

DRAFT: REPORT OF THE SECRETARIAT – ACTIVITIES IN SUPPORT OF THE IOTC SCIENCE PROCESS IN 2021

PREPARED BY: IOTC SECRETARIAT, 16 NOVEMBER 2021

PURPOSE

To inform the Scientific Committee (SC) of work undertaken by the IOTC Secretariat in 2021 in support of the IOTC Science process, endorsed by the Commission.

DISCUSSION

IOTC meetings – Working parties

In 2021, eleven (11) Working Party and Working Group meetings were organised and facilitated by the IOTC Secretariat (Table 1). The current Chairs and Vice-Chairs for each Committee and Working Party are provided in [Appendix I](#).

[Appendix II](#) lists the documents produced by the IOTC Secretariat in support of Working Party meetings held in 2021. In addition, the IOTC Secretariat produced revised Executive Summaries for all of the IOTC stocks, as well as for sharks, seabirds, marine turtles and cetaceans in association with various experts, totalling 26 Executive Summaries.

The IOTC Secretariat facilitated the participation of invited experts that were selected to attend each of the Working Party meetings in 2021. The names and affiliations of each of the Invited Experts are provided in Table 1.

Table 1. Working party and Working Group meetings and Invited Experts in 2021

Working Party	Date and place	Invited expert Name	Affiliation
MSE Task Force of the Working Party on Methods Meeting	1-5 March, Virtual	Nil	Nil
Ecosystems and Bycatch (Data Prep)	12-14 April, Virtual	Nil	Nil
Tropical tunas (Data preparatory)	10-14 May, Virtual	Nil	Nil
Neritic Tunas	5–9 July, Virtual	Nil	Nil
Ecosystems and Bycatch (Assessment meeting)	6–10 September, Virtual	Nil	Nil
Billfish	13–16 September, Virtual	Nil	Nil
Ad Hoc Working Group on FADs	4-6 October, Virtual	Nil	Nil
Methods	18–20 October, Virtual	Nil	Nil
Tropical Tunas (Assessment meeting)	25-30 October, Virtual	Dr Michael Schirripa	NOAA, USA
Ad hoc Working Group on the Development of Electronic Monitoring Programme Standards (WGEMS)	15-17 November, Virtual	Nil	Nil
Data Collection and Statistics	29 November – 3 December, Virtual	Nil	Nil

IOTC meetings – Meeting Participation Fund

The IOTC Meeting Participation Fund (MPF) has been utilised for the indicated scientific meetings and/or Working Parties indicated in [Table 1](#). Due to the Covid-19 pandemic in 2021 and the impossibility of international travel, no physical meetings were held in 2021. Noting that the intention of the MPF was to utilise the funds, as a first priority, to support the participation of scientists from developing Members in scientific meetings of the IOTC, the lack of physical meetings resulted in no MPF applications this year. This is compared with 2020 (0), 2019(77), 2018(46), 2017(64), 2016 (67), 2015 (53) and 2014 (50). Previously there were 58 in 2013, 46 in 2012, 33 in 2011 and 19 in 2010 (Table 2).

Table 2. Scientific Meetings held in 2021, prior to the 24rd Session of the IOTC Scientific Committee meeting. Numbers in brackets represent numbers for the previous Working Party meetings.

Working Party	Date and place of most recent meeting	No. of participants							Meeting Participation Fund							No. of documents (and for the previous meeting)
		2015	2016	2017	2018	2019	2020	2021	2015	2016	2017	2018	2019	2020		
Neritic Tunas	5–9 July, Virtual	31	20	26	18	18	43	33	9	8	8	6	6	0	0	Total: 14 (19) Working papers: 13 (16) Information papers: 1 (3)
Temperate Tunas	14–17 January 2019, Malaysia	-	29	-	-	19	-	-	-	4	-	-	1	-	-	Total: 43 (29) Working papers: 38 (29) Information papers: 5 (0)
	23–26 July 2019, Japan					23							4			
Billfish	13–16 September, Virtual	23	18	25	20	25	55	55	9 ¹	6	8	5	9	0	0	Total: 29 (22) Working papers: 26 (28) Information papers: 3 (2)
Ecosystems and Bycatch	12–14 April, Virtual	38	37	39	40	41	108	68	8 ²	8	7	7	13	0	0	Total: 67 (35) Working papers: 49 (26) Information papers: 18 (9)
	6–10 September, Virtual							93							0	
Methods	18–20 October, Virtual	26	29	27	23	37	55	54	6 ³	9	5	2	7	0	0	Total: 20 (16) Working papers: 20 (14) Information papers: 0 (2)
Tropical Tunas	10–14 May, Virtual	44	47	48	57	68	62	80	6	6	10	7	13	0	0	Total: 46 (50) Working papers: 38 (36) Information papers: 8 (14)
	20–25 October, Virtual						111	108						0	0	
Data Collection and Statistics	29 November – 3 December, Virtual	20	32	45	52	41	76	TBD	4	6	10	7	9	0	0	Total: X (22) Working papers: X (22) Information papers: X (0)
Scientific Committee	6 – 10 December, Virtual	71	78	63	73	43	141	TBD	13	18	13	12	15	0	0	Working papers: X (12) Executive Summaries: 26 (26) Information papers: X (3)

¹ 2 scientists attended both the WPB and WPEB;

² 2 scientists attended both the WPB and WPEB

³ Funded by the ABNJ tuna project

Data-related activities – General

A large proportion of time from the IOTC Data Section staff continues to be dedicated to the acquisition and processing of the data required under various IOTC Resolutions. These are utilised in support of scientific analyses necessary for the assessment of the status of stocks, and in monitoring the compliance of CPCs with respect to currently standing data reporting requirements.

The IOTC databases are constantly revised and updated, and the migration towards a fully integrated IOTC data repository continues to be under way: once completed, the IOTC data repository will improve several aspects of the IOTC statistical data management, dissemination and exchange workflow, including the proper attribution of metadata to all managed datasets, the inclusion of new ancillary data sources such as cannery sales data, daily buoy positions, scientific observer and morphometric data, as well the implementation of a two-way integration process with the e-MARIS platform⁴.

Significant effort is also dedicated to improve the range of fisheries indicators currently included in all Secretariat papers on data and statistics presented at the IOTC working parties, as well as the data-specific sections of the IOTC website and the *interactive data query tool* that allows users to filter and display information of several of the main IOTC data sets.

The regular IOTC statistical datasets have been produced and supplied to all scientists engaged in stock assessment activities and to stakeholders involved in management initiatives; reports on the status of all IOTC databases have been produced for all relevant Working Parties and SC, as well as for the preparation of the Country Reports of the Compliance Committee. No new information has been incorporated in the IOTTP tagging dataset, and the IOTC ROS Regional Database is regularly updates with new submissions from CPCs.

Data-related activities – Capacity building and other initiatives

The IOTC Secretariat continues with its mandate to provide direct support to and facilitate the work of developing coastal states, mainly through funds from the IOTC capacity building budget and other collaborating agencies.

The European Union and the Overseas Fishery Cooperation Foundation of Japan (OFCF) in particular have provided resources and advice for the strengthening of data collection systems in more than 20 countries in the region over the last years fifteen years.

Besides, the IOTC Secretariat cooperates with several other stakeholders that include COI-*SmartFish*, the BOBLME Project, the ABNJ Project, the ISS foundation, the World Bank, CMS and IOSEA, to coordinate and execute capacity building and research activities in developing coastal states of the Indian Ocean.

In addition, the IOTC Secretariat also initiated collaborations with NOAA, WWF-Pakistan, WWF-USA and SIOTI on capacity building activities to specifically support the implementation of the Regional Observer Scheme.

Table 3 provides a summary of the main capacity building activities undertaken since the end of SC23, which can be broadly categorised into the following activities:

- a. Data compliance and support missions: these are aimed at facilitating improvements in the validation and reporting of core statistical datasets to the IOTC Secretariat (i.e., nominal catches, catch-and-effort, and size data), to assess current shortcomings concerning the collection and management of fisheries data, and to agree on a plan of action with the CPC required to deliver improvements on their levels of reporting.

In 2021, due to the CoViD-19 pandemic and the consequent restrictions on travel, no on-the-field support could be provided to CPCs although staff members from the data Section of the IOTC Secretariat engaged in remote meeting and workshops with selected CPCs (e.g., Somalia) and participated remotely to the annual sessions of the EU-sponsored *Regional Coordination Group on Large Pelagics* (RCGLP, June 2021).

⁴ <https://www.iotc.org/documents/emar-is-technical-specifications>

- b. Technical assistance missions: including capacity building in data collection, support for the development of national fisheries databases and statistical systems, or other issues related to fisheries data management.

In 2021, due to the CoViD-19 pandemic and the consequent restrictions on travel, no direct support on these matters has been provided to CPCs through on-site missions, although some activities were carried on through remote meetings and workshops with selected CPCs (e.g., Somalia, Indonesia) and with regional and international stakeholders such as the World Bank.

- c. Support for implementation of the Regional Observer Scheme and implementation of the ROS Pilot Project: ROS-related capacity building activities cover several components, including the further development and improvements of the IOTC ROS e-tools, as well as studies on the implementation of electronic monitoring systems (EMS) on small-scale fisheries.

Work on the ROS electronic tools and ROS regional database is ongoing, to account for the feedback on malfunctioning and usability issues reported by end-users, as is the work on establishing direct integration mechanisms between ObServe data and the ROS regional database (in collaboration with scientists from IRD).

Following a proposal on Minimum standards for the design and implementation of EMS in Indian Ocean tuna fisheries presented at the SC in 2020, the Secretariat has also supported the establishment and delivery of the 1st ad-hoc Working Group on EMS (November 2021).

Below is a provisional list of the capacity building activities planned for 2022, conditional to the release of travel bans to and from all targeted countries:

- a. ROS implementation: continue with the development of the ROS Pilot Project, through provision of support to the service provider and the target countries selected for the pilot
- b. ROS e-monitoring in Sri Lanka: although the activity completed in September 2021, further on-site support might be required to guarantee that EMS data could be exchanged with the IOTC Secretariat in a suitable format
- c. Regional Observer Scheme e-tools: additional workshops to be scheduled with pilot countries once observer deployment activities re-start
- d. Data compliance and support missions: priority countries to be confirmed (also based on the agreed PoW of the Working Party on Data Collection and Statistics), but tentatively to include:
 1. Indonesia and India (to further discuss about the re-estimation of official catches and IOTC data reporting requirements)
 2. I.R. Iran and Pakistan (to verify and resolve potential issues with double counting of nominal catches)
 3. Oman (to better understand the factors driving the recent increases in reported catches from the handline fisheries)
 4. Pakistan and Sri Lanka (to further assess the potential of alternative data collection mechanisms trialled at national level)
 5. Bangladesh, Somalia, and Yemen (to develop data collection and reporting capacity)

Table 3. Activities of the IOTC Secretariat in relation to science and data related capacity building activities in the Indian Ocean in 2021.

Country	Date	Executing Agencies / Staff	Description of activities
Indonesia	May 2021	IOTC Data Coordinator IOTC Fishery Statistician IOTC Fishery Officer (data) IOTC Data assistant Representatives from the Ministry of Marine Affairs and Fisheries of Indonesia, national research institutions, IPNLF	<ul style="list-style-type: none"> i) Recall the reasons that led the IOTC Scientific Committee to request for a revision of Indonesia's artisanal catches ii) Present the rationale of these re-estimations, including their more recent revisions iii) Present the results of the re-estimations compared to official catch data for the period 2010-2019 iv) Discuss about past issues affecting data collection and reporting in Indonesia and how these have been or could be resolved v) Assess the extent of the improvements in data collection and reporting introduced by the One Data initiative
Indonesia	Sep 2021	IOTC SC Chair IOTC WPDSC Chair IOTC Data Coordinator IOTC Fishery Statistician IOTC Fishery Officer (data) IOTC Data assistant Representatives from the Ministry of Marine Affairs and Fisheries of Indonesia, national research institutions, IPNLF	<ul style="list-style-type: none"> i) Continuation of the discussions held during the 1st technical workshop in May 2021 ii) Further assessment of the improvements introduced by the One Data initiative iii) Identification of a way forward to improve the catch re-estimations in collaboration with national scientists and considering the improved data collection workflow at national level
Somalia	Sep 2021	IOTC Data Coordinator Compliance Expert Representatives from Somalia	<ul style="list-style-type: none"> i) General overview of IOTC ii) Introduction to the main data collection and reporting requirements iii) Discussions on the current state of the art of fishery data collection in Somalia
Sri Lanka (remote)	Sep 2021	IOTC Data Coordinator IOTC Fishery Statistician IOTC Fishery Officer (science) Marine Instruments AZTI-Tecnalia	<p>Assess the status of implementation of the EMS trial on-board selected small-scale coastal gillnet/longline vessels for what concern:</p> <ul style="list-style-type: none"> i) Finalization of the installation of EMS onboard 6 gillnet / longline vessels selected for the pilot trials ii) Current EMS data collection procedures and identification of the technical issues (complete or partial data loss) encountered during the pilot trials iii) Status of the remote training delivered by the service provider iv) Options to continue and potentially extend the project to other CPCs

Other data activities (2021)

CLAV: The IOTC Secretariat coordinates the activities of the Consolidated List of Authorized Vessels (CLAV), an evolving, global list of authorized vessels collated from data sourced by the five t-RFMOs. Since 2015, the CLAV has been further enhanced using funds from the FAO Common Oceans/ABNJ Tuna Project, with the main objective of ensuring that its updates occur in as close-to real time as possible. In January 2021, the IT infrastructure supporting

the CLAV and hosted by the IOTC Secretariat stopped operations due to unforeseen technical issues. Because of the increased workload on the Secretariat's staff responsible for its management, the system components responsible for data updates were temporarily put on hold, resulting in the CLAV not having been updated since then. The efforts required to resolve the issue will be put in place as soon as circumstances will allow.

FIRMS Global Tuna Atlas: The IOTC continues with its contribution to the provision of updated and harmonized geo-referenced monthly catches and total catches of main IOTC species to the Global Tuna Atlas. The resulting product (which is now part of the offering of FAO / FIRMS) provides a combined global overview of the extent and magnitude of commercial tuna fisheries across all major oceans, including data sourced from the five tRFMOs and the collated and harmonized dataset it manages has been used to support the work of the 2nd ad-hoc IOTC Working Group on FADs in October 2021, among others.

Regional Observer Scheme: A full update on progress with the implementation of the ROS Pilot Project is provided in paper IOTC-2021-SC24-07. Key areas of progress this year include:

- The Electronic Monitoring Systems trial project for small-scale fisheries in Sri Lanka has concluded. The equipment was successfully installed onboard four vessels and the final sets of equipment have been delivered and are ready for installation onboard two further vessels by the Sri Lanka Ministry of Fisheries and Aquatic Resources. Remote training sessions were delivered to selected Sri Lankan observers and their coordinators and initial data from the trials have been analysed.
- A contract was awarded for the development of training materials and supporting national observer schemes in six IOTC CPCs between 2019 and 2020 but project activities were postponed in Q2 2020 due to travel restrictions resulting from the Covid-19 pandemic. Project activities resumed in Q3 2021 and a package of training manuals and supporting documents were presented at the WPDCS17. Due to many CPCs being unable to meet the requirements set out for participating in the pilot project, the number of participating countries has now been reduced to four.

Processing of cannery sales data from ISSF-affiliated companies: since 2010, the IOTC Secretariat has been receiving quarterly summaries of the products offloaded at several canneries associated with the International Seafood Sustainability Foundation (ISSF). The highly variable nature of the data formats used by each company, together with the lack of dedicated personnel for its processing, has so far prevented a proper utilisation of this valuable information. Starting from Q2 2020, the IOTC Secretariat has put forward an initiative with some support from the ISSF aiming at cleaning-up all data submissions received since 2010, to eventually support the analysis of species composition estimated from cannery data in comparison with official data submissions from all involved IOTC CPCs. The ISSF funded a consultancy to clear, harmonize and compile all tuna factory quarterly reports submitted by the ISSF-participating companies during 2010-2021, upload harmonized reports into a relational tuna factory purchases database, and proceed to further data curation to improve the overall data quality and traceability to the original information source. In parallel, a master's student from the Department of Environmental sciences of the University of Seychelles analysed this information to cross-validate official sources of data available to tRFMOs and improve the understanding of the extent of tuna fishery activities, assess the levels of worldwide tuna trading and identify potential trends in commercial size categories of traded fish. Data from ISSF-affiliated canneries continue to be received by the Secretariat, with the Data Section staff of the Secretariat regularly engaged in the update of the cleaned-up dataset.

Socio-economic data: In 2021 the IOTC Secretariat has started a collaboration with the FAO GLOBEFISH project to develop a procedure of exchange of socio-economic data sets (e.g., monthly time series of FAO tuna price index) of interest for the scientific analyses conducted during the IOTC Working Parties.

Science activities (2021)

CPC contributions to the Scientific Work of the IOTC: These contributions, as requested in Para 16 of IOTC-2018-SC21-R are provided in [Appendix III](#). The text below contains links from the individual activities to the grants they are supported by.

IOTC Species ID guides: Work is ongoing to translate, typeset, format and print the IOTC Species ID guides into the priority languages identified by the SC. The current set of identification guides available is provided here: www.iotc.org/science/species-identification-cards.

Cetacean by-catch: The IOTC secretariat participated in a pre-meeting workshop of the WPEB in collaboration with the IWC, to discuss cetacean by-catch issues in the Indian Ocean.

Bigeye thresher shark tagging: A consortium has been established to work jointly on a tagging project to evaluate the post-release mortality of bigeye thresher sharks and the effectiveness of the no retention measure in Resolution 12/09. Scientists are working with observers to deploy tags on sharks released according to routine practices from the fleets of Japan, China, Taiwan, China, EU, Portugal, EU, France and South Africa. Fifty-four pop-up archival satellite tags have been purchased and are in the process of being deployed. An update was provided in IOTC-2021-WPEB17-INF02.

Yellowfin tuna stock assessment: The IOTC stock assessment scientist was part of a group of assessment modellers who carried out a stock assessment of yellowfin tuna (1950-2020) using stock synthesis III. Given the substantial uncertainties associated with the input parameters, a reference grid of 96 models was used. The results indicated that the stock is currently overfished and subject to overfishing. The updated yellowfin assessment was not considered for management advice in 2020, however, the current revisions to the model have resolved many of the previous issues and this has enabled the WPTT to provide management advice in 2021.

Neritic tuna stock assessment: The IOTC stock assessment scientist carried out stock assessments for several neritic tuna species (Indo-Pacific King Mackerel, Frigate tuna and Bullet tuna) using data poor assessment techniques. Due to large uncertainties in the data and therefore the outputs of the models, Bullet and Frigate tuna were determined to be of uncertain stock status. The results for Indo-Pacific King Mackerel indicated that the stock is currently not overfished nor is it subject to overfishing.

Blue Sharks stock assessment: A Stock Assessment consultant (Joel Rice) funded by the IOTC regular budget, conducted a stock assessment for Blue Sharks, and conducted a catch estimation exercise to fill data gaps and improve the information available for the Assessment. The assessment was carried out using stock synthesis III. The results indicated that the stock is currently not overfished nor subject to overfishing.

Yellowfin and bigeye tuna MSE: A Stock Assessment consultant (CSIRO) funded by a contribution from Australia conducted MSE for yellowfin and bigeye tuna. This voluntary contribution by Australia has provided ongoing funding for this work through 2021.

Skipjack MSE: A Stock Assessment consultant (Charles Edwards) funded by the IOTC regular budget, conducted MSE for skipjack tuna. The consultant is working to update the skipjack harvest control rule and develop a fully specified MP based on the updated stock assessment for the species.

Albacore MSE: A Stock Assessment consultant (Iago Mosqueira) funded by the IOTC regular budget, conducted MSE for albacore tuna. The consultant is working to update OM based on the updated stock assessment for the species.

Swordfish MSE: A PhD student partially funded by an [EU grant](#) administered by the IOTC secretariat as well as funding from the IOTC regular budget continued the work on swordfish MSE.

Biological Sampling Project: In 2020 a Contract was signed with a Consortium led by AZTI Tecnalia for the 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. The results of this project were presented to several IOTC working parties in 2021. This project has been funded by a [Grant provided by the EU](#).

Implementation for the ROS as well as E-Monitoring. In 2021 a project to implement the ROS in 4 member countries, as well as a project on a Pilot study for EMS in small scale vessels in Sri Lanka was continued utilizing [Grants provided by the EU](#).

Longline size data analysis: A consultant (Simon Hoyle) conducted a review of data collection and processing systems for size data from longline fleets in the Indian Ocean. This information was presented to the WPTT in 2021.

Size data modelling: The IOTC stock assessment scientist carried out a preliminary analysis to develop model-based estimates of length compositions. The model was applied to the commercial catch samples of yellowfin tuna to derive standardised length distributions. This information was presented to the WPM in 2021

Natural mortality estimates for tropical tunas: A consultant (Simon Hoyle) conducted a review of natural mortality estimates for Tropical tunas in the Indian Ocean. This information was presented to the WPTT in 2021

Other RFMO activities

IATTC Commission and Scientific Advisory Council meetings: In 2021 the IOTC Secretariat attended both the Commission and SAC meetings of the IATTC.

IWC Scientific Committee meeting: In 2021 the IOTC Secretariat attended the IWC SC meeting.

SWIOFC Commission meeting: In 2021 the IOTC Secretariat attended the SWIOFC Commission meeting

IOTC publications and information products

Documents

In 2021, the Secretariat produced 77 (59 in 2020, 71 in 2019, 62 in 2018, 59 in 2017 and 74 in 2016) papers/reports ([Appendix II](#)) in support of the IOTC Science process, not including the documents prepared for Working Groups (WGEMS, WGFAD or MSE Task Force), the reports of the various working parties (11) or the species Executive Summaries (26).

IOTC Website

The IOTC website continues to be a portal for communicating science related information to a variety of audiences. The Secretariat completed development of a new website in 2015, as requested by the Commission, which include:

- **Stock assessment:** Input and output files for yellowfin tuna stock assessments.
- **Species ID guides:** translated versions are being made available online, as they are produced.

and is in the process of linking the publicly disseminated executive summaries of all IOTC species with the corresponding entries in the FAO / FIRMS stocks and fisheries map viewer as well as with the FAO / FIRMS Global Record of Stocks and Fisheries (GRSF) to enhance information sharing and standardized access to stock statuses and related resources. In addition, new pages were added to the IOTC webpage in 2020 to provide information on the various projects overseen and coordinated by the IOTC secretariat

Recommendation

That the Scientific Committee **NOTE** paper IOTC–2021–SC24–05 which provides the report of the IOTC Secretariat for 2021, including the updates provided on the Recommendations and Requests directed to the IOTC Secretariat for implementation in 2021.

Appendices

Appendix I: [List of Chairs, Vice-Chairs and their respective terms for IOTC Science meetings.](#)

Appendix II: [Papers from the IOTC Secretariat \(or co-authorship\) submitted to the IOTC Working Parties or Scientific Committee in 2021.](#)

Appendix III: [IOTC Extra-Budgetary Funded Projects related to Science](#)

APPENDIX I

List of Chairs, Vice-Chairs and their respective terms for the IOTC Scientific Committee and its subsidiary bodies

Group	Chair/Vice-Chair	Chair	CPC/Affiliation	1 st Term commencement date	Term expiration date (End date is until replacement is elected)	Comments
SC	Chair	Dr Toshihide Kitakado	Japan	10–Dec–19	End of SC in 2021	1 st term
	Vice-Chair	Dr Denham Parker	South Africa	10–Dec–19	End of SC in 2021	1 st term
WPB	Chair	Dr Denham Parker	South Africa	12–Sept–19	End of WPB in 2023	2 nd term
	Vice-Chair	Dr Jie Cao	China	12–Sept–19	End of WPB in 2023	2 nd term
WPTmT	Chair	Dr Jiangfeng Zhu	China	26–July–19	End of WPTmT in 2022	2 nd term
	Vice-Chair	Dr Toshihide Kitakado	Japan	26–July–19	End of WPTmT in 2022	2 nd term
WPTT	Chair	Dr Gorka Merino	EU,Spain	03–Nov–18	End of WPTT in 2023	2 nd term
	Vice-Chair	Dr Shiham Adam	Maldives, Rep. of	13–Nov–18	End of WPTT in 2023	2 nd term
WPEB	Chair	Dr Mariana Tolotti	EU,France	10–Sept–21	End of WPEB in 2023	1 st term
	1 st Vice-Chair	Dr Mohamed Koya	India	10–Sept–21	End of WPEB in 2023	1 st term
	2 nd Vice-Chair	Dr Charlene da Silva	South Africa	10–Sept–21	End of WPEB in 2023	1 st term
WPNT	Chair	Ms Ririk Sulistyaningsih	Indonesia	5–July–19	End of WPNT in 2023	2 nd term
	Vice-Chair	Dr Farhad Kaymaram	I.R. Iran	5–July–19	End of WPNT in 2023	2 nd term
WPDCS	Chair	Mr Stephen Ndegwa	Kenya	28–Nov–17	End of WPDCS in 2021	2 nd term
	Vice-Chair	Dr Julien Barde	EU,France	28–Nov–17	End of WPDCS in 2021	2 nd term
WPM	Chair	Dr Hilario Murua	ISSF	19–Oct–19	End of WPM in 2023	2 nd term
	Vice-Chair	Vacant	Vacant	NA	NA	NA
WGFAD	Co-Chair	Dr Gorka Merino	EU,Spain	06–Oct–21	End of WGFAD in 2023	1 st term
	Co-Chair	Mr Abdirahim Sheik Heile	Somalia	06–Oct–21	End of WGFAD in 2023	1 st term
WGEMS	Chair	Dr Hilario Murua	ISSF	17–Nov–21	End of WGEMS in 2023	1 st term
	Vice-Chair	Dr Don Bromhead	Australia	17–Nov–21	End of WGEMS in 2023	1 st term

APPENDIX II

Papers from the IOTC Secretariat (or co-authorship) submitted to the IOTC Working Parties or Scientific Committee in 2021 (Note these are Working Parties and SC only and do not include WGs)

Document number	Title
17th Working Party on Ecosystems and Bycatch (WPEB): Data preparatory meeting	
IOTC-2021-WPEB17(DP)-03	Outcomes of the 24th Session of the Commission (IOTC Secretariat)
IOTC-2021-WPEB17(DP)-04	Review of the statistical data available for bycatch species (IOTC Secretariat)
IOTC-2021-WPEB17(DP)-12	A review of the data availability, model configuration and catch estimation for the 2017 blue shark (<i>Prionace glauca</i>) stock assessment in the Indian Ocean (Rice J)
IOTC-2021-WPEB17(DP)-INF04	Silky shark synopsis (IOTC Secretariat)
IOTC-2021-WPEB17(DP)-INF05	Blue shark synopsis (IOTC Secretariat)
23rd Working Party on Tropical Tuna (WPTT): Data preparatory meeting	
IOTC–2021–WPTT23(DP)-03	Outcomes of the 23rd Session of the Scientific Committee (IOTC Secretariat)
IOTC–2021–WPTT23(DP)–04	Outcomes of the 24th Session of the Commission and the 4th Special Session of the Commission (IOTC Secretariat)
IOTC–2021–WPTT23(DP)-05	Review of Conservation and Management Measures relevant to tropical tuna (IOTC Secretariat)
IOTC–2021–WPTT23(DP)-06	Progress made on the recommendations of WPTT22 (IOTC Secretariat)
IOTC–2021–WPTT23(DP)–07	Review of the statistical data and fishery trends for tropical tunas (IOTC Secretariat)
IOTC–2021–WPTT23(DP)–08	Review of size data from Indian Ocean longline fleets, and its utility for stock assessment (Hoyle S, Chang S-T, Fu D, Geehan J, Itoh T, Lee SI, Matsumoto T, Yeh Y-M and Wu R-F)
IOTC–2021–WPTT23(DP)–17	Introduction to the IOTC tuna factory sales data flow and database (Bodin N, Pierre L and Fiorellato F)
IOTC–2021–WPTT23(DP)-INF05	Yellowfin tuna Synopsis (IOTC Secretariat)
11th Session of the IOTC Working Party on Neritic Tunas	
IOTC–2021–WPNT11–03	Outcomes of the 23 rd Session of the Scientific Committee (IOTC Secretariat)
IOTC–2021–WPNT11–04	Outcomes of the 24 th Session of the Commission (IOTC Secretariat)
IOTC–2021–WPNT11–05	Review of current Conservation and Management Measures relating to neritic tuna species (IOTC Secretariat)
IOTC–2021–WPNT11–06	Progress made on the recommendations and requests of WPNT10 and SC23 (IOTC Secretariat)
IOTC–2021–WPNT11–07	Review of the statistical data available for the neritic tuna species (IOTC Secretariat)
IOTC–2021–WPNT11–08	Revision of the WPNT Program of Work (2022–2026) (IOTC Secretariat)
IOTC–2021–WPNT11–11	Assessment of Indian Ocean Indo-Pacific King Mackerel (<i>Scomberomorus guttatus</i>) using data-limited methods (Fu D)
IOTC–2021–WPNT11–12	Assessment of Indian Ocean Frigate tuna (<i>Auxis thazard</i>) using data-limited methods (Fu D)
IOTC–2021–WPNT11–13	Assessment of Indian Ocean Bullet tuna (<i>Auxis rochei</i>) using data-limited methods (Fu D)
17th Session of the Working Party on Ecosystems and Bycatch (Assessment meeting)	
IOTC-2021-WPEB17(AS)-03	Outcomes of the 23rd Session of the Scientific Committee (IOTC Secretariat)
IOTC-2021-WPEB17(AS)-04	Outcomes of the 25th Session of the Commission (IOTC Secretariat)
IOTC-2021-WPEB17(AS)-05	Review of Conservation and Management Measures relevant to ecosystems and bycatch (IOTC Secretariat)
IOTC-2021-WPEB17(AS)-06	Progress made on the recommendations and requests of WPEB16 and SC23 (IOTC Secretariat)
IOTC-2021-WPEB17(AS)-07	Review of the statistical data and fishery trends for ecosystems and bycatch species (IOTC Secretariat)
IOTC-2021-WPEB17(AS)-08_rev1	Status of development and implementation of National Plans of Action for seabirds and sharks, and implementation of the FAO guidelines to reduce marine turtle mortality in fishing operations (IOTC Secretariat)
IOTC-2021-WPEB17(AS)-09	Revision of the WPEB Program of Work (2021–2025) (IOTC Secretariat & Chairperson)

IOTC-2021-WPEB17(AS)-14	Catch estimates of blue shark in the IOTC area of competence for the 2021 stock assessment (Rice J)
IOTC-2021-WPEB17(AS)-15	Stock assessment of Blue Shark in the Indian Ocean (Rice J)
IOTC-2021-WPEB17(AS)-16	Estimates of natural mortality for blue shark in the Indian Ocean (Rice J)
IOTC-2021-WPEB17(AS)-29	Report of 2021 Meeting on collaborative activities for cetacean bycatch, IOTC-IWC (IWC/IOTC)
IOTC-2021-WPEB17(AS)- INF05	Shark mortality overlap cannot be assessed by fishery overlap alone (Murua H, Griffiths S, Hobday A, Clarke S, Cortés R, Gilman E, Santiago J, Arrizabalaga H, de Bruyn P, Lopez J, Aires-da-Silva A and Restrepo V)
19th Session of the IOTC Working Party on Billfish	
IOTC-2021-WPB19-03	Outcomes of the 23rd Session of the Scientific Committee (IOTC Secretariat)
IOTC-2021-WPB19-04	Outcomes of the 24th and 25th Sessions of the Commission (IOTC Secretariat)
IOTC-2021-WPB19-05	Review of Conservation and Management Measures relevant to billfish (IOTC Secretariat)
IOTC-2021-WPB19-06	Progress made on the recommendations and requests of WPB18 and SC23 (IOTC Secretariat)
IOTC-2021-WPB19-07	Review of the statistical data and fishery trends for billfish species (IOTC Secretariat)
IOTC-2021-WPB19-08	Revision of the WPB Program of Work (2022-2026) (IOTC Secretariat)
IOTC-2021-WPB19-24	Indian Ocean swordfish management strategy evaluation: Operating model (Rosa D, Fu D, Coelho R, Mosqueira I)
12th Working Party on Methods	
IOTC–2021–WPM12–03	Outcomes of the 23rd Session of the Scientific Committee (IOTC Secretariat)
IOTC–2021–WPM12–04	Outcomes of the 25th Session of the Commission (IOTC Secretariat)
IOTC–2021–WPM12–05	Review of Conservation and Management Measures relating to methods (IOTC Secretariat)
IOTC–2021–WPM12–06	Progress made on the recommendations and requests of WPM11 and SC23 (IOTC Secretariat)
IOTC–2021–WPM12–07	Revision of the WPM Program of Work (2022–2026) (IOTC Secretariat & Chairpersons)
IOTC–2021–WPM12–08	A new simulation platform for Indian Ocean albacore and swordfish (Mosqueira I)
IOTC–2021–WPM12–09	Update of the Indian Ocean albacore Operating Model (Mosqueira I)
IOTC–2021–WPM12–10	Evaluation of empirical control rules for Indian Ocean Skipjack (Edwards C)
IOTC–2021–WPM12–12	Update of the Indian Ocean swordfish operating model (Rosa D, Fu D, Coelho R and Mosqueira I)
IOTC–2021–WPM12–15	Model-based estimates of Length composition time series for Indian Ocean yellowfin tuna fisheries (Fu D)
23rd Session of the Working Party on Tropical Tunas: Assessment Meeting	
IOTC–2021–WPTT23–03	Review of the statistical data and fishery trends for tropical tunas (IOTC Secretariat)
IOTC–2021–WPTT23–04	Revision of the WPTT Program of Work (2022–2026) (IOTC Secretariat)
IOTC–2021–WPTT23–07	Review of size data from Indian Ocean longline fleets, and its utility for stock assessment (Hoyle S, Chang S-T, Fu D, Itoh T, Lee SI, Lucas J, Matsumoto T, Yeh Y-M, Wu R-F, Lee MK)
IOTC–2021–WPTT23–08	Approaches for estimating natural mortality in tuna stock assessments: application to Indian Ocean yellowfin tuna. (Hoyle, S).
IOTC–2021–WPTT23–12	Preliminary Indian Ocean yellowfin tuna stock assessment 1950-2020 (Stock Synthesis) (Fu et al.)
16th Working Party on Data Collection and Statistics	
IOTC-2021-WPDCS17-03	Outcomes of the 23rd Session of the Scientific Committee (IOTC Secretariat)
IOTC-2021-WPDCS17-05	Review of current Conservation and Management Measures relating to the WPDCS (IOTC Secretariat)
IOTC-2021-WPDCS17-06	Progress on the recommendations of WPDCS16 (IOTC Secretariat)
IOTC-2021-WPDCS17-07	Report on IOTC Data Collection and Statistics (IOTC Secretariat)
IOTC-2021-WPDCS17-08	IOTC capacity building activities in support of developing coastal IOTC CPCs (IOTC Secretariat)
IOTC-2021-WPDCS17-09	Revision of the WPDCS Program of Work (2022-2026) (IOTC Secretariat, Chairperson & Vice-Chairperson)

IOTC-2021-WPDCS17-10	Updates on the implementation of the IOTC Regional Observer Scheme and its pilot project (IOTC Secretariat)
IOTC-2021-WPDCS17-12	Revised electronic templates for the submission of IOTC ROS data (IOTC Secretariat)
IOTC-2021-WPDCS17-23	A proposal for an IOTC interactive statistical data browser (IOTC Secretariat)
IOTC-2021-WPDCS17-24	GLOBEfish (IOTC Secretariat)
IOTC-2021-WPDCS17-25	Morphometric Database (IOTC Secretariat)
IOTC-2021-WPDCS17-26	Sampling templates (IOTC Secretariat)
IOTC-2021-WPDCS17-27	Updates on yellowfin tuna catch limits according to IOTC Resolution 21/01 (IOTC Secretariat)
24th Session of the Scientific Committee	
IOTC–2021–SC24–03	Outcomes of the 25 th Session of the Commission (IOTC Secretariat)
IOTC–2021–SC24–04	Previous decisions of the Commission (IOTC Secretariat)
IOTC–2021–SC24–05	Report of the Secretariat – Activities in support of the IOTC science process in 2021 (IOTC Secretariat)
IOTC–2021–SC24–06	Status of development and implementation of national plans of action for seabirds and sharks, and implementation of the FAO guidelines to reduce marine turtle mortality in fishing operations (IOTC Secretariat)
IOTC–2021–SC24–07	2021: Update on the implementation of the regional observer scheme (IOTC Secretariat)
IOTC–2021–SC24–08	Revision of the program of work (2022–2026) for the IOTC science process (IOTC Secretariat)
IOTC–2021–SC24–09	Proposed schedule of Working Party and Scientific Committee meetings for 2022 and 2023 (IOTC Secretariat)
IOTC–2021–SC24–10	Progress on recommendations from SC23 (IOTC Secretariat)

APPENDIX III
IOTC Extra-Budgetary Funded Projects related to Science

Project No.	Area of Work	Donor	Description	Total Funding Amount US\$	Start Date	End date
GCP/INT/305/EC	Science	EC	Support to the Scientific Committee Programme of Work (2018)	721,153	01/01/2018	31/12/2021
GCP/INT/322/EC	Science	EC	Support to the implementation of the IOTC ROS (2018)	850,682	01/10/2018	31/12/2022
GCP/GLO/053/EC	Science	EC	Support to the Scientific Committee Programme of Work – Aspects of the Biology of IOTC Species	318,986	01/01/2020	31/12/2021
MPF Extra-budgetary	Meetings	China	Extra funds for meeting participation	18,000	01/01/2021	31/12/2021
Extra-budgetary	Science	Australia	Australia's contribution to IOTC Management Procedure and Management Strategy Evaluation Capacity Building	34,878	17/06/2021	30/06/2022