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## REVISION OF THE WPEB PROGRAM OF WORK (2019–2023)

PREPARED BY: IOTC SECRETARIAT & CHAIR, 29 AUGUST 2018

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### PURPOSE

To ensure that participants at the 14<sup>th</sup> Working Party on Ecosystems and Bycatch (WPEB14) revise the Program of Work for the WPEB by taking into consideration the specific requests of the Commission and Scientific Committee.

### BACKGROUND

#### *Scientific Committee*

At the 20<sup>th</sup> Session of the SC:

- (Para. 203) The SC **NOTED** paper IOTC–2016–SC20–09 which provided the Scientific Committee (SC) with a proposed Program of Work for each of its Working Parties (WP), including prioritisation of the elements requested by each WP.
- (Para. 204) The SC **NOTED** the proposed Program of Work and priorities for the Scientific Committee and each of the Working Parties and **AGREED** to a consolidated Program of Work as outlined in Appendix XXXVIa-g. The Chairpersons and Vice-Chairpersons of each working party shall ensure that the efforts of their working party are focused on the core areas contained within the appendix, taking into account any new research priorities identified by the Commission at its next Session.
- (Para. 206) The SC **AGREED** on the consolidated table of priorities across all Working Parties, as developed by each WP Chair, and **REQUESTED** that the IOTC Secretariat, in consultation with the Chair and vice-Chair of the SC and relevant Working Parties, develop ToRs for the specific projects to be carried out (Table 4).
- (Para 209) The SC noted Table 4 outlining the highest priorities from each WP in terms of funding requirements. The complete set of research priorities identified (and ranked according their importance) by each WP are detailed more fully in Appendix XXXVIa-g.

#### *Commission*

At Sessions of the Commission, Conservation and Management Measures adopted contained elements that call on the Scientific Committee, via the WPEB, to undertake specific tasks. These requests will need to be incorporated into a revised Program of Work for the WPEB:

#### **Resolution 12/12 To prohibit the use of large-scale driftnets on the high seas in the IOTC area**

(para. 1) The use of large-scale driftnets<sup>1</sup> on the high seas within the IOTC area of competence shall be prohibited.

(para. 6) The IOTC shall periodically assess whether additional measures should be adopted and implemented to ensure that large-scale driftnets are not used on the high seas in the IOTC area of competence. The first such assessment shall take place in 2013.

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

(para. 15) The elements of the Observer Scheme, notably those regarding its coverage, are subject to review and revision, as appropriate, for application in 2012 and subsequent years. Basing on the experience of other Tuna RFMOs, the IOTC Scientific Committee will elaborate an observer working manual, a template to be used for reporting (including minimum data fields) and a training program.

#### **Resolution 18/02 On Management Measures for the Conservation of Blue Shark Caught in Association with IOTC Fisheries**

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<sup>1</sup> “Large-scale driftnets” are defined as gillnets or other nets or a combination of nets that are more than 2.5 kilometres in length whose purpose is to enmesh, entrap, or entangle fish by drifting on the surface of, or in, the water column.

(para 5) CPCs are encouraged to undertake scientific research on blue shark that would provide information on key biological/ecological/behavioural characteristics, life-history, migrations, post-release survival and guidelines for safe release and identification of nursery grounds, as well as improving fishing practices. Such information shall be made available to the Working Party on Ecosystem and Bycatch and Scientific Committee through working documents and the national Annual Reports

(para 6) In light of the results of the next stock assessment of blue shark in 2021, the Scientific Committee shall provide advice, if possible, on options for candidate limit, threshold and target reference points for the conservation and management of this species in the IOTC Convention area.

(para 7) The Scientific Committee shall also provide advice, at the latest by 2021, on potential management options for ensuring long-term sustainability of the stock, such as mitigation measures to reduce the mortality of blue shark, improving selectivity of fishing gears, spatial/temporal closures or minimum conservation sizes.

#### **Resolution 18/04 On Biofad Experimental Project**

(para 5) The Project Consortium will make available to the IOTC Scientific Committee the results of the project at the latest two months in advance of its 2020 meeting. The Scientific Committee will analyse the outcomes of the project and provide scientific advice on possible additional FAD management options for consideration by the Commission in 2021.

#### **A pilot project for the IOTC Regional Observer Scheme**

(para. 48) The Commission recalled that in 2016 it adopted Resolution 16/04 *On the implementation of a pilot project in view of promoting the Regional Observer Scheme of IOTC* and requested the Secretariat to develop a comprehensive plan for a Regional Observer Scheme Pilot project, as part of a long-term, holistic strategy for supporting the implementation of the Regional Observer Scheme.

(para. 49 – 50) The Commission noted the presentation on the pilot project given by the Chair of the Scientific Committee and **ENDORSED** the framework as outlined in IOTC-2017-S21-10. Furthermore the Commission accepted that the Project Steering Committee will be required to advise the Secretariat on a range of critical matters relating to the implementation of the project.

(para. 51) The Commission encouraged CPCs, especially those that are likely to be participating in and benefitting directly from the project, to support the initiative further with co-funding. The Commission also **AGREED** that project activities would begin with the current funding available and that a budget for subsequent phases be prepared for the S22.

#### **On the Working Party of Ecosystems and Bycatch and the status of sharks**

(para 34) The Commission **REQUESTED** the SC to review the status of manta and mobula rays and their interaction with IOTC fisheries and to report this to the Commission in 2020. This work should include an evaluation of data availability and data gaps. Where data is insufficient, the SC should propose options for strengthening data collection.

(para. 38) The Commission **REQUESTED** the Scientific Committee to identify possible means to improve the submission of complete, accurate and timely catch records for sharks, as well as the collection of species-specific data on catch, biology, discards and trade.

#### **Matters affecting all IOTC species**

(para 54) The Commission **AGREED** to defer IOTC-2018-S22-PropD and PropJ On a Regional Observer Scheme. The proponents of these proposals attempted to merge the two proposals; however, they agreed more work needed to be done to reach a consensus and indicated that a revised proposal will be submitted to the next session of the Commission.

#### **DISCUSSION**

Participants at the WPEB14 are requested to consider the priorities set by the Commission via its Conservation and Management Measures, and the Scientific Committee, and revise its Program of Work (previously outlined in paper IOTC–2018–WPEB14–03) to match those priorities.

#### **RECOMMENDATION/S**

That the WPEB:

- 1) **NOTE** paper IOTC–2018–WPEB14–10, which encouraged the WPEB to further develop and refine its Program of Work for 2019–2023 to align with the requests and directives from the Commission and Scientific Committee.
- 2) **RECOMMEND** a revised Program of Work for 2019–2023 to the Scientific Committee for its consideration and potential endorsement.

## WORKING PARTY ON ECOSYSTEMS AND BYCATCH PROGRAM OF WORK (2019–2023)

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 develop stock status indicators for bycatch in the Indian Ocean; and
- **Table 2:** Stock assessment schedule.

**Table 1.** Priority topics for obtaining the information necessary to develop stock status indicators for bycatch species in the Indian Ocean

Topic	Sub-topic and project	Priority	Ranking	Lead	Est. budget (potential source)	Timing				
						2019	2020	2021	2022	2023
<b>SHARKS</b>										
1. Stock structure (connectivity and diversity)	1.1 Genetic research to determine the connectivity of select shark species throughout their distribution (including in adjacent Pacific and Atlantic waters as appropriate) and the effective population size.	High	17	CSIRO/AZTI/IRD/RITF	Financed (1.3m Euro (EU + 20% additional co-financing))					
	1.1.1 Next Generation Sequencing (NGS) to determine the degree of shared stocks for select shark species (highest priority species: blue shark, scalloped hammerhead shark, oceanic whitetip shark and shortfin mako shark) in the Indian Ocean with the southern Atlantic Ocean and Pacific Ocean, as appropriate. Population genetic analyses to decipher inter- and intraspecific evolutionary relationships, levels of gene flow (genetic exchange rate), genetic divergence, and effective population sizes.									

	1.1.2 Nuclear markers (i.e. microsatellite) to determine the degree of shared stocks for select shark species (highest priority species: blue shark, scalloped hammerhead shark and oceanic whitetip shark) in the Indian Ocean with the southern Atlantic Ocean and Pacific Ocean, as appropriate.								
	1.2 Connectivity, movements and habitat use	High	3						
	1.2.1 Connectivity, movements, and habitat use, including identification of hotspots and investigate associated environmental conditions affecting the sharks distribution, making use of conventional and electronic tagging (PSAT).			AZTI, IRD, Others	Partially funded (153,000€ IOTC + 100.000€ EU/DCF)	SMA, PTH			
	1.2.2 Whale sharks (RHN): Connectivity, movements, and habitat use, including identification of hotspots and investigate associated environmental conditions affecting distribution, making use of conventional and electronic tagging (P-SAT).				Funded (50,000€ EU/DCF)	RHN			
2. Fisheries data collection	2.1 Historical data mining for the key species and IOTC fleets (e.g. as artisanal gillnet and longline coastal fisheries) including:	High	1						
	2.1.1 Capacity building of fisheries observers (including the provision of ID guides, training, etc.)			WWF-Pakistan/ ACAP (seabirds)	US\$20,000 (ID guides)				
	2.1.3 Historical data mining for the key species, including the collection of information about catch, effort and spatial distribution of those species and fleets catching them			TBD					
	2.2 Implementation of the Pilot Project (Resolution 16/04) for the Regional Observer Scheme	High	4						

	2.2.1 Definition of minimum standards and development of a training package for the ROS to be reviewed and rolled out in voluntary CPCs (Sri Lanka, I.R.Iran, Tanzania)				Funded (EC)					
	2.2.2 Development of a Regional Observer database and population with historic observer data				Funded (NOAA and EC)					
	2.2.3 Development, piloting and implementation of an electronic reporting tool to facilitate data reporting				Funded (NOAA and EC)					
	2.2.4 Development and trial of Electronic Monitoring Systems for gillnet fleets				Partially funded (EC)					
	2.2.5 Port sampling protocols for artisanal fisheries				to be funded					
	2.2.6 Review the status of manta and mobula rays and their interaction with IOTC fisheries. Evaluation of data availability and data gaps				US\$?? (TBD)					
3. Biological and ecological information (incl. parameters for stock assessment)	3.1 Age and growth research (Priority species: blue shark (BSH), shortfin mako shark (SMA) and oceanic whitetip shark (OCS); Silky shark (FAL))	High	6		US\$?? (TBD)					
	3.1.1 CPCs to provide further research reports on shark biology, namely age and growth studies including through the use of vertebrae or other means, either from data collected through observer programs or other research programs.			CPCs directly	US\$?? (TBD)	OCS				
	3.2 Post-release mortality	High	16							

	3.2.1 Post-release mortality (electronic tagging), to assess the efficiency of management resolutions on no retention species (i.e. oceanic whitetip shark (OCS) and thresher sharks), shortfin mako shark (SMA) ranked as the most vulnerable species to longline fisheries, and blue shark as the most frequent in catches.			IRD/ NRIFSF	Partially funded (IOTC + EU/DCF)	SMA, PTH, BTH				
	3.2.2 Post-release mortality (electronic tagging), to assess the efficiency of management resolutions on no retention species (i.e. oceanic whitetip shark (OCS) for purse seine fisheries			IRD/AZTI	Funded (EU/DCF)	OCS				
	3.2.3 Post-release survivorship (electronic tagging) on whale shark to assess the effect of unintended interaction and efficiency of management resolution of non-intentioned encirclement on purse seine			IRD/AZTI	Funded (EU/DCF)					
	3.3 Reproduction research Priority species: blue shark (BSH), shortfin mako shark (SMA) and oceanic whitetip shark (OCS), and silky shark (FAL))	High	7	CPCs directly	US\$??(TBF)					
	3.4 Ecological Risk Assessment (sharks & rays)	High	2		TBD					
4. Shark bycatch mitigation measures	4.1 Develop studies on shark mitigation measures (operational, technological aspects and best practices)	High	14							
	4.1.1 Longline selectivity, to assess the effects of hooks styles, bait types and trace materials on shark catch rates, hooking-mortality, bite-offs and fishing yield (socio-economics)				US\$?? (TBD)					
	4.1.2 Gillnet selectivity, to assess the effect of mesh size, hanging ratio and net twine on sharks catches composition (i.e.			WWF-Pakistan	US\$?? (ABNJ funding to WWF)					

	species and size), and fishing yield (socio-economics)								
	4.1.3 Develop guidelines and protocols for safe handling and release of sharks caught on longlines and gillnets fisheries								
	4.1.4 Biodegradable FADs testing and implementing biodegradable FADs in the IO Purse Seine fleet to reduce environmental footprint of the gear.				EU Consortium + ISSF	Funded			
5. CPUE standardisation / Stock Assessment / Other indicators	5.1 Develop standardised CPUE series for each key shark species and fishery in the Indian Ocean	High	13			US\$?? (TBD)			
	5.1.1 Blue shark: Priority fleets: TWN,CHN LL, EU,Spain LL, Japan LL; Indonesia LL; EU,Portugal LL				CPCs directly	US\$??			
	5.1.2 Shortfin mako shark: Priority fleets: Longline and Gillnet fleets				CPCs directly	US\$??			
	5.1.3 Oceanic whitetip shark: Priority fleets: Longline fleets; purse seine fleets				CPCs directly	US\$??			
	5.1.4 Silky shark: Priority fleets: Purse seine fleets				CPCs directly	US\$??			
	5.2 Joint CPUE standardization across the main LL fleets, using detailed operational data	High	11		Consult.	30,000 €			
	5.3 Stock assessment and other indicators	High	12						
	5.3.1 Develop and compare multiple assessment approaches to determining stock status for key shark species (see Table 2)				TBD	Part of: 600K Euro (European Union)			
MARINE TURTLES									

6. Marine turtle bycatch mitigation measures

6.1 Review of bycatch mitigation measures High 8

6.1.1 Res. 12/04 (para. 11) Part I. The IOTC Scientific Committee shall request the IOTC Working Party on Ecosystems and Bycatch to:

- a) Develop recommendations on appropriate mitigation measures for gillnet, longline and purse seine fisheries in the IOTC area; [mostly completed for LL and PS]
- b) Develop regional standards covering data collection, data exchange and training;
- c) Develop improved FAD designs to reduce the incidence of entanglement of marine turtles, including the use of biodegradable materials. [partially completed for non-entangling FADS; ongoing or biodegradable FADS]

CPCs directly

US\$??

(TBD)


	<p>6.1.2 Res. 12/04 (para. 11) Part II. The recommendations of the IOTC Working Party on Ecosystems and Bycatch shall be provided to the IOTC Scientific Committee for consideration at its annual session in 2012. In developing its recommendations, the IOTC Working Party on Ecosystems and Bycatch shall examine and take into account the information provided by CPCs in accordance with paragraph 10 of this measure, other research available on the effectiveness of various mitigation methods in the IOTC area, mitigation measures and guidelines adopted by other relevant organizations and, in particular, those of the Western and Central Pacific Fisheries Commission. The IOTC Working Party on Ecosystems and Bycatch will specifically consider the effects of circle hooks on target species catch rates, marine turtle mortalities and other bycatch species.</p> <p>6.1.3 Res. 12/04 (para. 17) The IOTC Scientific Committee shall annually review the information reported by CPCs pursuant to this measure and, as necessary, provide recommendations to the Commission on ways to strengthen efforts to reduce marine turtle interactions with IOTC fisheries.</p>		CPCs directly	US\$?? (TBD)					
			CPCs directly	Nil					
	Regional workshop to review the effectiveness of marine turtle mitigation measures (Recommendation SC20.23)			TBD					
	SEABIRDS								
7. Seabird bycatch mitigation measures	7.1 Review of bycatch mitigation measures	High	10						

	<p>7.1.1 Res. 12/06 (para. 8) The IOTC Scientific Committee, based notably on the work of the WPEB and information from CPCs, will analyse the impact of this Resolution on seabird bycatch no later than for the 2016 meeting of the Commission. It shall advise the Commission on any modifications that are required, based on experience to date of the operation of the Resolution and/or further international studies, research or advice on best practice on the issue, in order to make the Resolution more effective.</p>		<p>Rep. of Korea, Japan, Birdlife Int.</p>	<p>US\$?? (TBD)</p>					
	<p>7.1.2 ERA for sea-birds</p>		<p>ACAP, Birdlife</p>						
<p>CETACEANS</p>									
<p>8.Bycatch assessment and mitigation</p>	<p>8.1 Review and development of cetacean bycatch mitigation measures</p> <p>8.1.1 Collate all data available on bycatch of key species interacting with all tuna fisheries in the IOTC area (tuna drift gillnets, longlines, purse seines)</p> <p>8.1.2 Creation of identification cards for cetacean species in IOTC Area of Competence</p> <p>8.1.3 Conduct an ecological risk assessment for cetaceans in the IOTC area</p> <p>8.1.4 Collaborate with other organisations on the assessment of marine mammal abundance and collect data on marine mammal bycatch interactions with gillnets.</p>	<p>High 9</p>	<p>Consultancy?</p> <p>IOTC</p> <p>Consultancy?</p> <p>FIU/WWF-Pakistan?</p>	<p>U.S.\$??</p> <p>IOTC / U.S. MM Commission (15k)</p> <p>?</p> <p>U.S.\$? (IWC)</p>					

	8.1.5 Testing mitigation methods for cetacean bycatch in tuna drift gillnet fisheries		WWF Pakistan	U.S. MM Commission? Others?					
DISCARDS									
9. Bycatch mitigation measures	<p>9.1 Review proposal on retention of non-targeted species</p> <p>9.1.1 The Commission requested that the Scientific Committee review proposal IOTC-2014-S18-PropL Rev_1, and to make recommendations on the benefits of retaining non-targeted species catches, other than those prohibited via IOTC Resolutions, for consideration at the 19th Session of the Commission. (S18 Report, para. 143). Noting the lack of expertise and resources at the WPEB and the short timeframe to fulfil this task, the SC RECOMMENDED that a consultant be hired to conduct this work and present the results at the next WPEB meeting. The following tasks, necessary to address this issue, should be considered for the terms of reference, taking into account all species that are usually discarded on all major gears (i.e., purse-seines, longlines and gillnets), and fisheries that take place on the high seas and in coastal countries EEZs:</p> <p>i) Estimate species-specific quantities of discards to assess the importance and potential of this new product supply, integrating data available at the Secretariat from the regional observer programs,</p>	High	5	Consultant			US\$?? (TBD)		

<p>ii) Assess the species-specific percentage of discards that is captured dead versus alive, as well as the post-release mortality of species that are discarded alive, in order to estimate what will be the added fishing mortality to the populations, based on the best current information,iii) Assess the feasibility of full retention, taking into account the specificities of the fleets that operate with different gears and their fishing practices (e.g., transshipment, onboard storage capacity).</p> <p>iv) Assess the capacity of the landing port facilities to handle and process this catch.</p> <p>v) Assess the socio-economic impacts of retaining non-target species, including the feasibility to market those species that are usually not retained by those gears,</p> <p>vi) Assess the benefits in terms of improving the catch statistics through port-sampling programmes,</p> <p>vii) Evaluate the impacts of full retention on the conditions of work and data quality collected by onboard scientific observers, making sure that there is a strict distinction between scientific observer tasks and compliance issues.</p>											
<b>ECOSYSTEMS</b>											
10.	Ecosystems	10.1 Develop a plan for Ecosystem Based Fisheries Management (EBFM) approaches in the IOTC, in conjunction with the Common Oceans Tuna Project.	High	15	WPEB	US\$?? (TBD)					
		10.1.1 Training workshop for CPCs on EBFM system and discussion on ecological components and the elements that are needed (ideally in 2018).									

10.1.2 Workshop for CPCs on developing strategic plan for formalized implementation of EBFM (2019).

10.1.3 Implementation of EBFM plan according to approved strategies and executive measures by the IOTC commission during 2020.

10.1.4 Evaluation of implemented EBFM plan in IOTC area of competence by the secretariat and review its elements, components and making corrective measures in 2021.


**Table 2.** Draft: Assessment schedule for the IOTC Working Party on Ecosystems and Bycatch 2019–2023 (adapted from IOTC–2017–SC20–R).

<b>Species</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
Blue shark		<b>Indicators</b>	<b>Full assessment*</b>	<b>Indicators</b>	–
Oceanic whitetip shark	<b>Indicators</b>	<b>Full assessment*</b>	<b>Revisit ERA</b>	<b>Indicators</b>	–
Scalloped hammerhead shark		–	<b>Revisit ERA</b>	<b>Indicators</b>	–
Shortfin mako shark	<b>Indicators</b>	<b>Full assessment*</b>	<b>Revisit ERA</b>	–	<b>Indicators</b>
Silky shark	<b>Full assessment*</b>	-	<b>Indicators; Revisit ERA</b>	<b>Full assessment*</b>	–
Bigeye thresher shark	–	–	<b>Revisit ERA</b>	–	<b>Indicators</b>
Pelagic thresher shark	–	–	<b>Revisit ERA</b>	–	<b>Indicators</b>
Porbeagle shark	–	–	–	–	<b>Indicators</b>
Mobulid rays		<b>Interactions/Indicators</b>			
Marine turtles	–	<b>Review of mitigation measures in Res. 12/04</b>	<b>Revisit ERA</b>	–	<b>Indicators</b>
Seabirds	<b>ERA; Review of mitigation measures in Res. 12/06</b>	–	-	<b>Review of mitigation measures in Res. 12/06</b>	–
Marine Mammals	<b>Report from the IWC</b>	–	<b>ERA</b>	–	–
Ecosystem Based Fisheries Management (EBFM) approaches	–	–	–	–	–

\*Including data poor stock assessment methods; Note: the assessment schedule may be changed dependent on the annual review of fishery indicators, or SC and Commission requests.