

OUTCOMES OF THE 19th SESSION OF THE SCIENTIFIC COMMITTEE

PREPARED BY: IOTC SECRETARIAT, 8 AUGUST 2017

PURPOSE

To inform participants at the 15th Working Party on Billfish (WPB15) of the recommendations arising from the 19th Session of the IOTC Scientific Committee (SC) held from 1–5 December 2016, specifically relating to the work of the WPB.

BACKGROUND

At the 19th Session of the SC, the SC noted and considered the recommendations made by the WPB in 2016 that included requests to address the deficiencies in data collection, monitoring and reporting by CPCs, as well as to carry out targeted research and analysis on billfish species.

Billfish caught in the IOTC area of competence

| IOTC code | English name | Scientific name |
|-----------|-----------------------|--------------------------------|
| BLM | Black marlin | <i>Makaira indica</i> |
| BUM | Blue marlin | <i>Makaira nigricans</i> |
| MLS | Striped marlin | <i>Tetrapturus audax</i> |
| SFA | Indo-Pacific sailfish | <i>Istiophorus platypterus</i> |
| SWO | Swordfish | <i>Xiphias gladius</i> |

Based on the recommendations arising from the WPB14, the SC19 adopted a set of recommendations, provided at [Appendix A](#) of this paper.

The recommendations contained in [Appendix A](#) were provided to the Commission for consideration at its 21st Session held in May 2017. A separate paper, IOTC–2017–WPB15–04 addresses the responses and actions of the Commission.

In addition, the SC19 reviewed and endorsed a Program of Work (2017–21) for the WPB, including a revised stock assessment schedule, as detailed in [Appendix B](#) and [Appendix C](#). A separate paper (IOTC–2017–WPB15–08) will outline the review and development process for a Program of Work for the WPB for the next five years (2018–22).

DISCUSSION

In addition to the recommendations outlined in [Appendix A](#), [Appendix B](#) and [Appendix C](#), the SC made several other comments relevant to the WPB, which participants are asked to consider:

Report of the 14th Session of the Working Party on Billfish

The SC **NOTED** that the IOTC Secretariat is currently implementing a pilot project to improve the acquisition of catch-and-effort and size data from sports and recreational fisheries in the western Indian Ocean in four CPCs (Kenya, EU, France (La Réunion), Mauritius and Seychelles), and that the ABF has been hired to assist delivery of the Project. A full update of the outcomes of the Project will be delivered during the 2017 Working Party on Billfish.

The SC **NOTED** that the WPB report considers that Resolution 15/05 established a catch limit for billfish, however, the SC **NOTED** that Resolution 15/05 only encourages catch restrictions:

*“Contracting Parties and Cooperating Non-Contracting Parties (CPCs) to make any possible effort to reduce in 2016 the level of catches of their vessels for the following species: striped marlin (*Tetrapturus audax*), black marlin (*Makaira indica*), and blue marlin (*Makaira nigricans*) to the baseline level of the average catches for the period between 2009 and 2014 “ and that this cannot be considered a catch limit.*

Review of the statistical data available for billfish

The SC **NOTED** that many CPCs important for catches of billfish species do not submit to Secretariat nominal catch data or catch-and-effort, particularly in the case of black marlin and Indo-Pacific sailfish. For those two species, the

CPUE based assessments currently only use data covering less than 15% of the estimated nominal catches. Therefore the SC strongly **REQUESTED** CPCs to fully comply with the data reporting standards of Resolutions 15/01 and 15/02.

Stock structure project

In light of the ongoing delays in the commencement of the EU-funded Indian Ocean stock structure project, the SC **PROPOSED** that the project workplan be revised where appropriate, in light of additional reviews and evaluation of similar studies that have taken place since the original stock structure proposal.

Executive summaries for billfish species

The SC also adopted revised Executive Summaries for each of the billfish species that can be found as appendices to the SC19 report, and which can be downloaded from the IOTC website in English and French:

English: <http://iotc.org/science/scientific-committee>

French: <http://iotc.org/fr/science/comit%C3%A9-scientifique>

These Executive Summaries are also available via the IOTC **Stock Status dashboard**:

<http://www.iotc.org/science/status-summary-species-tuna-and-tuna-species-under-iotc-mandate-well-other-species-impacted-iotc>

RECOMMENDATION/S

That the WPB:

- 1) **NOTE** paper IOTC–2017–WPB15-03 which outlined the main outcomes of the 19th Session of the Scientific Committee (SC19), specifically related to the work of the WPB.
- 2) **CONSIDER** how best to progress these issues at the present meeting.

APPENDICES

Appendix A: Consolidated set of recommendations of the 19th Session of the Scientific Committee to the Commission, relevant to the Working Party on Billfish.

Appendix B: Program of work (2017–2021) for the IOTC Working Party on Billfish (WPB).

Appendix C: Schedule of stock assessments for the WPB (2017–21).

APPENDIX A

CONSOLIDATED SET OF RECOMMENDATIONS OF THE 19th SESSION OF THE SCIENTIFIC COMMITTEE (1-5 December 2016) TO THE COMMISSION RELEVANT TO THE WORKING PARTY ON BILLFISH

Extract of the Report of the 19th Session of the Scientific Committee

(IOTC-2016-SC19-R; Appendix XXXVII, Page 209)

STATUS OF TUNA AND TUNA-LIKE RESOURCES IN THE INDIAN OCEAN AND ASSOCIATED SPECIES

Billfish

SC19.02 (para. 144) The SC **RECOMMENDED** that the Commission note the management advice developed for each billfish species under the IOTC mandate, as provided in the Executive Summary for each species, and the combined Kobe plot for the three species assigned a stock status in 2016 (Fig. 5):

- Swordfish (*Xiphias gladius*) – [Appendix XII](#)
- Black marlin (*Makaira indica*) – [Appendix XIII](#)
- Blue marlin (*Makaira nigricans*) – [Appendix XIV](#)
- Striped marlin (*Tetrapturus audax*) – [Appendix XV](#)
- Indo-Pacific sailfish (*Istiophorus platypterus*) – [Appendix XVI](#)

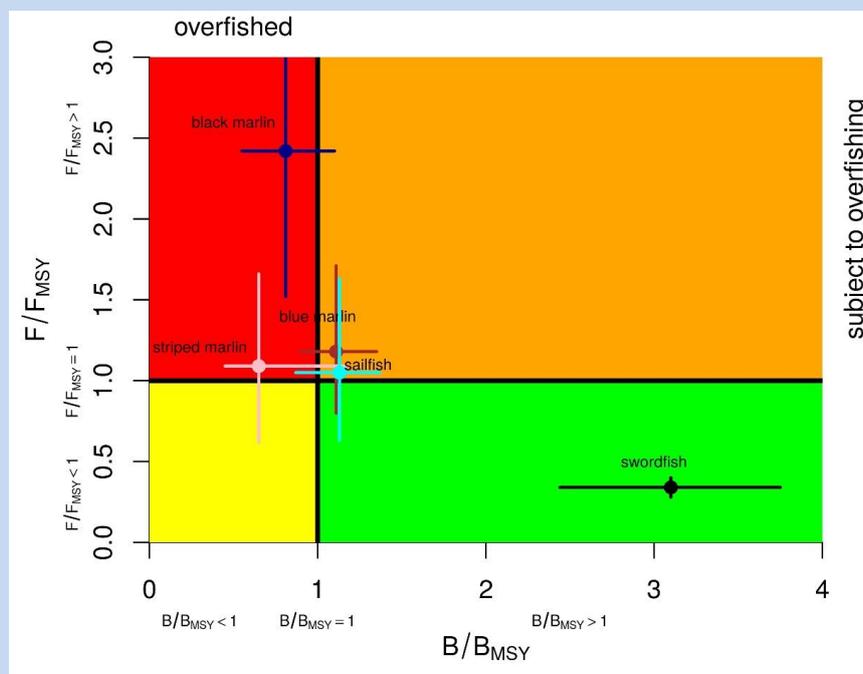


Fig. 1. Combined Kobe plot for swordfish (black), Indo-Pacific sailfish (cyan), black marlin (light blue), blue marlin (brown) and striped marlin (pink) showing the 2015 and 2016 estimates of current stock size (SB or B, species assessment dependent) and current fishing mortality (F) in relation to optimal spawning stock size and optimal fishing mortality. Cross bars illustrate the range of uncertainty from the model runs.

GENERAL RECOMMENDATIONS TO THE COMMISSION, TO SPECIFIC CPCs AND/OR OTHER BODIES

Report of the 14th Session of the Working Party on Billfish

SC19.13 (para. 46) The SC **RECOMMENDED** that on the next revisions of the IOTC Agreement, short billed spearfish be included as an IOTC species.

Billfish species identification

SC19.14 (para. 48) The SC **AGREED** on the importance of the hard, waterproof copies of the IOTC species identification guides for observers and port samplers, and **RECOMMENDED** that funds are allocated

for further printing of the species ID guides for distribution to sports fishing clubs and recreational fisheries to improve the quality of data reported, and that funds also be continued for the translation of these into the priority languages identified by the SC.

Swordfish habitat and behavior

- SC19.15 ([para. 51](#)) The SC **RECOMMENDED** that, for subsequent WPB meetings, swordfish is treated as a single stock and that references related to swordfish for the southwest Indian Ocean are removed from the Executive Summary and from the summary of available data for all billfish species.

Revision of the WPM Program of work (2017–2021)

- SC19.30 ([para. 102](#)) SC **NOTED** that the next stock assessment of Indian Ocean swordfish is due to take place in 2017 and **RECOMMENDED** that the development of MSE of swordfish is considered as a high priority in the revised WPM Program of Work and that funding is allocated for this activity, to start the conditioning of an OM for this stock.

Summary discussion of matters common to Working Parties (capacity building activities – stock assessment course; connecting science and management, etc.)

Data collection and capacity building

- SC19.34 ([para. 121](#)) The SC **AGREED** that, while external funding is helping the work of the Commission, funds allocated by the Commission to capacity building are still too low, considering the range of issues identified by the SC and its Working Parties, particularly in relation to the implementation of the Regional Observer Scheme and data collection and reporting for artisanal fisheries and **RECOMMENDED** that the Commission further increases the IOTC Capacity Building budget to fund these activities in the future.

Meeting participation fund

- SC19.35 ([para. 123](#)) The SC reiterated its **RECOMMENDATION** that the IOTC Rules of Procedure (2014), for the administration of the Meeting Participation Fund be modified so that applications are due not later than 60 days, and that the full Draft paper be submitted no later than 45 days before the start of the relevant meeting. The aim is to allow the Selection Panel to review the full paper rather than just the abstract, and provide guidance on areas for improvement, as well as the suitability of the application to receive funding using the IOTC MPF. The earlier submission dates would also assist with Visa application procedures for candidates.

IOTC Secretariat staffing

- SC19.37 ([para. 126](#)) **NOTING** the very heavy workload at the IOTC Secretariat and the ever increasing demands by the Commission and the Scientific Committee, and also the capacity to respond to requests for assistance by countries, the SC **RECOMMENDED** that the recommendation from the Performance Review PRIOTC02.07(g) is implemented, and that permanent staff of the IOTC Data and Science Section be increased by two (2) (1 x P4 and 1 x P3 level positions), supplemented by additional short-term consultants, to commence work by 1 January 2018 or earlier, and that funding for these new positions should come from both the IOTC regular budget and from external sources to reduce the financial burden on the IOTC membership.

Chairpersons and Vice-Chairpersons of the SC and its subsidiary bodies

- SC19.39 ([para. 128](#)) The SC **RECOMMENDED** that the Commission note and endorse the Chairpersons and Vice-Chairpersons for the SC and its subsidiary bodies for the coming years, as provided in [Appendix VII](#).

Implementation of the Regional Observer Scheme

Development of a proposal for a Pilot Project to be presented to the Commission 2017

- SC19.40 ([para. 160](#)) The SC **NOTED** the substantial resourcing that the proposed framework will require and **RECOMMENDED** that the Commission provide adequate resources to enable implementation of the project.

Progress on the Implementation of the Recommendations of the Second Performance Review Panel

- SC19.41 ([para. 168](#)) The SC **RECOMMENDED** that the Commission note the updates on progress regarding Resolution 16/03, as provided at [Appendix XXXIII](#).

*Program of work and schedule of Working Party and Scientific Committee meetings**Consultants*

SC19.42 ([para. 179](#)) **NOTING** the highly beneficial and relevant work done by IOTC stock assessment consultants in 2016 and in previous years, the SC **RECOMMENDED** that the engagement of consultants be continued for each coming year based on the Program of Work. Consultants will be hired to supplement the skill set available within the IOTC Secretariat and CPCs. The draft budget provided in [Table 5](#), shall be incorporated into the overall IOTC Science budget for the consideration of the Commission.

APPENDIX B**PROGRAM OF WORK (2017–2021) FOR THE SCIENTIFIC COMMITTEE AND ITS
SUBSIDIARY BODIES**

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 XXXIVa-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 (IOTC–2016–SC19–R, Para. 170).

Working Party on Billfish (WPB)
(Extracts from IOTC-2016-SC19-R: Appendix XXXIVc, Page 184)
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 | | | | |
|---|--|------------------|-------------------------------------|--------|------|------|------|------|
| | | | | 2017 | 2018 | 2019 | 2020 | 2021 |
| 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 estimates population size and other important demographic parameters. This method includes the sampling of juveniles and adult fish and genetic parenting analyses to estimate the population size from mark-recapture models. | High (1) | | | | | | |
| | 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 an 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) | | | | |
| | 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 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. | | High (5) | (CPCs directly) | | | | |
| 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 (Ongoing) | Consultant US\$54,000 | | | | | |
| 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 (10) | (CPCs directly) | | | | | |
| | 5.1.2 | Striped marlin: Priority fleets: Japan, Taiwan,China | High (11) | (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) | | | | | |
| 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 2017 and 2018 | High (3) | Consultant/ US\$16,250 | | | | | |
| | 6.3 | Workshops on techniques for assessment including CPUE estimations for billfish species from gillnet fisheries in 2017 and 2018. | 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. = Agreed to pass this task temporarily to WPM. | | 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.= Agreed to pass this task temporarily to WPM.

WPM

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APPENDIX C

ASSESSMENT SCHEDULE FOR IOTC SPECIES AND SPECIES OF INTEREST FROM 2017–2021

Extract of the Report of the 19th Session of the Scientific Committee

(IOTC–2016–SC19–R; Appendix XXXV, Page 206)

The SC **ADOPTED** a revised assessment schedule, ecological risk assessment and other core projects for 2016–20, for the tuna and tuna-like species under the IOTC mandate, as well as the current list of key billfish species of interest, as outlined in Appendix XXXV (IOTC–2016–SC19–R, Para. 177).

| <i>Working Party on Billfish</i> | | | | | |
|----------------------------------|------------------------|------------------------|-------------------------|------------------------|------------------------|
| Species | 2017 | 2018 | 2019 | 2020 | 2021 |
| Black marlin | | Full assessment | | Full assessment | |
| Blue marlin | | Full assessment | | Full assessment | |
| Striped marlin | Full assessment | | Full assessment | | Full assessment |
| Swordfish | Full assessment | | | | Full assessment |
| Indo-Pacific sailfish | | | Full assessment* | | |