
REVISION OF THE WORKING PARTY ON TROPICAL TUNAS WORKPLAN

PREPARED BY: IOTC SECRETARIAT, 3 OCTOBER 2013
Dr. David Wilson

PURPOSE

To ensure that the participants at the Working Party on Tropical Tunas (WPTT15) consider, revise and develop a detailed work plan for the WPTT for the coming years, for provision and potential endorsement by the Scientific Committee.

BACKGROUND

Scientific Committee

At the 15th Session of the SC, the SC **NOTED** the following:

(para. 236) The SC **NOTED** paper IOTC-2012-SC15-35 which outlined the proposed priorities for IOTC Working Parties and SC meetings for 2013 and tentatively for 2014.

(para.237) The SC **NOTED** the proposed workplans and priorities of each of the Working Parties and **AGREED** to the revised workplans as outlined in [Appendix XXXV \[of the SC15 Report\]](#). The Chairs and Vice-Chairs of each working part shall ensure that the efforts of their working party is 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. 238) The SC **ADOPTED** a revised assessment schedule 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 XXXVI \[of the SC15 Report\]](#). Following the uncertainty remaining in the bigeye tuna assessment carried out for the previous WPTT meetings in 2010 and 2011, the WPTT **AGREED** that bigeye tuna would be the priority species for stock assessments in 2013. Only stock status indicators (i.e standardised CPUE series) should be updated for skipjack tuna and yellowfin tuna.

Commission

At Sessions of the Commission, Conservation and Management Measures adopted contained elements which call on the Scientific Committee, via the WPTT, to undertake specific tasks. These requests need to be incorporated into a revised work plan:

Resolution 13/08 *Procedures on a fish aggregating devices (FADs) management plan, including more detailed specification of catch reporting from FAD sets, and the development of improved FAD designs to reduce the incidence of entanglement of non-target species*

(para. 7) The IOTC Scientific Committee will analyse the information, when available, and provide scientific advice on additional FAD management options for consideration by the Commission in 2016, including recommendations on the use of biodegradable materials in new and improved FADs and the phasing out of FAD designs that do not prevent the entanglement of sharks, marine turtles and other species. When assessing the impact of FADs on the dynamic and distribution of targeted fish stocks and associated species and on the ecosystem, the IOTC Scientific Committee will, where relevant, use all available data on abandoned FADs (i.e. FADs without a beacon).

Resolution 13/11 *On a ban on discards of bigeye tuna, skipjack tuna, yellowfin tuna, and a recommendation for non-targeted species caught by purse seine vessels in the IOTC area of competence*

(para. 4) The IOTC Scientific Committee, the IOTC Working Party on Tropical Tunas, and the IOTC Working Party on Ecosystems and Bycatch shall annually:

- review the information available on bycatch (retained and discarded) by purse seine vessels; and
- provide advice to the Commission on options to sustainably manage discards in purse seine fisheries.

Resolution 12/13 *For the conservation and management of tropical tunas stocks in the IOTC area of competence*

- (para. 10) The IOTC Scientific Committee will provide at its 2011, 2012 and 2013 Plenary sessions:
- a) an evaluation of the closure area, specifying in its advice if a modification is necessary, its basic scientific rationale with an assessment of the impact of such a closure on the tropical tuna stocks, notably yellowfin tuna and bigeye tuna;
 - b) an evaluation of the closure time periods, specifying in its advice if a modification is necessary, its basic scientific rationale with an assessment of the impact of such a closure on the tropical tuna stocks, notably yellowfin tuna and bigeye tuna;
 - c) an evaluation of the impact on yellowfin tuna and bigeye tuna stocks by catching juveniles and spawners taken by all fisheries. The IOTC Scientific Committee shall also recommend measures to mitigate the impacts on juvenile and spawners;
 - d) any other advice on possible different management measures based on the Kobe II matrix, on the main targeted species under the IOTC competence.

Resolution 05/01 *On Conservation and Management Measures for bigeye tuna*

- (para. 7) The IOTC Scientific Committee be tasked to provide advice, including advice on;
- the effects of different levels of catch on the SSB (in relation to MSY or other appropriate reference point);
 - the impact of misreported and illegal catch of bigeye tuna on the stock assessment and required levels of catch reduction; and
 - evaluation of the impact of different levels of catch reduction by main gear types.

DISCUSSION

Participants at the WPTT15 are requested to consider the priorities set by the SC and the Commission, via Conservation and Management Measures, and revise its work plan to match those priorities.

RECOMMENDATION/S

That the WPTT:

- 1) **NOTE** paper IOTC–2013–WPTT15–09, which encouraged the WPTT to further develop and refine its work plan for 2014 and future years to align with the requests and directives from the Commission and Scientific Committee.
- 2) **RECOMMEND** a revised work plan for 2014 and future years to the Scientific Committee for its consideration and potential endorsement.

APPENDIX

Appendix A: [Previous work plan for the Working Party on Tropical Tunas](#)

APPENDIX A

PREVIOUS WORK PLAN FOR THE WORKING PARTY ON TROPICAL TUNAS

Extract of the Report of the Fifteenth Session of the Scientific Committee

(IOTC–2012–SC15–R; PAGES 264–266, 269)

The WPTT may wish to develop and recommend a revised work plan, including priorities, for 2014 and tentatively for future years:

Working Party on Tropical Tunas (WPTT)

Size data improvements

The SC **NOTED** that the evaluation of length frequency samples collected by the longline fisheries of Japan and Taiwan,China, has been postponed until later in 2013, or will occur via correspondence only.

The SC **NOTED** the indication from Japan that over the last two years, problems had been identified by the WPTT in the Japanese size data for tropical tunas. However, the planned size data meeting, to be held in Taiwan,China in January 2013 had been cancelled. The intention of the meeting was for Japan, Taiwan,China and the IOTC Secretariat to work towards resolving the size data issues for these two fleets.

The SC **NOTED** the efforts by Japan and Taiwan,China, and **URGED** all parties to resolve the problems as soon as possible, and before the next WPTT meeting.

CPUE standardisation

NOTING the importance of the various CPUE indices for stock assessment of the tuna tropical species, the SC **AGREED** that there was an urgent need to investigate the CPUE issues as detailed for bigeye tuna, skipjack tuna and yellowfin tuna in the WPTT14 report, and for these to be a high priority research activity for the tropical tuna resources in the Indian Ocean in 2013.

NOTING that nominal juvenile purse seine CPUE, once standardised, can be used as an indicator of the recruitment index in the stock assessment models, the SC **RECOMMENDED** that the standardised CPUE index for juvenile yellowfin tuna and bigeye tuna caught by the EU purse seiner fleets, be estimated and submitted to the WPTT before the next round of stock assessments of tropical tunas.

The SC **RECOMMENDED** that standardisation of purse seine CPUE be made where possible using the operational data on the fishery.

The SC **REQUESTED** that the following matters be taken into account when undertaking CPUE standardisation analysis for bigeye tuna as well as yellowfin tuna in 2013, noting that this is a modified list produced at the previous WPTT meeting in 2011:

- The SC **AGREED** that changes in species targeting is the most important issue to address in CPUE standardisations, and
- time, or there may need to be careful that the following points should be taken into consideration:
 - i. While hooks between floats (HBF) provides some indication of setting depth, it is generally considered not to be a sufficient indicator of species targeting. HBF is just one aspect of the setting technique, which can vary by species, area, set-time, and other factors.
 - ii. Highly aggregated (e.g. 5x5 degrees) data can make it difficult to observe the factors driving CPUE in a fishery, in particular the targeting effects. Operational data provides additional information that may allow effort to be classified according to fishing strategy (e.g. using cluster analyses or regression trees to estimate species targeting as a function of spatial areas, bait type, catch species composition, set-time, vessel-identity, skipper, etc.). Operational data also permits vessel effects to be included in analyses.
 - iii. The inclusion of other species as factors in a Generalized Linear Model (GLM) standardization may be misleading, because the abundance of all species changes over time. Including these factors may also fail to resolve problems due to changes in targeting, particularly when modeling aggregated data. However, comparing models with and without the other species factors can be useful to identify whether there is likely to be a targeting problem.
- The SC **AGREED** that 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. The following points should also be taken into consideration:
 - i. Addition of finer scale (e.g. 1x1 degrees or latitude/longitude) fixed spatial effects in the model can help to account for heterogeneity within sub-regions.
 - ii. Efforts should be made to identify spatial units that are relatively homogeneous in terms of the population and fishery to the extent possible (e.g. uniform catch size composition and targeting practices).

- iii. There may be advantages in conducting separate analyses for different sub-regions. The error distribution may differ by sub-region (e.g. proportion of zero sets), and there may be very different interactions among explanatory variables.
 - iv. If the selectivity differs among regions (e.g. due to spatial variability in the age composition of the population), it may not be appropriate to pool sub-regional indices into a regional index.
 - v. The possibility of defining a representative ‘space-time’ window: if this leads to the identification of a fishery with homogeneous targeting practices, it is probably worthwhile. However, it may not be possible to identify an appropriate window, or the window may be so small that it is not representative of the larger population (or has a high variance).
- The SC **NOTED** that the appropriate inclusion of environmental variables in CPUE standardisation is an ongoing research topic. The SC **AGREED** that 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 consideration of the mechanisms of interaction to include the variable in the most informative way.

Impacts if Piracy

The SC **NOTED** that the development of Somalian piracy has produced major changes in purse seine fisheries in the western Indian Ocean, which has resulted in a change in their effort levels and distribution, catch and catch-per-unit-effort. Some of those changes are visible in the basic fishery statistics, such as the decline of purse seine fishing effort and their changes in effort distribution. This was the case when after 2005, the purse seine fleets moved offshore, far from the Somalian coast, due to the end of fishing agreements and to the expansion of piracy. The SC **RECOMMENDED** that effects of the Somalian “quasi MPA” on the productivity of the stocks and on CPUEs and catches should be better evaluated, because this area is positioned in a highly productive area of the Indian Ocean that was actively fished by many fleets up until 2005. This study should be done in parallel for the three tropical tuna species (skipjack tuna, yellowfin tuna and bigeye tuna: by decreasing order of priority).

The SC **NOTED** that other changes of the purse seine fisheries due to piracy are not visible in the basic data presently available, for instance the changes in the purse seine fishing tactics and efficiency, due to “military operations”. Various changes in the targeting of FAD associated or free schools due to the new fishing conditions may have also been occurring during recent years. The SC **RECOMMENDED** that the effects on the FAD CPUEs by the EU, Spain purse seine fleet, including the reduced number of supply vessels, should be tentatively estimated. The potential reduction of free school fishing power of EU, France purse seine fleet during their period of “twin vessels” fishing operations should be evaluated (and this period identified for IOTC scientists). If estimations are significant, all of these changes in the tactics and efficiency of the purse seine fleets should be taken into account in future stock assessment models.

The SC **NOTED** that longline fisheries have also been facing since 2007 similar effects of the Somalian piracy as those experienced by purse seine vessels. The major and more visible effect has been their change of fishing zones, all longliners abandoning since 2009 their best yellowfin tuna and bigeye tuna fishing zones of Indian Ocean, also creating in the north-west Indian Ocean a “quasi MPA” for the population of adult deep yellowfin tuna and bigeye tuna. These major changes in the longline fisheries have been widely altering the regional catches and CPUEs of longliners, but these effects remain difficult to incorporate in most stock assessment models. Furthermore, the SC has been informed that some armed longliners were now back in the “piracy area” where they are obtaining high CPUEs.

The SC **RECOMMENDED** that all these changes in fishing strategy, tactics and efficiency of the purse seine and longline fisheries in relation to piracy should be identified and analysed for the purse seine and longline fleets, and later carefully taken into account in future stock assessment models of the 3 species of tropical tunas.

Assessment schedule

The IOTC Scientific Committee **RECOMMENDED** that each of its Working Parties undertake stock assessments and development of stock status indicators following the schedule shown in Table 1.

Table 1. Schedule of stock assessments for IOTC species and species of interest in 2013 and tentatively for 2014–2017, and for the WPM priorities.

Species	2013	2014	2015	2016	2017
Working Party on Tropical Tunas					
Bigeye tuna	Full assessment	Indicators	Indicators	Full assessment	Indicators
Skipjack tuna	Indicators	Full assessment	Indicators	Indicators	Full assessment
Yellowfin tuna	Indicators	Indicators	Full assessment	Indicators	Indicators

Note: the assessment schedule may be changed dependant on the annual review of fishery indicators, or SC and Commission requests.