OUTCOMES OF THE 19th, 20th and 21st SESSIONS OF THE SCIENTIFIC COMMITTEE

PREPARED BY: IOTC SECRETARIAT, 17 DECEMBER 2018

PURPOSE

To inform participants at the 7th Working Party on Temperate Tunas (WPTmT07(DP)) of the recommendations arising from the 19th, 20th and 21st Sessions of the IOTC Scientific Committee (SC), with the latter held from 3–7 December 2018, specifically relating to the work of the WPTmT.

BACKGROUND

At the past 3 Sessions of the SC, the SC noted and considered the recommendations made by the WPTmT in 2016 (no WPTmT meetings in 2017 or 2018) 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 in paper IOTC–2019–WPTmT07(DP)–07 and are therefore not presented in this paper.

Based on the recommendations arising from the WPTmT06, the SC19 – SC21 adopted a set of recommendations, provided in Appendix A of this paper. These are all taken from SC21 as the advice has been the same since SC19 due to the lack of any additional WPTmT meetings in the interim.

The recommendations contained in Appendix A were first provided to the Commission for consideration at its 20th Session held in May 2016 and also at its subsequent Sessions in 2017 and 2018. A separate paper, IOTC–2019–WPTmT07(DP)–04 addresses the responses and actions of the Commission.

In addition, the SC19 (reiterated in SC20 and SC21) 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–2019–WPTmT07(DP)–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 2016, the following extracts **from the SC19, SC20 and SC21 Reports (2016, 2017 and 2018 respectively)** are provided here for the consideration and action of the WPTmT07(DP):

From the SC 19 report (2016):

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

(para. 38) The WPTmT **NOTED** that length frequency samples for the Taiwanese driftnet fishery were collected during the 1980s and published in a former IPTP paper, and **REQUESTED** that the IOTC Secretariat process the information to ensure the data is available for future stock assessments.

(para 39) **NOTING** changes in the length frequency distribution by the Taiwanese deep-freezing longline fleet since the early-2000s, and particularly the decline in the proportion of smaller sized fish sampled for lengths, the SC **REQUESTED** that length frequency and biological data collected by Taiwanese observers be provided to the IOTC Secretariat in order to validate and better understand recent changes in the length frequencies collected by on-board sampling – including samples collected for albacore tuna, tropical tuna species, and swordfish, **NOTING** that all observer data submitted to the IOTC Secretariat is subject to Resolution 12/02 *Data confidentiality policy and procedures*

From the SC 20 report (2017):

No new discussion

From the SC21 Report (2018):

(para. 132) The SC noted paper IOTC–2018–SC21–17 which provided an update on conditioning of an operating model and testing of generic candidate management procedures for Indian Ocean albacore

(para. 133) The SC thanked the author for his effort and the progress made so far on the albacore MSE. The SC noted that updating that OM, based on a model up to 2014, to 2017 led to a number of runs not being able to explain reported catches, and these run being eliminated from the OM grid, which consists now of a total of 414 model runs.

(para. 134) The SC noted that some of the current tuning objectives for this stock, provided by TCMP, led to trajectories that drive the stock towards overexploitation. This is due to the effect of estimating performance along the whole projection period. The SC noted that a more satisfactory performance could be obtained by either (i) tuning objectives with higher probabilities of a safe stock status (e.g. P(green) = 60%) or (ii) tuning for the performance to be achieved on the final half of the period. The SC **REQUESTED** the MSE development team to discuss the matter and to bring it to the attention of the next TCMP.

Executive summaries for albacore

The SC also adopted a revised Executive Summary for albacore that can be found as appendices to the SC21 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–2019–WPTmT07(DP)–03 which outlined the main outcomes of the 19th, 20th and 21st 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 21st Session of the Scientific Committee (3–7 November 2018) 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 2017–2021.

APPENDIX A

CONSOLIDATED SET OF RECOMMENDATIONS OF THE 21st SESSION OF THE SCIENTIFIC COMMITTEE (3-7 December 2018) TO THE COMMISSION RELEVANT TO THE WORKING PARTY ON NERITIC TUNAS

Extract of the Report of the 21st Session of the Scientific Committee

(IOTC–2018–SC21–R; Appendix 40, PAGES 242-248)

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

Tuna – Highly migratory species

SC21.01 (para. 197) 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 four species assigned a stock status in 2018 (Fig. 4):

- Albacore (*Thunnus alalunga*) – Appendix 8
- Bigeye tuna (*Thunnus obesus*) – Appendix 9
- Skipjack tuna (*Katsuwonus pelamis*) – Appendix 10
- Yellowfin tuna (*Thunnus albacares*) – Appendix 11

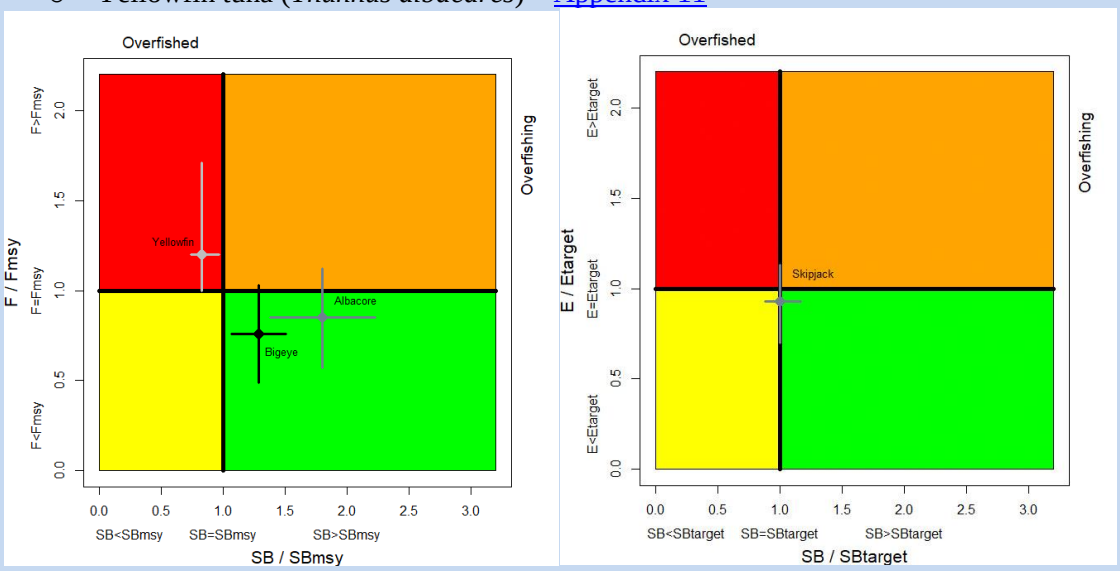

Fig. 4. (Left) Combined Kobe plot for bigeye tuna (black: 2015), yellowfin tuna (grey: 2018), and albacore tuna (dark grey: 2014) showing the estimates of current spawning stock size (SB) and current fishing mortality (F) in relation to SBtarget and Ftarget. (Right) Kobe plot for skipjack tuna (2016) showing the estimates of the current spawning stock status (SB) and exploitation rate in relation to SBtarget and Etarget. Numbers in brackets indicate the last year of data available at the time of the assessment. Cross bars illustrate the range of uncertainty from the model runs with 80% CI.

GENERAL RECOMMENDATIONS TO THE COMMISSION

Report of the Working Party on Temperate Tunas (WPTmT)

No WPTmT meeting was held in 2018.

Invited Expert(s) at the WP meetings

SC21.29 (para. 177) Given the importance of external peer review for working party meetings, the SC **RECOMMENDED** that the Commission continues to allocate sufficient budget for an invited expert to be regularly invited to all scientific WP meetings.

Meeting participation fund

SC21.30 (para. 178) 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 species identification guides: Tuna and tuna-like species

SC21.31 (para. 179) The SC reiterated its **RECOMMENDATION** that the Commission allocates budget towards continuing the translation and printing of the IOTC species ID guides so that hard copies of the identification cards can continue to be printed as many CPCs scientific observers, both on board and port, still do not have smart phone technology/hardware access and need to have hard copies on board.

IOTC Secretariat staffing

SC21.32 (para. 180) 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. 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

SC21.33 (para. 181) 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 7.

PROGRESS ON THE IMPLEMENTATION OF THE RECOMMENDATIONS OF THE PERFORMANCE REVIEW PANEL

SC21.34 (para. 214) The SC **RECOMMENDED** that the Commission note the updates on progress regarding Resolution 16/03, as provided at Appendix 33.

PROGRAM OF WORK AND SCHEDULE OF WORKING PARTY AND SCIENTIFIC COMMITTEE MEETINGS

Consultants

SC21.35 (para. 234) Noting the highly beneficial and relevant work done by IOTC stock assessment consultants 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.

IOTC SCIENTIFIC STRATEGIC PLAN

SC21.36 (para. 247) The SC **AGREED** that the draft IOTC Strategic Science Plan 2020–2024 will be distributed to Heads of Delegation from each CPC for comment during early 2019, following which time comments will be collated and consolidated and another version sent to CPCs for final review. Pending agreement of CPCs, and noting that the IOTC Strategic Science Plan would be a dynamic document that would change over time, the SC **RECOMMENDED** that the revised draft of the IOTC Strategic Science Plan 2020–2024 be tabled at the Commission meeting in 2019.

REVIEW OF THE DRAFT, AND ADOPTION OF THE REPORT OF THE 18TH SESSION OF THE SCIENTIFIC COMMITTEE

SC21.37 (para. 250) The SC **RECOMMENDED** that the Commission consider the consolidated set of recommendations arising from SC21, provided at Appendix 40.

APPENDIX B

RESEARCH RECOMMENDATIONS AND PRIORITIES

Extract of the Report of the 21st Session of the Scientific Committee

(IOTC–2018–SC21–R; Appendix 35b, PAGE 206 – 208)

WORKING PARTY ON TEMPERATE TUNAS PROGRAM OF WORK (2017–2021)

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				
				2017	2018	2019	2020	2021
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 (3)	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 (1)	TBD					
	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		TBD					

		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 assessment. Research needs to be undertaken to investigate the potential and the best approaches to be used. MSE process will 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 Age-at-Maturity	High (4)							
		2.2.1 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	Medium (5)							
		3.1.1 Collect gonad samples from albacore to confirm the spawning time and location of the spawning area that are presently hypothesized for albacore.		CPCs directly						
4	CPUE standardisation	4.1 Develop standardized 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 (2)	CPUE Workshop (TBD)						
		4.1.1 Changes in species targeting is the most important issue to address in CPUE standardizations.		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 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.		CPCs directly						

		4.1.4 The appropriate inclusion of environmental variables in CPUE standardization 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.		CPCs directly					
		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.		CPCs directly					
5	Target and Limit reference points	5.1 To advise the Commission, by end of 2016 at the latest on Target Reference Points (TRPs) and Limit Reference Points (LRPs).	High (WPM)						
		5.1.1 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.							
6	Management measure options	6.1 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. Agreed to pass this task temporarily to WPM.	High (WPM)						

APPENDIX C
ASSESSMENT SCHEDULE FOR IOTC WORKING PARTIES

Extract of the Report of the 21st Session of the Scientific Committee

(IOTC–2018–SC21–R; Appendix 36, PAGE 236)

The SC **ADOPTED** a revised assessment schedule, ecological risk assessment and other core projects for 2017–21, 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 36 (IOTC–2018–SC21–R).

Working Party on Temperate Tunas					
Species	**2017**	**2018**	**2019**	**2020**	**2021**
Albacore	–		Data preparatory meeting **and Stock assessment**	–	Data preparatory meeting