REVISION OF THE WPEB PROGRAM OF WORK (2020–2024)

PREPARED BY: IOTC SECRETARIAT & CHAIR, 02 AUGUST 2019

PURPOSE

To ensure that participants at the 15th Working Party on Ecosystems and Bycatch (WPEB15) 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 21st Session of the SC:

(Para. 219) The SC **NOTED** paper IOTC–2018–SC21–09 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. 220) 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 35a-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. 222) 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 225) The SC noted Table 5 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 35a-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[1] 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.

[1] "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.

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

(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.

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

(para 41) The Commission **NOTED** the concern expressed by the Scientific Committee regarding the status of mobulid rays. Although the recommendations on gear modifications made by the Scientific Committee relate mainly gillnet fisheries, there is also a need to monitor mobulid interactions with other gears and fleets and reduce their associated mortality.

(para. 114) The Commission **NOTED** that in 2019 the WPICMM considered the results of an analysis on the status of compliance with the shark measures. The WPICMM noted there is currently a lack of data to undertake any meaningful assessment on how CPCs are implementing these measures. In 2018, both the WPDCS and SC discussed possible means to improve the submission of complete, accurate and timely catch records for sharks. This matter has been deferred to the next meeting of the WPEB, noting that the focus would be on data improvement.

IOTC Strategic Science Plan (2020 – 2024)

(para. 34) The Commission **ADOPTED** the IOTC Strategic Science Plan 2020-2024, but **NOTED** that it was extremely ambitious and that its implementation should be reviewed by the Scientific Committee in 2022 and if necessary, modified.

Consideration of the IOTC Regional Observer Scheme Draft Standards

(para. 120) The Commission **ENDORSED** the IOTC Regional Observer Scheme (ROS) standards in principle in order for the Secretariat to implement the ROS, on the understanding that further comments can be made, and that the standards will be reviewed based on these comments and other feedback made during the implementation phase.

DISCUSSION

Participants at the WPEB15 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–2019–WPEB15–03) to match those priorities.

RECOMMENDATION/S

That the WPEB:

1) **NOTE** paper IOTC–2019–WPEB15–10, which encouraged the WPEB to further develop and refine its Program of Work for 2020–2024 to align with the requests and directives from the Commission and Scientific Committee.

2) **RECOMMEND** a revised Program of Work for 2020–2024 to the Scientific Committee for its consideration and potential endorsement.

WORKING PARTY ON ECOSYSTEMS AND BYCATCH PROGRAM OF WORK (2020–2024)

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				
						2020	2021	2022	2023	2024
	SHARKS									
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)					
	2.1.2 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			CPCs with assistance from secretariat	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					
	2.3 Review the status of manta and mobula rays and their interaction with IOTC fisheries. Evaluation of data availability and data gaps. Include ID guide revision and translation.	High	X?	Consultant?	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)	, BTH OCS				

	3.2.2Post-release mortality (electronic tagging), to assess the efficiency of management resolutions on no retention species ranked as the most vulnerable species to longline fisheries, and blue shark as the most frequent in catches			IRD/ NRIFSF	TBD	SMA, PTH				
	3.2.3 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 and longline fisheries			IRD/AZTI/IPMA/CAPRUN	Funded (EU/DCF)	OCS				
	3.2.4 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	AZTI	Funded (EU/DCF)					
	3.5 Close kin feasibility study for sharks	High	X	Consultant	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$?? (TBD)					
	4.1.2 Gillnet selectivity, to assess the effect of mesh size, hanging ratio and net twine on sharks and rays catches composition (i.e. species and size), and fishing yield (socio-economics)			WWF-Pakistan	US$?? (ABNJ funding to WWF)					
	4.1.3 Develop guidelines and protocols for safe handling and release of sharks and rays 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 Development of CPUE guidelines for standardisation of CPC data.			TBD	TBD					
	5.1.2 Blue shark: Priority fleets: TWN,CHN LL, EU,Spain LL, Japan LL; Indonesia LL; EU,Portugal LL			CPCs directly						
	5.1.3 Shortfin mako shark: Priority fleets: Longline and Gillnet fleets			CPCs directly						

	5.1.4 Oceanic whitetip shark: Priority fleets: Longline fleets; purse seine fleets			CPCs directly	
	5.1.5 Silky shark: Priority fleets: Purse seine fleets			CPCs directly	
	5.2 Joint CPUE standardization across the main LL fleets for SLK?, using detailed operational data	High	11	Consult.	30,000 €
	5.3 Stock assessment and other indicators	High	12		
	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:			CPCs directly	US$??
	a) Develop recommendations on appropriate mitigation measures for gillnet, longline and purse seine fisheries in the IOTC area; [mostly completed for LL and PS]				(TBD)
	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)]								
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.		CPCs directly	US$?? (TBD)					

	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.			CPCs directly	Nil					
	6.1.4 Regional workshop to review the effectiveness of marine turtle mitigation measures (Recommendation SC20.23)				TBD					
	6.1.5 Review mortality studies for sea turtles, particularly for PS and gillnets									
	SEABIRDS									
7. Seabird bycatch mitigation measures	7.1 Review of bycatch mitigation measures	High	10							
	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.			Rep. of Korea, Japan, Birdlife Int.	US$?? (TBD)					

	7.1.2 Bycatch assessment for seabirds taking into account the information from the various ongoing initiatives in the IO and adjacent oceans 7.1.3 Study on cryptic mortality of seabirds in tuna LL fisheries. 7.1.4 Post release survival rates for seabirds and review of safe release techniques.			ACAP, Birdlife					
	CETACEANS								
8.Bycatch assessment and mitigation	8.1 Review and development of cetacean bycatch mitigation measures	High	9						
	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)			Consultancy?	U.S.$??				
	8.1.3 Conduct an ecological risk assessment for cetaceans in the IOTC area			CPCs directly					
	8.1.4 Collaborate with other organisations on the assessment of marine mammal abundance and collect data on marine mammal bycatch interactions with gillnets across the IOTC region			FIU/WWF-Pakistan?	U.S.$? (IWC)				
	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	9.1 Review proposal on retention of non-targeted species	High	5							
	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:			Consultant – status to be checked	US$?? (TBD)					
	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,									

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., transhipment, onboard storage capacity).					
iv) Assess the capacity of the landing port facilities to handle and process this catch.					
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,					
vi) Assess the benefits in terms of improving the catch statistics through port-sampling programmes,					
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.					

		ECOSYSTEMS					
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 Introduction and review of case studies and approaches and discussion on ecological and socio economic components that are needed. Ideally 2020					
		10.1.2 Workshop for CPCs on developing strategic plan for formalized implementation of EBFM (2019) including delineation of candidate eco regions within IOTC.					
		10.1.3 Practical Implementation of EBFM with the development and testing of ecosystem report cards.					
		10.1.4 Evaluation of EBFM plan in IOTC area of competence by the WPEB to review its elements components and make any corrective measures.					
		10.2 Assessing the impacts of climate change and socio-economic factors on IOTC fisheries				TBD	

10.3 Evaluate alternative approaches to ERAs to assess ecological risk	TBD					

Table 2. Draft: Assessment schedule for the IOTC Working Party on Ecosystems and Bycatch 2020–2024 (adapted from IOTC–2018–SC21–R).

Working Party on Ecosystems and Bycatch					
Species	**2020**	**2021**	**2022**	**2023**	**2014**
Blue shark	Indicators	Full assessment*	Indicators	–	–
Oceanic whitetip shark	Full assessment*	–	Indicators	–	Indicators
Scalloped hammerhead shark	–	–	Indicators	–	–
Shortfin mako shark	Full assessment*	–	–	Indicators	Full assessment*
Silky shark	-	Indicators;	Full assessment*	–	Indicators
Bigeye thresher shark	–	–	–	Indicators	–
Pelagic thresher shark	–	–	–	Indicators	–
Porbeagle shark	–	–	–	Indicators	–
Marine turtles	Interactions/Indicators				Interactions/Indicators
Seabirds	Review of mitigation measures in Res.	–	–	Indicators	–
Marine Mammals	–	–	Review of mitigation measures in Res. 12/06	–	–
Ecosystem Based Fisheries Management (EBFM) approaches	–	ERA	–	–	–

*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.