



# Meta-rules: consideration of exceptional circumstances in 2021

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# Abstract

The meta-rules adopted with the CCSBT Management Procedure (MP) provide a process to determine whether exceptional circumstances exist and a process and guidelines for action to address issues when identified. The aim is to identify exceptional circumstances where stock or fishery indicators, the MP input data, population dynamics, fishing or fishing operations are substantially different from the conditions under which the MP was tested or if catches are greater than the recommended TAC. If there is evidence for exceptional circumstances, then the process is to determine the severity of these and follow the guidelines for action. In 2021, the only exceptional circumstance identified is the very high Japanese longline CPUE estimate for 2018, which is used in the MP. This issue was first identified in 2019, with the severity of impact on the TAC recommendation considered to be low, and the process for action is currently underway through agreement to develop a new CPUE. An alternative CPUE series was used in the 2020 stock assessment and there are some small differences in rate of rebuilding but differences in the population dynamics are not substantial. The operating models have not been updated in 2021, hence there is no new information to evaluate on population dynamics. The gene-tagging data and close-kin data used in the MP are unchanged. The close-kin dataset has been updated and there is a new gene-tagging abundance estimate for 2019, that will be used in future TAC recommendations, and both of these updates are within the expected range of values from the 2019 operating models. Review of other indicators of the stock and fishery has not identified any unusual conditions, and no substantial changes in fishing operations were noted. Total catches are below the TAC and there is no update on estimates for potential non-member catches, which are accounted for within the operating models used to test and tune the Cape Town MP. In summary, there is no evidence of exceptional circumstances other than the issue with the CPUE series used in the MP, which was identified in 2019, and the agreed process for action is underway to develop a new CPUE series for use in 2022. No further action is required under the meta-rules and no changes to the 2022 TAC are recommended.

# 1 Introduction

The SBT MP meta-rules' schedule of activities includes an annual process for identifying exceptional circumstances. Exceptional circumstances are events, or observations, that are outside the range for which the CCSBT MP was tested and, therefore, indicate that application of the total allowable catch (TAC) generated by the management procedure (MP) may be highly risky, or highly inappropriate.

The exceptional circumstances process under the meta-rules involves the following three steps:

1. Determining whether exceptional circumstances exist, by examining whether there were any substantial changes in stock and fishery indicators, inputs to the MP, population dynamics or fishery or fishing operations, and if recent catches and other removals have been greater than the MP's recommended TACs.
2. A "process for action" that examines the severity (and implications) of the exceptional circumstances for the operation of the MP, and the types of actions that may be considered.
3. "Guidelines for action" that determine how recommendations from the MP might be altered, if at all, based on the most recent reconditioning of the Operating Model (OM).

The meta-rules schedule of activities for implementation of the MP specifies frequency of TAC setting using the MP, that the stock assessment is offset by 1 year from MP TAC decisions, timing of an MP review and the consideration of exceptional circumstances. The meta-rules provide a safety-net around the implementation of the MP and TAC recommendations, and transparency of decision making by the Commission.

The meta-rules were revised in 2020 as part of the full specification of the Cape Town Procedure (Attachment 8, Anon 2020).

This year we are using the meta-rules process to review the recommended TAC for 2022 that came from running the MP in 2020 to set the 2021-2023 block of TACs.

## 2 Examining evidence for the existence of exceptional circumstances in 2021

The meta-rules specify the information that should be checked for evidence of exceptional circumstances. The following have been examined:

### 2.1 Stock and fishery indicators

The indicators papers (Takahashi and Itoh, 2021; Patterson, 2021) and national reports in 2021 do not identify any unusual or recent changes in characteristics of the stock or fishery. The trolling index (juveniles) is very low, but this could be affected by the slight disruption of the surveys due to COVID-19 restrictions for the researchers (Itoh, 2021a). Age specific CPUE signals were mixed across fisheries (Patterson 2021; Takahashi and Itoh, 2021).

### 2.2 MP input data

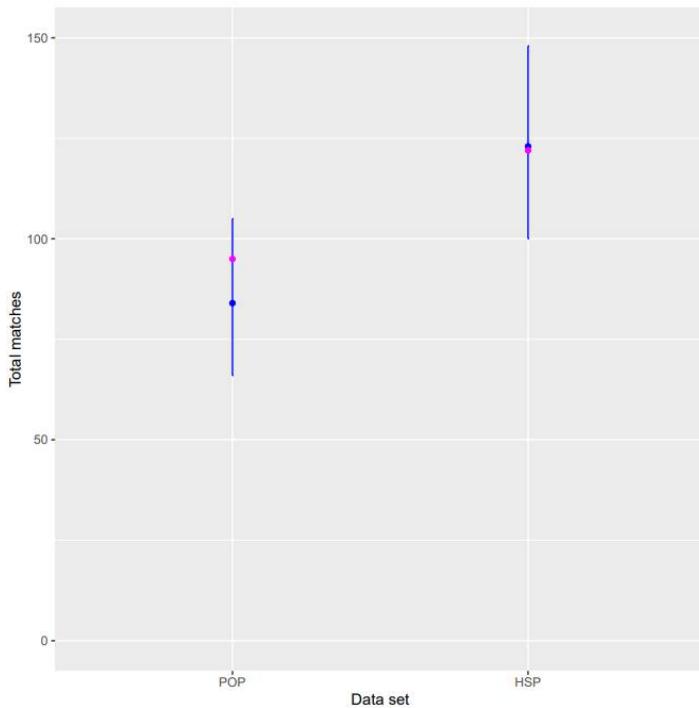
The specified data used in the MP are the Close-kin Parent-offspring Pairs (POPs) and half-sibling Pairs (HSP), gene-tagging and Japanese longline CPUE index of abundance. The MP was run in 2020 to recommend the TAC for 2021-2023. These input data were examined in 2020 and close-kin and gene-tagging data were within the ranges expected (Preece et al., 2020). The CPUE data triggered further review. New data provided in 2021 are not yet used in the MP but are examined for evidence of exceptional circumstances.

#### 2.2.1 Close-kin data

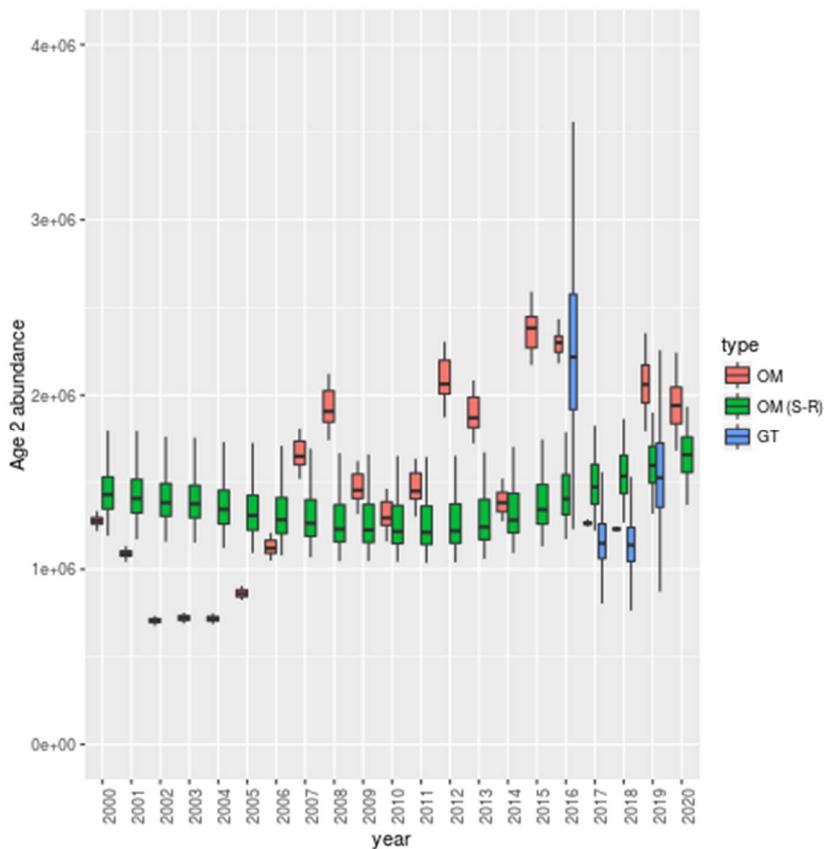
The Close-kin data were updated in 2021. The observed data (number of POPS and number of HSPs) fall within the range of estimates from the operating models used in MP testing in 2019 (Figure 1).

#### 2.2.2 Gene-tagging data

The gene-tagging program was developed and adopted as a recruitment monitoring program that provides absolute abundance of 2-year-old fish in the year of tagging for use in the MP. The new Gene-tagging estimate of age 2 abundance in 2019 (which is not yet used in the MP) is close to the range of expected values from the stock recruitment relationship in the operating models (Figure 2; Preece et al., 2021).



**Figure 1** The expected number of POPs and HSPs from 2019 OM (blue dot and confidence interval), and the 2021 observed data (magenta dot).



**Figure 2** Comparison of 2016-1019 gene-tagging age-2 abundance estimates (blue) and recent age-2 estimates from the 2020 reconditioning of the OM (red) and those predicted from the stock-recruitment function (OM-(S-R)) (green). The 2019 gene-tagging abundance estimate has not been included in the OM reconditioning.

### **2.2.3 CPUE series**

The standardised Japanese longline CPUE series used in the MP (Itoh and Takahashi, 2020) was identified as an exceptional circumstance in 2019, and there is a program of work underway to resolve problems identified in CPUE standardisation. Very high CPUE estimates from unfished squares are included in the standardisation and have resulted in very high point estimates for the index in 2018. The ESC agreed to use the existing standardisation in the MP in 2020 while working to resolve issues (Anon 2020b). The work plan involves exploration of alternative standardisation approaches to address the issues identified in 2020 and adoption of a new CPUE series prior to using the MP in 2022 to set the next 3-year block of TACs. More information on the CPUE exceptional circumstance is provided in the section 3 below.

## **2.3 Population dynamics**

There are no substantial changes in our knowledge and understanding of the SBT population dynamics compared to the OM conditioning used to test and tune the Cape Town Procedure in 2019. The operating models have not been updated in 2021. In 2020, a small difference was noted in the projected rebuilding timeframe for the stock between the 2020 stock assessment and 2019 operating models (Hillary et al., 2020). The 2020 stock assessment indicates a slightly slower rebuilding to the target SSB level (reached in 2037 rather than 2035). The difference arose from changes to the reference set of models for the stock assessment compared to the OMs used in 2019 for MP testing (e.g. a different range of steepness values), updated data and the change to the CPUE series being used in the OMs for the stock assessment. This rate of stock size increase is well within the range explored in the robustness testing of the MP. No action was recommended in 2020 in relation to these small differences, and since there is no update to these models, no action is required in 2021. We note that the changes to the OMs used for the stock assessment do not affect the operation of the MP.

## **2.4 Fishery or fishing operations**

There were no major changes in fisheries or fishing operations identified in 2021 from the available national reports, CPUE and fishing operation papers (Lee et al, 2021; Lu et al., 2021; Itoh, 2021b).

## **2.5 Catch relative to TAC**

Reported catches are below the TAC set in 2020 (Anon 2021). There is no update on estimates of potential non-member catches, and no reports of IUU catches detected in recent years. The Cape Town procedure has been designed to be robust to a level of unreported catch (Anon 2019a), and there is no evidence that this level has been exceeded.

### 3 2021 update on CPUE exceptional circumstance

In 2019, the ESC noted concerns with the very high CPUE estimate for 2018 in the Base CPUE series used when testing the candidate MPs (Anon 2019b). Further examination of CPUE standardisation models in 2020 by the CPUE working group, and in preparation for the OMMP technical meeting, identified that several very high CPUE values were predicted for unfished squares (strata) in the series used in the MP (Anon 2020c). Several alternative methods and models for CPUE estimation were examined by the CPUE working group and at the OMMP technical meeting in 2020, for use in the stock assessment. In 2021, further development of alternative CPUE series has continued. All indices have shown an increasing positive trend in CPUE since 2007. The very high CPUE estimate for 2018 is not evident in the alternative series developed by the CPUE working group and reviewed by the OMMP.

The issue with the Base CPUE series, which is an input to the MP, triggered the next steps in the exceptional circumstances process in 2020, to determine severity of the CPUE issue on MP performance and action required. The 2020 OMMP group noted that the MP testing included several CPUE specific robustness tests as part of a suite of mainly pessimistic future scenarios, and the MP was shown to be robust to these. Examination of the contribution of the CPUE component in the MP to the TAC calculation was explored in Hillary et al. (2020b) and found that the CPUE component of the MP did not affect the TAC recommendation in 2020 and the severity of this exceptional circumstance is low. The 2020 OMMP meeting agreed that because the Base CPUE series was used to test and tune the MP, that this series should continue to be used in 2020 for calculating the MP TAC recommendation for the 2021-2023 TAC block. No action to change the TAC was recommended in 2020. The ESC agreed, however, that further work was required to comprehensively examine the spatial-temporal issues that contributed to the anomalously high CPUE values for unfished squares with the Base CPUE and develop a new CPUE series which can be used in the future (Anon., 2020c). This work has continued in 2021 and will need to be completed in time for the 2022 ESC, when the MP is next scheduled to be run to recommend the TAC block for 2024-2026.

## 4 Conclusion

In considering the potential for exceptional circumstances, we have examined whether: 1) the inputs to the MP are affected, 2) the population dynamics are potentially significantly different from those for which the MP was tested (as defined by the 2019 Reference and Robustness sets of OMs), 3) the fishery or fishing operations have changed substantially, 4) available fishery indicators have concerning trends, 5) total removals are greater than the MP's recommended TACs, and 6) if there are likely to be impacts on the performance of the SBT rebuilding plan as a result. It is possible that additional exceptional circumstances may be identified at the ESC's annual review of stock and fishery indicators.

In summary:

1. The high 2018 CPUE data point in the Base CPUE series remains a concern, and the recommended action is to work on a new CPUE series in time for the running of the MP and TAC recommendation for 2024-2026 quota block in 2022. The need to re-tune the Cape Town MP will need to be reconsidered when a new CPUE standardisation is agreed prior to the 2022 ESC.
2. Small changes in the estimates of the population dynamics in the reconditioned operating models for the 2020 stock assessment do not affect running of the MP or the recommendation for the 2022 TAC.

Based on this review, no change is recommended for the 2022 TAC.

The meta-rules process provides a schedule of activities for the implementation and review of performance of the MP. The thorough and systematic annual examination of exceptional circumstances assists the ESC to provide transparent and clearly reasoned TAC recommendations to the Commission in the context of the objectives of the MP and the conditions under which it was tested.

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