPFC2 The WPFC agreed that input-based measures of fishing capacity are far more useful for management purposes (paragraph 15).
- WPFC3 The WPFC noted that improvements in certain areas are required in order to obtain more precise estimates of input fishing capacity, in particular (paragraph 30):
- Pakistan, Sri Lanka and Maldives providing lists of active vessels, including information about medium-scale vessels (<24m) that operate outside its EEZ;
  - India providing a complete list of active vessels under its flag;
  - Indonesia identifying which of its medium scale vessels (<24m) operate outside its EEZ;
  - Indonesia to verify vessel-tonnage measurements and to provide length measurements for all of its vessels;
  - All countries having large- and medium-scale vessels to provide separate catches by vessel size class, in particular Indonesia, Iran, India and Malaysia.
- WPFC4 The WPFC agreed that to understand the total fishing pressure directed at tuna resources, estimates of fishing capacity should include consideration of the fishing boats under 24 m which operated exclusively inside the EEZ of participating countries fleets (paragraph 31).
- WPFC5 The WPFC agreed that the use of only two vessel-length categories to assess input capacity, less than 24m and 24m or greater, may be insufficient recommending that the use of narrower vessel length categories be assessed for future estimates of input capacity (paragraph 32).
- WPFC6 The WPFC agreed that, in order for the estimates of fishing capacity in the IOTC Area to be useful in a management context, the following information is required. Detailed information on the fleets for which fishing capacity is to be estimated, in particular vessel unique identification, vessel length and gross tonnage, levels of activity and gear used for each individual vessel for the fleets under consideration, and target species (Paragraph 34).