

RESOLUTION 15/10

ON TARGET AND LIMIT REFERENCE POINTS AND A DECISION FRAMEWORK

Keywords: Limit reference points, management strategy evaluation, Kobe plot, maximum sustainable yield.

The Indian Ocean Tuna Commission (IOTC),

CONSIDERING the objectives of the Commission are to maintain stocks 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NOTING that the Scientific Committee noted that the interim limit reference points contained in Resolution 13/10 **[superseded by Resolution 15/10]** are not consistent with FAO and UNFSA guidelines;

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NOTING that recommendations 37 and 38 of the Performance Review Panel, adopted by the Commission as Resolution 09/01 **[superseded by Resolution 16/03, itself revoked by Resolution 25/12]**, indicate that pending the amendment or replacement of the IOTC Agreement to incorporate modern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);

HIGHLIGHTING that the IOTC Scientific Committee is now in a position to provide advice on stock status relative to reference points for several stocks of tropical, temperate or neritic tunas and billfish;

FURTHER NOTING that the IOTC Scientific Committee at its 17th Session made recommendations on possible alternates to limit and target reference points derived from B_{MSY} and F_{MSY} , when those are



considered as insufficiently robust, that are derived from proportions of B_0 , being the estimated virgin biomass;

FURTHER NOTING 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 the virgin biomass ($B_{LIM}=0.2 B_0$).

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:

Interim Target and Limit Reference Points (TRPs and LRPs)

1. When assessing stock status and providing recommendations to the Commission, the IOTC Scientific Committee should, where possible, apply MSY-based target and limit reference points for tuna and tuna-like species and in particular the interim reference points agreed by the Commission in 2013 for albacore, swordfish and the three (3) tropical tunas (Bigeye tuna, Skipjack tuna, Yellowfin tuna) (per Resolution 13/10 *On interim target and limit reference points and a decision framework*) [superseded by Resolution 15/10]), as listed in **Table 1**. B_{MSY} refers to the biomass level for the stock that would produce the Maximum Sustainable Yield; F_{MSY} refers to the level of fishing mortality that produces the Maximum Sustainable Yield.

Table 1. Interim target and limit reference points.

Stock	Target Reference Point	Limit Reference Point
Albacore Yellowfin tuna Swordfish	$B_{TARGET} = B_{MSY};$ $F_{TARGET} = F_{MSY}$	$B_{LIM} = 0.40 B_{MSY}$ $F_{LIM} = 1.40 F_{MSY}$
Bigeye tuna	$B_{TARGET} = B_{MSY}$ $F_{TARGET} = F_{MSY}$	$B_{LIM} = 0.50 B_{MSY}$ $F_{LIM} = 1.30 F_{MSY}$
Skipjack tuna	$B_{TARGET} = B_{MSY}$ $F_{TARGET} = F_{MSY}$	$B_{LIM} = 0.40 B_{MSY}$ $F_{LIM} = 1.50 F_{MSY}$

Alternate interim Target and Limit Reference Points

2. Where the IOTC Scientific Committee considers that MSY-based reference points cannot be robustly estimated, biomass limit reference points will be set at a rate of B_0 . Unless the IOTC Scientific Committee advises the Commission of more suitable limit reference point for a particular species, by default, the interim B_{LIM} will be set at $0.2 B_0$ and fishing mortality rate limit reference point at $F_{0.2 B_0}$ (the value corresponding to this biomass limit reference point). These interim limit reference points will be reviewed no later than 2018.
3. Where the IOTC Scientific Committee considers that MSY-based reference points cannot be robustly estimated, target reference points based on the depletion proportion (i.e. reference points with respect to the ratio of current biomass to B_0 , B_0 being the virgin biomass estimate) should be used as a basis for B_{TARGET} and F_{TARGET} , as follows:
 - a) the interim biomass target reference point B_{TARGET} could be set at a ratio of B_0 , the virgin biomass;
 - b) the interim fishing mortality rate target reference point F_{TARGET} could be set at a level consistent with the target biomass reference point, the fishing mortality rate corresponding then to the adopted ratio of B_0 , the virgin biomass).



4. These target and limit reference points, referred to in paragraphs 1, 2 and 3, shall be further reviewed by the IOTC Scientific Committee according to the program of work at **Annex 1** and in accordance with paragraph 6. The results shall be presented to the Commission for adoption of species-specific reference points.
5. The IOTC Scientific Committee shall continue to provide advice on the status of stocks and on recommendations for management measures in relation to the reference points referred to in paragraphs 1, 2 and 3, where available, until the Commission adopts other reference points that achieve the IOTC's conservation and management objectives and are consistent with paragraph 6.
6. The IOTC Scientific Committee shall recommend to the Commission for its consideration options for harvest control rules for IOTC species in relation to agreed reference points and, in doing so, shall take into account:
 - a) the provisions set forth in the UNFSA and in Article V of the IOTC Agreement;
 - b) the following objectives and any other objective identified through the Science and Management Dialogue process designed in Resolution 14/03 ^{[superseded by [Resolution 16/09](#)]} (or any revision thereof) and agreed thereafter by the Commission:
 - i. Maintain the biomass at or above levels required to produce MSY or its proxy and maintain the fishing mortality rate at or below F_{MSY} or its proxy;
 - ii. Avoid the biomass being below B_{LIM} and the fishing mortality rate being above F_{LIM} ;
 - c) the following guidelines:
 - i. 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;
 - ii. 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;
 - iii. 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;
 - iv. 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

7. 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;
8. The IOTC Scientific Committee is requested to evaluate the performance of any harvest control rules with respect to the species specific target and limit reference points adopted for IOTC species, but not later than 10 years following their adoption, and the Commission will consider, as appropriate and consistent with the scientific advice, these harvest control rules.



9. As soon as advice from the IOTC Scientific Committee regarding the appropriateness of TRPs and LRPs, as required under **Annex 1**, is available to the Commission, and where possible no later than at the IOTC Commission meeting in 2020, this Resolution will be reviewed with the view to adopting revised TRPs and LRPs.
10. This Resolution supersedes Resolution 13/10 *On interim target and limit reference points and a decision framework*.



Annex 1

Development and Assessment of Target (TRPs) and Limit Reference Points (LRPs), Harvest Control Rules (HCRs) through Management Strategies Evaluation (MSE) – Program of Work

1. The IOTC Scientific Committee is requested to assess the appropriateness of the limit reference points (LRP) and target reference points (TRP) referred to in paragraphs 1, 2 and 3 of the Resolution 15/10, where relevant, and other reference points based on the guidelines of UNFSA taking into account:
 - a) the nature of these reference points – target or limit,
 - b) the best scientific knowledge on population dynamics and on life-history parameters,
 - c) all fisheries exploiting the stock, and
 - d) major sources of uncertainty.
2. The IOTC Scientific Committee is requested to develop and assess, through the management strategy evaluation (MSE) process, the performance of Harvest Control Rules (HCRs), to achieve Target Reference Points (TRPs) on average and avoid the Limit Reference Points (LRPs) with a high probability taking into account the levels of uncertainty in the stock assessments for the priority species listed in point 4. To that end the following activities shall be carried out:
 - a) The IOTC Scientific Committee is requested to assess the robustness and the performance of the HCRs in relation to:
 - i. the TRPs and LRPs specified in [Resolution 15/10](#); and
 - ii. alternative candidate TRPs and LRPs, as identified through Science and Management Dialogue processes as laid down in Resolution 14/03 **[superseded by Resolution 16/09 then by [Resolution 25/10](#)]**.
 - b) The IOTC Scientific Committee is requested to provide a range of potential performance statistics to allow the Commission to evaluate the alternative candidate HCRs and alternative LRPs/TRPs.
3. When evaluating candidate HCRs for species identified in point 4a and 4b, the IOTC Scientific Committee will be requested to provide advice regarding the probability of the biomass being:
 - a) at or below the biomass LRP;
 - b) at or above the biomass TRP.
4. The initial assessment described in points 2 and 3 shall be completed, where possible, 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 and swordfish to be completed by 2017 and presented to the Commission meeting in 2018.