

IOTC TARGET AND LIMIT REFERENCE POINTS AND A DECISION FRAMEWORK

SUBMITTED BY: MALDIVES, 27 MARCH 2015

Explanatory Memorandum

This proposal on IOTC Target and Limit Reference Points and a Decision Framework seeks to revise and amend Resolution 13/10 taking into account the most recent IOTC Scientific Committee's recommendations regarding MSY based reference points versus biomass depletion based reference points. Furthermore, the rationale and justification for this proposed revision is based on progress of the IOTC Management Strategy Evaluation (MSE) work programme undertaken by the Working Party on Methods (WPM) and the recommendations followed from its last meeting (IOTC-2014-WPM05-R Rev_1) at the most recent Scientific Committee Meeting (IOTC-2014-SC17-R). The recommendations were also based on most recent stock assessment conducted by Working Party on Tropical Tuna (WPTT) and the issues flagged in those assessment reports (IOTC-2014-WPTT16-R).

The main issue stemming from the WPTT and WPM is the high level of uncertainty in stock assessments and therefore challenges in estimating MSY-based thresholds. The 2014 SC noted that the interim limit reference points contained in Resolution 13/10 are not consistent with FAO and UNFSA guidelines, as in those agreements the fishing mortality rate which generates MSY (F_{MSY}) is considered as the limit reference point (para 108, IOTC-2014-SC17-R). Moreover, the IOTC SC noted the difficulties with accurately estimating the MSY-based interim reference points within Resolution 13/10 in cases where there is uncertainty in our knowledge of stock dynamics (para 102, IOTC-2014-SC17-R).

Table 1. Limit reference points based on biomass and fishing mortality for situation where MSY-based reference points can be robustly estimated and for situation where MSY-based reference points cannot be robustly estimated.

Stock	Where MSY-based reference points can be robustly estimated	Where MSY-based reference points cannot be robustly estimated
Albacore	$0.4B_{MSY}; F_{MSY}$	$0.2B_0; F_{MSY}$ proxy $F_{B40\%}$
Bigeye tuna	$0.4B_{MSY}; F_{MSY}$	$0.2B_0; F_{MSY}$ proxy $F_{B40\%}$
Skipjack tuna	$0.4B_{MSY}; F_{MSY}$	$0.2B_0; F_{MSY}$ proxy $F_{B40\%}$
Yellowfin tuna	$0.4B_{MSY}; F_{MSY}$	$0.2B_0; F_{MSY}$ proxy $F_{B40\%}$
Swordfish	$0.4B_{MSY}; F_{MSY}$	$0.2B_0; F_{MSY}$ proxy $F_{B40\%}$
All other IOTC species	$0.4B_{MSY}; F_{MSY}$	$0.2B_0; F_{MSY}$ proxy $F_{B40\%}$

Table 2. Interim target reference points based on biomass and fishing mortality for situation where MSY-based reference points can be robustly estimated and for situation where MSY-based reference points cannot be robustly estimated

Stock	Where MSY-based reference points can be robustly estimated	Where MSY-based reference points cannot be robustly estimated
Albacore	$B_{MSY}; \leq F_{MSY}$	$0.4B_0; \leq F_{B40\%}$
Bigeye tuna	$B_{MSY}; \leq F_{MSY}$	$0.4B_0; \leq F_{B40\%}$
Skipjack tuna	$B_{MSY}; \leq F_{MSY}$	$0.4B_0; \leq F_{B40\%}$
Yellowfin tuna	$B_{MSY}; \leq F_{MSY}$	$0.4B_0; \leq F_{B40\%}$
Swordfish	$B_{MSY}; \leq F_{MSY}$	$0.4B_0; \leq F_{B40\%}$
All other IOTC species	$B_{MSY}; \leq F_{MSY}$	$0.4B_0; \leq F_{B40\%}$

The tables shows gives, for illustrative purposes, limit and target reference points for various species as recommended by the SC for situations when MSY-based targets cannot be robustly estimated and for situations when they can be robustly estimated.



Consequently the IOTC SC recommended that the Commission consider alternative approaches to identify limit reference points, such as those based on biomass depletion levels, when MSY-based reference points are difficult to estimate (para. 103 IOTC–2014–SC17–R). Specifically the IOTC SC highlighted that in cases where MSY-based reference points cannot be robustly estimated that the biomass limit reference point be set 20% of the unfished level ($B_{LIM} = 0.2B_0$) (para 144, IOTC–2014–SC17–R).

The IOTC SC went on to note that the same difficulties exist for the target reference points based on MSY as for MSY based limit reference points (para 105, IOTC–2014–SC17–R). As such, the SC recommended that the Commission consider target reference points based on biomass depletion levels equivalent to B_{MSY} which are expected to lie in the range of 30-40% of the unfished levels (para 105 2014, IOTC–2014–SC17–R). It was recommended to use these targets when MSY-based levels cannot be accurately estimated. For the purposes of this proposal the interim target has been set at 40% of unfished biomass levels to take account of the high levels of uncertainty in the stock assessment and provide for precautionary buffering thereby allowing the stock to safely remain at levels sufficient to produce MSY.

The SC also provided guidance on estimates of fishing mortality equivalents. It has been suggested, for example, given a biomass limit of the $0.2B_0$ a consistent F limit reference point would be $F_{B20\%}$ or the fishing mortality rate that reduced the biomass to 20% of the unfished stock.

These reference points are consistent those used in other tRFMOs and international instruments such as UNFSA and FAO Code. For example Clause 2 of Appendix II of the UNFSA states that the fishing mortality rate, which generate maximum sustainable yield should be regarded as the minimum standard for limit reference points.

The proposal provides clear guidance to the Scientific Committee to assess the robustness and performance of harvest controls rules in relation to a range of the interim targets given in the proposal through the ongoing MSE process.

If the proposal is adopted it will supersede **Resolution 13/10**.



RESOLUTION 15/XX

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Keywords: Limit reference points, Management Strategy Evaluation, Kobe plot, Maximum Sustainable Yield

The Indian Ocean Tuna Commission (IOTC),

CONSIDERING the desire of the Commission that stocks be maintained in perpetuity and with high probability, at levels not less than those capable of producing their maximum sustainable yield as qualified by relevant environmental and economic factors including the special requirements of developing States in the IOTC area of competence;

BEING MINDFUL of Article XVI of the IOTC Agreement regarding the rights of Coastal States and of Article 87 and 116 of the UN Convention of the Law of the Sea regarding the right to fish on the high seas;

RECALLING that Article 6, paragraph 3, of the Agreement for the Implementation of the Provisions of the United Nations Convention of the Law of the Sea of December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA), establishes the application of precautionary reference points as a general principle for sound fisheries management;

FURTHER RECALLING that Annex II of UNFSA provides guidelines for the application of precautionary reference points in the conservation and management of straddling fish stocks and highly migratory fish stocks, including the adoption of provisional reference points when information for establishing reference points is absent or poor;

NOTING that Article 7.5.3 of the FAO Code of Conduct for Responsible Fisheries also recommends the implementation of stock specific target and limit reference points, *inter alia*, on the basis of the precautionary approach;

NOTING that recommendations 37 and 38 of the Performance Review Panel, adopted by the Commission as Resolution 09/01, indicate that pending the amendment or replacement of the IOTC Agreement to incorporate modern fisheries management principles, the Commission should implement the precautionary approach including, *inter alia*, precautionary reference points, as set forth in the UNFSA;

NOTING [Resolution 12/01](#) *On the implementation of the precautionary approach* that recommends adoption of provisional reference points, and that the IOTC Scientific Committee proposed provisional values at its 14th Session;

RECALLING ALSO that the IOTC Scientific Committee commenced a process leading to a management strategy evaluation (MSE) process to improve upon the provision of scientific advice on Harvest Control Rules (HCRs) and further that the Scientific Committee, at its 17th Session, recommended the adoption of reference points based on biomass depletion levels for stocks, when the MSY-based reference points cannot be robustly estimated;

FURTHER NOTING that the Scientific Committee also recommended that in cases where MSY-based reference points cannot be robustly estimated, biomass limit reference points be set at 20% of unfished levels ($B_{LIM} = 0.2B_0$).

ACKNOWLEDGING that continuing dialog between scientists and managers is necessary to define appropriate HCRs for the IOTC tuna and tuna-like stocks;



ADOPTS in accordance with paragraph 1 of Article IX of the IOTC Agreement, that:

Limit Reference Points (LRP)

1. The biomass limit reference point (LRP) be 20% of unfished levels (i.e. $B_{LIM} = 0.2B_0$) for all IOTC species listed in Annex 1 of the IOTC Agreement, in cases where MSY related benchmarks cannot be reliably determined. The Fishing Mortality Rate (F) shall be maintained at a level no greater than F_{MSY} , or its proxy.

Interim Target Reference Points (TRP)

2. The target reference point (TRP) be set at not less than the biomass required to obtain B_{MSY} . However, taking into account of the uncertainty in the stock assessment and the difficulties involved in estimating B_{MSY} accurately, in the interim the TRP will be measured by the proxy recommended by the IOTC Scientific Committee of 40% of unfished biomass levels (i.e. $B_{TARG} = 0.4B_0$), until such time the Commission adopts an alternative that achieves the IOTC's conservation and management objectives and is consistent with the Decision Framework in paragraph 8.
3. When assessing stock status and providing management advice and recommendations to the Commission, the IOTC Scientific Committee should apply the interim target reference points (TRPs) of 40% of unfished biomass levels ($B_{TARG} = 0.4B_0$) for the IOTC tuna and tuna-like species.
4. These interim TRPs shall be assessed and further reviewed by the IOTC Scientific Committee according to the Program of Work detailed in paragraphs 5–8.

Program of Work

5. The IOTC Scientific Committee shall develop and assess, through the management strategy evaluation (MSE) process, the performance of possible harvest control rules (HCRs), to achieve the interim TRPs on average, avoid the limit reference points with a high probability, and take into account the levels of uncertainty in the stock assessments for the priority species listed in paragraph 7. To that end the following activities shall be carried out:
 - a) The IOTC Scientific Committee shall assess the robustness and the performance of the HCRs in relation to:
 - i. the interim TRPs specified in paragraph 2; and
 - ii. alternative candidate TRPs as determined through the MSE and Science and Management Dialogue processes (see Resolution 14/03), including B_{TARG} of $0.3B_0$, $0.4B_0$, $0.5B_0$, $0.6B_0$ of unfished biomass levels that could achieve the Commission's objective of maintaining stocks at, or rebuilding stocks to, levels capable of producing not less than their MSY.
- as qualified by relevant environmental and economic factors including the special requirements of developing coastal State members of the IOTC and as summarised in paragraph 10 below. In doing so, the IOTC Scientific Committee shall be guided by relevant international agreements and take into account:
- i. the nature of these TRPs;
 - ii. the best scientific knowledge on population dynamics and on life-history parameters;
 - iii. all fisheries exploiting the stock; and
 - iv. major sources of uncertainty.



- b) The IOTC Scientific Committee shall provide a range (up to five) of potential performance metrics to allow the Commission to evaluate the alternative candidate HCRs and alternative TRPs.
6. In assessing the candidate TRPs, the IOTC Scientific Committee shall provide advice regarding the risk of breaching the LRPs and the probability of maintaining stocks at levels capable of producing not less than their MSY for the species identified in paragraph 7a and 7b.
7. The initial assessment described in paragraph 5 and 6 shall be completed for:
 - a) Albacore and skipjack tuna by the Scientific Committee in 2015 for presentation to the Commission meeting in 2016.
 - b) Assessments for yellowfin tuna, bigeye tuna, swordfish and longtail tuna to be completed by 2017 and presented to the Commission meeting in 2018.
8. Based on the results of the MSE and considering the guidelines set forth in the UNFSA and in Article V of the IOTC Agreement, the IOTC Scientific Committee shall recommend to the Commission HCRs for these species and in doing so, the IOTC Scientific Committee shall take account of the objectives identified through the Science and Management Dialogue process (Resolution 14/03) and the following objectives:
 - a) For a stock where the assessed status places it within the lower right (green) quadrant of the Kobe Plot, aim to maintain the stock with a high probability within this quadrant;
 - b) For a stock where the assessed status places it within the upper right (orange) quadrant of the Kobe Plot, aim to end overfishing with a high probability in as short a period as possible;
 - c) For a stock where the assessed status places it within the lower left (yellow) quadrant of the Kobe plot, aim to rebuild these stocks in as short a period as possible;
 - d) For a stock where the assessed status places it within the upper left quadrant (red), aim to end overfishing with a high probability and to rebuild the biomass of the stock in as short a period as possible.

Final Clauses

9. Bearing in mind Article 64 of UNCLOS and Article 8 of UNFSA, the entirety of this Resolution is subject to Article XVI (Coastal States' Rights) of the IOTC Agreement for the Establishment of the Indian Ocean Tuna Commission, and Articles 87 and 116 of the UN Convention of the Law of the Sea regarding the right to fish on the high seas;
10. The IOTC Scientific Committee shall undertake a review the performance of any HCRs ability to maintain the species specific TRPs adopted for IOTC species in the future, but not later than 10 years following their adoption, and the Commission shall amend, as appropriate and consistent with the scientific advice, these HCRs.
11. This Resolution shall be reviewed, with the view to adopting binding TRPs, no later than at the IOTC Commission meeting in 2019.
12. This Resolution supersedes Resolution 13/10 *On interim target and limit reference points and a decision framework*.