



Consideration of Exceptional Circumstances for the Bigeye Tuna MP 2024

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Abstract

The IOTC's adopted management procedure (MP) for bigeye tuna is used to recommend the Total Allowable Catch (TAC) of bigeye in the Indian Ocean. As part of the implementation schedule, the Commission adopted an annual review of evidence for exceptional circumstances that could make the application of the TAC advice risky to the stock or fishery.

The Exceptional Circumstances Guidelines specify a three-stage process: (i) examining evidence for exceptional circumstances, (ii) determining severity and impact, and (iii) recommending any management or research action that should be taken. A wide range of information is reviewed to examine if there is evidence for exceptional circumstances, e.g., the data inputs to the MP, changes in the knowledge of stock or fishery uncertainties against which the MP was tested, and implementation of MP TAC advice.

The Exceptional Circumstances Guidelines (IOTC–2021–SC24 Appendix 6A) provide a scientific process for developing appropriate management responses to exceptional circumstances and, hence, provide transparency in TAC decision making by the Commission.

The consideration of exceptional circumstances in 2024 applies to the adopted TAC for 2025 from running the MP in 2022, and to the MP scheduled to be run in 2024 for recommending the TAC for 2026-2028.

There is no new information on exceptional circumstances that may affect the adopted TAC in 2025, but we note that 2023 catches are well above the TAC for 2024 and 2025 and catch constraints will need to be implemented.

The key issue identified in 2024 is the lack of a standardised CPUE that follows the specification adopted with the MP. This is an exceptional circumstance that we hope will be resolved in time for review of the TAC advice by the Scientific Committee (SC) or Technical Committee on Management Procedures (TCMP) prior to the Commission.

1 Introduction

The IOTC adopted a management procedure (MP) for bigeye tuna which is used to recommend the Total Allowable Catch (TAC) in the Indian Ocean. As part of the MP schedule, the Commission adopted an annual review of evidence of exceptional circumstances that could make implementing the MP TAC advice risky. Exceptional circumstances are conditions or data that fall outside the range of uncertainties that the MP was tested against, i.e., the reference set of operating models used for Management Strategy Evaluation (MSE), and the robustness tests. The Exceptional Circumstances Guidelines (IOTC, 2021: IOTC–2021–SC24 Appendix 6A) provide a scientific process for examining evidence for exceptional circumstances, evaluating potential impacts, and developing appropriate management responses if necessary. This process of examining evidence for exceptional circumstances provides a safety-net around the MP TAC advice and transparency in TAC decision making by the Commission.

The exceptional circumstances process has three stages:

- 1) determine whether any exceptional circumstances exist,
- 2) determine the severity and impact of the exceptional circumstances on achieving the objectives of the MP, and
- 3) if necessary, identify the research or management actions that could be taken by the IOTC.

2 Examining evidence for the existence of exceptional circumstances in 2024

The guidelines specify the information that should be checked for evidence of exceptional circumstances. The range of uncertainties and conditions that the MP was tested against are the MSE operating models used for the final tuning of the MP (Hillary et al., 2022; Kolody & Jumppanen, 2021), and a set of robustness tests. The data input specification (e.g., standardisation of the CPUE) are specified in Williams et al. (2022) and Kitikado et al. (2022). Total catch is available in the data preparation reports (IOTC, 2024). The MP was run in 2022 to provide the recommended TAC for 2024 and 2025, which was adopted by the Commission. This year the MP is scheduled to provide TAC advice for 2026-2028, for consideration by the SC and Commission (Williams et al, 2024).

The following items, specified in the Exceptional Circumstances Guidelines, have been examined:

- New knowledge about the stock, population dynamics or biology,
- Changes in fisheries or fishing operations,
- Changes to input data to the MP, or missing data, or
- Inconsistent implementation of the MP advice (e.g., total catch is greater or less than the Total Allowable Catch (TAC)).

2.1 New knowledge - Stock, population dynamics or biology

2.1.1 Stock status

The most recent information on the status of the stock is from the 2022 stock assessment for bigeye tuna (Fu et al., 2022). The stock assessment estimates of depletion are within the 90% probability interval of the projections of the operating models used to test the performance and tune the MP, and therefore there is no evidence of exceptional circumstances from the 2022 assessment (Figure 1). Any new information on the stock presented at WPTT should be considered in formulating TAC advice for 2026-2028. The next stock assessment is scheduled for 2025.

2.1.2 Population dynamics

The 2022 review of exceptional circumstances identified that there was new information on growth (Farley et al, 2021) and natural mortality parameters that were included in the 2022 assessment models (Fu et al., 2022) that had not been included in the MSE operating models. Differences between the MSE operating models (as specified in MP adoption resolution) and parameterisation of stock assessments are expected (as new stock assessments explore different models and methods). The SSB depletion time-series from the 2022 assessment was shown to be within the range of the operating models and projections and indicated that the population dynamics are reasonably stable. There were no exceptional circumstances noted in relation to the population dynamics in 2022 or 2023, and there is no new information in 2024, and therefore there are no exceptional circumstances in relation to population dynamics.

2.1.3 Biology

There is no new information on biological parameters presented in 2024. The new growth information and alternative natural mortality scenarios used in the assessment in 2022 do not affect any inputs or parameters in the MP. None of the stock assessment results are used in the MP to set the TAC. The biomass estimates from the model component of the MP may deviate from the assessment biomass estimates (Kolody & Jumppanen, 2016), but this is expected as different stock assessment methods, data and model structures are explored in future. The MSE testing of the MP demonstrated that even for a wide range of potential real states of the population, the performance objectives of the Commission would be met by using the MP to calculate the TAC. As the new growth information and alternative natural mortality scenario do not affect any inputs or parameters in the MP, there are no exceptional circumstances associated with this new information.

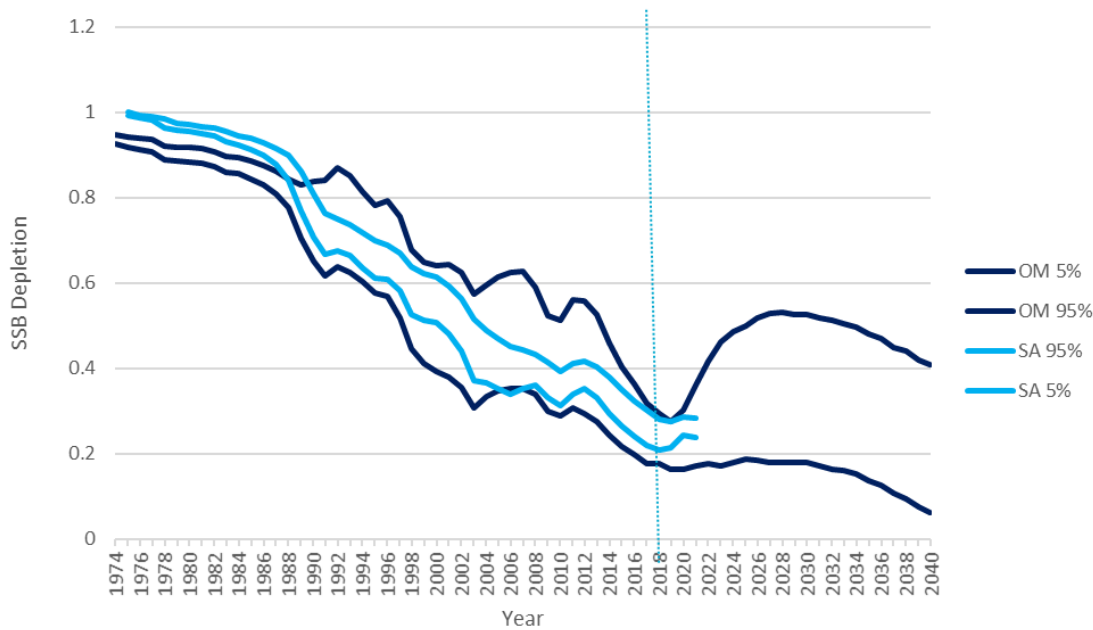


Figure 1 Comparison of the 90% probability interval for SSB depletion from the bigeye tuna MSE operating models (OM) (Hillary et al., 2022) and the 2022 stock assessment (SA) (Fu et al., 2022). The vertical line at year 2018 indicates the end of the historical years of the operating model and start of projections.

2.2 Fishery or fishing operations

There were no major changes in fisheries or fishing operations identified in the data reported to IOTC in recent years (IOTC, 2023) and no substantial changes in data reporting or quality (Pierre, 2024, pers. comm.,).

2.3 MP input data

2.3.1 Catch data

The MP uses catch data collated by the IOTC (IOTC, 2024) which has been collated using the same methods used when testing the MP. The WPTT(DP) 2023 reviewed recent nominal bigeye tuna catches, fishery features, quality and representativeness of catch data relative to previous years and have noted similar or slightly improved reporting (IOTC, 2023). There do not appear to be any new issues or evidence for exceptional circumstances in relation to the catch data.

2.3.2 CPUE data

The CPUE series specified for the MP is created from the spatially stratified CPUE series (Kitikado et al., 2022) and recombined using area weighting from Hoyle et al (2019), to create a single CPUE series used in the MP (Williams et al., 2022). The CPUE standardisation combines operational data from Japan, Korea and Taiwan, China longline fleets. A collaborative international team work together to develop the time series.

The spatial and temporal stratification of the series provided at WPTT(DP) does not match the CPUE specification for the MP. The CPUE team are kindly discussing how they can provide the standardised CPUE as soon as possible (for example, in time for the SC or TCMP to allow for review of implementation of the MP and TAC advice before the Commission). The absence of the CPUE series is an exceptional circumstance, and the way forward will be clarified in discussion at WPM.

In relation to the MP TAC that has already been set (2024 and 2025), in 2022 there were some small differences between the specification of the CPUE series in 2022 and how this was standardised. The severity and impact of this difference in the CPUE in 2022 was considered very low, and therefore no action on TAC was recommended. This is unchanged and therefore there are no exceptional circumstances in relation to the 2025 TAC.

2.4 Catch relative to TAC

The bigeye tuna TAC for the years 2024 and 2025 was adopted by the Commission (based on advice from running the MP in 2022, Resolution 23/04). We do not have the 2024 catch data to compare against the TAC set for 2024 and, therefore, there is no exceptional circumstance.

We note, however, that the reported catch for 2023 is 105,369t (IOTC 2024: IOTC-2024-WPTT26AS-DATA03-NC_Rev1) which is higher than the TAC for 2024 (80,583t), and catches will need to be constrained in 2024 to the agreed and adopted TAC, or exceptional circumstances will be triggered.

3 Discussion and Conclusion

The Exceptional Circumstances Guidelines make it clear that identifying exceptional circumstances does not necessarily result in changes to the recommended TAC. In fact, changes to the recommended TAC should be avoided except in situations where the TAC advice would pose a risk to the stock or the fishery if implemented. The alternatives are to collect more information, or do research, to inform review of evidence of exceptional circumstances in the next year or years. Another alternative is to proceed with the TAC advice (or precautionary advice) and trigger a review of the MP earlier than planned. Recommending a change to the TAC is appropriate if there is a high risk to the stock. If the TAC is to be adjusted, further evaluation of the scale and severity of the exceptional circumstance provides guidance (% change) on how to calculate an adjustment to the TAC.

A wide range of items are reviewed to examine if there is evidence for exceptional circumstances, i.e., the data inputs to the MP, the range of uncertainties against which the MP was tested, and implementation of MP TAC advice. This review is conducted annually to provide advice to the SC on any risks with the operation of the MP and TAC advice.

The annual review of exceptional circumstances is an important component of providing management advice using an adopted management procedure. It is the safety net process that evaluates the extent to which the MP is operating as expected (from the MP testing) and identifies

any risks associated with implementing the MP TAC advice. It requires consideration of evidence for exceptional circumstances. It provides a scientific process for developing appropriate management responses if any exceptional circumstances are identified and, hence, provides transparency in TAC decision making by the Commission.

In 2024, we are evaluating if there are any exceptional circumstances in relation to the adopted TAC for 2025 from running the MP in 2022, and any exceptional circumstances that may affect the recommended TAC for 2026-2028 from running the MP this year.

The last stock assessment in 2022 did not provide any new or different knowledge on the population dynamics or status of the stock. New information on growth and an alternative natural mortality scenario were incorporated into the 2022 assessment. The new growth data and natural mortality scenario did not have a substantial effect on the stock status or historical trends. These data are not used in the MP, and therefore no research or management action on TAC was recommended in relation to this new information for the 2024 and 2025 TAC.

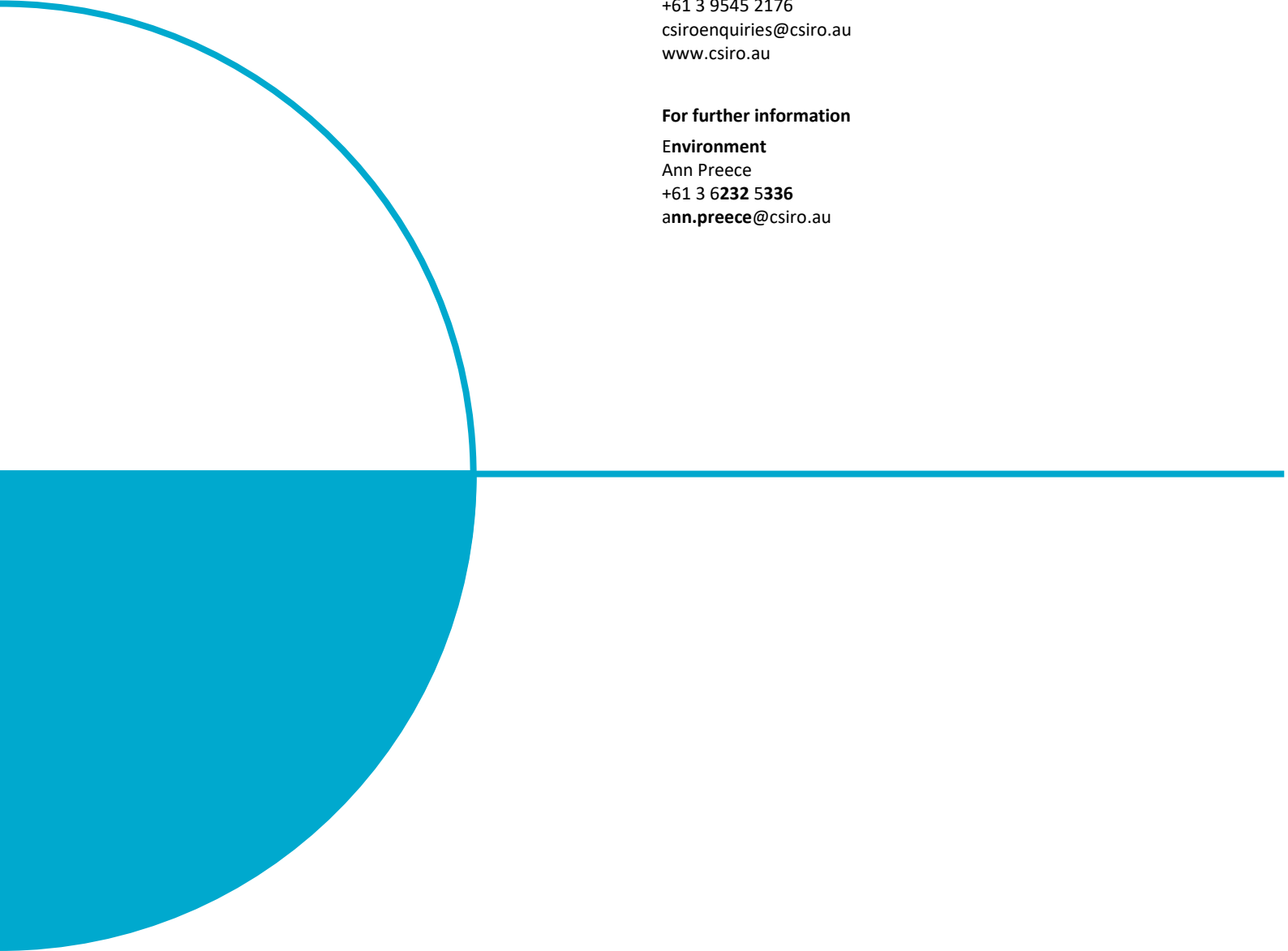
No new information has been provided on stock status, population dynamics, or catch data collation in 2024.

There are no exceptional circumstances in relation to the adopted TAC for 2025, although the 2023 catch is above the 2024 and 2025 TAC and catches will need to be constrained.

The CPUE series developed at WPTT(DP) in 2024 does not match the MP specification for CPUE standardisation. This is an exceptional circumstance in relation to running the MP in 2024 to provide recommended TAC advice for 2026-2028. We hope this can be resolved before the SC or TCMP in time for consideration of TAC advice at the Commission. The annual review of exceptional circumstances will need to take into account information on the standardised CPUE when it becomes available.

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