
REPORT OF THE 16TH SESSION OF THE IOTC WORKING PARTY ON DATA COLLECTION AND STATISTICS

Virtual meeting, 30 November – 3 December 2020

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Acronyms

ABNJ	Areas Beyond National Jurisdiction
AIS	Automatic Identification System
ALDFG	Abandoned, Lost or otherwise Discarded Fishing Gear
ALB	Albacore tuna
BET	Bigeye tuna
BLM	Black marlin
BLT	Bullet tuna
BUM	Blue marlin
CCSBT	Commission for the Conservation of Southern Bluefin Tuna
CMM	Conservation and Management Measure (of the IOTC; Resolutions and Recommendations)
COM	Narrow-barred Spanish mackerel
CPCs	Contracting parties and cooperating non-contracting parties of the IOTC
CPUE	Catch Per Unit of Effort
DGCF	Directorate General of Capture Fisheries (Indonesia)
DFAD	Drifting FAD
DFAR	Department of Fisheries and Aquatic Resources (Sri Lanka)
DOI	Digital Object Identifier
EEZ	Exclusive Economic Zone
EM	Electronic Monitoring
EMS	Electronic Monitoring System
ERA	Ecological Risk Assessment
ETP	Endangered, Threatened, and Protected species
EU	European Union
FAD	Fish aggregating device
FAO	Food and Agriculture Organization of the UN
FIRMS	Fisheries and Resources Monitoring System
FOB	Floating Object
FRI	Frigate tuna
GEF	Global Environmental Facility
GUT	Indo-Pacific king mackerel
GTA	FIRMS Global Tuna Atlas
IATTC	Inter-American Tropical Tuna Commission
ICCAT	International Commission for the Conservation of Atlantic Tunas
IEO	Instituto Español de Oceanografía (EU,Spain)
IFREMER	Institut Français de Recherche pour l'Exploitation de la Mer (EU,France)
IOC	Indian Ocean Commission
IOTC	Indian Ocean Tuna Commission
IRD	Institut de Recherche pour le Développement (EU,France)
I.R. Iran	Islamic Republic of Iran
ISSF	International Seafood Sustainability Foundation
KAW	Kawakawa
LOT	Longtail tuna
MLS	Striped marlin
MMAF	Ministry of Marine Affairs and Fisheries (Indonesia)
NARA	National Aquatic Resources Research and Development Agency (Sri Lanka)
OFCF	Overseas Fishery Cooperation Foundation (Japan)
OPAGAC	Organización de Productores de Atún Congelado (EU,Spain)
PET	Protected, Endangered and Threatened species
RFMO	Regional Fisheries Management Organization
ROS	Regional Observer Scheme
SC	IOTC Scientific Committee
SFA	Seychelles Fishing Authority (Seychelles)

SFA (fish)	Indo-Pacific sailfish
SSI	Species of Special Interest
SWO	Swordfish
Taiwan,China	Taiwan Province of China
USTA	Unité Statistique Thonière d'Antsiranana (Madagascar)
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
WPTmT	Working Party on Temperate Tunas of the IOTC
WPNT	Working Party on Neritic Tunas of the IOTC
WPTT	Working Party on Tropical Tunas of the IOTC
WCPFC	Western and Central Pacific Fisheries Commission
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 formalise 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 readers of IOTC reports 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 16th Session of the Indian Ocean Tuna Commission's (IOTC) Working Party on Data Collection and Statistics (WPDCS) was held remotely, from the 30th November to the 3rd December 2020. A total of 76 participants attended the Session.

The following are a subset of the complete recommendations and decisions from the WPDCS16 to the Scientific Committee, which are provided at [Appendix VI](#).

Further analysis of length frequency data and likely impacts on the assessments

WPDCS16.01 (para. [117147](#)): **RECALLING** that, in agreement with Resolution 15/02, the provision of documents covering sampling and raising procedures by species and type of fishery is a mandatory requirement for all IOTC members, the WPDCS **RECOMMENDED** that the Secretariat develops in cooperation with CPCs templates to drive the documentation of sampling procedures for all gears and fleets, focusing on time-area catches as well as size data, for review and discussion at the 2021 session of WPDCS.

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Use of electronic monitoring systems to optimize observer sampling protocols onboard French purse seiners of the Indian Ocean

WPDCS16.04 (para. [141444](#)): **ACKNOWLEDGING** that the proposed EM Programme Standards represent a basis for subsequent applications but still require additional contributions for their successful implementation on a regional scale, the WPDCS **AGREED** with the recommendation from document IOTC-2020-WPDCS16-18 to create an ad-hoc intersessional Working Group on the development of EM Programme Standards, and therefore **RECOMMENDED** that the Working Group be constituted and dedicated workshops (physical or virtual, depending on the circumstances) be held, to further progress on the definition of the standards.

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Revision of the WPDCS Program of work (2021–2025)

WPDCS16.05 (para. [169169](#)): The WPDCS **RECOMMENDED** that the Scientific Committee consider and endorse the WPDCS Program of Work (2021-2025), as provided at Appendix V.

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Review of the draft, and adoption of the report of the 15th Session of the WPDCS

WPDCS16.06 (para. [173173](#)): The WPDCS **RECOMMENDED** that the Scientific Committee consider the consolidated set of recommendations arising from **WPDCS16**, provided at [Appendix VI](#).

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1. Opening of the meeting

1. The 16th Session of the Indian Ocean Tuna Commission's (IOTC) Working Party on Data Collection and Statistics (WPDCS16) was held virtually (through the Microsoft collaborative platform Teams) from the 30th of November to the 3rd of December 2020. A total of 76 participants (41 in 2019, 55 in 2018, 45 in 2017, 32 in 2016) attended the Session. The list of participants is provided at [Appendix I](#). The meeting was opened on 30th of November 2020 by the Chairperson, Mr. Stephen Ndegwa (Kenya), who welcomed participants to the meeting and proceeded with the arrangements for the session.

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 WPDCS16 are listed in [Appendix III](#).

3. The IOTC Process: outcomes, updates and progress

3.1 Outcomes of the 22nd Session of the Scientific Committee and of the 24th Session of the Commission

3. The WPDCS **NOTED** paper IOTC-2020-WPDCS16-03 which outlined the main outcomes of the 22nd Session of the Scientific Committee (SC22), specifically related to the work of the WPDCS.
4. The WPDCS **NOTED** that in 2019, the SC made a number of requests in relation to the WPDCS15 and other IOTC Working Parties' reports (noting that updates on Recommendations of the SC22 are dealt with under Agenda item 3.3 of this report). Some of those requests and the associated responses from the WPDCS16 are provided below for reference.

Report of the 15th Session of the Working Party on Data Collection and Statistics (WPDCS15)

- (Para. 98) *The SC noted that the WPDCS endorsed the methodologies used by Pakistan to revise their historical gillnet catch series for tuna and tuna-like species, and that the results presented are currently the best scientific estimates available for this fishery. Therefore, the SC requested that these reconstructed catches be incorporated in the IOTC nominal catch database*

Response: the WPDCS **RECALLED** that the reconstructed catches provided by the government of Pakistan (with support from WWF PAK) have been incorporated in the IOTC databases since December 2019 and have regularly been used for scientific purposes ever since, and **NOTED** that further studies are expected - following up on the development of the crew-based data collection programme of Pakistan - to refine and corroborate actual estimates in the future.

- (Para. 99) *The SC requested the WPDCS to further support studies aimed at evaluating possible combinations of alternative data collection systems and protocols as a replacement for scientific data collected by onboard observers (whenever the deployment of the latter is considered unfeasible).*

Response: The WPDCS **ACKNOWLEDGED** the efforts made by Pakistan and Sri Lanka on assessing, at national level, the possibility of collecting scientific data onboard with the help of crew members, and **NOTED** that further updates on this matter will be presented during the course of the meeting.

- (Para. 100) *Noting that the quality of data available for artisanal fisheries in the Indian Ocean still needs to be greatly improved, the SC requested the WPDCS to continue assisting CPCs in improving the implementation of data collection and sampling activities for artisanal, coastal and small-scale fisheries.*

Response: The WPDCS **CONFIRMED** its commitment to provide capacity building and technical support to all CPCs in need of increasing the quality and accuracy of all data collected for their artisanal and small-scale fisheries, and **NOTED** that the IOTC Secretariat had to reduce the implementation of these types of activities

during 2020 due to the travel bans and health concerns raised by the onset of the CoViD-19 pandemic, with the goal of resuming their delivery as soon as circumstances allow.

National Reporting to the Scientific Committee: overview

- (Para. 20) (...) *The National Report does not replace the need for submission of data according to the IOTC Mandatory Data Requirements listed in the relevant IOTC Resolution (currently Resolution 15/02)*

National Reporting to the Scientific Committee: Contracting Parties (Members)

- (Para. 27) (...) *the SC expressed concern about the difference between the catches submitted in National Reports and total catches, by fleet, in the IOTC database. The IOTC Secretariat uses the information from the National Report to update estimates of nominal catches, in the case of revisions to the data or when CPCs have not submitted any catch data; however, the time available between submission of the National Reports and the Scientific Committee makes it difficult to update the IOTC nominal catch database prior to the annual Session (...)*

Response: the WPDCs **ENCOURAGED** CPCs to punctually submit all required mandatory statistical data by the yearly deadline, and to promptly inform the IOTC Secretariat of any updates made to their national statistics before these are reflected in the National Reports submitted to the IOTC Scientific Committee.

- (Para. 28) (...) *scientific and statistical information such as discard levels, observer coverage, fleet statistics etc., which are of particular relevance for several IOTC Resolutions (e.g. 15/02, 16/04, 17/05 etc.) is often only reported by CPCs in their national reports but not made available to the IOTC Secretariat in due time in accordance with the reporting requirements prescribed in the resolutions.*

Response: the WPDCS re-iterated the **REQUEST** from the SC that CPCs ensure the official submissions of such information to the IOTC Secretariat are in full agreement with the information presented in the respective national reports.

Report of the 9th Session of the Working Party on Neritic Tunas (WPNT09)

- (Para. 34) (...) *there are considerable uncertainties with the IOTC catch estimates of neritic species due to ongoing issues related to data collection and reporting (...) and that compliance with data reporting obligations remains low for neritic tuna species.*

Report of the 15th Session of the Working Party on Ecosystems and Bycatch (WPEB15)

- (Para. 52) *The SC reiterated the importance of having detailed information on climate indicators disseminated through the IOTC website as publicly available datasets. (...) Given this, the SC reiterated its request to the Secretariat that this activity be implemented as soon as possible.*

Response:

The WPDCS **AGREED** on the importance of considering climate and other environmental information in support of the analysis of all statistical data available to the IOTC, and **ACKNOWLEDGED** that ongoing developments within the workflows managed by the Data Section of the IOTC Secretariat are considering the inclusion of such data sources in the process.

- (Para. 55) *The SC recommended that several initiatives be implemented to improve data collection and reporting for shark species, including i) regional workshops (...), ii) data mining (...) and iii) developing alternative tools to improve species identification (e.g. genetic analyses, machine learning and artificial intelligence).*

Response: the WPDCS **ACKNOWLEDGED** that studies on the possibility of using A.I. and machine learning to improve species identification are ongoing in several oceans, and that comparable initiatives in the Indian Ocean might be built on top of the experience gained in the studies on automated image recognition that are part of the efforts for the implementation of Electronic Monitoring Systems in the region.

Report of the 21st Session of the Working Party on Tropical Tunas (WPNT21)

- (Para. 75) *The SC noted that a primary concern for the IOTC is the definitions and terminology related to FAD fishing activities, and to work with other tRFMOs on a similar terminology for reporting purposes and to allow inter-ocean comparative analysis. The SC therefore recalled the recommendation made by the WPTT21 that the IOTC FAD Working Group, that to date has met only once, be reactivated with a clear mandate to discuss these and other IOTC FAD issues.*

Response: the WPDCS **NOTED** that the lack of clarity on the reference FAD types and activities is one of the issues preventing CPCs from consistently reporting FAD data to the IOTC Secretariat through form 3-FA and that the CECOFAD classification was discussed as one of the possible alternatives. Furthermore, definitions provided in Res. 19/02 set a first basis upon which to consolidate an array of new terminologies. Also, the WPDCS **ACKNOWLEDGED** that the IOTC FAD Working Group has been re-activated and is scheduled to be held in October 2021.

WPTT priorities and Program of Work

- (Para. 78) (...) *the SC agreed to explore the possibility of holding data preparatory meetings in addition to stock assessment meetings for the major IOTC species in 2020.*

Response: the WPDCS **ACKNOWLEDGED** that an additional data preparatory session of the Working Party on Tropical Tuna was successfully held, in the form of a remote meeting, in June 2020 and was followed by a regular assessment session of the same Working Party in October 2020.

Implementation of the Regional Observer Scheme

- (Para. 126) *The SC encouraged CPCs to validate the information provided in appendices A, B and C of paper IOTC-2019-SC22-07, and confirm that it correctly reflects the status of implementation of the ROS at the national level, and to liaise with the IOTC Secretariat should any discrepancy be identified.*

Response: The WPDCS **NOTED** that all information currently available in the ROS regional database comes from industrial fleets, and that notwithstanding the possibility - through the IOTC ROS Pilot Project - to consider sampling activities at the landing site to collect scientific information for those fisheries where observers onboard cannot (or are not expected to) be deployed, there still is close to zero information coming from artisanal and small-scale fisheries. Also, the WPDCS **ACKNOWLEDGED** that alternative data collection mechanisms such as those piloted by Pakistan and Sri Lanka could be instrumental in increasing the level of ROS coverage for artisanal and small-scale fisheries or more in general for all those vessels for which it is impractical to deploy observers onboard.

- (Para. 129) (...) *The SC welcomed the confirmation by Mozambique and the offer by Maldives and Pakistan to join the project.*

Response: The WPDCS **NOTED** that notwithstanding the official requests made in 2020 by the IOTC Secretariat to Mozambique and Maldives to confirm their participation to the ROS Pilot Project, no formal agreement was signed by concerned CPCs, and therefore **INVITED** representatives from both countries to update the group on the status of their involvement in this important activity.

5. The WPDCS **NOTED** that due to the 24th Session of the Commission being rescheduled as a virtual meeting for November 2-6, with daily sessions shortened to two hours, it was previously agreed by all IOTC CPCs that no new CMM would be discussed during the meeting.
6. Furthermore, the WPDCS **NOTED** that the report of the 24th session of the Commission is still being circulated across CPCs for adoption, and therefore **ACKNOWLEDGED** that the expected paper IOTC-2020-WPDCS16-04, which was supposed to outline the main outcomes of the last Session of the Commission specifically related to the work of the WPDCS, would not available for this session of the WPDCS.

7. Nevertheless, the WPDCS **AGREED** to discuss the issue raised by Indonesia during the last session of the Commission related to the differences detected between the official data reported by Indonesia and the data used by the Scientific Committee, as this is of particular relevance for the WPDCS.
8. The WPDCS **RECALLED** that the data in the IOTC database represent the best scientific estimate of catch of IOTC species given the current knowledge of all involved fisheries and stocks, and that as such it is used for various scientific purposes in support of the work of the Scientific Committee and its subsidiary bodies.
9. Also, the WPDCS **ACKNOWLEDGED** that the IOTC Secretariat routinely performs several re-estimations of the catch information originally provided by CPCs, and that the reasons for these re-estimations are linked to well-known, long-standing issues affecting several coastal states and their fisheries, in particular those of an artisanal nature.
10. The WPDCS **NOTED** the summary table providing the list of CPCs (including Indonesia) for which catch re-estimation criteria are applied by the IOTC Secretariat, **ACKNOWLEDGING** that this list is revised every year on the basis of detected progress in data collection and reporting from concerned CPCs.
11. Furthermore, the WPDCS **ACKNOWLEDGED** that the re-estimations made by the IOTC Secretariat are generally affecting the gear and species composition of all catches reported by concerned CPCs, and that total catches of IOTC species remain unaffected.
12. **RECALLING** that the rationale for the current re-estimation process applied to Indonesia's catches (among others) was the result of a study commissioned by an external IOTC consultant in 2012 (and endorsed by the Scientific Committee that same year), the WPDCS **ACKNOWLEDGED** that the process was further discussed during the 14th Session of the WPDCS in 2018, although with a narrower scope as it focused on the re-estimation of billfish species caught by Indonesian longliners.
13. The WPDCS **NOTED** that Resolution 19/01 contains an explicit indication that, for the purposes of the conservation and management measure, "*catch of Indonesia is based on the national reports submitted to the Scientific Committee*" (see footnote 1 in Para. 13 of the Resolution text) and **AGREED** that additional clarity should be sought on whether this same approach shall also apply to the determination of baseline catches.
14. The WPDCS **NOTED** the presentation by Indonesia (no paper provided) which provided a summary overview of the current status of the *One Data National Program*, that aims to provide an integrated data production system for national planning process, and whose sign-off was completed in November 2019.
15. The WPDCS **THANKED** Indonesia for the presentation and **ACKNOWLEDGED** the efforts of *One Data* to deliver substantive and long-term improvements in the collection, processing, validation and dissemination of Indonesia's official fisheries statistics.
16. The WPDCS further **ACKNOWLEDGED** the positive progress in data submitted by Indonesia to IOTC and recent improvements in compliance with data-related Resolutions¹ including: the submission of Regional Observer Scheme data, and catch-and-effort and size frequency data for coastal fisheries.
17. Nevertheless, the WPDCS **NOTED** that the *One Data National Program* aims to focus on the collation of data from fishers and that its *sampling* component does not appear to include elements of data collection independent from the industry, e.g. from sampling at landing sites, for the purpose of fishery data validation.
18. The WPDCS further **NOTED** the observations from the IOTC Secretariat, and FAO (regarding the reporting of capture fisheries in the FAO NS-1 questionnaire), in relation to the continued volatility in Indonesia's official catches. This volatility may, in part, be related to deficiencies in the sampling conducted at landing sites, lack of enumerators, limited financial resources available for data collection, and partial coverage of fishing port data collection (i.e., around 39% of fishing ports).

¹ Resolution 15/01; Resolution 15/02; Resolution 11/04; Resolution 17/05, etc

19. For this reason, the WPDCS **AGREED** that the IOTC Secretariat should continue to produce their own *best scientific estimates* for Indonesia, for the purposes of stock assessments, in order to moderate the effects of:
- i. Sharp, and largely unexplained fluctuations in Indonesia's official catch submissions; for example:
 - the 500% increase in the official catches of yellowfin tuna, that went from 36k tons in 2016 to over 217k tons in 2017 (subsequently corrected and revised to 40k tons);
 - the 700% increase in the official catches of bullet tuna, that went from 2.2k tons in 2016 to 18.2k tons in 2017.
 - ii. Possible inconsistencies in the official catches and number of active vessels. For example, the number of active longline vessels in Indonesia decreased by 82% (from 1,200 in 2013 to 214 in 2017), as a result of the de-registration of 'ex-foreign' longline vessels according to official DGCF sources, while official longline catches also decreased over the same period – but by a much smaller magnitude (decreasing by ≈68%).
 - iii. Inconsistencies in the fishing activities of purse seine and longline vessels between logbooks and VMS data, which raises issues over the reliability of time-area catches derived from logbooks.
20. The WPDCS **REQUESTED** that, for the purposes of transparency, the IOTC Secretariat liaises with Indonesia to address concerns regarding the current estimation methodology and the rationale for adjusting the official catches of Indonesia. Furthermore, that the estimation methodology for Indonesia – implemented since 2012 onwards – should be subject to periodic review, taking into account on-going uncertainties in the quality of Indonesia's official statistics, but equally improvements in the data submitted as a result of the *One Data* initiative
21. In particular, the WPDCS **CONSIDERED** that a thorough revision of Indonesia's historical catch estimates should properly take into account the need for harmonizing the information available *before* and *after* the implementation of the *One Data* initiative.
22. More generally, and **ACKNOWLEDGING** that the original data submissions from all CPCs subject to catch revisions are kept by the IOTC Secretariat but not publicly disseminated, the WPDCS **CONSIDERED** the possibility of regularly sharing the original data submissions as an additional data set in order to increase the transparency of the process.
23. For this reason, the WPDCS **REQUESTED** the IOTC Secretariat to evaluate the efforts required to disseminate this new data set in the future, and report back on the findings to the WPDCS at its next meeting.

3.2 Review of Conservation and Management Measures relevant to the WPDCS

24. The WPDCS **NOTED** paper IOTC–2020–WPDCS16–05 which encouraged participants at the WPDCS16 to review some of the existing Conservation and Management Measures (CMM) relevant to the WPDCS, **RECALLING** that no new CMM was discussed during the re-scheduled 24th session of the Commission, 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. Proposed amendments were discussed later in the meeting and are detailed subsequently in this report.
25. In particular, the WPDCS **ENCOURAGED** participants to review the texts of Resolutions 18/07 (*On measures applicable in case of non-fulfilment of reporting obligations in the IOTC*), 19/01 (*On an interim plan for rebuilding the Indian Ocean yellowfin tuna stock in the IOTC Area of competence*), 19/02 (*Procedures on a fish aggregating devices (FADs) management plan*) and 19/03 (*On the conservation of mobulid species caught in association with fisheries in the IOTC area of competence*) to identify aspects that might require further clarification from the SC.
26. The WPDCS **RECALLED** that Resolutions 19/01 and 19/02 introduced new requirements that include the reporting of explicit breakdown of yellowfin tuna catches by fishing vessel categories, and the reporting of daily instrumented buoy positions (starting from January 2020), and **ACKNOWLEDGED** that the level of implementations of these new requirements is increasing across CPCs, although not complete for all fleets.

3.3 Progress on the recommendations of WPDCS15

27. The WPDCS **NOTED** paper IOTC–2020–WPDCS16–06 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.
28. The WPDCS **RECALLED** that any recommendation 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 frame for delivery of the action (i.e. by the next working party meeting, or other date).
29. The WPDCS **NOTED** that the recommendation from the SC that a data preparatory meeting be held prior to the Working Party on Tropical tunas, although not having been officially endorsed by the Commission (due to its postponement) has been implemented in practice.
30. The WPDCS **RECALLED** that systems should be put in place to collect information on discards (as these cannot be assessed from sampling at landing sites) and **ACKNOWLEDGED** that notwithstanding this re-iterated request, total level of discards for tuna and bycatch species are lacking for several fisheries and fleets.
31. The WPDCS **NOTED** that EU,Spain has not yet provided a corrected version of their nominal and time-area catches, **ACKNOWLEDGING** that a comprehensive revision process from the EU is expected to start in early 2021 and that, until further notice, the original catches provided by EU,Spain for 2018 have to be considered as official.
32. The WPDCS **ACKNOWLEDGED** that revised nominal catches for the gillnet fishery of Pakistan are now incorporated in the IOTC databases and **ENCOURAGED** Pakistan to also officially submit reconstructed time-area catches for the fisheries concerned.
33. **NOTING** that concerns still exist as to whether catches from gillnet vessels known to be registered to both I.R. Iran and Pakistan are double-counted, and that no practical action to resolve this issue has been taken so far by involved CPCs, the WPDCS **ENCOURAGED** I.R. Iran and Pakistan to liaise with the IOTC Secretariat and determine the extent at which their historical catches should be revised, and effort required to completely remove (or reduce) any potential double counting.
34. The WPDCS **CONFIRMED** the importance of IOTC developing a biological data repository as requested by other Working Parties, and **NOTED** that a great part of these data is expected to come from observer data, which are subject to confidentiality rules as they include detailed operational information.
35. The WPDCS **NOTED** that the purpose of this data repository is not to disclose any sensitive information relating to fleet operations, but rather to provide valuable biological data to the scientific community and **ACKNOWLEDGED** that a balance needs to be found to allow data to be publicly disseminated with an adequate level of resolution for scientific purposes, while abiding by the confidentiality rules set forth by Resolution 12/02 (as it already happens with ROS data disseminated at the WPEB).
36. The WPDCS **REMINDED** that Resolution 15/01 and 15/02 are complementary and serve two different purposes, as the former indicates gear-specific requirements for data collection through logbooks, while the latter prescribes how (and to what level of resolution) the information captured by logbooks should be submitted to the IOTC Secretariat.
37. The WPDCS further **RECALLED** that providing up-to-date samples of actual logbooks (for public dissemination through the IOTC website) is also one of the key requirements of Resolution 15/01, as is the detailed description of sampling schemes under Resolution 15/02.

38. The WPDCS **NOTED** that updates to several other important requests issued during its 15th session are still lacking, and **ENCOURAGED** all concerned CPCs to report to this meeting on the issues of their pertinence.

4. Progress report of the Secretariat on data related issues

4.1 IOTC Secretariat report

39. The WPDCS **NOTED** paper IOTC-2020-WPDCS16-07_Rev1 which provided an overview of the status of data holdings in the IOTC Secretariat, in particular 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.
40. The WPDCS **NOTED** that the quality of the data available by species is highly dependent on the importance of artisanal fisheries (that account for around two thirds of total catches), and which tend to be the least well reported fisheries and often require catches to be at least partially (or fully) estimated by the IOTC Secretariat.
41. The WPDCS further **NOTED** that the catch-and-effort and size data for neritic tunas and billfish continue to be poorly reported, and this remains a major challenge for stock assessments which in many cases continue to be highly uncertain.
42. The WPDCS **ACKNOWLEDGED** that the IOTC Secretariat currently reverts to using additional sources of information for all those CPCs (e.g. Somalia, Yemen, Eritrea) which currently lack data reporting capabilities, and that said sources include the FAOStat database, as well as national statistical reports that might public be available online.
43. The WPDCS **NOTED** that the definition of *artisanal fisheries* is not used consistently throughout the CMMs and IOTC Working Parties, and **REQUESTED** the SC to develop a standard definition of the term *artisanal* which is to be used across all IOTC scientific bodies, and **ACKNOWLEDGED** that the term *artisanal* may have a different meaning according to the CPCs and the national administrations or institutions.
44. The WPDCS **RECALLED** that the term *artisanal*, equivalently used with *coastal* or *small-scale* in the context of the IOTC, includes any fishery composed of fishing vessels less than 24m in length overall (LOA) and operating exclusively inside the areas under the national jurisdiction of the flag State. Conversely, the term *industrial* fisheries is used for fishing vessels of 24m and above in length overall or smaller vessels operating in areas beyond the limits of national jurisdiction.
45. The WPDCS **NOTED** that FAO is developing a matrix that aims to provide a statistical definition of small-scale fisheries, as part of the *Illuminating Hidden Harvest project* between FAO, the World Bank, and Duke University. The matrix approach² applies 13 criteria (e.g., vessel size, motorization, distance from fishing grounds, ownership, etc.) that results in an aggregated score to pre-defined fishing units along a continuum of small to large-scale fisheries, as opposed to the binary classification currently used for scientific and management purposes in the IOTC.
46. **NOTING** that this assessment matrix is currently being tested in several countries around the world, the WPDCS **REQUESTED** CPCs to take part in the survey, in order to gain better insight into the diversity of small-scale fisheries currently operating in the Indian Ocean and contribute to a better definition of all fisheries-specific aspects of IOTC CMMs.
47. The WPDCS **NOTED** that the table 3a of the paper IOTC-2020-WPDCS16-07_Rev1 only displays the major tuna species caught by each fleet (e.g. skipjack and yellowfin tuna for the EU purse seine fleet) and that this may be misleading.
48. **ACKNOWLEDGING** that the information on nominal catches (NC) as it appears in the summary tables of document IOTC-2020-WPDCS16-07_Rev1 implicitly includes also discards, the WPDCS **NOTED** that for some fleets for which retention bans exist on sharks and other bycatch species (such as Maldives), the assessment

² http://www.fao.org/fi/static-media/MeetingDocuments/cwp/cwp_26/11e.pdf

criteria should reflect the non-applicability of those reporting requirements that depend on the species being actually retained (e.g. catch-and-effort).

49. Therefore, the WPDCS **NOTED** that the IOTC Secretariat will continue with its process of fully reviewing and improving the structure and format of the information included in the paper, and that several tables and figures will be modified, including table 3a.
50. The WPDCS **RECALLED** that the status of the datasets available at the IOTC Secretariat is a cause for concern for a number of important fleets that operate in the Indian Ocean, in particular, but not limited to:

Total catches (including retained catches and discards):

- On-going uncertainties in the total catches, species and gear composition reported for the coastal fisheries of Indonesia in recent years, and possible misidentification of juvenile yellowfin and bigeye tunas as neritic tuna species;
- Uncertain estimates of total catch of sharks and billfish for the driftnet fishery of Pakistan and I.R. Iran (respectively), handline and driftnet fisheries of Yemen and Oman, coastal fisheries of Madagascar, log-associated catches of EU,Spain (in 2018);
- Very poor reporting of data on the total level of discards of tuna and tuna-like species (as well as all other incidentally caught species) across the majority of fisheries and time periods.

Catch-and-effort:

- Insufficient (or lacking) implementation of logbooks and minimum requirements for operational catch-and-effort data, which compromise reporting of catch-and-effort statistics to the IOTC Secretariat, including industrial longline and purse seine fisheries of Indonesia (until 2017), driftnet fisheries of Pakistan, gillnet and longline fishery of Sri Lanka (until 2014), handline and gillnet of Oman;
- Lack of catch-and-effort data and indices of abundance for coastal fisheries for the major tuna species, and particularly neritic tuna species targeted by artisanal fisheries operating in Oman, Pakistan, India and Indonesia (until 2017);
- Possible species composition bias in the time-area catches reported by EU,Spain for 2018, following changes introduced in the statistical methodologies adopted at national level.

Size data:

- Lack of size frequency data for most major coastal fisheries, including the coastal longline fishery of India, the driftnet fishery of Pakistan, the coastal fisheries of Indonesia, India, Yemen and Oman.
- Low levels of coverage of size data for Japan (until recently) and reliability of length frequencies available for longliners flagged in Taiwan,China in recent years. Possible revisions expected by Q1 2020;
- Possible repetition of size-frequency distributions for some tropical tuna species across years, and abrupt truncations in size measurements (potentially due to sampling bias) detected for Sri Lanka gillnet fisheries in 2016-2019.

Regional observer (ROS) data:

- Most levels of reporting of (industrial fisheries) observer coverage are below those recommended by the Commission (i.e., a minimum of 5% of the total number of fishing operations shall be covered by scientific observers).
- Little or no observer data collection by CPCs for artisanal fisheries. Ongoing efforts in adopting self-sampling mechanisms ("*crew-based data collection programmes*" of Pakistan and Sri Lanka) are being

evaluated as possible replacements for scientific observer information when combined with other data collection and validation mechanisms.

51. The WPDCS **ENDORSED** the proposals from the IOTC Secretariat to undertake the necessary 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

4.2.1 IOTC data dissemination: discussion of potential improvements

Proposals for draft CPCs data fact sheets

52. The WPDCS **NOTED** paper IOTC-2020-WPDCS16-10_Rev1 that provides details on the IOTC Secretariat's effort to draft and automate the compilation of CPC-specific *data fact-sheets*, and how these will support the internal workflow for the evaluation of statistical data submission to the Secretariat, and eventually contribute to increase the transparency of the processes implemented by the IOTC Secretariat, build the foundation for the set-up of a public library of statistical data assessments and increase capacity building at national level.
53. **ACKNOWLEDGING** the need of the IOTC Secretariat to rationalize their internal data management processes and provide feedback to CPCs in close-to-real time fashion, the WPDCS **NOTED** the effort and principles driving the design of *automated data fact-sheets*, and that once implemented, these will contribute to resolve these long standing issues and also to: i) increase transparency, ii) enable full-reproducibility, iii) create a public repository of the information assessments performed on the mandatory statistical data submissions from all CPCs.
54. The WPDCS **NOTED** that the proposed data fact-sheets collate information received by the IOTC Secretariat as part of the mandatory reporting requirements for the science and compliance aspects of the IOTC, including data sources never exploited before for scientific purposes such as the e-PSM and the ROP, together with external, third party sources of information such as Global Fishing Watch AIS products, ISSF cannery, VMS and environmental data among others.
55. For this reason, the WPDCS **AGREED** that the data fact-sheets can provide a holistic and broader view on the status of fisheries information available to all IOTC CPCs.
56. Furthermore, the WPDCS **RECOGNIZED** that data fact-sheets could be an extremely useful tool to identify issues common to several flag states and fisheries, and contribute to the definition of the priorities that will drive the work of the scientific bodies of IOTC.
57. At the same time, the WPDCS **ACKNOWLEDGED** the challenges that lie ahead in the path towards full implementation of the proposed data fact-sheets, and that one of the key issues to resolve for this exercise to be successful is ensuring that CPCs can provide their mandatory statistical information in a timely and accurate way, due to the interlocked nature of the indicators that the fact-sheets are supposed to synthesize.
58. The WPDCS **AGREED** that several CPCs might still require support from the IOTC Secretariat in terms of capacity building and technical assistance for the compilation of mandatory statistical data according to the requirements of all currently standing resolutions.
59. **RECALLING** that the IOTC recommended forms for data submissions are not compulsory, and that CPCs can use whatever format they feel comfortable with as long as all the minimum data fields (per data set) are provided, the WPDCS **ACKNOWLEDGED** that the IOTC Secretariat is evaluating the possibility of supporting CPCs in this process through the implementation of simplified data reporting tools to be used in place of the existing reporting templates.
60. Also, the WPDCS **CONFIRMED** that the IOTC is in the process of adopting the e-MARIS platform for the provision of statistical and compliance-related data and information, that trials are likely to start in 2021, and that this platform is not a solution to data collection issues but rather a tool for improved data reporting.

4.2.2 Alternative data series

Research proposal: an evaluation of data from ISSF-affiliated canneries for use in tuna fisheries management

61. The WPDCS **NOTED** paper IOTC-2020-WPDCS16-11 that illustrates a novel research proposal that focuses on evaluating the usage of sales data from ISSF-affiliated canneries (received by the IOTC Secretariat since 2010 as part of an agreement with ISSF) in support of the management of tuna and tuna-like species in the Indian Ocean.
62. The WPDCS **NOTED** with interest the proposed research activity, to be undertaken by a MSc candidate from the University of Seychelles, that will evaluate the usage of sales data (as provided since 2010 to the IOTC Secretariat by canneries affiliated with ISSF) as an alternative source of information to cross-validate the statistical information submitted to IOTC by concerned fleets and attempt at identifying trends in commercial weight and species composition over the course of the years.
63. The WPDCS **ACKNOWLEDGED** that due to the lack of a standardized format for data submission (at least until 2019) additional clean-up work is required for the data to be ready for future analysis, and that this activity is presently being carried on by an external consultant whose work is funded by ISSF.
64. **NOTING** the wide extent of the geographical distribution of ISSF-affiliated canneries, and also that the information they provide to the IOTC Secretariat is not limited to fish sourced from the Indian Ocean, the WPDCS **ACKNOWLEDGED** that, once available, this data set would become an extremely important asset to analyse the magnitude and routes of tuna trading across the globe.
65. The WPDCS also **NOTED** the confidentiality requirements that ISSF and their affiliated canneries have established for this data exchange, and **ACKNOWLEDGED** that all publicly disseminated information should be aggregated to such a level as to abide by the rules of Resolution 12/02.
66. **ACKNOWLEDGING** the importance of this source of information, the WPDCS **NOTED** that its use might be partially limited by the non-comprehensive coverage of ISSF-affiliated canneries (estimated to be around 65% of all canneries worldwide) and by the fact that not all catches of IOTC species are necessarily sold through this route.

4.3 Updates on data-related requests from other Working Parties

5 . Updates on national statistics systems

5.1 Update on national statistical systems, including the main challenges in collecting and reporting data to the IOTC Secretariat and proposals to improve future levels of compliance with IOTC data requirements

5.1.1 A new protocol to collect verified scientific data on catch including bycatch information using crew-based observers on small size longline tuna fishing vessels (<24m) in Sri Lanka

67. The WPDCS **NOTED** paper IOTC-2020-WPDCS16-12_Rev1 that provides the latest updates on Sri Lanka's crew-based protocol in support of the collection of scientific data for catch and bycatch species from small longline vessels operating in national waters and the high seas, including its abstract, as provided by the authors:

"Independent scientific data is vital for effective fisheries management. Scientific data provides an independent source of detailed, high quality information on fishing activity and catch at a sufficient level of resolution to be used for analyses, such as the standardization of catch rates, the analysis of non-target species and the need for mitigation measures (IOTC, 2016). Under the IOTC's Regional Observer Scheme (Resolution 11/04) each CPC is required to submit a range of scientific data by Independent Observers, who are deployed on selected vessels for the duration of a fishing trip. The small size of Sri Lankan multi-day fishing vessels registered to fish beyond Sri Lanka's exclusive economic zone (EEZ) (average LO 13.09m) compared to the average of length of the IOT registered fleet (22.84m); the lack of on-board accommodation and sanitary facilities and health and safety

concerns precludes the deployment of Independent Observers on Sri Lanka's small-scale fishing fleet. In response to this challenge the Government of Sri Lanka has recently evolved a new protocol through which to collect independently verifiable, digital information and scientific data in compliance with the IOTC's Resolution. The new protocol combines existing primary data from each fishing trip collected using DFAR's successful Logbook System; new primary information collected by DFAR officers using a semi-structured interview and visual verification and digital images incorporating spatial and temporal information about the catch. The capital and data collection cost of the new protocol is low. There are no new operation or maintenance costs associated with the protocol. The technology and human resources needed to run the system is already in place. The new protocol has been tested initially with longline fishing vessels and proved to be successful."

68. The WPDCS **CONGRATULATED** Sri Lanka's continued efforts to improve the coverage and reliability of data collected from small-scale, multi-day fishing vessels with the implementation of electronic logbooks, piloting of electronic monitoring systems (EMS), complemented by data collected by crew-based "local observers".
69. The WPDCS further **ACKNOWLEDGED** the benefits of data collected by these recent initiatives, in particular the improvements in the estimates of incidences of bycatch species, as well as interactions and release practices of prohibited species such as leatherback turtles and mobulids.
70. As part of the evaluation of these alternative data collection methods the WPDCS **ENCOURAGED** Sri Lanka, as well as other CPCs such as Pakistan, to share the data collection protocols of crew-based data collection schemes, as well as to facilitate the exchange of knowledge and expertise with other CPCs considering developing similar programs.
71. **NOTING** the difficulties faced by CPCs in implementing the Regional Observer Scheme on small-scale artisanal tuna fisheries, the WPDCS **ACKNOWLEDGED** the value of alternative data collection systems to supplement the gaps in data and to minimize the issues faced by observers for small-scale artisanal vessels, including the use of "crew as observers", electronic monitoring and port sampling.
72. The WPDCS **NOTED** that, given the characteristics and area of operation of the vessels subject to the implementation of this novel data collection protocol (longline vessels of less than 24m LOA, fishing in the high seas), this cannot at present times be formally seen as a valid implementation of the IOTC Regional Observer Scheme (regardless of the quality and completeness of the information collected) as under such circumstances [Resolution 11/04](#) calls for scientific information to be collected by observers, therefore excluding crew members from this possibility.
73. Also, the WPDCS **RECALLED** that the EU is funding a pilot project to trial the implementation of Electronic Monitoring Systems onboard this same category of vessels in Sri Lanka, and **NOTED** that although the project had to be put on forced halt, the trials are expected to resume soon and will eventually contribute to a proper evaluation of EMS as an alternative data collection mechanism for artisanal and small-scale fisheries operating in the Indian Ocean.
74. In light of the above, the WPDCS **ACKNOWLEDGED** that a combination of the two approaches (well structured, crew-based data collection protocols supplemented by EMS) could be considered as a viable alternative to the deployment of independent observers onboard in the context of the IOTC Regional Observer Scheme, and **SUGGESTED** that further evidence (e.g., assessment of the feasibility of recording all minimum ROS data fields) be collected to validate these findings and support a potential revision of the underlying IOTC resolutions.
75. The WPDCS **ACKNOWLEDGED** that the existing crew-based data collection programme implemented by Sri Lanka could represent an opportunity to also collect biological samples as per the requirements of the IOTC-FAO GERUNDIO project on "Development and Implementation of a sampling scheme to support the collection of biological samples and conduct analysis on these samples to provide improved estimates of age, growth and reproduction of tropical tunas, swordfish, and blue sharks for the Indian Ocean Tuna Commission (IOTC)" (currently in development), and **NOTED** the interest of Sri Lanka to participate to such activity.

76. Finally, the WPDCS **RECALLED** that the SC in 2018 already requested the WPDCS to continue evaluating the validity of alternative data collection tools to onboard human observers, and that this activity should be prioritized accordingly in the WPDCS [Program of Work](#).

5.1.2 Updating of the statistics reported for the EU-Spain purse seine fleet in the Indian Ocean (1990-2019), and the effect of the COVID19 pandemic on the port sampling from Victoria (Seychelles)

77. The WPDCS **NOTED** paper IOTC-2020-WPDCS16-13_Rev2 that presents updates on the statistical data collected since 1990 by the Spanish purse seine fleet operating in the Indian Ocean, including its abstract, as provided by the authors:

“This document provides an update on the statistics of the Spanish purse seine fleet fishing in the Indian Ocean for the period 1990 to 2019. Data include catch and effort statistics, as well as some fishery indicators by species and fishing mode. Information about the scheme and coverage of the sampling, together with maps and diagrams illustrating the spatio-temporal fishing patterns of this fleet are also provided”

78. The WPDCS **NOTED** that between April-October 2020, port sampling of the Spanish purse seine fleet in Port Victoria, Seychelles was suspended due the restrictions imposed by the COVID-19 pandemic and that, as a comparison, during the same period in 2019 around 57% of the yearly sampling data were collected, which suggests future potential difficulties in the standardization of the tropical tuna catches for 2020.
79. The WPDCS **NOTED** that uncertainties introduced by the lack of sampling in the estimation of catches for 2020 may be further compounded by changes in the fishing fleet during the same year, notably the continuing trend in fishing activities extending further in the north-west Indian Ocean, and the reduced activity in the Mozambique channel, and that these might cause changes in the catch composition (e.g., due to changes in targeting from yellowfin tuna).
80. In absence of catch samples between April and October 2020, the WPDCS **NOTED** that a specific methodology will have to be developed and implemented for the estimation of the species-specific nominal and geo-referenced catch data sets for 2020, and that this issue also concerns the purse seine fisheries of EU,France, EU,Italy, Mauritius and Seychelles which all adopt similar samples-based estimation approaches.
81. Despite these concerns, the WPDCS **NOTED** that, in accordance with EU regulations, robust and multiple verification methods are in place for Spanish purse seine vessels to ensure the proper monitoring of yellowfin tuna catches as per the requirements set by [Res. 19/01](#), including: onboard sampling by the crew (i.e. estimate of the species composition in weight from the first brail), landing declarations, and sales slips that are in addition to, and complementary of the data processing approaches currently used to obtain the catch-and-effort and length frequency datasets.
82. The WPDCS **NOTED** that the Spanish Ministry of Fisheries has developed a system of sanctions that applies to individual vessels when the difference between logbooks and landings exceeds 10%.
83. The WPDCS further **NOTED** that the Spanish observer programme was halted in 2020 due to administrative issues at the Instituto Español de Oceanografía (IEO) and problems related to the CoViD pandemic, with only five trips having been monitored under the European DCF programme by an independent onboard observer until November 2020.
84. The WPDCS further **NOTED** that, despite the challenges in deploying Spanish onboard observers during 2020, the Spanish purse seine fleet was still able to deploy Seychelles-based observers in addition to vessels equipped with EMS, and that EU,Spain was optimistic that overall observer coverage levels in 2020 should still be adequate.

5.1.3 Statistics of the French purse seine fishing fleet targeting tropical tunas in the Indian Ocean (1981-2019)

85. The WPDCS **NOTED** paper IOTC-2020-WPDCS16-14 that presents an updated summary of the status of statistics (for the period 1981-2019) as collected by the French purse seine fleet operating in the Indian Ocean, including its abstract, as provided by the authors:
- “This document presents an up-to-date summary of the French purse seine fleet targeting tropical tunas in the Indian Ocean. The statistics cover the period 1981-2019 and specifically focus on the activity of the last year of the fishery. In 2019, a total of 15 French vessels operated in the eastern Indian Ocean including 12 purse seiners and 3 supplies. The total capacity weighted by the months of activity for each vessel is 10724t. The total nominal effort in 2019 was of 2501 fishing days and 2561 sets with 1918 sets on floating objects and 643 on free schools. The total catch of the French component of the EU purse seine fleet of the Indian Ocean was 70622t, being composed of 38.5%, 55.7%, 5.5% and 0.3% of yellowfin tuna, skipjack tuna, bigeye tuna and other species respectively. The most noticeable change in 2019 was the decrease of the percentage of the number of sets on floating object with 75% in comparison with 90% in 2018. This change in the fishing strategy led to a reporting of the catches on free school despite a global decrease (-17%). Remarkably, skipjack proportion in free school became important (37%) since 2018.”*
86. The WPDCS **NOTED** that the fishing activities of the French purse seine fleet in 2019 were notably different to previous years (2018 in particular), for reasons due to the following:
- A decrease by 8% in carrying capacity of French purse seiners between 2018 and 2019;
 - A decrease of the sets on Floating Objects (FOBs) from 90% to 75% over the same period;
 - A relative increase in catches of skipjack tuna in 2019, mostly due to the increase in catches from free-school sets, as well as changes in targeting from yellowfin tuna due to the catch limit;
 - Changes in the purse seine fishing grounds in 2019, with no fishing in the Mozambique channel and fishing effort more concentrated in the north-west Indian Ocean.
87. The WPDCS **NOTED** that, similar to the difficulties reported for the Spanish purse seine fleet, no sampling data was collected onboard French purse seiners between April and November 2020 due to the COVID-19 pandemic, and **ENCOURAGED** EU-France to ensure that estimates of catches-by-species for 2020 are not adversely impacted by the lack of onboard samples during the reference year.
88. The WPDCS **NOTED** that EU,France has submitted raw size-frequency data for its purse seine fishery for 2019, instead of raised data (i.e. catch-at-size, as done in previous years), and that this was a response to a general request made by the Secretariat, as raw data are needed for integrated stock assessment models and compliance purposes.
89. The WPDCS **THANKED** the proposal from EU,France to start to systematically provide both types of size-frequency data (raw and raised) for consistency reasons, and that this can also be done for historical time series.
90. The WPDCS **NOTED** that the IOTC Res. 15/02 is not prescriptive about the size data processing level (i.e. unraised vs. raised) and that modifying the resolution to include the requirement of reporting both unraised and raised data would constitute a major challenge for many CPCs that already fall short in submitting any size frequency data.
91. The WPDCS **RECALLED** that Res. 15/02 explicitly states that *“documents covering sampling and raising procedures shall also be provided, by species and type of fishery”* and that this information, which should be kept constantly updated as it is of particular importance to understand the nature and the peculiarities of the available size-frequency data, currently lacks for all CPCs.
92. The WPDCS **NOTED** that the original source of a minimum target of *“1 fish per metric tonne, by species and type of fishery”* (see Res. 15/02) to be sampled for size can be traced back to the outcomes of the IOTC WPDCS06 (2009), and that currently similar requirements either do not exist in other tuna RFMOs or have a different formulation, for instance based on the number of fish caught rather than their total weight.

93. [MOVE TO THE SECTION (6.x) WHERE IT BELONGS BETTER] The WPDCS **NOTED** that the sampling of at least 1 fish per metric tonne may be difficult to achieve for some species in longline fisheries and that reducing this target to privilege higher-quality samples could be beneficial to the assessment models and other scientific analyses.
94. The WPDCS **RECALLED** that Res. 15/02 allows CPCs providing size-frequency data through regular Regional Observer Scheme submissions for those longline fleets that are subject to Res. 11/04 and meet the minimum requirement of 5% observer coverage of their fishing operations.
95. The WPDCS further **NOTED** that, although not grounded in solid scientific evidence, the definition of a minimum sampling target provides an efficient and simple way to ensure that CPCs report size data to the Secretariat.
96. The WPDCS **REQUESTED** that the Secretariat start to report to WPDCS on the level of sampling coverage by CPCs to see how many are meeting the requirement of sampling one fish per tonne and **NOTED** that this same information is covered, to a certain extent, in the Compliance reports generated by the Secretariat.

5.1.4 First results of the FLOPPED project : satellite tagging and biological sampling of billfish around the Indian Ocean

97. The WPDCS **NOTED** paper IOTC-2020-WPDCS16-15 that outlines the preliminary results of a satellite tagging (and biological sampling) programme implemented in Reunion Island, Rodrigues, Seychelles and Mayotte and directed to billfish species in the Indian Ocean, including its abstract, as provided by the authors:

*“The FLOPPED project aims to investigate the reproduction zones of five billfish species in the Indian Ocean through a comprehensive data collection initiative, including satellite tagging data and biological sampling. Within the framework of this project, 100 satellite tags are to be deployed around the Indian Ocean, on blue marlin (*Makaira nigricans*), black marlin (*Makaira indica*), striped marlin (*Tetrapturus audax*), swordfish (*Xiphias gladius*), and sailfish (*Istiophorus platypterus*). Tagging and biological sampling were originally focused on six study sites, including Reunion, Mayotte, Mauritius (Rodrigues), Seychelles, Sri Lanka and Indonesia. However, due to logistical complications resulting from the global COVID-19 pandemic, we search for participants from a broader range of sites among our WPDCS colleagues to maximise the coverage and representativeness of this dataset. Here, we present on the first results of the 42 tags that have been deployed since the start of the project. Of these, 34 tags were deployed via a network of sports fishers using pole and line that were trained to tag by IFREMER and COOL personnel in Reunion Island, Rodrigues, Seychelles and Mayotte (...)”* (refer to the original paper for its full abstract).

98. The WPDCS **NOTED** that the FLOPPED project adopts a multi-disciplinary approach that combines the following:
- Biological sampling: age and maturity from gonad sampling;
 - Tagging: migrations to reproduction zones during spawning seasons;
 - Genetics: connectivity between reproduction zones and their contributions to the breeding population size;
 - Ocean modelling: origin of larvae and likely spawning regions.
99. The WPDCS further **NOTED** that the project aims to deploy 100 tags across six sites throughout the Indian Ocean (La Réunion, Rodrigues, Mayotte, Seychelles, Sri Lanka and Indonesia). Four of the six sites have been targeted to date, while one of the five billfish species (striped marlin) has still to be tagged.
100. The WPDCS **NOTED** that the trajectories of species tagged so far appear to show a strong north-south movement, with some evidence of east-west movement; although indications of movements over a longer time-frame are constrained by the life-span of the tags deployed.
101. The WPDCS **NOTED** that the project is continuing to look for partners to assist in the deployment of tags, particularly in the northern and eastern Indian Ocean basins, and **ENCOURAGED** WPDCS participants interested in participating in the tagging and biological sampling to contact the Project coordinators.

5.1.5 Fisheries data collection working group: significant progress for Somalia's fisheries

102. The WPDCS **NOTED** that paper IOTC-2020-WPDCS16-21 that outlines the major achievements of Somalia's Fisheries Data Collection Working Group and how these led to a definition of harmonized data collection protocols that resulted in the implementation of the first, nation-wide database of catch data, including its abstract, as provided by the authors:
- "(...) In October 2019, the Federal Government of Somalia began the Fisheries Data Collection Working Group (FDCWG). The pilot project was led by Secure Fisheries, a program of One Earth Future Foundation. A team of Technical Working Group members, civil society representatives, and representatives from the Ministries of Fisheries and Marine Resources of the Federal Government of Somalia, and the Federal Member States of Jubaland, Southwest, Galmudug, HirShabelle, and Puntland, held an initial workshop to adopt a harmonized data collection protocol, fish identification guide, and set of data collection forms. Starting in late December 2019, a team of enumerators at the following fish landing sites began collecting catch and effort data from fishing vessels, three times per week: Kismayo, Merca, Mogadishu, Adale, Hobyo, and Bosaso. This effort has resulted in the creation of a catch database that holds the first nation-wide effort to rigorously collect scientifically valid fisheries catch data in Somalia in over 30 years."* (refer to the original paper for its full abstract).
103. The WPDCS **ACKNOWLEDGED** that the paper provides important updates on the implementation status of a national data collection system for artisanal fisheries in Somalia, that was based on preliminary studies from 2016 and has been funded by the EU through the Italian Agency for Development and Cooperation.
104. The WPDCS **NOTED** the methodological approach for this initiative, that includes the establishment of a fisheries data collection working group (consisting of 18 participants), the identification of six landing sites, the training of three enumerators per landing site and the delivery of a number of workshops to refine the protocol and provide technical support to data analysis activities.
105. The WPDCS **NOTED** that Somalia is expanding the project in six new landing sites, therefore reaching a total of twelve landing sites for the entire country and that each new landing site will be covered by three enumerators.
106. Contrary to what previously assumed, the WPDCS **NOTED** that tropical tuna species are frequently caught by the gears subject to this (random) survey, with yellowfin tuna accounting for over 20% of the sampled number of individuals in the period between December 2019 and August 2020 (followed by longtail tuna, kawakawa and skipjack tuna).
107. Also, the WPDCS **NOTED** that the program was successful in collecting information on the fishing grounds reached by the vessels, and size samples of several key IOTC species.
108. **NOTING** that the described national data collection system is designed for artisanal and small-scale fisheries, the WPDCS **ACKNOWLEDGED** that no industrial fishery (i.e., employing vessels of 24m LOA and above) currently exists in Somalia.
109. The WPDCS **CONGRATULATED** Somalia for their successful initiative and **ENCOURAGED** the continuation of the efforts, **ACKNOWLEDGING** that, based on the results of this data collection programme, Somalia will be soon (2021) in the position of providing validated data to the IOTC Secretariat for the first time.

5.2 Further analysis of length frequency data and likely impacts on the assessments

5.2.1 Review of detected anomalies in S-F data sent to the Secretariat

110. The WPDCS **NOTED** paper IOTC-2020-WPDCS16-16 that highlights potential anomalies detected in the size-frequency data for tuna and tuna-like species received by the IOTC Secretariat, and suggests potential areas of intervention to address the issues with concerned CPCs, including its abstract as provided by the authors:

"This document constitutes a review of the processing applied to the size data submitted to the Secretariat, including the current species-specific measurement types, and provides compelling examples of the major issues encountered with some data sets available in the IOTC database. It illustrates four major cases: data inconsistencies, truncation of size distributions, duplication of size data, and discrepancies in size data between

sources. Through these examples, the paper aims to recall the need for each CPC to (i) provide a thorough and up-to-date description of the data collection and curation systems in place and (ii) scrupulously follow IOTC reporting guidelines so as to reduce as much as possible the exclusion of data not compliant with IOTC standards"

111. The WPDCS **NOTED** that the IOTC Secretariat intends to review all the characteristics and constraints that are being applied to the length frequency data received from CPCs and present this work at the next session of the WPDCS in 2021.
112. The WPDCS **CLARIFIED** that the data processing steps that the IOTC Secretariat applies to size-frequency data do not remove whole sets of samples when outliers are found, but just the outliers.
113. The WPDCS **NOTED** that the IOTC Secretariat can automatically generate *curated* size-frequency datasets from raw data, and that for this reason changes in standards can be immediately reflected in the datasets publicly available to the Scientific Community.
114. At the same time, the WPDCS **ACKNOWLEDGED** that changes to standards affecting the structure of the time series used to calculate average catch weights may have an impact on future stock assessments.
115. The WPDCS **NOTED** that it would be beneficial for the purposes of Resolution 15/02 to consider revising the minimum standards for sampling, in order to allow for the submission of higher quality data.
116. Also, the WPDCS **ACKNOWLEDGED** the importance of current minimum standards as a target sampling level for many CPCs.
117. **RECALLING** that, in agreement with Resolution 15/02, the provision of documents covering sampling and raising procedures by species and type of fishery is a mandatory requirement for all IOTC members, the WPDCS **RECOMMENDED** that the Secretariat develops in cooperation with CPCs templates to drive the documentation of sampling procedures for all gears and fleets, focusing on time-area catches as well as size data, for review and discussion at the 2021 session of WPDCS.
118. In the meantime, the WPDCS **REQUESTED** that current documentation be sent to the IOTC Secretariat during the intersessional period, so that thorough analyses could be performed and their results presented at the next session of the WPDCS.

6. Review of data requirements in conservation and management measures relevant to the WPDCS

119. The WPDCS **NOTED** that several topics specifically dealing with aspects of the most common IOTC Conservation and Management Measures relevant to the WPDCS were already discussed during the previous points, and that therefore no additional discussion was undertaken (or required) under this agenda item.

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)

120. The WPDCS **NOTED** that the uncertainty in catch data for a range of gears is affecting the quality and reliability of the stock assessments, as already pointed out by the WPTT.
121. Notwithstanding the availability of a scoring system for data quality already implemented by the IOTC Secretariat, the WPDCS **CONSIDERED** that detailed information on sampling schemes developed by CPCs would allow the Scientific Committee to better assess the representativeness of the data submitted to the IOTC.
122. The WPDCS further **NOTED** that uncertainty in catch time-series should properly be considered in stock assessment models like all other sources of uncertainties (e.g. natural mortality, growth, movements, spatial

stratification, etc.) and that efforts should be made to ensure that such uncertainty is assessed by all possible means.

6.1.2 Resolution 17/05 On the conservation of sharks caught in association with fisheries managed by IOTC

123. The WPDCS **ACKNOWLEDGED** that for some CPCs and fleets where national regulations prevent the measurement of discarded live individuals due to safety reasons (e.g. sharks), it might be impractical to fulfil the requirement of measuring 1 fish / metric ton of live discards (as per Res. 15/02 and 17/05), and that therefore exemptions to the assessment of this criteria to determine compliance levels with IOTC data reporting requirements should be considered.

124. Therefore, the WPDCS **REQUESTED** the issue is brought to the attention of the concerned scientific bodies of the IOTC (e.g. SC and WPEB) for their further consideration.

6.1.3 Resolution 18/07 On measures applicable in case of non-fulfilment of reporting obligations in the IOTC

6.1.4 Resolution 19/01 On an interim plan for rebuilding the Indian Ocean yellowfin tuna stock in the IOTC area of competence

6.2 Data recording (logbooks)

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

6.2.2 Resolution 19/02 Procedures on a fish aggregating devices (FADs) management plan

Summary overview of current buoy data submissions

125. The WPDCS **NOTED** paper IOTC-2020-WPDCS16-17_Rev1 that provides a preliminary summary on the status of instrumented buoys' data for 2020 as received by the IOTC Secretariat from several purse seine fleets operating in the Indian Ocean, including the following abstract as provided by its authors:

"The document compiles all GPS buoy data sets submitted to the IOTC Secretariat for the period January-July 2020. Data were submitted using Form 3BU on a monthly basis by the EU (France, Italy, and Spain), Japan, Mauritius and Seychelles following the requirements expressed by Para. 24 of Resolution 19/02. Information available on the vessels active in 2019 and authorized to operate within the IOTC area of competence in 2020 suggests that GPS buoy data may be missing for the purse seine fleets of Korea (2 purse seiners) and Kenya (6 purse seiners). Daily positions of operational buoys equipping the drifting floating objects monitored by the purse seine fleets provide a holistic view of the magnitude and extent of the use of buoys and FADs in the Indian Ocean. Between January and July 2020, the total daily number of operational buoys varied between 10,207 and 11,583, with each purse seiner monitoring an average of 250 buoys per day. Information available on the sharing of buoys between vessels shows that some of the buoys equipping floating objects occurring East of 75°E are shared among vessels from the same company. The spatial distribution of the satellite-tracked buoys shows the highest density in the purse seine fishing grounds of the Western Indian Ocean, between 10°S and 10°N and 40-70°E. Although the buoys numbers and spatial density pattern were relatively stable over January-July 2020, the buoy data give insight into the complex dynamics of FAD deployments and drift in the Indian Ocean."

126. **CONGRATULATING** the IOTC Secretariat and the data providers for the successful submission of this information, and the results achieved in analysing its content, the WPDCS **ACKNOWLEDGED** that what presented is a region-wide, comprehensive view on the distribution of FADs in the Indian Ocean, and **RECOGNIZED** that this dataset might be the first of its kind available to any trFMO.

127. **NOTING** that six purse-seiners appear as currently flagged by Kenya in the IOTC Record of Authorised Vessels, the WPDCS **REQUESTED** the flag state to provide information on the activity of this segment of its fleet, in particular on whether these vessels were actively fishing in the Indian Ocean during early 2020, and in case, if they were fishing using FADs and instrumented buoys.

128. The WPDCS **ACKNOWLEDGED** that the six purse seiner vessels flagged by Kenya were not actively fishing for tuna and tuna-like species during 2020.
129. The WPDCS **NOTED** that the reduced activity of the Japanese purse seiners in 2019 and 2020 as inferred by the trajectories of their instrumented buoys, is due to the very low catch rates of skipjack tuna, caused by adverse environmental conditions in the Eastern Indian Ocean (cold waters, in particular), and **ACKNOWLEDGED** that during 2018 and 2019 the Japanese vessels have moved to other fishing grounds in the Western-Central Pacific Ocean and deployed very little sets while still in the Indian Ocean.
130. The WPDCS **NOTED** that the buoy positions are reported at the operational level (i.e. not aggregated) and with a temporal resolution of one day, and **ACKNOWLEDGED** that these may indeed be used to reconstruct the trajectories of floating objects at sea, although the analysis presented in this paper limits its scope on analysis of the buoys density in larger areas (regular grids of one by one degrees, aggregated by month).
131. The WPDCS **NOTED** that paragraph 24 of Res. 19/02 makes explicit reference to business confidentiality aspects, indicating that daily buoy positions data be used mostly to monitor compliance with the limit set on the maximum number of operational buoys per vessel, and **RECOMMENDED** that the SC assess the interest in using these same buoy data for scientific purposes, deferring consideration of confidentiality aspects to the Commission, possibly through the update of Res. 12/02.

Commented [1]: The resolution shall be reviewed by the Commission based on recommendations from the Scientific Committee (para 27)

7. Regional Observer Scheme

7.1 Resolution 11/04 On a regional observer scheme

7.2 Resolution 16/04 On the implementation of a pilot project in view of promoting the Regional Observer Scheme of IOTC

7.2.1 Minimum standards for designing and implementing Electronic Monitoring Systems in Indian Ocean tuna fisheries

132. The WPDCS **NOTED** paper IOTC-2020-WPDCS16-18_Rev1 that proposes minimum standards for the implementation of EMS for industrial (and semi-industrial) fisheries in the Indian Ocean, including its abstract, as provided by the authors:

"In addition to catch and effort fishery-dependent information collected through logbooks and/or port-sampling of commercial vessels, observer data is key to compile, complement and verify fishery activity information. Electronic monitoring (EM) using cameras and other sensors is a proven technology that has been widely used for various purposes on fishing vessels, primarily in industrial fleets. EM systems include equipment that tracks a vessel's position and activity, together with cameras that record key aspects of the fishing operations. EM has been used extensively for this purpose to obtain reliable information on catches and their composition, as well as to monitor and collect data on bycatches of protected species (ETP). EM pilot tests in different regions on tuna purse seiners and longline vessels, as well as in small-scale artisanal fisheries, have demonstrated the validity of this technology to improve the collection of fishery. However, before considering the wide application of any EM in general, and particularly in tuna fisheries, EM minimum standard for the installation, collection, analysis and storage of data are needed. Moreover, it is also particularly important to assess the congruence between EM and observers-collected fishery data, to verify the capability, and ensure the replicability and accuracy of the information collected through EM (e.g. collection of the same data fields, with information comparable to those collected by human observers) with the purpose of improving the stock assessment and management process. Thus, this document aims to progress on the development of EM minimum standards, including specifications and procedures, for the implementation of Electronic Monitoring Systems for IOTC fisheries, as well as evaluate EMS' capabilities to collect the ROS minimum standards data fields as per latest requirements."

7.2.2 Use of electronic monitoring systems to optimize observer sampling protocols onboard French purse seiners of the Indian Ocean

133. The WPDCS **NOTED** paper IOTC-2020-WPDCS16-20 that provided details on how electronic monitoring systems (EMS) contribute to the improvement and optimization of scientific data collection operations onboard the French purse seine fleet operating in the Indian Ocean, including its abstract, as provided by the authors:

“Observer programs on tuna purse seine vessels are essential to collect information on bycatch and discards in order to monitor the impact of fisheries on populations and ecosystems. On-board observers estimate discards following a sampling protocol and sometimes extrapolation methods (based on the number of brailers or time) when counting exhaustively is not possible. However, these methods may be biased because brailers have different filling rates, which in turns results in a heterogeneous flow of discarded individuals during the sorting process, and may lead to biased estimates. Electronic Monitoring Systems (EMS) have been implemented since 2013 on French purse seiners to complement on-board observer programs on vessels that cannot embark observers. On-board cameras allow monitoring sorting operations continuously and monitoring the discard flow in time and space (upper vs lower deck). In this study, we used EMS « counts per minute » of discards from 5 vessels operating in the Indian Ocean to describe the general trends in sorting flow on the upper and lower decks. We analysed 50 FOB (Floating Objects) fishing sets with various sorting time and simulated different observer strategies (using bootstrap without resampling) on the total number of discarded individuals in order to optimize (i) the total sampling duration and (ii) the duration of sampling sequences. This analysis is detailed at the species level on the lower deck where the number of individuals and the level of identification were higher. We finally propose an optimized sampling strategy for evaluating discards that reduces both sampling time and estimation bias, and that can be applicable to both electronic and on-board observations.”

134. **NOTING** that these two last documents provide important details on common aspects related to the management of Electronic Monitoring Systems (EMS), the WPDCS **AGREED** to combine together the response of the group in terms of feedback and remarks on their content.
135. In first place, the WPDCS **CONGRATULATED** the authors for the quality and comprehensiveness of the presentations and their underlying documents, which constitute a valuable source of information on EMS and a very good basis for the further development and implementation of Electronic Monitoring Programme Standards for IOTC fisheries.

~~136.~~ The WPDCS **NOTED** that, mostly for practical reasons, EMS alone cannot fully meet the requirements of the ROS minimum standard data fields for scientific purposes.

~~136-137.~~ ~~Therefore, the WPDCS, and~~ **AGREED** that ~~it-EMS~~ should rather be considered as a complementing mechanism to increase the level of coverage of scientific data collection on fisheries activities.

~~137. [REMOVE THIS PARAGRAPH] While~~ **ACKNOWLEDGING** the complementary nature of EMS with respect to human observers, the WPDCS further **NOTED** that EMS is capable of going beyond that role, and therefore **STRESSED** the importance of EMS as an additional mechanism to improve the coverage of scientific observer data collection programmes.

~~138. Furthermore, t~~he WPDCS **NOTED** that the CoViD-19 pandemic has further highlighted the potential of EMS as a valuable tool to ensure the collection of required data in all those circumstances when the deployment of human observers onboard is prevented by reasons of *force majeure*.

139. The WPDCS **ACKNOWLEDGED** that the current definition of “*For reporting (Optional)*” used in the context of the ROS minimum data fields³ might be subject to interpretation, and therefore **RECOMMENDED** that the SC requests CPCs to report to the IOTC Secretariat all ROS data fields marked as “*For reporting (Optional)*”, when available.

³ See Appendix 6a of the Report of the 21st session of the IOTC Scientific Committee (2018), [IOTC-2020-SC21-R/E1_Rev1](#)

140. The WPDCS **ACKNOWLEDGED** the importance of including all different stakeholders in the discussions around EMS (i.e., scientists, EMS designers/vendors, fishermen, representatives from the industry) to improve its current approach and contribute to EM Programme Standards by providing technical advice on the operational aspects of their implementation, and foster the developments of new tools such as Artificial Intelligence (AI) subsystems for the identification of the most effective sampling strategies and to facilitate the analysis of the images.
141. **ACKNOWLEDGING** that the proposed EM Programme Standards represent a basis for subsequent applications but still require additional contributions for their successful implementation on a regional scale, the WPDCS **AGREED** with the recommendation from document IOTC-2020-WPDCS16-18 to create an *ad-hoc* intersessional Working Group on the development of EM Programme Standards, and therefore **RECOMMENDED** that the Working Group be constituted and dedicated workshops (physical or virtual, depending on the circumstances) be held, to further progress on the definition of the standards.
142. Overall, the WPDCS strongly **SUPPORTED** the interest of EMS as an additional source of observations to improve the monitoring of different fishery activities, and **ENCOURAGED** scientists to further investigate the possible ways of defining sound and comprehensive EM Programme Standards.
143. The WPDCS **NOTED** that EMS sampling effort and coverage level should be analysed at the species and gear level, and that gear and/or fishery-specific EMS coverage objectives should also be included in the EM Programme Standards.
144. The WPDCS **ACKNOWLEDGED** the need for further efforts towards the improvement of automated data collection and analyses: in particular, while AI is generally seen as a promising tool for both data collection (e.g. adaptive changes of resolution in video recording according to situation) and analysis (e.g. to optimize the process of footage review through identification of fishing activities), AI tools adapted to each fishery still require to be conceptualized and operationalized, and this is expected to take some years.
145. The WPDCS **SUGGESTED** the Spanish and French scientists to share experiences on their preliminary EMS pilot studies to define common approaches already done with human observer programmes (e.g. ObServe database) and **RECALLED** the existence of an EU-funded pilot project implementing EM on small longliners in Reunion island ([RECOLAPE](#) - Strengthening Regional cooperation in the area of large pelagic fisheries data collection).

7.2.3 Updates on the ROS supporting tools and the Regional Observer Database

8. Capacity building activities: data collection and processing in coastal countries, and compliance with minimum requirements

8.1 IOTC capacity building activities in support of developing coastal IOTC CPCs

146. The WPDCS **NOTED** paper IOTC-2020-WPDCS16-08 on the implemented (and scheduled) capacity building activities of the IOTC Secretariat for the biennium 2020 - 2021, including the following abstract provided by the authors:

“Since its inception, the Commission has allocated funds from its regular budget to assist developing coastal CPCs in the Indian Ocean in the implementation of the IOTC data requirements. In addition to the funds allocated by the Commission, the IOTC Secretariat has also secured funding from external sources with funds sourced from third parties that in recent years have been well above those allocated by the Commission. Since April 2002, the Overseas Fisheries Cooperation Foundation of Japan has been assisting developing coastal states in the IOTC area of competence with their statistical data collection, processing, and reporting systems, with a view to enhancing the capacity of institutions in those countries and improve their compliance with IOTC requirements for statistics and other scientific data used on the assessments of IOTC species. In recent years, the IOTC has also received substantial funding for capacity building activities from other sources, including the Bay of Bengal Large Marine Ecosystems Project (BOBLME), the IOC-SmartFish Project and, more recently, the GEF-Areas Beyond

National Jurisdiction Project (ABNJ) and EU DG-MARE. This document presents the activities undertaken by the IOTC and its partners during the last year (2020), including those activities that will extend to 2021 and following years, where appropriate."

147. The WPDCS **THANKED** the IOTC Secretariat for the efforts in delivering on-site and remote capacity building activities to support the data collection and reporting systems of developing coastal CPCs, and **ACKNOWLEDGED** the continuous progress achieved in the implementation of the Regional Observer Pilot Project, including the finalization of the IOTC Regional Database and of the ROS electronic tools, the completion of the procurement of Electronic Monitoring Systems for Sri Lanka and the support to the implementation of the ROS training programme, that should lead to sensible improvements in the coverage and quality of observer data reported to the IOTC.
148. The WPDCS **NOTED** again with concern that non-reporting of mandatory data continued to fundamentally affect the quality of stock assessments and management of IOTC species (particularly neritic tunas and billfish), and that the overall quality and reporting coverage is disproportionately related to a number of CPCs important for artisanal fisheries.
149. The WPDCS **ACKNOWLEDGED** the renewed support provided by OFCF with the commencement of Phase VI of the IOTC-OFCF project, that will focus on the realization of sustainable utilization of tuna resources by improving the accuracy of data collection and statistical analysis of the catch and resources of tuna in the Indian Ocean.

8.2 ABNJ fishing gear loss surveys in IOTC fisheries - summary proposal

150. The WPDCS **NOTED** paper IOTC-2020-WPDCS16-19 on "Fishing gear loss surveys in IOTC fisheries", including the following abstract provided by the authors:
- "The aim of this survey is providing scientific, evidence-based and defensible global estimates of the amount of abandoned, lost or otherwise discard fishing gear (ALDFG), temporal and spatial distribution and trends of gear loss across fisheries, geographies and gear types. Data will be collected through surveys of fishers, and/or representatives with standardized survey forms and methodology. Data collected will be inputted and stored in a database for further analysis and synthesis of global estimates of gear loss, as well as for mapping the distribution of gear loss and estimates of temporal and spatial trends. The development and planning of this global survey has been guided by recommendations provided by GESAMP WG43 on Sea-Based Sources of Marine Litter (also see COFI/2020/SBD.8) jointly led by FAO and IMO, and co-sponsored by UNEP"*
151. **ACKNOWLEDGING** the importance of the topic, the WPDCS **CONGRATULATED** the author of this initiative to assess the magnitude and extent of abandoned, lost and discarded fishing gear (ALDFG) and to develop effective mitigation strategies to reduce ALDFG and its impact in the marine environment at global scale.
152. The WPDCS **NOTED** that the survey will be conducted through online forms with a sample of active fishers and it will cover a large number of countries and aspects, including fishing gear practices, availability of disposal techniques, existence of recycling systems, knowledge of regulations and perception of fishing gear in their environment.
153. The WPDCS **NOTED** that some other survey-based initiatives dealing with ALDFG are already ongoing in the Indian Ocean (IPNLF in the Maldives, WWF in collaboration with Global Ghost Gear Initiative in Pakistan) and other oceans (e.g. The Nature Conservancy, UC Santa Barbara) and that there may be some duplication of the efforts and overlap between studies.
154. The WPDCS **NOTED** that the authors are aware of the different ongoing projects dealing with ALDFG and that the ABNJ survey aims to collect some additional information not covered by the other studies.

9. Fisheries information and dissemination systems

9.1 Proposed metadata standards for the fisheries domain

9.2 Best practices for (meta)data access and visualization

9.2.1 The FIRMS Tuna Atlas: towards a scalable data portal for global tuna fisheries

155. The WPDCS **NOTED** paper IOTC-2020-WPDCS16-22 that provides an overview of the current state-of-the-art for what concerns the implementation of the FAO / FIRMS *Global Tuna Atlas*, including the following abstract provided by the authors:

“The five tuna Regional Fishery Management Organizations (tRFMOs) are responsible for collating, analysing and disseminating fisheries data from their member countries required for stock assessment, management, and enforcement of management measures. These datasets generally include catch, effort, and size data covering large spatial scales over several decades. These rich datasets are also very complex, heterogenous, and include some large uncertainties, e.g. in reporting small-scale fisheries. In addition, data structures differ between the tRFMOs, and similar information across tRFMOs may be expressed by using different formats, labels, units, and granularity. These factors make interbasin comparisons difficult, and they can lead to misunderstandings of tuna fisheries. Recent projects have aimed to harmonise the semantics of tRFMO data in terms of concepts and terminology (e.g. code lists), improve communication, and promote greater transparency and accessibility to their datasets (i.e., GEF funded Common Oceans ABNJ Tuna project, 1,2). These projects were driven by the need to improve data quality and availability in order to address key questions on monitoring and management of tuna fisheries (e.g. monitoring of the global fishing capacity) and ecology such as habitat preferences and the impacts of climate change (Lewison et al. 2004, Reygondeau et al. 2012, Arrizabalaga et al. 2015, Dueri et al. 2016, Monllor-Hurtado et al. 2017). These datasets can also be a valuable source of information for data-poor assessment approaches (e.g. catch time series collapse, changes in mean trophic level of catch). There is a global call for increased data quality and harmonisation between national, regional and global statistics such that the collation of fisheries statistics is systematic and transparent across all levels. Increasingly, the streamlining of data flows among agencies is being encouraged (ABNJ, CWP), and data sharing arrangements are being promoted among FAO and RFMs. The Coordinating Working Party (CWP) on Fishery Statistics Task Group was established to develop a global standard for Reference Harmonization”.

156. The WPDCS **CONGRATULATED** the authors for the work undertaken and **AGREED** that the FIRMS Tuna Atlas can be a useful tool to visualize data from tuna-RFMO at the global scale and **ENCOURAGED** the authors to continue development of the platform.
157. The WPDCS **ACKNOWLEDGED** that the Global Tuna Atlas builds on the experience gathered from other similar initiatives (e.g. the IRD Tuna Atlases, the FAO *Global Tuna Catches by stocks* and the FAO *Atlas of Tuna and Billfish catches*) and that now it has officially been adopted by FIRMS, becoming one of its services.
158. Considering the FIRMS governance model, the WPDCS **ACKNOWLEDGED** that the public dissemination of the FIRMS Global Tuna Atlas interface and the underlying datasets are in agreement with FIRMS partners (the t-RFMOs in particular), and that other datasets might exist (e.g. Level 1 and Level 2 datasets) that are built on top of the original Level 0 dataset (public t-RFMO data) and introduce additional levels of processing.
159. For this reason, the WPDCS **NOTED** that the public dissemination of such augmented datasets (and the processes leading to their production) needs to receive formal approval from the original data owners.
160. The WPDCS **NOTED** the updates introduced in the FIRMS Global Tuna Atlas during its last development iteration, including the improvements in the underlying infrastructure, its optimised data import workflow and the additional developments in the ancillary tools (e.g., the map viewer) that leverage standard metadata to automatically adapt to the datasets being explored.

161. The WPDCS **NOTED** that the collaboration between IOTC and the FIRMS Global Tuna Atlas has proven that the latter can be successfully used as a test platform to standardize metadata and data of interests for key IOTC datasets (including nominal catches and catch-and-effort, so far) and that externally funded projects such as *BlueCloud* and the future *INTERREG*, are concrete opportunities to further investigate this collaboration.
162. **RECALLING** the global nature of the FIRMS GTA, the WPDCS **CONSIDERED** that IOTC (as well as any other participating partner) could further contribute to the identification of new datasets (e.g. regional FAD densities, cannery sales data and trading routes) and assign priorities for their development in order to drive the future work of the Fisheries Atlas demonstrator in the context of BlueCloud project (ending in September 2022) and of the *INTERREG* project (ending in October 2023), with the latter expected to further support work streams focusing on *Datacite* metadata elements and DOIs assignment for IOTC Digital Objects (datasets, reports, working papers, etc.).
163. While the WPDCS **ACKNOWLEDGED** the potential for the platform to manage various types of data (such as AIS or FAD track data) in addition to current geo-referenced catch data sets, it also **NOTED** that the dissemination of this information will be subject to the approval from data owners as it oftentimes is considered of highly sensitive nature.
164. Furthermore, the WPDCS **NOTED** that the existing GTA dataset contains high-resolution data (regular grids of 1x1 degrees) from three tRFMOs, as that same type of information is not in the public domain for the other two, and that dissemination of data through the GTA portal will require approval from all the RFMO that have shared information.
165. Considering these shortcomings, the WPDCS **AGREED** on the need to promote cooperation from all tRFMOs with this initiative, and **AGREED** to defer this matter for the consideration of the IOTC Scientific Committee.

10. WPDCS program of work

10.1 Revision of the WPDCS program of work 2021-2025

166. The WPDCS **NOTED** paper IOTC-2020-WPDCS16-09 which provides an opportunity to consider and revise the WPDCS Program of Work (2021-2025), by taking into account the specific requests of the Commission, Scientific Committee, and the resources available to the IOTC Secretariat and CPCs.
167. The WPDCS **RECALLED** that the SC, at its 18th Session, made the following request to its working parties:
- “The SC REQUESTED that during all future 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.”* (SC18. Para 154)
168. 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.
169. The WPDCS **RECOMMENDED** that the Scientific Committee consider and endorse the WPDCS Program of Work (2021-2025), as provided at [Appendix V](#).
170. The WPDCS **ACKNOWLEDGED** that, notwithstanding the recent increase in the number of staff resources at the IOTC Secretariat, additional capacity might be required to provide support for the following core functions:
- Assist countries to facilitate reporting and improve compliance in terms of IOTC mandatory statistical data collection and reporting requirements, including the Regional Observer Scheme;

- Improve the quality and transparency of data in the IOTC database, including documentation of data reviews and dataset processing procedures, development of data quality indicators and quantifying uncertainty in catch estimates;
- Provide technical support to countries in the region in establishing and maintaining statistical systems for collecting and reporting data to the IOTC, particularly in relation to sampling of artisanal fisheries;
- Support for new priorities identified by the Scientific Committee and Commission, including the Regional Observer Scheme pilot project, Electronic-monitoring, and catch monitoring in support of Resolution 19/01 *On an Interim Plan for Rebuilding the Indian Ocean Yellowfin tuna Stock in the IOTC area of competence*;
- Dissemination of information on data-related Commission activities through the IOTC website, assigning standard metadata and DOIs, data exchange between tRFMOs and related organizations.

11. Other business

11.1 Date and place of the 17th and 18th Sessions of the WPDCS: 2021 & 2022

171. The WPDCS **NOTED** that the global CoViD-19 pandemic has resulted in an almost complete halt to international travel and with no clear end to the pandemic in sight, it was impossible to finalise arrangements for the meeting in 2021.
172. Therefore, the WPDCS **REQUESTED** the IOTC Secretariat to liaise with CPCs to determine the feasibility of hosting the 17th and 18th sessions of the WPDCS (**Table 1**) if and when circumstances will allow the reinstatement of physical meetings, and that in any case the WPDCS meeting sessions be held back-to-back with the SC, with the WPDCS taking place before the SC in 2021.

Table 1. Draft meeting schedule for the WPDCS (2021 and 2022)

Meeting	2021			2022		
	No.	Date	Location	No.	Date	Location
Working Party on Data Collection and Statistics (WPDCS)	17 th	TBD	TBD	18 th	TBD	TBD

11.2 Review of the draft, and adoption of the report of the 16th Session of the WPDCS

173. The WPDCS **RECOMMENDED** that the Scientific Committee consider the consolidated set of recommendations arising from WPDCS16, provided at [Appendix VI](#).
174. The report of the 16th Session of the Working Party on Data Collection and Statistics (IOTC-2020-WPDCS16-R) was **ADOPTED** on the 3rd of December 2020.

Appendix I

List of participants

Title	First name	Last name	Organisation	E-mail	CPC / Observer
Chairpersons					
Mr.	Stephen	Ndegwa	Kenya Fisheries Service	ndegwafish@yahoo.com	Kenya (Chair)
Dr.	Julien	Barde	Institut de Recherche pour le Développement	julien.barde@ird.fr	European Union (Vice-chair)
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IOTC-2020-WPDCS16-R[E]

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IOTC-2020-WPDCS16-R[E]

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IOTC-2020-WPDCS16-R[E]

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Appendix II
Agenda for the 16th Working Party on Data Collection and Statistics

Date: 30th November – 3rd December 2020

Location: Online

Platform: Microsoft Teams

Time: 12:00 – 16:00 daily (Seychelles time, GMT+04:00)

Chair: Mr Stephen Ndegwa (Kenya); **Vice-Chair:** Dr Julien Barde (EU,France)

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 22nd Session of the Scientific Committee and of the 24th Session of the Commission
 - 3.2 Review of Conservation and Management Measures relevant to the WPDCS
 - 3.3 Progress on the recommendations of WPDCS15
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: updates
 - 4.2.2 IOTC Data Dissemination: discussion of potential improvements
 - 4.2.3 Alternative data series
 - 4.3 Updates on data-related requests from other Working Parties
5. **UPDATE ON NATIONAL STATISTICAL SYSTEMS** (CPCs)
 - 5.1 Update on national statistical systems, including the main challenges in collecting and reporting data to the IOTC Secretariat and proposals to improve future levels of compliance with IOTC data requirements.
 - 5.2 Further analysis of length frequency data and likely impacts on the assessments (IOTC Secretariat & CPCs)
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)*
 - 6.1.2 Resolution 17/05 *On the conservation of sharks caught in association with fisheries managed by IOTC*
 - 6.1.3 Resolution 18/07 *On measures applicable in case of non-fulfilment of reporting obligations in the IOTC*
 - 6.1.4 Resolution 19/01 *On an interim plan for rebuilding the Indian Ocean yellowfin tuna stock in the IOTC area of competence*
 - 6.2 Data recording (logbooks)
 - 6.2.1 Resolution 15/01 *On the recording of catch and effort data by fishing vessels in the IOTC area of competence*

6.2.2 Resolution 19/02 *Procedures on a fish aggregating devices (FADs) management plan*

7 REGIONAL OBSERVER SCHEME (IOTC Secretariat & CPCs)

7.1 Resolution 11/04 *On a regional observer scheme*

7.2 Resolution 16/04 *On the implementation of a pilot project in view of promoting the Regional Observer Scheme of IOTC*

7.3 Updates on the ROS supporting tools and the Regional Observer Database

7.3.1 Outcomes of the national workshops on the adoption of the ROS supporting tools

8 CAPACITY BUILDING ACTIVITIES: DATA COLLECTION AND PROCESSING IN COASTAL COUNTRIES, AND COMPLIANCE WITH MINIMUM REQUIREMENTS (Chair & IOTC Secretariat)

9 FISHERIES INFORMATION AND DISSEMINATION SYSTEMS (Chair & IOTC Secretariat)

9.1 Proposed metadata standards for the fisheries domain

9.2 Best practices for (meta)data access and visualization

10 WPDCS PROGRAM OF WORK (Chair & IOTC Secretariat)

10.1 Revision of the WPDCS Program of Work 2021–2025

11 OTHER BUSINESS

11.1 Date and place of the 17th and 18th Sessions of the WPDCS: 2021 & 2022 (Chair)

11.2 Review of the draft, and adoption of the report of the 16th Session of the WPDCS (Chair)

Appendix III

List of documents

Document	Title
IOTC-2020-WPDCS16-01a	Agenda of the 16 th Working Party on Data Collection and Statistics
IOTC-2020-WPDCS16-01b	Annotated agenda of the 16 th Working Party on Data Collection and Statistics
IOTC-2020-WPDCS16-02	List of documents of the 16 th Working Party on Data Collection and Statistics
IOTC-2020-WPDCS16-03	Outcomes of the 22 nd Session of the Scientific Committee (IOTC Secretariat)
IOTC-2020-WPDCS16-04	Outcomes of the 24th Session of the Commission (IOTC Secretariat)
IOTC-2020-WPDCS16-05	Review of current Conservation and Management Measures relating to the WPDCS (IOTC Secretariat)
IOTC-2020-WPDCS16-06	Progress on the recommendations of WPDCS15 (IOTC Secretariat)
IOTC-2020-WPDCS16-07_Rev1	Report on IOTC Data Collection and Statistics (IOTC Secretariat)
IOTC-2020-WPDCS16-08	IOTC capacity building activities in support of developing coastal IOTC CPCs (IOTC Secretariat)
IOTC-2020-WPDCS16-09	Revision of the WPDCS Program of Work (2021-2025) (IOTC Secretariat, Chairperson & Vice-Chairperson)
IOTC-2020-WPDCS16-10_Rev1	Proposals for draft CPCs data fact sheets (IOTC Secretariat)
IOTC-2020-WPDCS16-11	Research proposal: an evaluation of data from ISSF-affiliated canneries for use in tuna fisheries management (IOTC Secretariat)
IOTC-2020-WPDCS16-12_Rev1	A new protocol to collect verified scientific data on catch including bycatch information using crew-based observers on small size longline tuna fishing vessels (<24m) in Sri Lanka (Gunawardane N, Hewapathirana K, Chandrakumara S, Creech S, Gunasekera E, Pinnagoda D)
IOTC-2020-WPDCS16-13_Rev1	Updating of the statistics reported for the EU-Spain purse seine fleet in the Indian Ocean (1990-2019), and the effect of the COVID19 pandemic on the port sampling from Victoria (Seychelles) (Báez J-C, Ramos M-L, González Carballo M, Pérez San Juan A, Deniz S, Sierra V)
IOTC-2020-WPDCS16-14	Statistics of the French purse seine fishing fleet targeting tropical tunas in the Indian Ocean (1981-2019) (Floch L, Depetris M, Duparc A, Lebranchu J, Marsac F, Pernak M, Bach P)
IOTC-2020-WPDCS16-15	First results of the FLOPPED project : satellite tagging and biological sampling of billfish around the Indian Ocean (Nieblas A-E, Bernard S, Chanut J, Brisset B, Evano H, Kerzho V, Rouyer T, Faure C, Colas Y, Coelho R, Big Game Fishing Réunion, Bonhommeau S)
IOTC-2020-WPDCS16-16	Review of detected anomalies in S-F data sent to the Secretariat (IOTC Secretariat)
IOTC-2020-WPDCS16-17_Rev1	Summary overview of current buoy data submissions (IOTC Secretariat)
IOTC-2020-WPDCS16-18_Rev1	Minimum standards for designing and implementing Electronic Monitoring Systems in Indian Ocean tuna fisheries (Murua H, Fiorellato F, Ruiz J, Chassot E, Restrepo V)
IOTC-2020-WPDCS16-19	ABNJ fishing gear loss surveys in IOTC fisheries - summary proposal (Lansley J, Einarsson H)
IOTC-2020-WPDCS16-20	Use of electronic monitoring systems to optimize observer sampling protocols onboard French purse seiners of the Indian Ocean (Briand K, Sabarros P, Maufroy A, Vernet A-L, Yon A, Relot-Stirnemann A, Bonnieux A, Goujon M, Bach P)
IOTC-2020-WPDCS16-21	Fisheries data collection working group: significant progress for Somalia's fisheries (Sheik Heile A-I, Glaser S, Hassan J)
IOTC-2020-WPDCS16-22	The FIRMS Tuna Atlas: towards a scalable data portal for global tuna fisheries (Blondel E, Barde J, Nieblas A-E, Chassot E, Ellenbroek A, Gentile A, Taconet M)

Appendix IV

Main data issues identified by the WPDCS and actions proposed to address them

Nominal catches	
Main Issues	Proposed Actions
<p>Indonesia: coastal fisheries <u>Issue:</u> improve estimates of total catch and species composition of artisanal fisheries.</p>	<ul style="list-style-type: none"> Continue ad-hoc collaboration with DGCF (dependent on available funds/resources) and support for sampling of artisanal fisheries, to ensure Indonesia has capacity to monitor artisanal fisheries and fulfill IOTC data reporting requirements.
<p>Sri Lanka: coastal and offshore fisheries <u>Issue:</u> implementation of ROS / ROS pilot project.</p>	<ul style="list-style-type: none"> Continue support for Sri Lanka, primarily through development of the Regional Observer Scheme. IOTC Secretariat to continue supporting the implementation of the ROS e-Tools; finalization of EMS trials (for 6 gillnet/longline vessels) commenced in Q3-2019.
<p>Yemen: handline fishery <u>Issue:</u> improve quality of catch estimates.</p>	<ul style="list-style-type: none"> FAO catch estimates currently used; the IOTC Secretariat to explore options for further improvements in the catch estimates.
<p>Somalia: coastal fisheries <u>Issue:</u> lack of data collection, including catch and effort and size data</p>	<ul style="list-style-type: none"> Support to national initiatives (e.g. Fisheries Data Collection Working Group) for the validation of databases and data collection programmes
<p>India: commercial longline fishery and coastal fisheries <u>Issue:</u> inconsistencies in reported catches.</p>	<ul style="list-style-type: none"> India has indicated that the IOTC shall use official figures, communicated by national authorities. In 2017 data was submitted late (October), and partial data has been reported in 2019 and 2020 due to the incompatibility of the national data collection and reporting systems with the IOTC reporting formats. Increases in engagement from national scientists and stakeholders during 2019 and 2020.

<p>Pakistan: drifting gillnet fishery. <u>Issue:</u> validation of revised catch series; improvements in data collection and reporting of IOTC data.</p>	<ul style="list-style-type: none"> ● ABNJ-WWF Project crew-based data collection pilot programme initiated in 2014; IOTC Secretariat liaising with Pakistan in terms of support for appraisal of the data. ● Revised catch series for the last 30 years have been evaluated by the IOTC Secretariat and endorsed by the WPDCS / SC 2019 for their inclusion in the IOTC database.
<p>Madagascar: coastal fisheries and longline fisheries <u>Issue:</u> lack of data collection, including catch and effort and size data (longline fleet).</p>	<ul style="list-style-type: none"> ● Provide assistance in the sampling of artisanal fisheries upon request (dependent on staff / funds available). Liaise with FAO / FI to assess possible options for combined interventions in the country.

Catch-and-Effort

Main Issues

Proposed Actions

Implementation of minimum requirements for operational data (logbook)

Indonesia: Longline
Issue: Inconsistencies between logbook and VMS data.

- IOTC to encourage strengthening management and validation of logbook data – particularly inconsistencies with VMS data and issues of low reporting rates of submitted logbooks (<10% in recent years).

India, Malaysia and Oman: Longlines
Pakistan: Driftnets
Issue: Data either not submitted, or falls short of the IOTC data reporting requirements.

- As part of the IOTC Data Compliance and Support missions, provide assistance to CPCs to understand the IOTC data requirements and processing of information and urge them to implement requirements and report data to the IOTC; for Pakistan gillnetters, appraisal of the capacity of the local crew-based data collection database to provide reliable Catch-and-Effort (as well as Size-Frequency) data to the Secretariat

Most fisheries	<ul style="list-style-type: none"> Implement minimum data requirements for sharks (noting that those for India are different as it has objected to the logbook Resolution).
<i>Catch-and-effort not available for coastal fisheries</i>	
Issue: Many CPCs have failed to report catches and effort per month for their coastal fisheries.	<ul style="list-style-type: none"> As a minimum, request CPCs to report catches and fishing by species, gear, and month, in addition to the total numbers of fishing craft operated by gear, and month (or year). Follow-up to 2019-09 mission to Oman to finalize proper standardization of the statistical information available for handlines and gillnets, and eventually submission of C-E data according to Res. 15/02

Size-Frequency	
Main Issues	Proposed Actions
<i>Lack of reporting</i>	
Coastal fisheries of India, Indonesia, Malaysia, Oman, Yemen	<ul style="list-style-type: none"> Assist CPCs to understand data requirements, and provide support to pilot sampling and processing of fisheries data and urge them to strictly implement IOTC mandatory data reporting requirements.
Driftnets of Pakistan	<ul style="list-style-type: none"> ABNJ-WWF Project crew-based data collection pilot programme initiated in 2014 includes collection of size frequency samples. IOTC Secretariat liaising with Pakistan in terms of possible assistance for data entry, processing and submission of data via the Pakistan government.
<i>Poor data quality</i>	
Longline fisheries of Japan and Taiwan, China <u>Issue:</u> Catch-and-effort and size data conflicting over the time series.	<ul style="list-style-type: none"> A project planned for 2019_–completed<u>progressed during in-2020 and will be completed in 2021</u>: it examinesd the inconsistencies in size frequency data reported by distant water fishing nations and <u>attempts to resolved</u> long standing inconsistencies between average weights derived from length frequencies and catch-and-effort between fleets operating in

	comparable time-area strata. Decisions to be taken on how final outputs could be used to update the information in the IOTC database.
Gillnet fishery of I.R. Iran . <u>Issue</u> : Data not by IOTC standards for the	<ul style="list-style-type: none"> The IOTC Secretariat to continue to provide assistance to I.R. Iran to submit size data according to fishing ground (rather than landing site) based on port sampling (as logbooks are currently being piloted on a limited number of vessels).

Socio-Economic Data	
Main Issues	Proposed Actions
<u>Issue</u> : Limited data available, and collated within the IOTC database.	<ul style="list-style-type: none"> A scoping study was initiated by the IOTC Secretariat in 2019, at the request of the Commission, to identify the social and economic data that are relevant to CPCs and IOTC and to recommend comprehensive methods to acquire these data. IOTC-OFCF project reached the finalization phase for the fisheries satellite national account of Seychelles.

Observer Schemes	
Main Issues	Proposed Actions
Observer reports <u>Issue</u> : Very poor rates of reporting, or formats not suitable for data extraction	<ul style="list-style-type: none"> Explore ways of facilitating reporting of data using the new IOTC ROS electronic tools. Organize ROS training and workshops to assist CPCs with implementation of the ROS data collection and reporting requirements, also under the activities of the ROS Pilot Project (training programme). Resume implementation of the pilot study of Electronic Monitoring Systems in Sri Lanka for coastal fisheries for which there are difficulties placing on-board observers.

Appendix V

Working Party on Data Collection and Statistics program of work (2021–2025)

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	Timing				
			2021	2022	2023	2024	2025
1. Artisanal fisheries data collection	1.1 Assist the implementation of data collection and sampling activities of coastal fisheries in countries/fisheries insufficiently sampled in the past; priority to be given to the following fisheries: <ul style="list-style-type: none"> • Coastal fisheries of Indonesia • Coastal fisheries of Kenya • Coastal fisheries of Somalia • Coastal fisheries of Pakistan • Coastal fisheries of Sri Lanka • Coastal fisheries of I.R. Iran 	3					
2. Compliance with IOTC Data Requirements	2.1 Data support missions 2.1.1 Drafting 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: <ul style="list-style-type: none"> • Indonesia • Pakistan 						

		<ul style="list-style-type: none"> India Sri Lanka Somalia 							
3.	IOTC Data access	3.1 Improving discoverability of IOTC scientific assets through standard metadata and DOIs							
4.	ROS – Support for the implementation of the IOTC Regional Observer Scheme	<p>4.1 ROS tools</p> <p>4.1.1 Support the adoption of the ROS e-Reporting and ROS national database tools by countries not having any existing observer data collection and management system in place</p> <p>4.2 ROS Regional Database</p> <p>4.2.1 Incorporate all historical observer data currently available in other proprietary data formats (e.g. ObServe, ICCAT ST09 and other custom observer forms)</p> <p>4.2.2 Implement dissemination best-practices for all data collected by the ROS Regional Database</p> <p>4.3 ROS Electronic Monitoring Systems</p> <p>4.3.1 Implement pilot EMS system on gillnet / coastal longline vessels for fleets insufficiently covered by on-board observers possibly by providing support through remote meetings until travel bans are lifted</p> <p>4.3.2 Ad-hoc Working Group on EMS programme standards, including workshops (in person / virtual, depending on the case)</p> <p>4.4 Evaluate the combination of alternative data collection systems and protocols for the collection of scientific observer data for artisanal and coastal fisheries, with an initial expert workshop (in person / virtual, depending on the case) to develop protocols and guidelines for minimum data collection requirements in small-scale, artisanal and coastal fisheries.</p>							
				1					
				2					
					2021	2022	2023	2024	2025

Appendix VI

Consolidated recommendations of the 16th Session of the Working Party on Data Collection and Statistics

Note: Appendix references refer to the Report of the 16th Session of the Working Party on Data Collection and Statistics (IOTC-2020-WPDCS16-R)

Further analysis of length frequency data and likely impacts on the assessments

WPDCS16.01 (para. [117147](#)): **RECALLING** that, in agreement with Resolution 15/02, the provision of documents covering sampling and raising procedures by species and type of fishery is a mandatory requirement for all IOTC members, the WPDCS **RECOMMENDED** that the Secretariat develops in cooperation with CPCs templates to drive the documentation of sampling procedures for all gears and fleets, focusing on time-area catches as well as size data, for review and discussion at the 2021 session of WPDCS.

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Resolution 19/02 Procedures on a fish aggregating devices (FADs) management plan

WPDCS16.02 (para. [131131](#)): The WPDCS **NOTED** that paragraph 24 of Res. 19/02 makes explicit reference to business confidentiality aspects, indicating that daily buoy positions data be used mostly to monitor compliance with the limit set on the maximum number of operational buoys per vessel, and **RECOMMENDED** that the SC assess the interest in using these same buoy data for scientific purposes, deferring consideration of confidentiality aspects to the Commission, possibly through the update of Res. 12/02.

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Use of electronic monitoring systems to optimize observer sampling protocols onboard French purse seiners of the Indian Ocean

WPDCS16.03 (para. [139139](#)): The WPDCS **ACKNOWLEDGED** that the current definition of “*For reporting (Optional)*” used in the context of the ROS minimum data fields might be subject to interpretation, and therefore **RECOMMENDED** that the SC requests CPCs to report to the IOTC Secretariat all ROS data fields marked as “*For reporting (Optional)*”, when available.

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WPDCS16.04 (para. [141141](#)): **ACKNOWLEDGING** that the proposed EM Programme Standards represent a basis for subsequent applications but still require additional contributions for their successful implementation on a regional scale, the WPDCS **AGREED** with the recommendation from document IOTC-2020-WPDCS16-18 to create an ad-hoc intersessional Working Group on the development of EM Programme Standards, and therefore **RECOMMENDED** that the Working Group be constituted and dedicated workshops (physical or virtual, depending on the circumstances) be held, to further progress on the definition of the standards.

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Revision of the WPDCS Program of work (2019–2023)

WPDCS16.05 (para. [169169](#)): The WPDCS **RECOMMENDED** that the Scientific Committee consider and endorse the WPDCS Program of Work (2020–2024), as provided at [Appendix V](#).

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Review of the draft, and adoption of the report of the 16th Session of the WPDCS

WPDCS16.06 (para. [173173](#)): The WPDCS **RECOMMENDED** that the Scientific Committee consider the consolidated set of recommendations arising from WPDCS16, provided at [Appendix VI](#).

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