
REVISION OF THE WPB PROGRAM OF WORK (2019–2023)

PREPARED BY: IOTC SECRETARIAT, 09TH AUGUST 2018

PURPOSE

To ensure that participants at the 16th Working Party on Billfish (WPB16) revise the Program of Work for the WPB by taking into consideration the specific requests of the Commission and Scientific Committee.

BACKGROUND

Scientific Committee

At the 20th Session of the SC:

- (Para. 203) The SC noted paper IOTC–2017–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. 208) The SC noted that the WPM has selected five species for MSE (albacore, yellowfin, bigeye, skipjack and swordfish). While these species are equally prioritised in terms of science, swordfish has been labelled as the first priority in Table 4 given that it is the only species currently lacking funding.
- (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 to 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 WPB, to undertake specific tasks. These requests will need to be incorporated into a revised Program of Work for the WPB:

Resolution 15/11 *On the implementation of a limitation of fishing capacity of contracting parties and cooperating non-contracting parties*

Para. 2: In notifying their vessels fishing for tropical tunas in the area in 2006, and for swordfish and albacore in 2007, the CPCs shall confirm that they have verified the effective presence and fishing activities of their vessels in the IOTC area of competence in 2006 and in 2007, through their VMS records, catch reports, port calls, or other means. The IOTC Secretariat shall have access to such information upon request.

Resolution 18/05 *On management measures for the conservation of the billfishes: striped marlin, black marlin, blue marlin and indo-pacific sailfish*

Para. 5: Pending advice from the Scientific Committee on a joint and/or a species specific minimum conservation size, notwithstanding Resolution 17/04, CPCs shall not retain on board, trans-ship, land, any specimen smaller than 60 cm Lower Jaw Fork Length (LJFL) of any of the species referred to in paragraph 2, but shall return them immediately to the sea in a manner that maximizes post-release survival potential without compromising the safety of crew.

Para. 12: *The IOTC Working Party on Billfish and the Scientific Committee shall continue their work on assessing and monitoring the status of Striped Marlin, Black Marlin, Blue Marlin and Indo-pacific Sailfish and provide advice to the Commission*

Para. 13: *The Scientific Committee and the Compliance Committee shall annually review the information provided and assess the effectiveness of the fisheries management measures reported by CPCs on striped marlin, black marlin, blue marlin and Indo-Pacific sailfish and, as appropriate, provide advice to the Commission.*

Para. 14: *For each of the four species covered by this Resolution, the Scientific Committee shall provide advice:*

- a. Options to reduce fishing mortality with a view to recover and/or maintain the stocks in the Green zone of the Kobe Plot with levels of probability ranging from 60 to 90% by 2026 at latest. The advice shall be provided on the basis of the current exploitation pattern as well as of its likely change to take into account the advice under point c. below;*
- b. Options for candidate reference points for their conservation and management in the IOTC Area of Competence;*
- c. Species specific minimum conservation sizes by taking into account the size at maturity and the recruitment size to the fishery by gear as well as its practicability. Where adequate, due to considerations on technical interaction of fisheries, advice shall provide also a minimum conservation size common to the four species.*

Current Conservation and Management Measures that require action by the Commission in 2018

(para. 12) The Commission noted Resolution 15/11 (*On the implementation of a limitation of fishing capacity of contracting parties and cooperating non-contracting parties*), which required the Commission to review the implementation of Resolution 15/11 at its annual sessions since 2015.

(para.13) The Commission **AGREED** to extend the applicability of Resolution 15/11 for an additional year; however, the Commission also **AGREED** that Resolution 15/11, as it currently stands, may not be extended beyond 2018. Some CPCs highlighted that they would work to table a resolution proposal on capacity in 2018.

DISCUSSION

Participants at the WPB16 are requested to consider the priorities set by the Commission and the Scientific Committee, via Conservation and Management Measures, and revise its Program of Work (previously outlined in paper IOTC–2018–WPB16–03) to match those priorities.

RECOMMENDATION/S

That the WPB:

- 1) **NOTE** paper IOTC–2018–WPB16–08, which encouraged the WPB 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.

APPENDICES

[Appendix A](#): Working Party on Billfish Program of Work (2019–2023)

APPENDIX A

WORKING PARTY ON BILLFISH 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:** High priority topics for obtaining the information necessary to develop stock status indicators for billfish 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 billfish in the Indian Ocean

Topic	Sub-topic and project	Priority ranking	Est. budget and/or potential source	Timing				
				2019	2020	2021	2022	2023
1. Stock structure (connectivity and diversity)	1.1 Genetic research to determine the connectivity of billfish throughout their distribution (including in adjacent Pacific and Atlantic waters as appropriate) and the effective population size.	High (1)	1.3 m Euro: (European Union)					
	1.1.1 Next Generation Sequencing (NGS) to determine the degree of shared stocks for billfish 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.	High (1)						
	1.1.2 Nuclear markers (i.e. microsatellite) to determine the degree of shared stocks for billfish (highest priority species: blue, black, striped marlin and sailfish) in the Indian Ocean with the southern Atlantic Ocean and Pacific Ocean, as appropriate.	High (1)						
	1.1.3 Develop a close-kin mark recapture method (<i>Bravington et al.</i> 2016) on marlins to estimate population size and other important demographic parameters. This method includes the	High (1)						

	sampling of juveniles and adult fish and genetic parenting analyses to estimate the population size from mark-recapture models.							
	1.2 Tagging research to determine connectivity, movement rates and mortality estimates of billfish.	High (2)	US\$100,000					
	1.2.1 Tagging studies (PSAT)		(TBD)					
2. Biological and ecological information (incl. parameters for stock assessment)	2.1 Age and growth research	High (7)						
	2.1.1 CPCs to provide further research reports on billfish biology, namely age and growth studies including through the use of fish otolith or other hard parts, either from data collected through observer programs or other research programs.		(CPCs directly)					
	2.2 Age-at-Maturity	High (8)						
	2.2.1 Quantitative biological studies are necessary for billfish throughout its range to determine key biological parameters including age-at-maturity and fecundity-at-age/length relationships, age-length keys, age and growth, which will be fed into future stock assessments.		(CPCs directly)					
	2.3 Spawning time and locations	High (9)						
	2.3.1 Collect gonad samples from billfish to confirm the spawning time and location of the spawning area that are presently hypothesized for each billfish species.		(CPCs directly)					
3. Historical data review	3.1 Changes in fleet dynamics							
	3.1.1 Japan and Taiwan,China to undertake a historical review of their longline fleets and to document the changes in fleet dynamics. The historical review should include as much explanatory information as possible regarding changes in fishing areas, species targeting, gear changes and other fleet characteristics to assist the WPB understand the current fluctuations observed in the data.	High (6)	(CPCs directly)	Is this require for 2019 ?				
	3.2 Species identification							
	3.2.1 The quality of the data available at the IOTC Secretariat on marlins (by species) is likely to be compromised by species	High (5)	(CPCs directly)	Is this				

	miss-identification. Thus, CPCs should review their historical data in order to identify, report and correct (if possible) potential identification problems that are detrimental to any analysis of the status of the stocks.					require for 2019 ?				
4. Sports/recreational fisheries	4.1 Fishery trends									
	4.1.1 The catch and effort data for sports/recreational fisheries targeting marlins and sailfish in the Indian Ocean should be submitted to the IOTC Secretariat to assist in future assessments for these species. CPCs with active sports/recreational fisheries targeting marlins and sailfish should undertake a comprehensive analysis for provision to the WPB.	High (First phase to be finalized in 2017)	Consultant US\$TBD			Is this require for 2019 ?				
5. CPUE standardization	5.1 Develop and/or revise standardized CPUE series for each billfish species and major fisheries/fleets for the Indian Ocean.									
	5.1.1 Swordfish: Priority LL fleets: Taiwan,China, EU(Spain, Portugal, France), Japan, Indonesia	High (20)	(CPCs directly)							
	5.1.2 Striped marlin: Priority fleets: Japan, Taiwan,China	High (21)	(CPCs directly)							
	5.1.3 Black marlin: Priority fleets: Longline: Taiwan,China; Gillnet: I.R. Iran, Sri Lanka	High (13)	(CPCs directly)							
	5.1.4 Blue marlin: Priority fleets: Japan, Taiwan,China	High (14)	(CPCs directly)							
	5.1.5 I.P. Sailfish: Priority fleets: Priority gillnet fleets: I.R. Iran and Sri Lanka; Priority longline fleets: EU(Spain, Portugal, France), Japan, Indonesia;	High (12)	(CPCs directly)							
	5.1.6 Joint analysis of operational catch and effort data from Indian Ocean longline fleets as recommended by WPM	High (to be considered from 2020)	Consultant/ US\$40K							
6. Stock assessment / Stock indicators	6.1 Develop and compare multiple assessment approaches to determining stock status for swordfish (SS3, ASPIC, etc.).	High (15)	US\$??							
	6.2 Stock assessment on billfish species in 2019 and 2020	High (3)	Consultant/ US\$16,250							
	6.3 Workshops on techniques for assessment including CPUE estimations for billfish species in 2019 and 2020.	High (4)	Consultant US\$11,750							

7	Target and Limit reference points	7.1 To advise the Commission, by end of 2016 at the latest on Target Reference Points (TRPs) and Limit Reference Points (LRPs).	High (16)					
		7.1.1 Assessment of the interim reference points as well as alternatives: Used when assessing the Swordfish stock status and when establishing the Kobe plot and Kobe matrices.		WPM				
8	Management measure options	8.1 To advise the Commission, by end of 2016 at the latest, on potential management measures having been examined through the Management Strategy Evaluation (MSE) process.	High (17)					
		8.1.1 These management measures will therefore have to ensure the achievement of the conservation and optimal utilization of stocks as laid down in article V of the Agreement for the establishment of the IOTC and more particularly to ensure that, in as short a period as possible and no later than 2020, (i) the fishing mortality rate does not exceed the fishing mortality rate allowing the stock to deliver MSY and (ii) the spawning biomass is maintained at or above its MSY level.		WPM				

Table 2. Assessment schedule for the IOTC Working Party on Billfish (WPB)

Species	2019	2020	2021	2022	2023
Black marlin		Full assessment		Full assessment	
Blue marlin	Full assessment			Full assessment	
Striped marlin			Full assessment		
Swordfish	Indicators	Full assessment			Full assessment
Indo-Pacific sailfish	Full assessment*		Full assessment*		Full assessment*

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