

OUTCOMES OF THE 18th SESSION OF THE SCIENTIFIC COMMITTEE

PREPARED BY: IOTC SECRETARIAT, 1 JULY 2016

PURPOSE

To inform participants at the 6th Working Party on Temperate Tunas (WPTmT06) of the recommendations arising from the 18th Session of the IOTC Scientific Committee (SC) held from 23–27 November 2015, specifically relating to the work of the WPTmT.

BACKGROUND

At the 18th Session of the SC, the SC noted and considered the recommendations made by the WPTmT in 2014 (no WPTmT meeting in 2015) that included requests to address the deficiencies in data collection, monitoring and reporting by CPCs, as well as to carry out targeted research on understanding stock structure of the albacore in the Indian Ocean and possible connectivity with the southern Atlantic Ocean albacore population.

The recommendations on the deficiencies in data collection, monitoring and reporting by CPCs in relation to temperate tunas will be discussed under agenda item 4 and in paper IOTC–2014–WPTmT05–07 and are therefore not presented in this paper.

Based on the recommendations arising from the WPTmT05, the SC18 adopted a set of recommendations, provide at [Appendix A](#) of this paper.

The recommendations contained in [Appendix A](#) were provided to the Commission for consideration at its 20th Session held in May 2016. A separate paper, IOTC–2016–WPTmT06–04 addresses the responses and actions of the Commission.

In addition, the SC18 reviewed and endorsed a work plan for the WPTmT (*Research recommendation and priorities for IOTC Working Parties*), including a revised assessment schedule, as detailed in [Appendix B](#) and [Appendix C](#). A separate paper (IOTC–2016–WPTmT06–08) will outline the review and development process for a *Program of Work* for the WPTmT for the next five years.

DISCUSSION

In addition to the recommendations outlined in [Appendix A](#), [Appendix B](#) and [Appendix C](#), and noting that the last WPTmT meeting report was considered in detail by the SC in 2014, the following extracts **from the SC17 Report (2014)** are provided here for the consideration and action of the WPTmT06:

Stock structure research

The SC **RECALLED** that in 2013, it had made an additional recommendation on stock structure research, targeted primarily at neritic tunas under the IOTC mandate. Subsequently, at the request of the EU (DG-MARE), a concept note was developed to examine if there is a population structure of neritic tunas throughout the Indian Ocean. The IOTC Secretariat proposed that the list of species be expanded from only neritic tunas, to other IOTC species, including billfish, tropical, temperate tunas and sharks. The concept note has since been approved by the EU who will contribute €1.3 million and require an additional 20% co-contribution (€260,000) from either the IOTC regular budget or in combination with collaborating Institutions. The project will encourage a collaborative approach to the extent feasible to meet the needs of the Commission. The need to work collaboratively with scientists in other oceans to assess stock structure as well as with scientists within the Indian Ocean region was highlighted.

Review of the data available at the IOTC Secretariat for temperate tuna species

NOTING that in recent years many foreign vessels have been unloading catches of albacore in Mauritius, representing around 60% of the total albacore catch, the SC **REQUESTED** that the Chair of the WPTmT and the Chair of the SC contact Mauritius and indicate that they should be in attendance at all WPTmT meetings, given the

high proportion of total albacore catch being landed in Mauritius, and that they should present information on its efforts to monitor albacore landings for catch and size (length) data, and to provide summaries of that data.

The SC **RECOGNISED** the value of the biological information for albacore being collected in Mauritius by port samplers and **REQUESTED** that the IOTC Secretariat provide additional support to Mauritius on how to collect and report this information. This should occur as soon as possible in 2015.

From the SC18 Report (2015):

Albacore MSE update

The SC **NOTED** the progress made towards management strategy evaluation (MSE) for the Indian Ocean albacore fishery. This work was primarily led by the WPM Chair and the informal MSE working group. An operating model (OM) was presented together with an initial set of Management Procedures (MP), and the platform that could be used to explore alternative control rules for the Commission.

The SC **ENDORSED** the Operating Model for albacore as the basis for the provision of advice to the Commission on the performance of alternative Management Procedures, **NOTING** that external reviewers have considered the albacore MSE work and largely endorsed the approach taken, while recommending a number of improvements to be incorporated.

The SC **NOTED** that Resolution 15/10 calls for completing the work on assessing the appropriateness of interim target and limit reference points and evaluating candidate harvest control rules as per the decision framework for skipjack tuna and albacore for presentation to the Commission in 2016.

Executive summaries for albacore

The SC also adopted a revised Executive Summary for albacore that can be found as appendices to the SC18 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>

RECOMMENDATION

That the WPTmT:

- 1) **NOTE** paper IOTC–2016–WPTmT06–03 which outlined the main outcomes of the 17th and 18th Sessions of the Scientific Committee, specifically related to the work of the WPTmT.
- 2) **CONSIDER** how best to progress these issues at the present meeting.

APPENDICES

Appendix A: Consolidated set of recommendations of the 18th Session of the Scientific Committee (23–27 November 2015) to the Commission, relevant to the Working Party on Temperate Tunas.

Appendix B: Research recommendations and priorities for the IOTC Working Party on Temperate Tunas (WPTmT).

Appendix C: Assessment schedule for the WPTmT 2016–2020.

APPENDIX A

CONSOLIDATED SET OF RECOMMENDATIONS OF THE 18th SESSION OF THE SCIENTIFIC COMMITTEE (23-27 November 2015) TO THE COMMISSION RELEVANT TO THE WORKING PARTY ON NERITIC TUNAS

Extract of the Report of the 18th Session of the Scientific Committee

(IOTC–2015–SC18–R; Appendix XXXVII, PAGES 168-170)

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

Tuna – Highly migratory species

SC18.01 (para. 121) The SC **RECOMMENDED** that the Commission note the management advice developed for each tropical and temperate tuna species as provided in the Executive Summary for each species, and the combined Kobe plot for the three species assigned a stock status in 2015 (Fig. 4):

- Albacore (*Thunnus alalunga*) – [Appendix VIII](#)
- Bigeye tuna (*Thunnus obesus*) – [Appendix IX](#)
- Skipjack tuna (*Katsuwonus pelamis*) – [Appendix X](#)
- Yellowfin tuna (*Thunnus albacares*) – [Appendix XI](#)

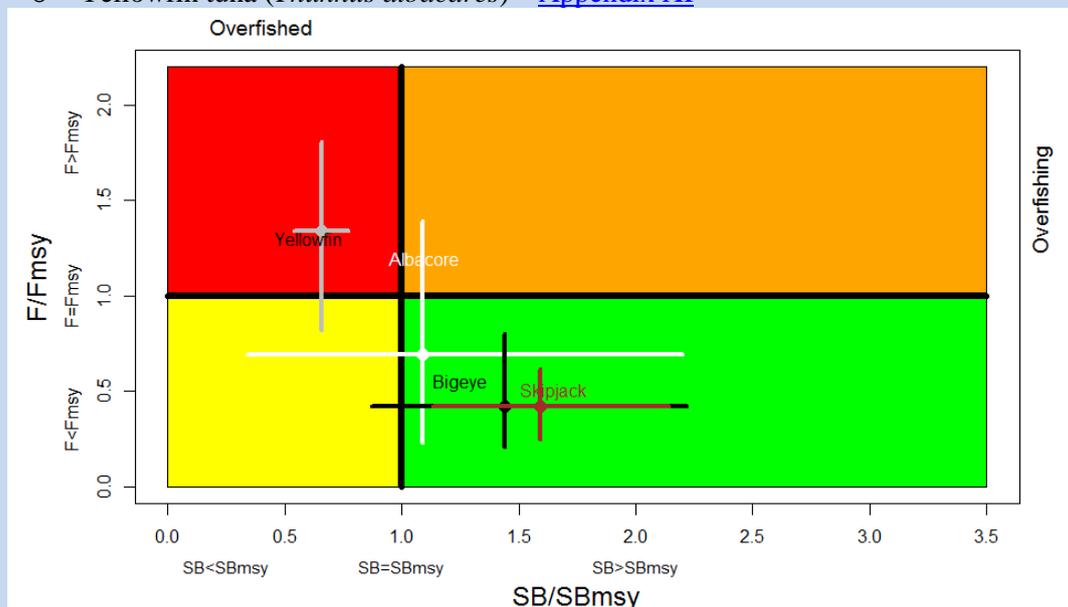


Fig. 4. Combined Kobe plot for bigeye tuna (black: 2013), skipjack tuna (brown: 2014), yellowfin tuna (grey: 2015) and albacore (white: 2014) showing the estimates of current stock size (SB) and current fishing mortality (F) in relation to the interim target spawning stock size and interim target fishing mortality. Cross bars illustrate the range of uncertainty from the model runs. Note that for skipjack tuna, the estimates are highly uncertain as F_{MSY} is poorly estimated, and as suggested for stock status advice it is better to use B_0 as a biomass reference point and $C(t)$ relative to C_{MSY} as a fishing mortality reference point.

GENERAL RECOMMENDATIONS TO THE COMMISSION

Report of the Working Party on Temperate Tunas (WPTmT)

No WPTmT meeting was held in 2015.

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

Meeting participation fund

SC18.24 (para. 98) The SC **RECOMMENDED** 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.

Capacity building activities

SC18.25 (para. 99) 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, and **RECOMMENDED** that the Commission consider allocating more funds to these activities in the future.

SC18.26 (para. 100) The SC **RECOMMENDED** that Commission further increases the IOTC Capacity Building budget line so that capacity building training on data analysis and applied stock assessment approaches, with a priority being data poor approaches, can be carried out in 2016.

IOTC species identification guides: Marine mammal and Best practice guidelines for the safe release and handling of encircled cetaceans

SC18.27 (para. 102) The SC **RECOMMENDED** that the Commission allocate funds in its 2016/2017 budget, to produce and print the IOTC best practice guidelines for the safe release and handling of encircled cetaceans. The guidelines could be incorporated into a set of IOTC cetacean identification cards: “*Cetacean identification for Indian Ocean fisheries*”.

IOTC Secretariat staffing

SC18.28 (para. 106) **NOTING** the very heavy and constantly increasing workload on the IOTC Secretariat, and the current staffing capacity to respond to requests for assistance by countries, the SC strongly **RECOMMENDED** that at least three (3) additional staff (Science/Data) be hired to join the IOTC Secretariat to work on tasks including but not limited to 1) science and capacity building to improve understanding of IOTC processes; and 2) data quality/exchange improvement, to commence work by 1 January 2017. Funding for these new positions should come from both the IOTC regular budget and from external sources to reduce the direct financial burden on the IOTC membership.

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

SC18.29 (para. 107) 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

SC18.30 (para. 138) **NOTING** that training of observers and crew is long-term and necessarily meticulous work that should be done in a recurrent way in order to optimise the efficiency of observers, the SC **RECOMMENDED** that the IOTC Secretariat increases its effort in training observers, including species identification. This would only be possible if the Commission were to increase staffing at the IOTC Secretariat and allocate specific funding for the Regional Observer Scheme implementation.

Resolution 11/04 On a regional observer scheme

SC18.31 (para. 145) **NOTING** that the objective of the Regional Observer Scheme contained in Resolution 11/04, and the rules contained in Resolution 12/02 *On data confidentiality policy and procedures* makes no reference to the data collected not being used for compliance purposes, the SC **RECOMMENDED** that at the next revision of Resolution 11/04, it be clearly stated that the data collected within the Regional Observer Scheme shall not be used for compliance purposes.

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

SC18.32 (para. 151) The SC **RECOMMENDED** that the Commission note the updates on progress regarding Resolution 09/01 *on the performance review follow-up*, as provided at [Appendix XXXIII](#).

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

Consultants

SC18.33 (para. 157) **NOTING** the highly beneficial and relevant work done by IOTC stock assessment consultants in 2015 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.

Schedule of meetings for 2016 and 2017

- SC18.34 ([para. 160](#)) The SC **RECOMMENDED** that the Commission discuss the merits of moving the annual Scientific Committee meeting to February each year. This would allow the species working parties to be moved later in the year, thus ensuring that the most recent data is available for assessment purposes. If the Commission were to approve a February date, it may wish to fix its own meeting date in June each year, thus allowing sufficient consultation time between the Scientific Committee and the Commission meeting.

Review of publication deadlines for IOTC data summaries and other datasets for use by Working Parties

- SC18.35 ([para. 165](#)) The SC **RECOMMENDED** that the reporting deadline for stock assessment inputs (index of abundance, catch reconstructions, size data, etc.) be 45 days prior to the meeting in which the species is to be assessed.

APPENDIX B**RESEARCH RECOMMENDATIONS AND PRIORITIES**

*Extract of the Report of the 18th Session of the Scientific Committee
(IOTC-2015-SC18-R; Appendix XXXIV, PAGE 135)*

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 XXXIV. 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.

The SC **REQUESTED** that during all future Working Party meetings, each group not only develop a Draft Program of Work for the next five years containing low, medium and high priority projects, but that all High Priority projects are ranked. The intention is that the SC would then be able to review the rankings and develop a consolidated list of the highest priority projects to meet the needs of the Commission. Where possible, budget estimates should be determined, as well as the identification of potential funding sources.

APPENDIX XXXIVC
WORKING PARTY ON TEMPERATE TUNAS PROGRAM OF WORK (2016–2020)

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

Topic	Sub-topic and project	Priority	Est. budget and/or potential source	Timing				
				2016	2017	2018	2019	2020
1. Stock structure (connectivity and diversity)	1.1 Genetic research to determine the connectivity of albacore throughout its distribution and the effective population size.	High (5)	1.3 m Euro: European Union					
	1.1.1 Determine albacore stock structure, migratory range and movement rates in the Indian Ocean.		TBD					
	1.1.2 Determine the degree of shared stocks for albacore in the Indian Ocean with the southern Atlantic Ocean.		Ifremer					
	1.1.3 Population genetic analyses to decipher inter- and intraspecific evolutionary relationships, levels of gene flow (genetic exchange rate), genetic divergence, and effective population sizes.		TBD					
2. Biological information (parameters for stock assessment)	2.1 Age and growth research (collaborative research to estimate ages across research facilities; stratification of sampling across fishery and stock)	High (3)	CPCs directly					
	2.1.1 China and other CPCs to provide further research reports on albacore biology, including through the use of fish otolith studies, either from data collected through observer programs or other research programs, at the next WPTmT meeting.		CPCs directly					
	2.1.2 Growth curve analysis: Uncertainty about the growth curve is a primary source of uncertainty in the stock assessment. Depending on the shape of the growth curve, it is likely that only limited information about total mortality can be obtained from catch-at-size data. As an additional information source, data on the age structure of the catch may be very informative about total mortality and may considerably reduce uncertainty in the		CPCs directly					

	assessment. Research needs to be undertaken to investigate the potential and the best approaches to be used. MSE process to look at improvement in precision of estimates given different amounts of age structure data, depending on fishery, growth curve, and effective sample sizes.							
	2.2 Natural mortality (M)	High (3)						
	2.2.1 Examine the impacts of a range of M values on stock assessments, from constant rates of 0.2, 0.3. and 0.4 over time, to M values which change with age, from 0.4 to 0.2.		CPCs directly					
	2.2.2 Review evidence of currently available estimates are realistic, and whether more recent data is available on this key parameter.		CPCs directly					
	2.3 Age-at-Maturity	High (3)						
	2.3.1 Quantitative biological studies are necessary for albacore 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					
3. Ecological information	3.1 Spawning time and locations	High (4)						
	3.1.1 Collect gonad samples from albacore to confirm the spawning time and location of the spawning area that are presently hypothesised for albacore.		CPCs directly					
4. CPUE standardisation	4.1 Develop standardised CPUE series for each albacore fishery for the Indian Ocean, with the aim of developing a single CPUE series for stock assessment purposes (either a combined or single fleet series approved by the WPTmT).	High (1)	CPUE Workshop (TBD)					
	4.1.1 Changes in species targeting is the most important issue to address in CPUE standardisations.		CPCs directly					
	4.1.2 Appropriate spatial structure needs to be considered carefully as fish density (and targeting practices) can be highly variable on a fine spatial scale, and it can be misleading to assume that large areas are homogenous when there are large shifts in the spatial distribution of effort.		CPCs directly					
	4.1.3 If there are many observations with positive effort and zero catch, it is worth considering models which explicitly model the processes that lead to the zero observations (e.g. negative binomial, zero-inflated or delta-lognormal models). Adding a		CPCs directly					

	<p>small constant to the lognormal model may be fine if there are few zero's, but may not be appropriate for areas with many zero catches (e.g. north of 10oS). Sensitivity to the choice of constant should be tested.</p>																									
	<p>4.1.4 The appropriate inclusion of environmental variables in CPUE standardisation is an ongoing research topic. Often these variables do not have as much explanatory power as, or may be confounded with, fixed spatial effects. This may indicate that model-derived environmental fields are not accurate enough at this time, or there may need to be careful consideration of the mechanisms of interaction to include the variable in the most informative way.</p>	CPCs directly																								
	<p>4.1.5 It is difficult to prescribe analyses in advance, and model building should be undertaken as an iterative process to investigate the processes in the fishery that affect the relationship between CPUE and abundance.</p>	CPCs directly																								
5. Stock assessment / Stock indicators	<p>5.1 Develop and compare multiple assessment approaches to determining stock status for albacore (SS3, ASPIC etc).</p>	High (2)																								
	<p>5.1.1 A consultant be hired to assist in building capacity among the WPTmT participants by supplementing the skill set available within IOTC CPCs to further develop the SS3 model. An indicative budget is provided below:</p> <p>Estimated budget (US\$) required to hire a consultant to further develop the SS3 stock assessment model on albacore tuna in 2016 and 2018.</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Unit price</th> <th>Units required</th> <th>2016 Total (US\$)</th> <th>2018 Total (US\$)</th> </tr> </thead> <tbody> <tr> <td>SS3 Stock assessment for albacore (fees)</td> <td>550</td> <td>40</td> <td>22,000</td> <td>22,000</td> </tr> <tr> <td>SS3 Stock assessment for albacore (travel)</td> <td>4,000</td> <td>1</td> <td>4,000</td> <td>4,000</td> </tr> <tr> <td></td> <td></td> <td>Total estimate</td> <td>26,000</td> <td>26,000</td> </tr> </tbody> </table>	Description	Unit price	Units required	2016 Total (US\$)	2018 Total (US\$)	SS3 Stock assessment for albacore (fees)	550	40	22,000	22,000	SS3 Stock assessment for albacore (travel)	4,000	1	4,000	4,000			Total estimate	26,000	26,000	US\$26,000 in 2016 and 2018 IOTC Regular Budget	*	*		
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6. Target and Limit reference	<p>6.1 To advise the Commission, by end of 2014 at the latest on Target Reference Points (TRPs) and Limit Reference Points (LRPs).</p>	High (WPM)																								

points	6.1.1 Assessment of the interim reference points as well as alternatives: Used when assessing the albacore stock status and when establishing the Kobe plot and Kobe matrices. Agreed to pass this task temporarily to WPM.					
7. Management measure options	7.1 To advise the Commission, by end of 2014 at the latest, on potential management measures having been examined through the Management Strategy Evaluation (MSE) process. Agreed to pass this task temporarily to WPM.					

APPENDIX C
ASSESSMENT SCHEDULE FOR IOTC WORKING PARTIES

Extract of the Report of the 18th Session of the Scientific Committee
(IOTC-2015-SC18-R; Appendix XXXV, PAGE 165)

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 shark species of interest, as outlined in Appendix XXXV (IOTC-2015-SC18-R, Para. 155).

<i>Working Party on Temperate Tunas</i>					
Species	2016	2017	2018	2019	2020
Albacore	Full assessment	–	Full assessment	–	Full assessment