

REPORT OF THE SECRETARIAT – ACTIVITIES IN SUPPORT OF THE IOTC SCIENCE PROCESS IN 2022

PREPARED BY: IOTC SECRETARIAT, 4 NOVEMBER 2022

PURPOSE

To inform the Scientific Committee (SC) of work undertaken by the IOTC Secretariat in 2022 in support of the IOTC Science process, endorsed by the Commission.

DISCUSSION

IOTC meetings – Working parties

In 2022, eleven (12) 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 2022. 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 2022. The names and affiliations of each of the Invited Experts are provided in Table 1.

Table 1. Working party and Working Group meetings in 2022 (no invited experts were facilitated in 2022)

Working Party	Date and place
MSE Task Force of the Working Party on Methods Meeting (WPM_MSE)	7-10 March, Virtual
Working Party on Temperate Tuna Data Preparatory Meeting (WPTmT_DP)	13-15 April, Virtual
Working Party on Tropical tunas (Data preparatory) (WPTT_DP)	30 May – 3 June, Virtual
Ad hoc Working Group on the Development of Electronic Monitoring Programme Standards (WGEMS)	13-15 June, Virtual
Working Party on Neritic Tunas (WPNT)	4–8 July, Virtual
Working Party on Temperate Tuna (WPTmT)	25-29 July, Virtual
Working Party on Ecosystems and Bycatch (Assessment meeting) (WPEB)	5–9 September, Virtual
Working Party on Billfish (WPB)	12–15 September, Virtual
Ad Hoc Working Group on FADs (WGFAD)	3-5 October, Virtual
Working Party on Methods (WPM)	19–21 October, Virtual
Working Party on Tropical Tunas (WPTT)	24-29 October, Virtual
Working Party on Data Collection and Statistics (WPDCS)	28 November – 2 December, Virtual

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 2022 and the difficulty of international travel, no physical meetings were held in 2022 apart from the Scientific Committee. 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 for Working Party meetings this year. This is compared with 2021 (0), 2020 (0), 2019 (77), 2018 (46), 2017 (64), 2016 (67) and 2015 (53) (Table 2).

Table 2. Scientific Meetings held in 2022, prior to the 25th 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)
		2016	2017	2018	2019	2020	2021	2022	2016	2017	2018	2019	2020	2021	2022	
Working Groups																
Electronic Monitoring Programme Standards	13-15 June, Virtual	-	-	-	-	-	79	104	-	-	-	-	-	0	0	Total: 15 (12) Working papers: 6 (11) Information papers: 9 (1)
FADs	3-5 October, Virtual	-	48	-	-	-	93	111	-	NA	-	-	-	0	0	Total: 22 (33) Working papers: 21 (13) Information papers: 1 (20)
Working Parties																
Neritic Tunas	4–8 July, Virtual	20	26	18	18	43	33	36	8	8	6	6	0	0	0	Total: 18 (14) Working papers: 14 (13) Information papers: 4 (1)
Temperate Tunas	13-15 April, Virtual	29	-	-	19	-	-	51	4	-	-	1	-	-	0	Total: 30 (43) Working papers: 29 (38) Information papers: 1 (5)
	25-29 July, Virtual				23			42				4			0	
Billfish	12–15 September, Virtual	18	25	20	25	55	55	51	6	8	5	9	0	0	0	Total: 23 (29) Working papers: 20 (26) Information papers: 3 (3)
Ecosystems and Bycatch	5–9 September, Virtual	37	39	40	41	108	68	103	8	7	7	13	0	0	0	Total: 54 (67) Working papers: 30 (49) Information papers: 24 (18)
							93							0		
Methods	7-10 March, Virtual	29	27	23	37	55	41	46	9	5	2	7	0	0	0	Total: 24 (20) Working papers: 22 (20) Information papers: 2 (0)
	19–21 October, Virtual						54	60						0	0	
Tropical Tunas	30 May – 3 June, Virtual	47	48	57	68	62	80	67	6	10	7	13	0	0	0	Total: 48 (46) Working papers: 37 (38) Information papers: 11 (8)
	24-29 October, Virtual					111	108	113					0	0	0	
Data Collection and Statistics	28 November – 2 December, Virtual	32	45	52	41	76	94	TBC	6	10	7	9	0	0	0	Total: TBC (42) Working papers: TBC (29) Information papers: TBC (13)
Scientific Committee	5 – 9 December, Virtual	78	63	73	43	141	130	TBC	18	13	12	15	0	0	TBC	Working papers: TBC (10) Executive Summaries: 26 (26) Information papers: 2 (11)

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, tagging and biological data, as well the implementation of a two-way integration process with the e-MARIS platform¹.

Significant effort is also dedicated to improving 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 standard 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 updated with new submissions from CPCs.

During 2022 the IOTC Secretariat has also initiated work on a proposal to rationalize and simplify the submission of statistical data through new versions of the IOTC data reporting forms (including those for the provision of FAD data to different level of resolutions), as well as for a more systematic definition and identification of the fisheries of relevance to the IOTC, which were presented for endorsement at the WPDCS.

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 twenty years.

Besides, the IOTC Secretariat cooperates with several other stakeholders that include ECOFISH, , the ABNJ Project, the International Seafood Sustainability 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 SC24, 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), assess current shortcomings concerning the collection and management of fisheries data, and agree on a plan of action required for CPCs to deliver improvements in their levels of reporting.

¹ <https://www.iotc.org/documents/emar-is-technical-specifications>

Due to the travel restrictions still in place during 2022 in some areas of the region, only on-the-field support could only be provided to Indonesia through two missions conducted in July and November 2022 (Table 3).

However, staff from the data Section of the IOTC Secretariat has continued to be engaged in remote meetings with selected CPCs (e.g., Madagascar, Comoros) and international stakeholders (e.g., FAO, EU).

- 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.

Due to the travel restrictions still in place during 2022 in some areas of the region, only limited on-the-field support could be provided on these matters to CPCs through direct on-site missions.

However, although some activities were carried on through remote meetings and workshops with selected CPCs (e.g., Madagascar, Comoros) and with regional and international stakeholders.

- 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 further developments and improvements of the IOTC ROS e-tools, as well as studies on the implementation of electronic monitoring systems (EMS) in small-scale fisheries.

Work on the ROS electronic tools and ROS regional database is still ongoing, to account (among other things) for the feedback on malfunctioning and usability issues reported by end-users and establish direct integration mechanisms between *ObServe* 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 and delivery of the 2nd ad-hoc Working Group on EMS (June 2022).

Below is a provisional list of the capacity building activities planned for 2023, 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 those target countries that were successfully engaged in the pilot
- b. ROS e-monitoring in Sri Lanka: even though the core part of this activity completed in September 2021, further on-site support is still required to guarantee that EMS data could be properly exchanged with the IOTC Secretariat
- c. Regional Observer Scheme e-tools: additional workshops to be scheduled with pilot countries once observer deployment activities re-start
- d. Regional workshop(s) to clarify and improve data reporting requirements (as also recommended by the Compliance Committee)
- e. Data compliance and support missions: priority countries to be confirmed (also on the basis of the PoW agreed by the 18th Working Party on Data Collection and Statistics), but tentatively to include:
 1. Indonesia (to continue discussions regarding the re-estimation of official catches) and India (to improve compliance with 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. Indonesia, 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 2022.

Country / CPC	Dates	Executing agencies / staff	Description of activities
Madagascar (remote)	March 2022 COMPLETED	IOTC Data Assistant, IOTC Compliance Expert, Representatives from Madagascar	Support mission led by the Compliance Section of the Secretariat (with participation from the Data Section) to address some of the outstanding issues in terms of data collection and reporting identified for the county. The activities delivered include: <ul style="list-style-type: none"> • General overview of IOTC • Introduction to the main data collection and reporting requirements • Discussion on the current sampling methodology in Madagascar which is funded by world bank • Discussions on the inconsistencies between various data sources from Madagascar
Comoros (remote)	March 2022 COMPLETED	IOTC Data Assistant, IOTC Compliance Expert, Representatives from Comoros	Support mission led by the Compliance Section of the Secretariat (with participation from the Data Section) to address some of the outstanding issues in terms of data collection and reporting identified for the county. The activities delivered include: <ul style="list-style-type: none"> • General overview of IOTC • Introduction to the main data collection and reporting requirements • Discussion on data quality submitted by Comoros • Discussions on the fishery types from Comoros, which are inconsistencies with IOTC database, with the possibility of reviewing past data
FAO - InfoFish (remote)	September 2022 COMPLETED	IOTC Fishery Officer (data) IOTC Data assistant	FAO Workshop on Fisheries Data Collection and Statistics (Africa, Mediterranean, Middle East) <ul style="list-style-type: none"> • Discussion on various data collection systems in Africa, Mediterranean, and Middle East, including their setbacks and way forward to improve the current state-of-the-art • IOTC data requirements and the capability of the CPCs to report data based on these
EU (remote)	June 2022 COMPLETED	IOTC Fishery Officer (data)	Annual meeting of the Regional Coordination Group on Large Pelagic (RCGLP) <ul style="list-style-type: none"> • Presentation of the status of data reported to IOTC by EU member fleets for the previous statistical year • Revision of compliance status on data related requirements by CMMs, identifying potential issues and providing support for the improvement of future data submission to the Secretariat
	September 2022 COMPLETED	IOTC Fishery Officer (data)	EU Liaison Meeting <ul style="list-style-type: none"> • Presentation of the current state of preliminary data reported to IOTC by EU members fleets • Revision of IOTC data requirements, identification of issues and provision of support for the improvement of data submissions to the Secretariat

<p>Indonesia (In person, Jakarta and Bali)</p>	<p>July 2022 COMPLETED</p>	<p>IOTC SC Chair IOTC Data Coordinator IOTC Fishery Officer (data) IOTC Data Assistant FAO Capture Fishery Statistician Representatives from:</p> <ul style="list-style-type: none"> • Ministry of Marine Affairs and Fisheries of Indonesia • National research institutions • IPNLF 	<p>Continuation on the previous remote meetings held in 2021, to discuss the current state-of-the-art in terms of re-estimation procedures for Indonesia's annual catches.</p> <p>The main activities of the missions were:</p> <ul style="list-style-type: none"> • Recall the reasons that led the IOTC Scientific Committee to request for a revision of Indonesia's artisanal catches • Present the rationale of these re-estimations, including their more recent revisions • Present the results of the re-estimations compared to official catch data for the period 2010-2020 • Discuss about past issues affecting data collection and reporting in Indonesia and how these have been or could be resolved • Assess the extent of the improvements in data collection and reporting introduced by the One Data initiative • Assess the methodology used to estimate industrial and coastal fisheries catch data
<p>Oman</p>	<p>September 2022 CANCELLED</p>		<p>Oman declined the request from the Commission for a data support mission to assess the tuna fisheries of Oman which yield substantial increases in yellowfin catches in recent years.</p> <p>The activities originally proposed for the mission were:</p> <ul style="list-style-type: none"> • Improve the understanding of the composition and characteristics of Omani fisheries catching tuna and tuna-like species • Assess the status of implementation of the follow-up activities identified by the previous workshop delivered by IOTC and FAO in September 2019 • Clarify any outstanding aspects of the IOTC data reporting process, and propose potential improvements to increase the efficiency of data reporting to IOTC • Understand the factors explaining the recent increasing trends in reported catches of yellowfin tuna, including through review of the tools and methodologies adopted by the Department of Fishery Statistics to produce official catch estimates for all concerned fisheries • Identify the type and extent of all scientific information on IOTC species held by national institutions and currently not available to the IOTC Secretariat • Assess the potential of setting up sharing agreements between Oman and IOTC regarding the scientific information identified through the previous point
<p>Indonesia (in person, Jakarta)</p>	<p>November 2022 COMPLETED</p>	<p>IOTC Data Coordinator IOTC Fishery Statistician IOTC Data assistant Representatives from:</p> <ul style="list-style-type: none"> • Ministry of Marine Affairs and Fisheries of Indonesia • national research institutions • IPNLF 	<p>Follow-up of the support mission conducted in July to review and assess the progress in the re-estimation procedures proposed by Indonesia for their annual catches</p> <p>The main activities of the mission were:</p> <ul style="list-style-type: none"> • Review and assess the methodologies leading to the latest catch estimation procedure proposed by Indonesia, which include revisions of catch series from 2010 to 2020,

			<p>and comparing the results with current data from 1-RC forms and from IOTC re-estimations</p> <ul style="list-style-type: none"> Analyse the logbook and port sampling data collected for various Indonesian's fisheries, and assess their level of coverage and suitability for inclusion in the re-estimation procedure Review the availability of shark data collected for Indonesian coastal fisheries, to corroborate the re-estimated level of catches for all sharks species
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Other data activities (2022)

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. As of today, the IT infrastructure supporting the CLAV and currently hosted by the IOTC Secretariat is only partially operative due technical reasons, and the system components responsible for data updates were temporarily put on hold, resulting in the CLAV not having been updated. The IOTC Secretariat has set aside resources and time to resolve the issue by Q1 2023.

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 Working Party on Tropical Tunas, and IOTC Working Group on FADs, among others.

Regional Observer Scheme: A full update on progress with the implementation of the ROS Pilot Project is provided in paper IOTC-2022-SC25-07. 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 but are still pending 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 preliminary 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 was reduced to four. This project is now wrapping up. Full training has been completed in all four participating countries and pilot deployments have been conducted in two participating countries. The Secretariat expects to receive data from these deployments in the near future.

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: Since 2021 the IOTC Secretariat has started a collaboration with the Fisheries Development Division of the Pacific Islands Forum Fisheries Agency (FFA) and the FAO GLOBEFISH project team to develop a procedure to exchange 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. Price data are now available from the IOTC website for download.

Science activities (2022)

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. Funding for translating and delivering ID cards was provided by OFCF. The current set of identification guides available is provided here: www.iotc.org/science/species-identification-cards.

Ecoregions workshop: The IOTC secretariat participated in an ad hoc workshop of the WPEB, to discuss the definition of Ecoregions in the Indian Ocean for potential use in Ecosystems Based Fisheries Management (EBFM). The outcomes of that workshop were presented to the WPEB in document [IOTC-2022-WPEB18-22_rev1](#).

Driftnet/gillnet Multi-taxa Bycatch Mitigation Workshop: The IOTC secretariat facilitated and participated in an ad hoc workshop of the WPEB, to discuss mitigation techniques to reduce incidental bycatch in gillnet/drift net fisheries in the Indian Ocean. The outcomes of the workshop are provided in document [IOTC-2022-WPEB18-INF11](#).

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-2022-WPEB18-INF22](#).

Bigeye tuna stock assessment: The IOTC stock assessment scientist carried out a stock assessment of bigeye tuna (1950-2021) using stock synthesis III. The results indicated that the stock is currently overfished and subject to overfishing. The updated bigeye assessment was not considered for management advice in 2022 as the bigeye tuna stock is managed according to the Management Procedure adopted in Res 22/03.

Albacore tuna stock assessment: A Stock Assessment consultant (Joel Rice) funded by the IOTC regular budget, carried out a stock assessment of albacore tuna (1950 – 2020) using stock synthesis II. The consultant was aided by the IOTC Stock assessment scientist. The results for the Albacore assessment indicated that the stock is currently not overfished nor is it 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 2022.

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 and Swordfish MSE: A Stock Assessment contract with the University of Wageningen funded by the IOTC regular budget, conducted MSE for albacore tuna. The University is working to update the OM based on the updated stock assessment for albacore as well as develop an OM for Swordfish.

Implementation for the ROS as well as E-Monitoring. In 2022 the project to implement the ROS in 4 member countries, was continued utilizing [Grants provided by the EU](#).

Standardising CPUE of tuna and billfish species: A consultant (Simon Hoyle) conducted a review of best practices for CPUE standardization and presented the results to the WPTT in 2022. The work provided general advice to analysts developing CPUE indices for IOTC stock assessments.

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 2022

CITES shark proposals: The Secretariat participated in a workshop to discuss how the CITES and RFMO processes could be better harmonized. The Secretariat also participated in the 7th FAO expert advisory panel for the assessment of commercially-exploited aquatic species proposals to amend appendices I and II of CITES. The Secretariat provided the information available for the species being considered.

Global implementation of the United Nations' shark conservation and management plan: The Secretariat participated in a workshop to discuss the status of NPOAs for sharks and their implementation. The Secretariat provided information on the submitted NPOAs for IOTC CPCs.

Spatial stock assessment workshop: the IOTC Stock assessment scientist participated in a spatial stock assessment workshop that used Indian Ocean Yellowfin tuna stock as a case study, and has developed several models based on simulated data to investigate the relative performance of the spatial/non-spatial assessment models.

Close kin mark recapture workshop: the IOTC Stock assessment scientist participated in a CKMR training workshop organized by CSIRO. The workshop consists of a mix of training on CKMR theory and practical work, including how to build fundamental CKMR models in a variety of contexts. IOTC has recently completed several feasibility study on applying CKM abundance estimates to IOTC species including yellowfin tuna as well as major shark species.

Other RFMO activities

IATTC Commission and Scientific Advisory Council meetings: In 2022 the IOTC Secretariat attended both the Commission and SAC meetings of the IATTC.

IWC Scientific Committee meeting: In 2022 the IOTC Secretariat attended the IWC SC meeting.

SWIOFC Commission meeting: In 2022 the IOTC Secretariat attended the SWIOFC Commission meeting

IOTC publications and information products

Documents

In 2022, the Secretariat (including consultants) produced 91 (77 in 2021, 59 in 2020, 71 in 2019, 62 in 2018 and 59 in 2017) papers/reports ([Appendix II](#)) in support of the IOTC Science process, not including 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 and a new page has been created in 2022 to provide capacity building tools for MSE.

Recommendation

That the Scientific Committee **NOTE** paper IOTC–2022–SC25–05 which provides the report of the IOTC Secretariat for 2022, including the updates provided on the Recommendations and Requests directed to the IOTC Secretariat for implementation in 2022.

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 2022.](#)

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 2023	2 nd term
	Vice-Chair	Dr Denham Parker	South Africa	10-Dec-19	End of SC in 2023	2 nd 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-Sep-19	End of WPB in 2023	2 nd term
WPTmT	Chair	Dr Toshihide Kitakado	Japan	29-July-22	End of WPTmT in 2028	1 st term
	Vice-Chair	Dr Jiangfeng Zhu	China	29-July-22	End of WPTmT in 2028	1 st 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	Dr Julien Barde	EU,France	3-Dec-21	End of WPDCS in 2023	1 st term
	Vice-Chair	Mr Nuwan Gunawardane	Sri Lanka	3-Dec-21	End of WPDCS in 2023	1 st 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 Avelino Munwane	Mozambique	03-Oct-22	End of WGFAD in 2024	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 2022

Document number	Title
2nd Ad Hoc Working Group on the Development of Electronic Monitoring Programme Standards (WGEMS)	
IOTC-2022-WGEMS02-03	Electronic Monitoring related Terms and Definitions (WGEMS chairs and Secretariat)
IOTC-2022-WGEMS02-05	Minimum standards for designing and implementing Electronic Monitoring systems in Indian Ocean tuna fisheries (Murua H, Fiorellato F, Ruiz J, Chassot E and Restrepo V)
3rd Ad Hoc Working Group on FADs	
IOTC-2022-WGFAD03-03	Review of the statistical data on FADs (IOTC Secretariat)
13th Working Party on Methods Management Strategy Evaluation Task Force (WPM/MSE)	
IOTC-2022-WPM13(MSE)-07	Further evaluations of an empirical MP for Indian Ocean skipjack tuna (Edwards C)
8th Working Party on Temperate Tuna (WPTmT) Data Preparatory Meeting	
IOTC-2022-WPTmT08(DP)-03	Outcomes of the 24 th Session of the Scientific Committee (IOTC Secretariat)
IOTC-2022-WPTmT08(DP)-04	Outcomes of the 25 th Session of the Commission (IOTC Secretariat)
IOTC-2022-WPTmT08(DP)-05	Review of Conservation and Management Measures relevant to temperate tuna (IOTC Secretariat)
IOTC-2022-WPTmT08(DP)-06	Progress made on the recommendations of WPTmT07 (IOTC Secretariat)
IOTC-2022-WPTmT08(DP)-07	Review of the statistical data and fishery trends for albacore (IOTC Secretariat)
IOTC-2022-WPTmT08(DP)-17	A review of the data availability, model configuration and parameterization of the 2019 Indian Ocean albacore tuna (<i>Thunnus alalunga</i>), stock assessment in the Indian Ocean. (Rice J)
24th Working Party on Tropical Tuna (WPTT): Data preparatory meeting	
IOTC-2022-WPTT24(DP)-03	Outcomes of the 24 th Session of the Scientific Committee (IOTC Secretariat)
IOTC-2022-WPTT24(DP)-04	Outcomes of the 25 th Session of the Commission (IOTC Secretariat)
IOTC-2022-WPTT24(DP)-05	Review of Conservation and Management Measures relevant to tropical tuna (IOTC Secretariat)
IOTC-2022-WPTT24(DP)-06	Progress made on the recommendations of WPTT23 (IOTC Secretariat)
IOTC-2022-WPTT24(DP)-07 – BET	Review of bigeye tuna statistical data (IOTC Secretariat)
IOTC-2022-WPTT24(DP)-07 – TROPICALS	Overview of Indian Ocean tropical tuna fisheries
IOTC-2022-WPTT24(DP)-16	Assessing the impact of the growth on estimates of fishing mortality for the Indian Ocean bigeye tuna (Fu D)
IOTC-2022-WPTT24(DP)-17	Proposed natural mortality ogives for the Indian Ocean bigeye tuna stock assessment (Hoyle S)
IOTC-2022-WPTT24(DP)-18	A preliminary report on Estimates of fecundity, age at maturity, sex ratios, spawning season, and spawning fraction for bigeye tuna to be provided to the Working Party on Tropical Tunas. (Zudaire I, Artetxe-Arrate I, Farley J, Murua H, Kukul D, Vidot A, Abdul Razzaque S, Ahusan M, Romanov E, Eveson P, Clear N, Luque P, Fraile I, Bodin N, Chassot E, Govinden R, Ebrahim A, Shahid U, Marsac F and Merino G)
IOTC-2022-WPTT24(DP)-19	Analysis of recruitment deviates of tropical tuna stock assessments (Merino, G., A. Urtizbera, D. Fu, H. Winker, M. Cardinale, M.V. Lauretta, H. Murua, T. Kitakado, H. Arrizabalaga, R. Scott, G. Pilling, C. Minte-Vera, H. Xui, A. Laborda, M. Erauskin-Extramiana, A. Uriarte, J. Santiago)
IOTC-2022-WPTT24(DP)-INF04	Review of Indian Ocean skipjack tuna statistical data (IOTC Secretariat)
IOTC-2022-WPTT24(DP)-INF05	Review of Indian Ocean yellowfin tuna statistical data (IOTC Secretariat)
12th Session of the IOTC Working Party on Neritic Tunas	
IOTC-2022-WPNT12-03	Outcomes of the 24 th Session of the Scientific Committee (IOTC Secretariat)
IOTC-2022-WPNT12-04	Outcomes of the 25 th Session of the Commission (IOTC Secretariat)

IOTC-2022-WPNT12-05	Review of current Conservation and Management Measures relating to neritic tuna species (IOTC Secretariat)
IOTC-2022-WPNT12-06	Progress made on the recommendations and requests of WPNT11 and SC24 (IOTC Secretariat)
IOTC-2022-WPNT12-07	Review of the statistical data available for the neritic tuna species (IOTC Secretariat)
IOTC-2022-WPNT12-08	Revision of the WPNT Program of Work (2022-2026) (IOTC Secretariat)
IOTC-2022-WPNT12-INF02	Longtail tuna synopsis
IOTC-2022-WPNT12-INF03	Bullet tuna synopsis
IOTC-2022-WPNT12-INF04	Frigate tuna synopsis
8th Working Party on Temperate Tuna (WPTmT) Assessment Meeting	
IOTC-2022-WPTmT08-03	Revision of the WPTmT Program of Work (2020-2024) (IOTC Secretariat)
IOTC-2022-WPTmT08-04	Overview of Indian Ocean albacore fisheries (Secretariat)
IOTC-2022-WPTmT08-06_Rev2	Preliminary analysis of the variability in the length-weight relationship of Indian Ocean albacore (IOTC Secretariat, R.-F. Wu, J. Zhu, T. Nishida, S. Bonhommeau, T. Kitakado, S. Hoyle)
IOTC-2022-WPTmT08-09	Stock assessment of albacore tuna (<i>Thunnus alalunga</i>) in the Indian Ocean using Stock Synthesis (Rice J)
18th Working Party on Ecosystems and Bycatch (WPEB)	
IOTC-2022-WPEB18-03	Outcomes of the 24 th Session of the Scientific Committee (IOTC Secretariat)
IOTC-2022-WPEB18-04	Outcomes of the 26 th Session of the Commission (IOTC Secretariat)
IOTC-2022-WPEB18-05	Review of Conservation and Management Measures relevant to ecosystems and bycatch (IOTC Secretariat)
IOTC-2022-WPEB18-06	Progress made on the recommendations and requests of WPEB17 and SC24 (IOTC Secretariat)
IOTC-2022-WPEB18-07	Review of the statistical data and fishery trends for ecosystems and bycatch species (IOTC Secretariat)
IOTC-2022-WPEB18-08	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-2022-WPEB18-09	Revision of the WPEB Program of Work (2023-2027) (IOTC Secretariat & Chairperson)
IOTC-2022-WPEB18-22	Second IOTC Ecoregion Workshop: identification of regions in the IOTC convention area to inform the implementation of the ecosystem approach to fisheries management (M. J. Juan Jordá, A. E. Nieblas, H. Murua, E. Chassot, P. de Bruyn, D. Hayes, F. Marsac, U. Shahid, P. Thoya, S. Tsuji, E. Andonegi, M. Green, T. Kitakado, L. Nelson, M. Khan, L. Ramos Alonso, J. Moss, L. Lopetegui, Z. Hoque, L. Pierre, A. Sheikh)
IOTC-2022-WPEB18-INF11	Report of the multi-taxa gillnet bycatch mitigation workshop (Shahid U <i>et al.</i> and IOTC Secretariat)
IOTC-2022-WPEB18-INF14	Pre-workshop analysis in preparation for the 2022 IOTC Ecoregions Workshop: "Identification of regions in the IOTC convention area to inform the implementation of the ecosystem approach to fisheries management" (A. E. Nieblas, H. Murua, P. De Bruyn, E. Chassot, F. Fiorellato, M. J. Juan Jordá)
IOTC-2022-WPEB18-INF24	An overview of morphological data available on sharks at the IOTC Secretariat (Secretariat)
20th Session of the IOTC Working Party on Billfish	
IOTC-2022-WPB20-03	Outcomes of the 24 th Session of the Scientific Committee (IOTC Secretariat)
IOTC-2022-WPB20-04	Outcomes of the 26 th Session of the Commission (IOTC Secretariat)
IOTC-2022-WPB20-05	Review of Conservation and Management Measures relevant to billfish (IOTC Secretariat)
IOTC-2022-WPB20-06	Progress made on the recommendations and requests of WPB19 and SC24 (IOTC Secretariat)
IOTC-2022-WPB20-07	Review of the statistical data and fishery trends for billfish species (IOTC Secretariat)
IOTC-2022-WPB20-07a-e	Review of the statistical data available for Indian Ocean (a) black marlin, (b) blue marlin, (c) striped marlin, (d) Indo-Pacific sailfish, and (e) swordfish (IOTC Secretariat)
IOTC-2022-WPB20-08	Revision of the WPB Program of Work (2023-2027) (IOTC Secretariat)
13th Working Party on Methods	

IOTC-2022-WPM13-03	Outcomes of the 24 th Session of the Scientific Committee (IOTC Secretariat)
IOTC-2022-WPM13-04	Outcomes of the 26 th Session of the Commission (IOTC Secretariat)
IOTC-2022-WPM13-05	Review of Conservation and Management Measures relating to methods (IOTC Secretariat)
IOTC-2022-WPM13-06	Progress made on the recommendations and requests of WPM12 and SC24 (IOTC Secretariat)
IOTC-2022-WPM13-07	Revision of the WPM Program of Work (2023–2027) (IOTC Secretariat & Chairpersons)
IOTC-2022-WPM13-09	Presentations of empirical MPs for Indian Ocean skipjack tuna accounting for implementation error (Edwards C)
24th Session of the Working Party on Tropical Tunas: Assessment Meeting	
IOTC-2022-WPTT24-03	Review of the statistical data and fishery trends for (a) tropical tunas (b) bigeye tuna (c) skipjack tuna and (d) yellowfin tuna. (IOTC Secretariat)
IOTC-2022-WPTT24-04	Fisheries Indicators for Indian Ocean tropical tuna (Secretariat)
IOTC-2022-WPTT24-05	Revision of the WPTT Program of Work (2023–2027) (IOTC Secretariat)
IOTC-2022-WPTT24-10	Preliminary Indian Ocean bigeye tuna stock assessment 1950-2021 (stock synthesis) (Fu D, Merino G and Winker H)
IOTC-2022-WPTT24-11	Using data-limited approaches to assess data-rich Indian Ocean bigeye tuna: Data quantity evaluation and critical information for management implications (Li Y, Zhu J, Dai X, Dan F)
IOTC-2022-WPTT24-16	Approaches for estimating natural mortality in tuna stock assessments: application to global yellowfin tuna stocks (Hoyle S, Williams A, Minte-Vera C, Maunder M)
IOTC-2022-WPTT24-INF04	Natural mortality ogives for the Indian Ocean bigeye and yellowfin tuna stock assessments (Hoyle S)
18th Working Party on Data Collection and Statistics	
IOTC-2022-WPDCS18-03	Outcomes of the 24 th session of the Scientific Committee (IOTC Secretariat)
IOTC-2022-WPDCS18-04	Outcomes of the 26 th session of the Commission (IOTC Secretariat)
IOTC-2022-WPDCS18-05	Review of current Conservation and Management Measures relating to the WPDCS (IOTC Secretariat)
IOTC-2022-WPDCS18-06	Progress on the recommendations of WPDCS17 (IOTC Secretariat)
IOTC-2022-WPDCS18-07	Report on IOTC Data Collection and Statistics (IOTC Secretariat)
IOTC-2022-WPDCS18-08	IOTC capacity building activities in support of developing coastal CPCs (IOTC Secretariat)
IOTC-2022-WPDCS18-09	Revision of the WPDCS Program of Work 2023–2027 (IOTC Secretariat)
IOTC-2022-WPDCS18-10	Updates on the implementation of the IOTC Regional Observer Scheme and its pilot project (IOTC Secretariat)
IOTC-2022-WPDCS18-11	Updated calculations of yellowfin tuna catch limits for 2022 / 2023 (IOTC Secretariat)
IOTC-2022-WPDCS18-12	Summary of updates on data-related requests from other Working Parties (IOTC Secretariat)
IOTC-2022-WPDCS18-13	Proposed updates to the definitions of fisheries in support to the reporting of statistical data to the IOTC (IOTC Secretariat)
IOTC-2022-WPDCS18-14	Improvements to the IOTC recommended data reporting forms (IOTC Secretariat)
IOTC-2022-WPDCS18-15	Draft revision of IOTC data reporting guidelines (IOTC Secretariat)
IOTC-2022-WPDCS18-16	Results of the implementation of the Small-Scale Fisheries matrix approach to selected IOTC fisheries (IOTC Secretariat)
IOTC-2022-WPDCS18-17	Finalized ROS data collection and reporting forms (IOTC Secretariat)
IOTC-2022-WPDCS18-24	Metadata for fisheries: ongoing work, examples and outlooks (J. Barde, S. Poulain, E. Chassot, F. Fiorellato, E. Blondel, B. Grasset)
IOTC-2022-WPDCS18-25	The yearly updates of the Global Tuna Atlas and the necessity to share conversion factors datasets (B. Grasset, J. Barde, E. Chassot)
IOTC-2022-WPDCS18-30	Note on the collaboration of the Secretariat with international partners on data-related matters (IOTC Secretariat)
25th Session of the Scientific Committee	
IOTC-2022-SC25-03	Outcomes of the 26 th Session of the Commission (IOTC Secretariat)
IOTC-2022-SC25-04	Previous decisions of the Commission (IOTC Secretariat)
IOTC-2022-SC25-05	Report of the Secretariat – Activities in support of the IOTC science process in 2022 (IOTC Secretariat)

IOTC-2022-SC25-06	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-2022-SC25-07	Update on the implementation of the regional observer scheme (IOTC Secretariat)
IOTC-2022-SC25-08	Revision of the program of work (2023-2027) for the IOTC science process (IOTC Secretariat)
IOTC-2022-SC25-09	Proposed schedule of Working Party and Scientific Committee meetings for 2023 and 2024 (IOTC Secretariat)
IOTC-2022-SC25-10	Progress on SC24 recommendations (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/322/EC	Science	EC	Support to the implementation of the IOTC ROS (2018)	850,682	01/10/2018	31/12/2022
MPF Extra-budgetary	Meetings	China	Extra funds for meeting participation*	18,000	01/01/2022	31/12/2022
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

*Extra funds confirmed but not yet received, as of date of report