Report of the 11th Session of the IOTC Working Party on Data Collection and Statistics

Montpellier, France, 22 October 2015

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ACRONYMS

ALB	Albacore
ABNJ	Areas Beyond National Jurisdiction
BET	Bigeye tuna
BOBLME	Bay of Bengal Large Marine Ecosystems Project
CMM	Conservation and Management Measure (of the IOTC; Resolutions and Recommendations)
CPCs	Contracting parties and cooperating non-contracting parties of the IOTC
DGCF	Directorate General of Capture Fisheries of Indonesia
DFAR	Department of Fisheries and Aquatic Resources of Sri Lanka
EEZ	Exclusive Economic Zone
EU	European Union
FAD	Fish aggregating device
FMA	Fisheries Management Area
GEF	Global Environmental Facility
ICCAT	International Commission for the Conservation of Atlantic Tunas
IOC	Indian Ocean Commission
IOTC	Indian Ocean Tuna Commission
I.R. Iran	Islamic Republic of Iran
ISSF	International Seafood Sustainability Foundation
IFDCS	Iran Fishery Data Collection System
NARA	National Aquatic Resources Research and Development Agency of Sri Lanka
OFCF	Overseas Fishery Cooperation Foundation of Japan
RFMO	Regional Fisheries Management Organization
ROS	Regional Observer Scheme
Taiwan,China	Taiwan Province of China
USTA	*Unité Statistique Thonière d'Antsiranana*
VMS	Vessel Monitoring System
WPB	Working Party on Billfish of the IOTC
WPDCS	Working Party on Data Collection and Statistics of the IOTC
WPEB	Working Party on Ecosystems and Bycatch of the IOTC
WTmT	Working Party on Temperate Tunas of the IOTC
WPNE	Working Party on Neritic Tunas of the IOTC
WPTT	Working Party on Tropical Tunas of the IOTC
WWF	World Wide Fund for Nature
YFT	Yellowfin tuna

STANDARDISATION OF IOTC WORKING PARTY AND SCIENTIFIC COMMITTEE REPORT TERMINOLOGY

SC16.07 (para. 23) The SC **ADOPTED** the reporting terminology contained in Appendix IV and **RECOMMENDED** that the Commission considers adopting the standardised IOTC Report terminology, to further improve the clarity of information sharing from, and among its subsidiary bodies.

HOW TO INTERPRET TERMINOLOGY CONTAINED IN THIS REPORT

Level 1: ***From a subsidiary body of the Commission to the next level in the structure of the Commission:***
RECOMMENDED, RECOMMENDATION: Any conclusion or request for an action to be undertaken, from a subsidiary body of the Commission (Committee or Working Party), which is to be formally provided to the next level in the structure of the Commission for its consideration/endorsement (e.g. from a Working Party to the Scientific Committee; from a Committee to the Commission). The intention is that the higher body will consider the recommended action for endorsement under its own mandate, if the subsidiary body does not already have the required mandate. Ideally this should be task specific and contain a timeframe for completion.

Level 2: ***From a subsidiary body of the Commission to a CPC, the IOTC Secretariat, or other body (not the Commission) to carry out a specified task:***
REQUESTED: This term should only be used by a subsidiary body of the Commission if it does not wish to have the request formally adopted/endorsed by the next level in the structure of the Commission. For example, if a Committee wishes to seek additional input from a CPC on a particular topic, but does not wish to formalize the request beyond the mandate of the Committee, it may request that a set action be undertaken. Ideally this should be task specific and contain a timeframe for the completion.

Level 3: ***General terms to be used for consistency:***
AGREED: Any point of discussion from a meeting which the IOTC body considers to be an agreed course of action covered by its mandate, which has not already been dealt with under Level 1 or level 2 above; a general point of agreement among delegations/participants of a meeting which does not need to be considered/adopted by the next level in the Commission's structure.
NOTED/NOTING: Any point of discussion from a meeting which the IOTC body considers to be important enough to record in a meeting report for future reference.

Any other term: Any other term may be used in addition to the Level 3 terms to highlight to the reader of and IOTC report, the importance of the relevant paragraph. However, other terms used are considered for explanatory/informational purposes only and shall have no higher rating within the reporting terminology hierarchy than Level 3, described above (e.g. **CONSIDERED**; **URGED**; **ACKNOWLEDGED**).

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EXECUTIVE SUMMARY

The 11th Session of the Indian Ocean Tuna Commission's (IOTC) Working Party on Data Collection and Statistics (WPDCS) was held in Montpellier, France, on the 22nd of October 2015. A total of 20 participants attended the Session.

The following are a subset of the complete recommendations and decisions from the WPDCS11 to the Scientific Committee, which are provided at Appendix VII.

Resolution 15/02 Mandatory statistical requirements for IOTC Members and Cooperating Non-Contracting Parties (CPC's)

WPDCS11.02 (para. 41): **NOTING** that the units of effort requested for longliners in IOTC Resolution 15/02 and 11/04 are not consistent as the former requests numbers of hooks and the latter numbers of sets, the WPDCS reiterated its previous **RECOMMENDATION** that provisions in Resolution 15/02 are amended to include a requirement for longline fleets to report effort in terms of both number of hooks and number of sets, and that reporting of effort in terms of number of sets is also requested from surface purse seine fleets in addition to the current requirements to report effort as fishing days.

Capacity Building Activities: Data Collection and Processing in Coastal Countries, and Compliance with Minimum Requirements

WPDCS11.03 (para. 53): **NOTING** the issues detailed in paragraph 52, the WPDCS **RECOMMENDED** that the Commission allocate substantially more funds – including funds for consultancies and additional fixed term staff at the IOTC Secretariat – to fully implement the priorities identified by the WPDCS Program of Work.

Further analysis of length frequency data from longline fleets and likely impacts on the assessments (Taiwan,China)

WPDCS11.04 (para. 60): The WPDCS **RECOMMENDED** further analysis to fully understand the recent changes in length composition reported by Taiwan,China – in particular whether there have been changes to the sampling protocols and selection of fish for sampling – and that the decline in the number of samples of small specimens of tropical tunas in particular may originate from high grading of catch onboard Taiwan,China longliners following the implementation of quotas on the Taiwan,China longline fleet in the Indian Ocean (i.e. only large specimens from the catch measured for length).

All other related fleets/issues

WPDCS11.05 (para. 63): **NOTING** that in both cases of the Japan and Taiwan,China size-frequency data, further analysis as a high priority for the WPDCS Programme of Work was suggested, given the potential impact on stock assessment, the WPDCS **RECOMMENDED** joint work on the documentation of procedures for the collection, processing and reporting of size frequency data continues, based on a template to be produced by the IOTC Secretariat, in particular:

- Full description of the type of sampling platforms used (e.g. commercial boats, research boats, training boats, etc.), and collecting sources (e.g. fishermen, researchers, scientific observers, etc.)
- Full description of the sampling protocols used, on each (e.g. full enumeration of every set, every other set, first 30 fish from each set sampled for size, etc.), by type of sampling platform and collecting source.
- Type of measurements collected (e.g. gilled-and-gutted weight, fork length, etc.) and measurement tools used (calliper, measuring board, measuring tape, scale, etc.) by type of sampling platform, collecting source, and species.
- Type of time-area stratification used for each species (e.g. quarter and defined area) and procedures used for the estimation of sampled weights in each stratum, including all equations used for the conversion of non-standard measurements into standard measurements, by species (e.g. deterministic conversion using a single length weight equation for all areas and time periods, etc.).
- Description of any other procedures which involve the use of length frequency data (e.g. estimation of weights from the numbers reported in logbooks and substitution scheme in the case that lengths are not available in areas where there are catches and effort recorded, etc.).

WPDCS Programme of Work

WPDCS11.07 (para. 69): **NOTING** the very heavy workload at the IOTC Secretariat and the ever increasing demands by the Commission and the Scientific Committee, and also the capacity to respond to requests for assistance by countries, the WPDCS strongly **RECOMMENDED** that at least three additional Fishery Officers be hired to join the IOTC Secretariat (Data Section: 1 x P4, 1 x P3 and 1 x P1), and to commence work by 1 January 2017.

1. OPENING OF THE MEETING

1. The 11th Session of the Indian Ocean Tuna Commission's (IOTC) Working Party on Data Collection and Statistics (WPDCS11) was held in Montpellier, France on the 22 October 2015. A total of 20 participants (30 in 2014, 23 in 2013) attended the Session. The list of participants is provided at Appendix I. The meeting was opened on 22 October 2015 by the Chairperson, Dr Emmanuel Chassot (EU,France) who welcomed participants to France.

2. ADOPTION OF THE AGENDA AND ARRANGEMENT FOR THE SESSION

2. The WPDCS **ADOPTED** the Agenda provided at Appendix II. The documents presented to the WPDCS11 are listed in Appendix III.

3. THE IOTC PROCESS: OUTCOMES, UPDATES AND PROGRESS

3.1 Outcomes of the 17th Session of the Scientific Committee

3. The WPDCS **NOTED** paper IOTC–2015–WPDCS11–03 which outlined the main outcomes of the 17th Session of the Scientific Committee (SC17), specifically related to the work of the WPDCS.

4. The WPDCS **NOTED** that in 2014, the SC made a number of requests in relation to the WPDCS10 report (noting that updates on Recommendations of the SC17 are dealt with under Agenda item 3.4). Those requests and the associated responses from the WPDCS11 are provided below for reference.

- ***General discussion on data issues***
  - (Para. 81) ***NOTING*** *that some CPCs provide little or no feedback regarding clarification sought on the data issues identified by the IOTC Secretariat or the science Working Parties, following communications from the IOTC Secretariat or actions recommended by the Working Parties, the SC* ***AGREED*** *that when this occurs and the IOTC Secretariat has access to alternative information, the IOTC Secretariat shall continue attempts to compile best scientific estimates of catch for those fisheries, using the information available, and present those estimates to the Working Parties and Scientific Committee for further review and endorsement. In this regard the SC* ***ENDORSED*** *the data review process presented in Appendix V of the WPDCS10 Report.*
  - **Response:** The WPDCS **NOTED** the issue and **REQUESTED** that the IOTC Secretariat continue to compile best scientific estimates of catches for review and endorsement to the IOTC Working Parties and Scientific Committee.
- ***Review of length frequency data from longline fleets and likely impacts on the assessments***
  - (Para. 91) *The SC* ***AGREED*** *that further analysis was required to fully understand the recent changes in length composition reported by Taiwan,China – in particular whether there have been changes to the sampling protocols and selection of fish for sampling, and that the decline in the number of samples of small specimens of tropical tunas in particular may originate from high grading of catch onboard Taiwan,China longliners following the implementation of quotas on the Taiwan,China longline fleet in the Indian Ocean (i.e. only large specimens from the catch measured for length).*
  - **Response:** The WPDCS **NOTED** the request and discussed the issue later in the meeting (see section 8).
  - (Para. 92) *The SC* ***AGREED*** *that additional work is required by Japan, in collaboration with the IOTC Secretariat, to understand the lack of coherence in the historical time series between the size frequency data, and catch-and-effort and nominal catch reported by Japan longline vessels.*
  - **Response:** The WPDCS **NOTED** the request and discussed the issue later in the meeting (see section 8).

3.2 Outcomes of the 19th Session of the Commission

5. The WPDCS **NOTED** paper IOTC–2015–WPDCS11–04 which outlined the main outcomes of the 19th Session of the Commission, specifically related to the work of the WPDCS and **AGREED** to consider how best to provide the Scientific Committee with the information it needs, in order to satisfy the Commission's requests, throughout the course of the current WPDCS meeting.

6. The WPDCS **NOTED** the 11 Conservation and Management Measures (CMMs) adopted at the 19th Session of the Commission (consisting of 11 Resolutions and 0 Recommendations) as listed below:

IOTC Resolutions

- Resolution 15/01 *On the recording of catch and effort data by fishing vessels in the IOTC area of competence*
- Resolution 15/02 *On mandatory statistical reporting requirements for IOTC Contracting Parties and Cooperating Non-Contracting Parties (CPCs)*
- Resolution 15/03 *On the vessel monitoring system (VMS) programme*
- Resolution 15/04 *Concerning the IOTC record of vessels authorised to operate in the IOTC area of competence*
- Resolution 15/05 *On conservation measures for striped marlin, black marlin and blue marlin*
- Resolution 15/06 *On a ban on discards of bigeye tuna, skipjack tuna, yellowfin tuna, and a recommendation for non-targeted species caught by purse seine vessels in the IOTC area of competence*
- Resolution 15/07 *On the use of artificial lights to attract fish to drifting fish aggregating devices*
- Resolution 15/08 *Procedures on a fish aggregating devices (FADs) management plan, including a limitation on the number of FADs, more detailed specifications of catch reporting from FAD sets, and the development of improved FAD designs to reduce the incidence of entanglement of non-target species*
- Resolution 15/09 *On a fish aggregating devices (FADs) working group*
- Resolution 15/10 *On target and limit reference points and a decision framework*
- Resolution 15/11 *On the implementation of a limitation of fishing capacity of Contracting Parties and Cooperating Non-Contracting Parties*

7. The WPDCS **NOTED** that pursuant to Article IX.4 of the IOTC Agreement, the above mentioned Conservation and Management Measures became binding on Members, 120 days from the date of the notification communicated by the IOTC Secretariat in IOTC Circular 2015–049 (i.e. **10 September 2015**).

8. **NOTING** that the Commission also made a number of general comments and requests on the recommendations made by the Scientific Committee in 2014, which have relevance for the WPDCS (details as follows: paragraph numbers refer to the report of the Commission (IOTC–2015–S19–R): the WPDCS **AGREED** that any advice to the Commission would be provided in the relevant sections of the report below.

(Para. 10) *The Commission **CONSIDERED** the list of recommendations made by the SC17 (Appendix VI) from its 2014 report (IOTC–2014–SC17–R) that related specifically to the Commission. The Commission **ENDORSED** the list of recommendations as its own, while taking into account the range of issues outlined in this Report (S19) and incorporated within Conservation and Management Measures adopted during the Session and as adopted for implementation as detailed in the approved annual budget and Program of Work. (para. 10 of the S19 report)*

(Para. 12) *The Commission **NOTED** some minor improvements in the quantity of fisheries statistics available to the SC and its Working Parties in 2014 but reiterated its concerns about the lack of fisheries data from some gears and fleets for target and bycatch species. Specifically, many fisheries statistics are missing or incomplete for some industrial and artisanal fisheries.*

Meeting Participation Fund

(Para. 37) *The Commission **NOTED** that the MPF was used to fund the participation of a reduced number of national scientists to the Working Parties in 2014 (49 in 2014; 58 in 2013; 42 in 2012), all of which were required to submit and present a working paper at the meeting.*

(Para. 38) *The Commission **NOTED** that at its 2014 meeting, the Scientific Committee had recommended that the Meeting Participation fund be maintained into the future and increased back to its original allocation of $200,000 per year (see recommendations SC17.34, para. 119). As per the IOTC Rules of Procedure (2014), the SC had reminded the IOTC Secretariat that the MPF budget should be spent at the ratio of 75:25 (science: non-science meetings) which would equate to US$150,000 science: US$50,000 non-science meeting.*

(Para. 39) *The Commission **AGREED** that the MPF budget remains important and therefore provisions according to the estimated needs will be integrated into the budget.*

Consultants

(Para. 40) ***NOTING*** *the Scientific Committee's attempts to prioritise the various projects and consultancies which it had requested funding for in 2016, in particular, that the High priority projects were those which it felt must be undertaken in 2016, the Commission* ***REQUESTED*** *that only those High priority projects listed in the Scientific Committee budget be funded by the Commission's regular budget, with exceptions detailed in other areas of the S19 report.*

3.3 Review of Conservation and Management Measures relevant to the WPDCS

9. The WPDCS **NOTED** paper IOTC–2015–WPDCS11–05 which aimed to encourage participants at the WPDCS11 to review some of the existing Conservation and Management Measures (CMM) relevant to the WPDCS, noting the CMMs referred to in document IOTC–2015–WPDCS11–04, and provided as Information Papers (IOTC–2015–WPDCS11–INF01; INF02; INF03); and as necessary to 1) provide recommendations to the Scientific Committee on whether modifications may be required; and 2) recommend whether other CMMs may be required.

10. The WPDCS **AGREED** that it would consider proposing modifications for improvement to the existing CMMs following discussions held throughout the current WPDCS meeting.

3.4 Progress on the recommendations of WPDCS10

11. The WPDCS **NOTED** paper IOTC–2015–WPDCS11–06 which provided an update on the progress made in implementing the recommendations from the previous WPDCS meeting which were endorsed by the Scientific Committee, and **AGREED** to provide alternative recommendations for the consideration and potential endorsement by participants as appropriate given any progress.

12. The WPDCS **RECALLED** that any recommendations developed during a Session, must be carefully constructed so that each contains the following elements:
    - a specific action to be undertaken (deliverable);
    - clear responsibility for the action to be undertaken (i.e. a specific CPC of the IOTC, the IOTC Secretariat, another subsidiary body of the Commission or the Commission itself);
    - a desired time from for delivery of the action (i.e. by the next working party meeting, or other date);
    - if appropriate, an approximate budget for the activity, so that the IOTC Secretariat may be able to use it as a starting point for developing a proposal for the Commission's consideration.

4. PROGRESS REPORT OF THE SECRETARIAT ON DATA RELATED ISSUES

4.1 IOTC Secretariat Report

13. The WPDCS **NOTED** paper IOTC–2015–WPDCS11–07 Rev_1 which provided an overview of the status of data holdings in the IOTC Secretariat, in particular statistics of catch, effort, size frequency and other biological data for IOTC species, sharks, and other species that are caught incidentally by fisheries directed at IOTC species.

14. The WPDCS **NOTED** that there have been some progress in the quality of data reported to the IOTC Secretariat in previous years, improvements in quality vary considerably according to species and fleet. The quality of the data available by species is also highly dependent on the importance of artisanal fisheries which tend to be the least well reported and often require to be partially adjusted or estimated by the IOTC Secretariat.

15. The WPDCS **NOTED** that during the period of piracy in the late-2000's, the reduction in fishing effort (and catches) associated with industrial fleets operating in the north-west Indian Ocean led to relative decrease in the quality of catch estimates for these years, during which catches of artisanal fisheries accounted for an increasing proportion of total catches.

16. The WPDCS **NOTED** the statement made by the participant from the Republic of Mauritius, which reiterates the position conveyed in the statements made by the Republic of Mauritius at the 19th Session of the Commission and contained in Report IOTC–2015–SC19–R[E] at Appendix Va.

17. The WPDCS **AGREED** that the status of the datasets available at the IOTC Secretariat is a cause for concern for some of the important fleets that operate in the Indian Ocean, in particular, but not limited to:
    - Marked changes in total catches and species and gear composition reported for the coastal fisheries of Indonesia in recent years; and uncertainty concerning the levels of catch of small tunas around anchored FADs (Rumpons), in particular yellowfin tuna and bigeye tuna.
    - Catches reported are not broken by gear: gillnet and longline fishery of Sri Lanka.

- Uncertain estimates of total catch for the commercial longline fishery of India; driftnet fishery of Pakistan; handline and driftnet fishery of Yemen; and coastal fisheries of Madagascar.
- Catches not reported by species: requirement to estimate the catches of bigeye tuna on the majority of coastal fisheries, such as the pole-and-line fishery in the Maldives.
- Very poor reporting of data on the level of discards of tuna and tuna-like species, and incidentally caught species, across the majority of fisheries and time periods.
- Insufficient implementation of minimum requirements for operational catch-and-effort data, which compromise reporting of catch-and-effort statistics to the IOTC: longline fisheries of Indonesia and India; driftnet fisheries of I.R. Iran and Pakistan; gillnet and longline fishery of Sri Lanka.
- Poor reporting of catch-and-effort data, for major tuna species and neritic tuna species: all coastal fisheries, in particular those operating in India and Indonesia.
- Lack of size frequency data for most major coastal fisheries, including the longline fishery of India, the driftnet fishery of Pakistan, and coastal fisheries of Indonesia, Indian and Yemen.
- Levels of coverage for Japan and quality of the size data available for longliners flagged in Taiwan,China in recent years.
- Levels of reporting of observer trip reports below those recommended by the Commission (a minimum of 5% of the total number of fishing operations shall be covered by scientific observers).

18. **NOTING** that total catches for Yemen have been repeated in the IOTC database since 2012, due to the lack of information available to the IOTC Secretariat, the WPDCS **RECOMMENDED** that the IOTC Secretariat conduct a thorough review of alternative information available to estimate the recent catches for Yemen (for example, using information available on international trade data).

19. The WPDCS **NOTED** that while the identification of shark species has improved in the recent years in some fishing fleets through the dissemination of IOTC identification cards provided to fishermen, the reporting of catch of sharks from major fisheries (e.g. Somalia, Yemen, Pakistan and I.R. Iran) remains very limited.

20. **RECALLING** its previous recommendation that scientists from Taiwan,China assist India in the estimation of catches of IOTC species and sharks for India's longline fleet, in particular for the years 2006 and 2007, the WPDCS **NOTED** with concern that while India had indicated that it will not work with external institutions to revise catch estimates for its fishery, India had not provided revised catches for its longline fleet.

21. The WPDCS **RECALLED** that the Scientific Committee had endorsed the alternative catches estimated for this component and **AGREED** that these estimates are maintained until India provide a revised time-series for its fleet.

22. **NOTING** that the above fisheries detailed above in paragraph 17 account for a substantial quantity of catches of IOTC species, the WPDCS **REQUESTED** that all of the CPCs listed address the issues identified, and report progress made at the next WPDCS.

23. The WPDCS **NOTED** that neritic tunas are of major importance for small scale artisanal fisheries in coastal areas and less migratory than other major tunas. An IOTC project funded by the EU and based on genetic approaches will start in early 2016 to elucidate the stock limits for neritic tunas that are, until now, considered as single population in the whole Indian Ocean.

24. The WPDCS **RECALLED** that the reporting of data, according to deadline, as per the requirements of IOTC Resolution 15/02 is essential for assessing the status of the stocks availability of data for fisheries scientists.

25. The WPDCS **ENDORSED** the proposal from the IOTC Secretariat to undertake the actions to address the issues for each fishery, as provided in Appendix IV.

4.2 Dissemination of IOTC Datasets and documents

4.2.1 IOTC Data Summary: Update

26. The WPDCS **NOTED** the work that the IOTC Secretariat has been coordinating to incorporate new online querying tools in the IOTC Web Page that will allow querying of nominal catch, fishing craft from the IOTC Database.

27. The WPDCS **NOTED** the good progress of the IOTC Secretariat regarding development of the new IOTC database, which is due to be completed in early-2016, and which was demonstrated during the meeting. The new database aims to consolidate the range of current IOTC datasets and in-house databases into a single platform that will facilitate improvements in the processing, validation, dissemination and visualisation of datasets required by the IOTC Working Parties, the Scientific Commission, and stock assessment experts.

28. The WPDCS **NOTED** that the IOTC Secretariat is planning to develop further functionality and tools to facilitate access to data in the IOTC databases and the graphical representation of that information, including through charts and maps, and **ENCOURAGED** the IOTC Secretariat to finalise this work and report progress to the next meeting of the WPDCS.

4.2.2 Tagging database: Update

29. The WPDCS **NOTED** that the IOTC Secretariat has been continually updating the tagging database with recoveries and that this work is extremely valuable for a range of scientific studies, including stock assessment models.

30. The WPDCS **NOTED** the update provided on the status of the IOTC tagging database and new tags recovered during 2014–15. Recoveries from longline fisheries remain at very low levels, at around 1% of total recoveries across all gears, and also compared to recoveries from purse seiners (e.g. around 420 recoveries reported by longline vessels compared to almost 26,900 recoveries on purse seine vessels).

31. The WPDCS **NOTED** that such low rates of recovery by longline vessels may be for various reasons, in particular a low reporting rate by longline vessel crews, and **REQUESTED** that the countries representing the main longline fleets ensure that skippers are aware of the importance of reporting and returning recovered tags.

4.2.3 IOTC website data pages: Discussion of potential improvements

32. **NOTING** that reports originating from the technical workshops and meetings involving the IOTC Secretariat are generally disseminated through the IOTC website, the WPDCS **REQUESTED** that the IOTC Secretariat improves the way in which technical reports are publicised to increase their dissemination, e.g. through IOTC email lists or signposting on the IOTC website.

5. UPDATE ON NATIONAL STATISTICS SYSTEMS

5.1 Thailand data collection methods

33. The WPDCS **NOTED** paper IOTC–2015–WPDCS11–10 which detailed data collection on tuna fisheries in Thailand: The transition of the old practice to the modern technology development, including the following abstract provided by the authors:

"*Data collection on tuna fisheries in Thailand has been categorized into two themes. The first one is collecting of data from tuna foreign vessels landing their catch in Thailand and the second one is collecting of data from Thai neritic tuna purse seiners fishing within the national water. For many years of the history, both of fisheries data were mainly derived from interviewing of the vessel skippers and port sampling statistic, this required a lot of resources to dealing with while the receiving data and information was somewhat limited, particularly in terms of fishing grounds and fishing effort. Moreover, the data of these conditions required the more time to analyze before publishing or submission to the relevant organizations to benefit from. In 2015, there has been a lot of changing in Thailand fisheries management that might affect these practices. For national fisheries, it mainly started with the enforcement of the new Thai Fisheries Act 2015 (B.E. 2558) that the keys provisions is to control number of fishing vessels and their input fishing effort and equipped them with the vessel monitoring system (VMS).*" – see paper for full abstract

34. The WPDCS **NOTED** that Thailand is aiming to train the first batch of observers between December 2015 and January 2016 as part of the wider implementation of the Regional Observer Scheme in Thailand.

35. The WPDCS **NOTED** that Thailand has requested assistance from the IOTC Secretariat for the initial training of observers, but that due to current staffing resource limitations at the IOTC Secretariat, Thailand will work remotely with the IOTC Secretariat in order to develop their national Observer program. However Thailand requested that the IOTC Secretariat provide Thailand with training for onboard observers, at a future date, once sufficient resources are available.

5.2 Mauritius data collection methods

36. The WPDCS **NOTED** paper IOTC–2015–WPDCS11–11 which detailed data collection and reporting system in Mauritius, including the following abstract provided by the authors:

"*Tuna fishing in the waters of Mauritius are mainly practiced by foreign longliners (mostly Asian) and purse-seiners (mostly European) operating under fishing licence against payment of a licence fee. The local tuna fishery is relatively small as compared to the foreign tuna fishery with a local fleet consisting of 3 longliners (< 24 meters) and seven purse seiners. Every year the national database is updated by incorporating the catch and effort data obtained from logbook submitted by both local and foreign vessels.*

Prior to logbook entry in the database, the logbook catches are verified against the landing catches that are recorded by the Fisheries protection officers at the port during unloading and transshipment (Port State Control Unit). In addition, the fishing positions are also validated using the Vessel Monitoring System of the Fisheries Monitoring Centre." – see paper for full abstract

37. The WPDCS **NOTED** that Mauritius is currently lacking an information system to manage operational data for purse seiners and **ENCOURAGED** Mauritius and EU,France to collaborate together to implement the EU information system in Mauritius.

5.3 Other updates on National Statistical Systems

38. The WPDCS **NOTED** paper IOTC–2015–WPDCS11–INF06 that presents some estimates of the species composition of FAD catches from the European Union and associated flags based on smaller spatial strata than used in the current data processing. The large number of samples available from the purse seine fleet allows for considering smaller spatio-temporal strata in the processing which would better reflect the fine-scale time and area variability in size and species composition of the catch.

39. The WPDCS **ENCOURAGED** the European Union and Seychelles to further explore the effect of changes in the strata on the catch composition and use statistical criteria to assess the bias and precision in estimates associated with each stratum design.

40. The WPDCS **NOTED** the developments by Sri Lanka regarding the collation of information from port sampling and logbooks, which has facilitated recent improvements in compliance in terms Resolution 15/02 Mandatory statistical reporting requirement, and **ENCOURAGED** Sri Lanka to continue to improvements with their national statistical systems.

6. REVIEW OF DATA REQUIREMENTS IN CONSERVATION AND MANAGEMENT MEASURES RELEVANT TO THE WPDCS

6.1 Data reporting

6.1.1 Resolution 15/02 Mandatory statistical requirements for IOTC Members and Cooperating Non-Contracting Parties (CPC's)

41. **NOTING** that the units of effort requested for longliners in IOTC Resolution 15/02 and 11/04 are not consistent as the former requests numbers of hooks and the latter numbers of sets, the WPDCS reiterated its previous **RECOMMENDATION** that provisions in Resolution 15/02 are amended to include a requirement for longline fleets to report effort in terms of both number of hooks and number of sets, and that reporting of effort in terms of number of sets is also requested from surface purse seine fleets in addition to the current requirements to report effort as fishing days.

6.2 Regional observer scheme

6.2.1 Resolution 11/04 On a regional observer scheme

42. The WPDCS **NOTED** the proposals by a participant from Japan to revise the current interim (longline) templates of the Regional Observer Scheme, including moving tables from Word (.doc/x) format spreadsheet format (e.g. .xls/x), however, it was **AGREED** that the changes should be considered thoroughly by the CPCs beforehand and discussed at the next WPDCS, or relevant IOTC Working Party.

- ***Discussion of observer coverage rates***

43. The WPDCS **NOTED** the annual estimates of observer coverage on Japan longline vessels in 2014 based on the numbers of operations, and that a full update of the Regional Observer Scheme coverage rates will be delivered during the 18th Session of the Scientific Committee in Bali, Indonesia.

- ***Update on planned ROS capacity building activities in 2015/16***

44. The WPDCS **NOTED** the update provided by the IOTC Secretariat on capacity building activities conducted in 2015, including observer training and species identification in Sri Lanka, and the first IOTC Regional Observer Scheme regional workshop, held in October 2015 in Oman, involving participants from Oman, I.R. Iran and Pakistan to assist with the implementation of the Regional Observer Scheme.

- ***Date recording***

6.2.2 Resolution 15/01 On the recording of catch and effort data by fishing vessels in the IOTC area of competence

45. The WPDCS **NOTED** that no comments were received on this issue.

6.2.3 Resolution 15/08 Procedures on a fish aggregating devices (FADs) management plan, including a limitation on the number of FADs, more detailed specifications of catch reporting from FAD sets, and the development of improved FAD designs to reduce the incidence of entanglement of non-target species

46. The WPDCS **NOTED** that no comments were received on this issue.

7. CAPACITY BUILDING ACTIVITIES: DATA COLLECTION AND PROCESSING IN COASTAL COUNTRIES, AND COMPLIANCE WITH MINIMUM REQUIREMENTS

7.1 Capacity Building Activities: Data Collection and Processing in Coastal Countries, and Compliance with Minimum Requirements

47. The WPDCS **NOTED** paper IOTC–2015–WPDCS11–08 which provided an overview of the capacity building activities the IOTC Secretariat have been involved with since the last meeting of the WPDCS.

48. The WPDCS **THANKED** the IOTC-OFCF Project for its continued support to the enhancement of data collection and processing systems in developing countries of the IOTC and **ENCOURAGED** the OFCF to consider extending support in the future, budget dependent.

49. The WPDCS **NOTED** that the IOTC Secretariat is also assisting the implementation of activities in the area of data collection, management and reporting, in cooperation with the Bay of Bengal Large Marine Ecosystems Project and European Union DG-Mare, which have provided financial support in 2015.

50. The WPDCS **NOTED** that capacity building activities are not always successful in the countries in which they are implemented. This is especially the case of countries that receive financial and technical support for the implementation of data collection activities but fail to secure the funds necessary to maintain these activities once that support is discontinued.

51. The WPDCS **URGED** all countries that receive support from the IOTC to ensure continuation of these activities into the future. The IOTC Secretariat assesses continuation of activities by the countries through follow-up missions to those countries or other means.

52. The WPDCS **AGREED** that:
    - while external funding is helping the work of the Commission, funds allocated by the Commission to capacity building are still too low;
    - considering the range of issues identified by the WPDCS, particularly the lack of data available for artisanal fisheries, the number of capacity building activities and data compliance missions which have been postponed or cancelled in 2015 due to staffing resources at the IOTC Secretariat is unacceptable.

53. **NOTING** the issues detailed in paragraph 52, the WPDCS **RECOMMENDED** that the Commission allocate substantially more funds – including funds for consultancies and additional fixed term staff at the IOTC Secretariat – to fully implement the priorities identified by the WPDCS Program of Work.

8. FURTHER ANALYSIS OF LENGTH FREQUENCY DATA FROM LONGLINE FLEETS AND LIKELY IMPACTS ON THE ASSESSMENTS

8.1 Japan

54. The WPDCS **NOTED** that Japan had been unable to conduct any further analysis of the size data in 2015 due to resource issues.

55. The WPDCS **NOTED** the analysis by the IOTC Secretariat in 2010 which highlighted inconsistences in the average weights recorded for grids in which size frequency samples are available, and other grids, for which the available catch in numbers (catch-and-effort) and weight (nominal catch) was used. Differences are highest on years where levels of sampling coverage were also highest, particularly during the 1980s.

56. The WPDCS **NOTED** that the number of size frequency samples collected by Japanese longliners has declined substantially in recent years, and **ENCOURAGED** Japan to increase sampling activities.

57. The WPDCS **NOTED** comments from Japan that training vessels account for the majority of length samples collected up to the mid-1980s, and that small differences in the size of samples may account for some of the observed inconsistencies between average weights calculated from total catches and catch-and-effort data.

58. **NOTING** that additional work is required by Japan, the WPDCS **REQUESTED** that this work is undertaken in collaboration with the IOTC Secretariat, to understand the lack of coherence in the historical time series between the size frequency data, catch-and-effort and nominal catch reported by Japanese longline vessels.

8.2 Taiwan,China

59. The WPDCS **NOTED** that Taiwan,China was unable to attend the WPDCS11 meeting. The IOTC Secretariat informed the WPDCS that size data for Taiwan,China longliners from 2002 onwards have been removed from the yellowfin tuna stock assessment for the first time, due to concerns over the uncertainty of the estimates; also that the latest size data reported by Taiwan,China for 2014 appears to show similar characteristics of sampling bias, as in prior years, and which still need to be fully understood.

60. The WPDCS **RECOMMENDED** further analysis to fully understand the recent changes in length composition reported by Taiwan,China – in particular whether there have been changes to the sampling protocols and selection of fish for sampling – and that the decline in the number of samples of small specimens of tropical tunas in particular may originate from high grading of catch onboard Taiwan,China longliners following the implementation of quotas on the Taiwan,China longline fleet in the Indian Ocean (i.e. only large specimens from the catch measured for length).

8.3 Seychelles

61. The WPDCS **NOTED** that size frequency samples collected on deep-freezing longline vessels under the flag of Seychelles would be useful to compare with the main Taiwan,China fleet to assess the recent changes in length composition, and **REQUESTED** Seychelles to submit the complete dataset of size frequency samples for 2009 and 2010 which are currently only partially recorded in the IOTC Secretariat database.

62. The WPDCS **REQUESTED** that Seychelles collaborate with IRD and the IOTC Secretariat in terms of analysis of the operational (logbook) level data collected for catch-and-effort and size frequency data, to better understand inconsistencies noted in the data for the main Taiwanese longline fleet.

8.4 All other related fleets/issues

63. **NOTING** that in both cases of the Japan and Taiwan,China size-frequency data, further analysis as a high priority for the WPDCS Programme of Work was suggested, given the potential impact on stock assessment, the WPDCS **RECOMMENDED** joint work on the documentation of procedures for the collection, processing and reporting of size frequency data continues, based on a template to be produced by the IOTC Secretariat, in particular:

    - Full description of the type of sampling platforms used (e.g. commercial boats, research boats, training boats, etc.), and collecting sources (e.g. fishermen, researchers, scientific observers, etc.)
    - Full description of the sampling protocols used, on each (e.g. full enumeration of every set, every other set, first 30 fish from each set sampled for size, etc.), by type of sampling platform and collecting source.
    - Type of measurements collected (e.g. gilled-and-gutted weight, fork length, etc.) and measurement tools used (calliper, measuring board, measuring tape, scale, etc.) by type of sampling platform, collecting source, and species.
    - Type of time-area stratification used for each species (e.g. quarter and defined area) and procedures used for the estimation of sampled weights in each stratum, including all equations used for the conversion of non-standard measurements into standard measurements, by species (e.g. deterministic conversion using a single length weight equation for all areas and time periods, etc.).
    - Description of any other procedures which involve the use of length frequency data (e.g. estimation of weights from the numbers reported in logbooks and substitution scheme in the case that lengths are not available in areas where there are catches and effort recorded, etc.).

9. WPDCS PROGRAMME OF WORK

9.1 Revision of the WPDCS Program of work (2016–2020)

64. The WPDCS **NOTED** paper IOTC–2015–WPDCS11–09 which provided an opportunity to consider and revise the WPDCS Program of Work (2016–2020), by taking into account the specific requests of the Commission, Scientific Committee, and the resources available to the IOTC Secretariat and CPCs.

65. The WPDCS **RECALLED** that the SC, at its 17th Session, made the following request to its working parties:

> "*The SC **REQUESTED** that during the 2015 Working Party meetings, each group not only develop a Draft Program of Work for the next five years containing low, medium and high priority projects, but that all High Priority projects are ranked. The intention is that the SC would then be able to review the rankings and develop a consolidated list of the highest priority projects to meet the needs of the Commission. Where possible, budget estimates should be determined, as well as the identification of potential funding sources*." (SC17. Para 178)

66. The WPDCS **REQUESTED** that the Chairperson and Vice-Chairperson of the WPDCS, in consultation with the IOTC Secretariat, develop Terms of Reference (TOR) for each of the high priority projects that are yet to be funded, for circulation to potential funding sources.

67. The WPDCS **RECOMMENDED** that the Scientific Committee consider and endorse the WPDCS Program of Work (2016–2020), as provided at Appendix V.

68. The WPDCS **NOTED** that, compared to staffing resources in other RMFOS and also the extent of fisheries under the mandate of the IOTC, the IOTC Secretariat is under-resourced and limited in its capacity to provide support for the following core functions:

- Assist countries to facilitate reporting and improve compliance in terms IOTC mandatory statistical data collection and reporting requirements.
- Review of current data in the IOTC database, documentation of data reviews and catch estimation procedures, and development of data quality indicators.
- Provide technical support to countries in the region as required in establishing and maintaining statistical systems for collecting and reporting data to the IOTC, particularly in relation to artisanal fisheries and support for the Regional Observer Scheme.
- Dissemination of information on data-related Commission activities through the IOTC website and graphical representation of the data, and exchange of data between tuna RMFOs.

69. **NOTING** the very heavy workload at the IOTC Secretariat and the ever increasing demands by the Commission and the Scientific Committee, and also the capacity to respond to requests for assistance by countries, the WPDCS strongly **RECOMMENDED** that at least three additional Fishery Officers be hired to join the IOTC Secretariat (Data Section: 1 x P4, 1 x P3 and 1 x P1), and to commence work by 1 January 2017.

10. OTHER BUSINESS

10.2 Election of a Chairperson for the next biennium

Chairperson

70. The WPDCS **NOTED** that the first term of the current Chairperson, Dr Emmanuel Chassot (EU,France) is due to expire at the closing of the current WPDCS meeting and as per the IOTC Rules of Procedure (2014), participants are required to elected a Chairperson for the next biennium.

71. **NOTING** the Rules of Procedure (2014), the WPDCS **CALLED** for nominations for the position of Chairperson of the IOTC WPDCS for the next biennium. Dr Emmanuel Chassot (EU,France) was nominated, and re-elected as Chairperson of the WPDCS for the next biennium.

10.3 Date and place of the 12th and 13th Sessions of the WPDCS: 2016 & 2017

72. The WPDCS **THANKED** France for hosting the 11th Session of the WPDCS and commended IRD on the warm welcome, the excellent facilities and assistance provided to the IOTC Secretariat in the organisation and running of the Session.

73. The WPDCS **REQUESTED** that the IOTC Secretariat liaise with CPCs to determine the host country for the 12th and 13th sessions of the WPDCS respectively (Table 1).

Table 1. Draft meeting schedule for the WPDCS (2016 and 2017)

	2016			2017		
Meeting	**No.**	**Date**	**Location**	**No.**	**Date**	**Location**
Working Party on **Data Collection and Statistics** (WPDCS)	12th	TBD	TBD	13th	TBD	TBD

10.4 Review of the draft, and adoption of the report of the 11th Session of the WPDCS

74. The WPDCS **RECOMMENDED** that the Scientific Committee consider the consolidated set of recommendations arising from WPDCS11, provided at Appendix VII.

75. The report of the 11th Session of the Working Party on Data Collection and Statistics (IOTC–2015–WPDCS11–R) was **ADOPTED** on the 26 October 2015.

APPENDIX I
LIST OF PARTICIPANTS

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APPENDIX II
AGENDA FOR THE 11TH WORKING PARTY ON DATA COLLECTION AND STATISTICS

Date: 22 October 2015
Location: Montpellier, France
Venue: Montpellier Aquarium
Time: 09:00 – 17:00 daily
Chair: Dr Emmanuel Chassot (EU,France); **Vice-Chair:** Mr Stephen Ndegwa (Kenya)

1. **OPENING OF THE MEETING** (Chair)
2. **ADOPTION OF THE AGENDA AND ARRANGEMENTS FOR THE SESSION** (Chair)
3. **THE IOTC PROCESS: OUTCOMES, UPDATES AND PROGRESS** (IOTC Secretariat)
   - 3.1 Outcomes of the 17th Session of the Scientific Committee and of the 19th Session of the Commission
   - 3.3 Review of Conservation and Management Measures relevant to the WPDCS
   - 3.4 Progress on the recommendations of WPDCS10
4. **PROGRESS REPORT OF THE SECRETARIAT ON DATA RELATED ISSUES** (IOTC Secretariat)
   - 4.1 IOTC Secretariat Report
   - 4.2 Dissemination of IOTC data sets and documents
     - 4.2.1 IOTC Data Summary: Update
     - 4.2.2 Tagging database: Update
     - 4.2.3 IOTC website data pages: Discussion of potential improvements
5. **UPDATE ON NATIONAL STATISTICAL SYSTEMS** (CPCs)
   Update on national statistical systems, including the main challenges collecting and reporting data to the IOTC Secretariat and proposals to improve future levels of compliance with IOTC data requirements.
6. **REVIEW OF DATA REQUIREMENTS IN CONSERVATION AND MANAGEMENT MEASURES RELEVANT TO THE WPDCS** (IOTC Secretariat)
   - 6.1 Data reporting (to the IOTC Secretariat)
     - 6.1.1 Resolution 15/02 *On mandatory statistical reporting requirements for IOTC Contracting Parties and Cooperating Non-Contracting Parties (CPCs)*
   - 6.2 Regional Observer Scheme
     - 6.2.1 Resolution 11/04 *On a regional observer scheme*
     - 6.2.2 Discussion of observer coverage rates
     - 6.2.3 Update on planned ROS capacity building activities in 2015/16
   - 6.3 Data recording (logbooks)
     - 6.3.1 Resolution 15/01 *On the recording of catch and effort data by fishing vessels in the IOTC area of competence*
     - 6.3.2 Resolution 15/08 *Procedures on a fish aggregating devices (FADs) management plan, including a limitation on the number of FADs, more detailed specifications of catch reporting from FAD sets, and the development of improved FAD designs to reduce the incidence of entanglement of non-target species*
7. **CAPACITY BUILDING ACTIVITIES: DATA COLLECTION AND PROCESSING IN COASTAL COUNTRIES, AND COMPLIANCE WITH MINIMUM REQUIREMENTS** (IOTC Secretariat)
8. **FURTHER ANALYSIS OF LENGTH FREQUENCY DATA FROM LONGLINE FLEETS AND LIKELY IMPACTS ON THE ASSESSMENTS** (IOTC Secretariat & CPC's)
   - 8.1 Japan
   - 8.2 Taiwan,China
   - 8.3 Seychelles

8.4 All other related fleets/issues

9. WPDCS PROGRAM OF WORK

9.1 Revision of the WPDCS Program of Work 2016–2020 (Chair)

10. OTHER BUSINESS

10.1 Election of a Chairperson for the next biennium (IOTC Secretariat)
10.2 Date and place of the 12th and 13th Sessions of the WPDCS: 2016 & 2017 (Chair)
10.3 Review of the draft, and adoption of the report of the 11th Session of the WPDCS (Chair)

APPENDIX III
LIST OF DOCUMENTS

Document	Title	Availability
IOTC–2015–WPDCS11–01a	Draft: Agenda of the 11th Working Party on Data Collection and Statistics	✓(11 March 2015) ✓(14 October 2015)
IOTC–2015–WPDCS11–01b	Draft: Annotated agenda of the 11th Working Party on Data Collection and Statistics	✓(6 October 2015) ✓(21 October 2015)
IOTC–2015–WPDCS11–02	Draft: List of documents of the 11th Working Party on Data Collection and Statistics	✓(6 October 2015) ✓(21 October 2015)
IOTC–2015–WPDCS11–03	Outcomes of the 17th Session of the Scientific Committee (IOTC Secretariat)	✓(6 October 2015)
IOTC–2015–WPDCS11–04	Outcomes of the 19th Session of the Commission (IOTC Secretariat)	✓(6 October 2015)
IOTC–2015–WPDCS11–05	Review of current Conservation and Management Measures relating to the WPDCS (IOTC Secretariat)	✓(6 October 2015)
IOTC–2015–WPDCS11–06 Rev_1	Progress made on the recommendations of WPDCS10 (IOTC Secretariat)	✓(7 October 2015) ✓(21 October 2015)
IOTC–2015–WPDCS11–07 Rev_1	Report on IOTC Data Collection and Statistics (IOTC Secretariat)	✓(7 October 2015) ✓(13 October 2015)
IOTC–2015–WPDCS11–08	IOTC capacity building activities in support of developing coastal IOTC CPCs (IOTC Secretariat)	✓(7 October 2015)
IOTC–2015–WPDCS11–09	Revision of the WPDCS Program of Work (2016–2020) (IOTC Secretariat, Chairperson & Vice-Chairperson)	✓(6 October 2015)
IOTC–2015–WPDCS11–10	[DRAFT]: Data Collection on Tuna Fisheries in Thailand: The transition of the old practice to the modern technology development (Panjarat S)	✓(30 September 2015)
IOTC–2015–WPDCS11–11	Data collection and Reporting System in Mauritius (Sheik Mamode A, Sooklall T & Curpen-Mahadoo M)	✓(7 October 2015)
Information papers		
IOTC–2015–WPDCS11–INF01	Resolution 15/01 *On the recording of catch and effort data by fishing vessels in the IOTC area of competence*	✓(6 October 2015)
IOTC–2015–WPDCS11–INF02	Resolution 15/02 *On mandatory statistical reporting requirements for IOTC Contracting Parties and Cooperating Non-Contracting Parties (CPCs)*	✓(6 October 2015)
IOTC–2015–WPDCS11–INF03	Resolution 15/08 *Procedures on a fish aggregating devices (FADs) management plan, including a limitation on the number of FADs, more detailed specifications of catch reporting from FAD sets, and the development of improved FAD designs to reduce the incidence of entanglement of non-target species*	✓(6 October 2015)
IOTC–2015–WPDCS11–INF04	Marine Fisheries Management Plan of Thailand: A National Policy for Marine Fisheries Management (2015–2019)	✓(7 October 2015)
IOTC–2015–WPDCS11–INF05	DRAFT: Thailand National Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (Thailand NPOA-IUU) (2015–2019)	✓(7 October 2015)
IOTC–2015–WPDCS11–INF06	Alternate improved estimates of the species composition of FAD catches by purse seiners in the Indian Ocean (Fonteneau A)	✓(18 October 2015)

APPENDIX IV
MAIN DATA ISSUES IDENTIFIED BY THE WPDCS AND ACTIONS PROPOSED TO ADDRESS THEM

Nominal catches	
Main Issues	**Proposed Actions**
Indonesia: Total catch of Artisanal fisheries Species composition: Catch of small tunas around anchored FADs (*rumpons*)	Assess if large increase in catch in recent years is a product of implementation of new sampling design and time-series need to be corrected; Catch estimates corrected in 2014 Provincial Data Collection Workshops (IOTC-OFCF); Pilot sampling activities (IOTC-BOBLME-DGCF); both ongoing
Sri Lanka: Coastal and offshore fisheries	Statistical system strengthened (IOTC-OFCF-BOBLME); support to data management ongoing
Yemen: Handline fishery	Use previous estimates and trends in catches for handlines in Oman
India: Commercial longline fishery Coastal fisheries	India has indicated that the IOTC shall use official figures irrespective of how incomplete they may be; to be discussed by the IOTC Scientific Committee Catch from different sources conflicting; as above
Pakistan: Driftnet fishery	ABNJ-WWF Project initiated in 2014
Madagascar: Coastal and longline fisheries	Need to attempt estimate catch using the data available
Catches of bigeye tuna by baitboat (Maldives) and coastal fisheries (Malaysia)	Consider implementation of pilot sampling to assess species composition and strengthen shore sampling
Catch-and-Effort	
Main Issues	**Proposed Actions**
Implementation of minimum requirements for operational data (logbook)	
Indonesia: Longline	Need to strengthen management and validation of logbook data
Sri Lanka: Gillnet and longline fishery	Need to strengthen management and validation of logbook data
India & Malaysia & Oman Longlines I.R. Iran & Pakistan: Driftnets Maldives: Pole-and-line	Data falls short of requirements: Assist CPCs to understand data requirements and with processing of information and urge them to strictly implement requirements and report data to the IOTC
Most fisheries	Implement minimum data requirements for sharks (noting that those for India are different as it has objected the logbook Resolution)
Catch-and-effort not available for coastal fisheries	
Many CPCs have failed to report catches and effort per month for their coastal fisheries	As a minimum request reports of catch by species, gear, and month and total numbers of fishing craft operated by gear, and month (or year) Propose requirements for the reporting of fishing craft statistics

Observer Schemes	
Main Issues	**Proposed Actions**
Observer reports: Very poor rates of reporting	Explore ways to facilitate reporting of data (e.g. web based reports) Organise Training and Workshops to assist CPCs Urge countries to implement ROS requirements and report data Implement pilot study of electronic monitoring in coastal fisheries
Size Frequency	
Data not reported	
Coastal fisheries of India, Indonesia, Malaysia, Oman, Yemen, and longlines of India	Data Mining/assist CPCs to understand data requirements/support to pilot sampling and with processing of information and urge them to strictly implement requirements and report data to the IOTC
Driftnets of Pakistan	ABNJ-WWF Project initiated in 2014
Data poor quality	
Longline fisheries of Japan and Taiwan,China: Catch-and-effort and size data conflicting over the time series	Analysis of length frequency data ongoing Effects of changes in gear selectivity Discrepancies in length data in the last decade (Taiwan,China) , and from the mid-1970s to mid-1980s (Japan). Lack of small sizes in the samples and inconsistent allocation of lengths to size bins (Taiwan,China).
Data not by IOTC standards for the gillnet & longline fishery of Sri Lanka and the driftnet fishery of I.R. Iran	Assist CPCs to understand data requirements and with processing of information and urge them to strictly implement requirements and report data to the IOTC
Socio-Economic Data	
Little data available	Propose standards for the reporting of data, as requested in the IOTC Agreement

APPENDIX V
WORKING PARTY ON DATA COLLECTION AND STATISTICS PROGRAM OF WORK (2016–2020)

The Program of Work consists of the following, noting that a timeline for implementation would be developed by the SC once it has agreed to the priority projects across all of its Working Parties:

Table 1. Priority topics for obtaining the information necessary to deliver the necessary advice to the Commission.

Topic	Sub-topic and project	Priority ranking	Lead	Est. budget (potential source)	Timing				
					2016	2017	2018	2019	2020
1. Data requirements and data collection protocols, including ROS	1.1 Artisanal fisheries	1 (High)	IOTC Secretariat (plus external consultants)	IOTC budget & external funding					
	1.1.1 Develop minima data requirements for the routine collection of data at the landing place, through sampling by enumerators			US$?? (TBD)					
	1.1.2 Develop General Guidelines for data collection from artisanal fisheries; including development of a set of indicators to be used to assess the quality of data collection and management systems for artisanal fisheries			US$?? (TBD)					
	1.1.3 Develop/Amend Fisheries specific data collection protocols, by country, where necessary			US$?? (TBD)					
	1.1.4 Assist implementation of pilot sampling activities in countries/fisheries not/insufficiently sampled in the past; priority to be given to the following fisheries: Coastal fisheries of Indonesia Coastal fisheries of India Coastal fisheries of Pakistan			US$?? (TBD)					

	Coastal fisheries of Sri Lanka Coastal fisheries of Yemen Coastal fisheries of Madagascar Coastal fisheries of Comoros Coastal fisheries of Tanzania Coastal fisheries of Thailand Coastal fisheries of Malaysia								
	1.1.5 Feasibility study of electronic monitoring for coastal fisheries. Priority to be given to the following fisheries: I.R. Iran Thailand (coastal purse seine) Indonesia								
	1.2 Industrial fisheries	1 (High)		IOTC budget & external funding					
	1.2.1 Develop General Guidelines for data collection by at-sea observers; including development of a set of indicators to be used to assess the quality of data collection and management systems for industrial fisheries			US$?? (TBD)					
	1.2.2 Organize a Regional Workshop on the Implementation of the IOTC Regional Observer Scheme (all IOTC CPCs having industrial fisheries)			US$100K (TBD)					
	1.2.3 Develop/Amend fisheries specific at-sea observer data collection protocols, by country, where necessary			US$?? (TBD)					
	1.2.4 Assist implementation of at-sea observer schemes in countries/fisheries not/insufficiently monitored in the past; including: • Evaluation of existing observer schemes and arrangements			US$?? (TBD)					

	• Coordination of country/fishery specific Training Sessions and Workshops on the ROS • Assistance to data management and reporting Priority to be given to the following fisheries: 1. I.R. Iran (driftnet; purse seine) 2. Sri Lanka (purse seine; drifting gillnet & longline) 3. Indonesia (longline) 4. Pakistan (driftnet) 5. India (longline) 6. Mauritius (purse seine; longline)									
2. Compliance with IOTC Data Requirements	2.1 Data support missions Identification of indicators to assess performance of IOTC CPCs against IOTC Data Requirements; evaluation of performance of IOTC CPCs with those Requirements; development of plans of action to address the issues identified, including timeframe of implementation and follow-up activities required. Priority to be given to the following fisheries: 1. I.R. Iran 2. Indonesia 3. Pakistan 4. Yemen 5. Tanzania 6. Madagascar 7. Mauritius	2 (High)	IOTC Secretariat	External funding US$?? (TBD)						

	8. Sri Lanka 9. Indonesia								
3 Review Size Data Longline Fisheries	Assistance to historical review of length frequency data for longline fisheries, in particular longliners from Taiwan,China and Japan (TORs Appendix VI).	3 (High)	IOTC Secretariat, Japan, & Taiwan,China	External funding: US$50K (TBD)					
4 Yemen catch data review	Review the historical catch series, and catches for most recent years, for Yemeni fisheries, particularly in relation to catches of tropical tuna and neritic tuna species.	4 (Medium)	IOTC Secretariat	External funding: US$20K (TBD)					
5 Mauritius albacore size frequency sampling	Port Louis in Mauritius is one of the main landing places for albacore in the Indian Ocean. This activity addresses previous concerns from the IOTC Scientific Committee regarding the quality of size data for albacore available for the longline fleet of Taiwan,China. The main objective of this activity is to provide alternative length frequency data through sampling of lengths of albacore at the landing place. The feasibility and usefulness of sampling will be assessed at the end of the pilot-project.	5 (Medium)	IOTC Secretariat	External funding: US$60K (TBD)					
6 Implementation Data Collection Sport Fisheries	Produce a catalogue of sport fisheries in the Indian Ocean; facilitate collection and reporting of data from sport clubs; training of local staff (TORs Appendix VI)	6 (Low)	IOTC Secretariat	US$54K (TBD)					
7 IOTC Data Summary	Further development of Web Based online querying procedures for the dissemination of IOTC datasets, including graphical representation of that information through charts and maps, etc. (Phase II)	7 (Low)	IOTC Secretariat	US$40K (TBD)					

APPENDIX VI
PROGRAM OF WORK RELATED TERMS OF REFERENCE

1. <u>Assistance to historical review of length frequency data for longline fisheries, in particular longliners from Taiwan,China and Japan</u>

Title: Review of data collection and processing systems for size data from longline fleets in the Indian Ocean.

Background

- Each year the IOTC Secretariat prepares input tables for the assessments of IOTC stocks, including catches in number and weight for tropical tunas, albacore and swordfish, by fishery, species, length class, year, quarter and fishing area, as defined by the IOTC working parties. Total numbers of tunas and billfish are derived from the available nominal catch, catch-and-effort and size frequency datasets, as provided by IOTC CPCs[1] or other Parties.
- For a number of years the IOTC Scientific Committee has expressed concern about the low levels of data compliance arising from poor coverage of length frequency samples for some important longline fleets, such as the Japanese, Indonesian, and Indian longline fleets, and potential impact on stock assessments.
- In addition there have been difficulties reconciling the catch-and-effort and size frequency datasets available for the Taiwan,China longline fleet, in which average weights derived from catch-and-effort and size data for the same area and time-period are highly conflicting.
- In light of the above, and additional information presented at the previous meetings of the IOTC Working Party for Tropical Tunas (WPTT)[2], in 2013 the Scientific Committee recommended "joint work on the documentation of procedures for the collection, processing and reporting of size frequency data" (SC15.78) for the main longline fleets, given the potential impact on stock assessments.
- Also, given that the data collection and processing systems used for distant-water longline fisheries tend to apply to all oceans, the WPTT agreed on the value to inform other tuna-RFMO Secretariats on the issues identified for longline fisheries and facilitate their participation in a review of the datasets reported by longline fleets.

Proposed work

1) Review the procedures used by the IOTC Secretariat to prepare input files for the assessments of IOTC species, in particular tropical tunas, albacore, swordfish and marlins.
2) Review the procedures used for the collection and processing of size data from large-scale tuna longline fisheries in the Indian Ocean, over the entire size frequency data series, in particular:
   a) Types of size data collected, data sources, and data validation and processing (e.g. stratification, procedures used to convert sizes into fork length, etc. where required).
   b) Other uses of size frequency data, where applicable (e.g. estimation of catches in weight from numbers recorded in logbooks, or contribution of size data to the estimation of nominal catches for the fishery).
3) Address the concerns raised by the IOTC Working Parties and Scientific Committee concerning the quality of size data available for the main longline fleets (e.g. Japan, Taiwan,China, Seychelles). Specifically -
   a) Assess the effect of changes in sampling coverage and contribution of length frequency data from longline fleets have on the assessments of IOTC species, in particular tropical tunas, albacore, swordfish and marlins.
   b) Compare length frequency data from different sources (e.g. scientific observers, fishers, training and research boats) and the effect on the assessments of IOTC species, in particular tropical tunas, albacore, swordfish and marlins.
   c) For fleets, such as Taiwan,China, which have been collecting both length and weight measurements for the same species, compare measured lengths and lengths derived from weight measurements in order to validate the reliability of datasets.
   d) Further explore the reasons for discrepancies in average weights derived from the catch and effort and size frequency datasets, and the reasons behind the sudden changes in the shape of length frequency distributions

[1] IOTC Contracting and Cooperating Non-Contracting Parties.

[2] Geehan, J.; Hoyle, S., Review of length frequency data of the Taiwan,China distant water longline fleet, IOTC-2013-WPTT15-41 Rev_1. Indian Ocean Tuna Commission Working Party on Tropical Tunas, San Sebastian, Spain, 23–28 October, 2013.

recorded for the Taiwanese longline fleet since the early-2000s; in particular the marked decrease in the amount of small fish in the samples recorded for the last decade.

4) Where required, identify areas of future work and propose a road-map for these activities to be carried out, for consideration and endorsement by the IOTC Scientific Committee.
5) Liaise with other Tuna-RMFOs and, when appropriate, facilitate their participation in a review of the datasets reported by longline fleets.

Expected timeline for deliverables:

The incumbent will be responsible to prepare the following information and final report for dissemination at the WPDCS, WPTT and SC:

1. Documentation of procedures for the collection and reporting of size frequency data used by Taiwan,China, Japan, Seychelles and other important longline fisheries over the entire history of the fishery, including:
   a) Full description of the type of sampling platforms used (e.g. commercial boats, research boats, training boats, etc.), and data collection source (e.g. fishermen, researchers, scientific observers, etc.)
   b) Full description of the sampling protocols used (e.g. full enumeration of every set, every other set, first 30 fish from each set sampled for size, etc.), by type of sampling platform and data collection source.
   c) Type of measurements collected (e.g. gilled-and-gutted weight, fork length, etc.) and measurement tools used (caliper, measuring board, measuring tape, scale, etc.) by type of sampling platform, data collection source, and species.
   d) Type of time-area stratification used for each species (e.g. quarter and defined area) and procedures used for the estimation of sampled weights in each stratum, including all equations used for the conversion of non-standard measurements into standard measurements, by species (e.g. deterministic conversion using a single length weight equation for all areas and time periods, etc.).
   e) Description of any other procedures which involve the use of length frequency data (e.g. estimation of weights from the numbers reported in logbooks and substitution scheme in the case that lengths are not available in areas where there are catches and effort recorded, etc.).
2. Where necessary, recommend changes to the data collection and/or processing systems for longline fleets, and propose a roadmap for the implementation of the activities recommended by the institutions concerned.
3. Report the results and provide guidance to the IOTC Working Parties and Scientific Committee on the best use of the available length frequency data for the assessments of IOTC species, including the type of fisheries to be considered and the procedures that are recommended for the preparation of the different datasets.
4. Ensure other Tuna-RMFOs are fully informed on the issues discussed by the report findings.

2. <u>Produce a catalogue of sport fisheries in the Indian Ocean; facilitate collection and reporting of data from sport clubs; training of local staff</u>.

Terms of reference published in the Report of the Eleventh Session of the IOTC Working Party on Billfish, Appendix VI, available at: http://www.iotc.org/documents/report-eleventh-session-iotc-working-party-billfish.

APPENDIX VII
CONSOLIDATED RECOMMENDATIONS OF THE 11TH SESSION OF THE WORKING PARTY ON DATA COLLECTION AND STATISTICS

Note: Appendix references refer to the Report of the 11th Session of the Working Party on Data Collection and Statistics (IOTC–2015–WPDCS11–R)

Progress report of the Secretariat on data related issues

WPDCS11.01 (para. 18): **NOTING** that total catches for Yemen have been repeated in the IOTC database since 2012, due to the lack of information available to the IOTC Secretariat, the WPDCS **RECOMMENDED** that the IOTC Secretariat conduct a thorough review of alternative information available to estimate the recent catches for Yemen (for example, using information available on international trade data).

Resolution 15/02 Mandatory statistical requirements for IOTC Members and Cooperating Non-Contracting Parties (CPC's)

WPDCS11.02 (para. 41): **NOTING** that the units of effort requested for longliners in IOTC Resolution 15/02 and 11/04 are not consistent as the former requests numbers of hooks and the latter numbers of sets, the WPDCS reiterated its previous **RECOMMENDATION** that provisions in Resolution 15/02 are amended to include a requirement for longline fleets to report effort in terms of both number of hooks and number of sets, and that reporting of effort in terms of number of sets is also requested from surface purse seine fleets in addition to the current requirements to report effort as fishing days.

Capacity Building Activities: Data Collection and Processing in Coastal Countries, and Compliance with Minimum Requirements

WPDCS11.03 (para. 53): **NOTING** the issues detailed in paragraph 52, the WPDCS **RECOMMENDED** that the Commission allocate substantially more funds – including funds for consultancies and additional fixed term staff at the IOTC Secretariat – to fully implement the priorities identified by the WPDCS Program of Work.

Further analysis of length frequency data from longline fleets and likely impacts on the assessments (Taiwan,China)

WPDCS11.04 (para. 60): The WPDCS **RECOMMENDED** further analysis to fully understand the recent changes in length composition reported by Taiwan,China – in particular whether there have been changes to the sampling protocols and selection of fish for sampling – and that the decline in the number of samples of small specimens of tropical tunas in particular may originate from high grading of catch onboard Taiwan,China longliners following the implementation of quotas on the Taiwan,China longline fleet in the Indian Ocean (i.e. only large specimens from the catch measured for length).

All other related fleets/issues

WPDCS11.05 (para. 63): **NOTING** that in both cases of the Japan and Taiwan,China size-frequency data, further analysis as a high priority for the WPDCS Programme of Work was suggested, given the potential impact on stock assessment, the WPDCS **RECOMMENDED** joint work on the documentation of procedures for the collection, processing and reporting of size frequency data continues, based on a template to be produced by the IOTC Secretariat, in particular:

- Full description of the type of sampling platforms used (e.g. commercial boats, research boats, training boats, etc.), and collecting sources (e.g. fishermen, researchers, scientific observers, etc.)
- Full description of the sampling protocols used, on each (e.g. full enumeration of every set, every other set, first 30 fish from each set sampled for size, etc.), by type of sampling platform and collecting source.
- Type of measurements collected (e.g. gilled-and-gutted weight, fork length, etc.) and measurement tools used (calliper, measuring board, measuring tape, scale, etc.) by type of sampling platform, collecting source, and species.
- Type of time-area stratification used for each species (e.g. quarter and defined area) and procedures used for the estimation of sampled weights in each stratum, including all equations

used for the conversion of non-standard measurements into standard measurements, by species (e.g. deterministic conversion using a single length weight equation for all areas and time periods, etc.).

- Description of any other procedures which involve the use of length frequency data (e.g. estimation of weights from the numbers reported in logbooks and substitution scheme in the case that lengths are not available in areas where there are catches and effort recorded, etc.).

WPDCS Programme of Work

WPDCS11.06 (para. 67): The WPDCS **RECOMMENDED** that the Scientific Committee consider and endorse the WPDCS Program of Work (2016–2020), as provided at Appendix V.

WPDCS11.07 (para. 69): **NOTING** the very heavy workload at the IOTC Secretariat and the ever increasing demands by the Commission and the Scientific Committee, and also the capacity to respond to requests for assistance by countries, the WPDCS strongly **RECOMMENDED** that at least three additional Fishery Officers be hired to join the IOTC Secretariat (Data Section: 1 x P4, 1 x P3 and 1 x P1), and to commence work by 1 January 2017.

Review of the draft, and adoption of the report of the 11th Session of the WPDCS

WPDCS11.08 (para. 74): The WPDCS **RECOMMENDED** that the Scientific Committee consider the consolidated set of recommendations arising from WPDCS11, provided at Appendix VII.