
ON HARVEST CONTROL RULES FOR SKIPJACK TUNA IN THE IOTC AREA OF COMPETENCE

SUBMITTED BY: MALDIVES, 27 MARCH 2015

Explanatory Memorandum

Since 2013 the Maldives together with the IOTC has been working with a range of experts to undertake a Management Strategy Evaluation (MSE) for the Indian Ocean (IO) Skipjack tuna (SKJ) stock. In 2014, the results of this project, including the operating model and evaluation methods which have been developed, were presented to the 16th Working Party on Tropical Tunas (WPTT). Furthermore, several candidate SKJ harvest control rules (HCRs) were presented at the 5th Working Party on Methods (WPM).

This proposal for a HCR for IO SKJ draws on the full set of SC recommendations, including the new guidance on stock reference points in cases where MSY-based reference points are difficult to estimate. The key objective of this proposal seeks to ensure the long term sustainability of the SKJ stock for all IOTC members.

At the last WPTT scientists illustrated that MSY-based reference points were often poorly defined for skipjack tuna due to peculiar nature of the yield curve. In these cases, the SC recommended the use of depletion based limits and targets.

This proposal sets a biomass limit reference point at 20% of the unfished level ($B_{LIM} = 0.2B_0$) and a target biomass reference point at 40% of the unfished level ($B_{TARG} = 0.4B_0$). These reference points are consistent with the SC advice that reference points based on depletion level should be used for stocks where MSY-based reference points cannot be robustly estimated and with international conventions and current practices followed in other tRFMOS. For example, Appendix II of the UNFSA clearly states that fishing mortality at MSY should be the minimum limit reference point.

A key feature of this proposal is the explicit harvest control rule, or HCR to achieve the objectives of maintaining the stock at, or above, the TRP and above the LRP with a high probability. The HCR produces a recommended catch limit that is directly linked to the stock assessment cycle of 3-5 years. If the stock assessment estimates the stock is above the TRP, then the recommended catch limit is set at the estimate of the catch level that will maintain the stock at the TRP. If the stock assessment estimates the stock biomass is less than the TRP, the recommended catch limit is reduced so as to bring the stock back up to the TRP level on average

The proposal refers to the Resolutions 13/03 (on the recording of catch and effort data by fishing vessels in the IOTC area of competence), 10/02 (Mandatory Statistical Requirements for IOTC Contracting Parties and Cooperating Non-Contracting Parties) and 12/02 (Data Confidentiality Policy and Procedures) that relate flag States' requirements to record and report and catch effort data to the IOTC in timely manner. In order for the Secretariat to maintain and update total SKJ catches in timely manner CPCs are required to report the SKJ catch / effort data on a quarterly basis. The Secretariat is requested to notify the CPCs when 80% and 90% of the total annual catch is registered.

A full range of scientific advice will be provided by the SC on whether agreed management action will achieve the objective and in relation to the long-term outlook for the stock under this management framework.

RESOLUTION 15/XX

ON HARVEST CONTROL RULES FOR SKIPJACK TUNA IN THE IOTC AREA OF COMPETENCE

Keywords: Skipjack tuna, Reference Points, Harvest Control Rules, Precautionary Approach, Management Strategy Evaluation.

The Indian Ocean Tuna Commission (IOTC),

NOTING Article 5, paragraph 2(c), of the IOTC Agreement is to adopt, in accordance with Article IX and on the basis of scientific evidence, Conservation and Management Measures to ensure the conservation of the stocks covered by this Agreement and to promote the objective of their optimum utilisation throughout the Area;

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;

RECOGNISING [Resolution 12/01](#) *On the implementation of the precautionary approach* calls on the Indian Ocean Tuna Commission to implement and apply, in accordance Article 6 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), the precautionary approach;

RECALLING Article 6, paragraph 3(b) of UNFSA that calls on States to implement the precautionary approach using the best scientific information available, using stock-specific reference points and outlining the action to be taken if they are exceeded;

FURTHER RECALLING 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;

ACKNOWLEDGING that implementing pre-agreed Harvest Strategies including harvest control rules is considered a critical component of modern fisheries management and international best practices for fisheries management;

FURTHER NOTING that a harvest control rule encompasses a set of well-defined, pre-agreed rules or actions used for determining a management action in response to changes in indicators of stock status with respect to reference points;

NOTING that the Scientific Committee at its 17th Session, recommended the Commission consider an alternative approach to identify biomass limit reference points, such as those based on biomass depletion levels, when the MSY-based reference points are difficult to estimate. In cases where MSY-based reference points can be robustly estimated, limit reference points may be based around MSY.

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 the IOTC Scientific Committee has initiated a process leading to a management strategy evaluation (MSE) process to improve upon the provision of scientific advice on HCRs;

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

General Provisions

1. Nothing contained in this Resolution confers the allocation of rights to any CPC and is without prejudice to any future decisions of the Commission.

2. Nothing contained in this Resolution shall restrict developing coastal States members of the IOTC from implementing their Fleet Development Plans in accordance with Resolution 03/01 (or any subsequent revision) as submitted to the IOTC Secretariat.

Objectives

3. To maintain the Indian Ocean Tuna Commission skipjack tuna stock in perpetuity and with high probability, at levels not less than those capable of producing maximum sustainable yield (MSY) as qualified by relevant environmental and economic factors including the special requirements of Developing Coastal States and Small Island Developing States in the IOTC area of competence and considering the general objectives identified in Resolution 13/10¹ (or any subsequent revision).
4. To use a pre-agreed harvest control rule (HCR) to maintain the skipjack tuna stock around, or above, the interim target reference point (TRP) and well above the interim limit reference point (LRP).

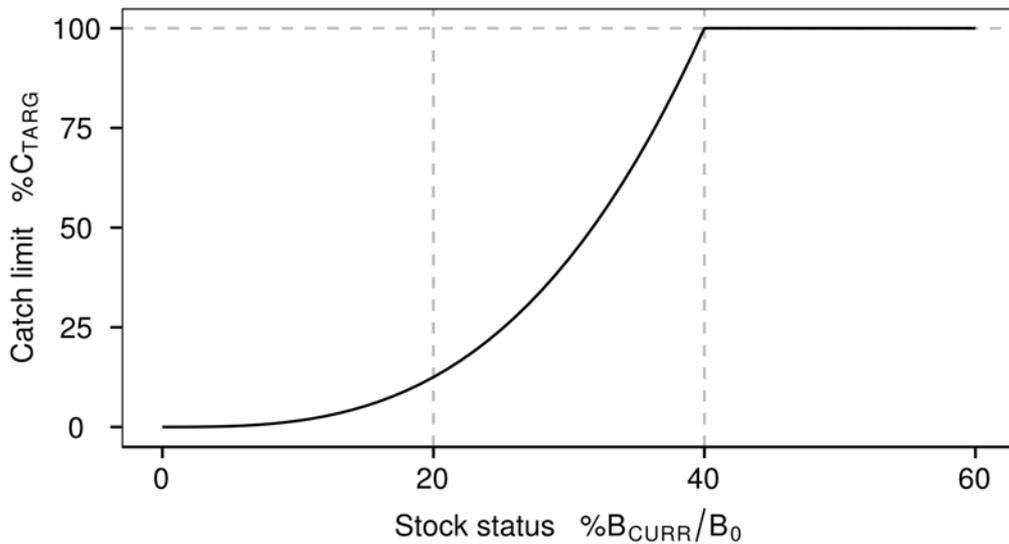
Reference Points

5. The biomass limit reference point, B_{LIM} , shall be 20% of unfished biomass levels (i.e. $0.2B_0$).
6. The biomass target reference point, B_{TARG} , shall be 40% of unfished biomass levels (i.e. $0.4B_0$). This TRP takes into account difficulties involved in estimating B_{MSY} accurately for skipjack tuna. The IOTC Scientific Committee has recommended that in such cases the use of a TRP based on unfished biomass levels. This biomass TRP shall be reviewed by the IOTC Scientific Committee to ensure that it provides for biomass levels capable of producing not less than their MSY, as qualified by relevant environmental and economic factors, while assuring with high probability that the biomass LRP shall not be breached.
7. The HCR described in paragraphs 8–11 seeks to maintain the skipjack tuna stock biomass at, or above, the TRP and above the LRP with high probability.

Harvest Control Rule (HCR)

8. The skipjack tuna HCR shall recommend an annual catch limit by using three values estimated from each skipjack stock assessment:
 - a) B_{CURR} , the estimate of current spawning stock biomass;
 - b) B_0 , the estimate of the unfished spawning stock biomass;
 - c) C_{TARG} , the estimate of the equilibrium catch associated with sustaining the stock at B_{TARG} .
9. The skipjack tuna stock assessment should be conducted every three (3) years, but no later than five (5) years, commencing no later than 2017. Estimates of 8(a–c) shall be taken from a model based stock assessment that has been reviewed and recommended for use by the Working Party on Tropical Tunas and reported in advice to the Commission for adoption. The reported median estimates of 8(a–c) from the final range of models shall be used.
10. The recommended catch limit shall be set as follows:
 - a) If the stock is estimated to be at, or above, the target reference point, i.e. $B_{CURR} \geq 40\%B_0$, then the catch limit shall be set at C_{TARG} .
 - b) If the stock is estimated to be below the target reference point, i.e. $B_{CURR} < 40\%B_0$, then the catch limit shall be set using the formula, $C_{TARG}(B_{CURR}/0.4B_0)^3$, resulting in a recommended catch limit which is equal to C_{TARG} when the stock is estimated to be above $40\%B_0$ and which reduces as stock status reduces (graph below).

¹To be updated when the Proposal to amend Resolution 13/10 is adopted.



11. The HCR set out in paragraphs 8–10, shall be in place commencing at the conclusion of the 2016 Commission meeting and continue until the IOTC Scientific Committee advises and the Commission adopts an alternative total annual catch limit that shall not be exceeded considering paragraphs 3–7.

Reporting

12. CPCs shall:

- a) Notify all vessels flying their flag of the requirements to record catch and effort and provide this information to their fisheries management authority in accordance with Resolution 13/03, 10/02 and consistent with Resolution 12/02 (or any subsequent revisions) and provide a copy of the notification sent to flagged vessels to the IOTC Secretariat.
- b) Report their quarterly skipjack tuna catch and effort by gear type landed in the previous quarter to the IOTC Secretariat in accordance with Resolution 10/02 (or any subsequent revision).
- c) Report total annual catch, effort and size data of skipjack tuna to the IOTC Secretariat according to paragraph 6 of Resolution 10/02 (or any subsequent revision).
- d) Notify all of their flagged tuna fishing vessels when 80 per cent and 90 per cent of the total annual catch limit has been caught.

13. The IOTC Secretariat shall:

- a) Promptly notify all CPCs when the total IOTC skipjack tuna catch reaches 80 per cent of the annual total annual catch limit.
- b) Promptly notify all CPCs when the total IOTC skipjack tuna catch reaches 90 per cent of the annual total annual catch limit.

Scientific Advice

14. The IOTC Scientific Committee shall include the target reference point as part of any analysis when undertaking all future assessments of the status of the IOTC skipjack tuna stock and provide advice to the Commission on whether the agreed management action will achieve the objective and in relation to the long term outlook for the stock under this management framework.

15. The IOTC Scientific Committee, through its Working Party on Tropical Tunas, should undertake and report to the Commission a model-based skipjack tuna stock assessment every three (3) years, but no later than five (5) years, commencing with the next stock assessment in 2017.
16. The stock assessment advice shall include a determination of the recommended total allowable catch that would maintain the skipjack tuna stock at the TRP plus or minus 10 per cent on average relative to the time frame of the IOTC skipjack tuna assessment cycle.
17. The IOTC Scientific Committee shall also provide advice regarding the likelihood of the management measures in this Resolution to maintain the skipjack tuna stock at the TRP using the management strategy evaluation (MSE) process. Through the MSE process the IOTC Scientific Committee shall assess the suitability of the LRP, TRP and the robustness and the performance of the HCR specified in paragraph 5, 6–7 and 8–10 respectively, and where appropriate suggest alternatives, specifically in relation to:
 - a) major sources of uncertainty;
 - b) the best scientific knowledge on population dynamics and on stock-wide life-history parameters;
 - c) all fisheries exploiting IOTC skipjack tuna; and
 - d) the impact of different gears and fish aggregating device (FAD) associated sets on the skipjack tuna stock, including providing advice regarding potential FAD management measures.

Final Clause

18. The Commission shall review this measure at its annual session in 2018, or before if there is reason and/or evidence to suggest that the skipjack tuna stock is at risk of breaching the LRP.