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Evaluation of exceptional circumstances – SBT 2024

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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 Total Allowable Catch (TAC). If there is evidence for exceptional circumstances, then the next step in the process is to determine the potential severity of the 'exception' and follow the guidelines for action.

Review of the population dynamics, other indicators of the stock and fishery, and fishery operations, did not identified any unusual conditions. The CCSBT's total reported catches are below the TAC. The estimates of potential non-member unaccounted mortality were updated in 2023, and the MP has been tested to be robust to these levels. The most recent gene-tagging estimate of abundance, for the 2022 age-2 cohort has been slightly delayed and is not yet available, but preliminary indications are that the estimate will be within the range of estimates seen previously. The close-kin data and CPUE index are within the expected range of values. There is no evidence for exceptional circumstances, and the MP recommended TAC for 2024-2026 should therefore remain unchanged.

The issues that remain of concern, but do not currently trigger exceptional circumstances, are:

1. Low numbers of close-kin tissue samples collected in Indonesia for 21/22, 22/23 and 2023/24 seasons. This is an essential dataset for use in the MP. Work is underway to resume sampling of adult SBT in 2024/25.
2. The high 2022 CPUE point in the new GAM index, and impact of contraction in the areas of operation of Japanese longline fishery on the standardisation.
3. Changes in the Indonesian spawning ground fishery, uncertainty in the length/age frequency, and limited otolith collection from the catch monitoring program in recent years.

1 Introduction

The SBT MP meta-rules' schedule of activities includes an annual process for identifying exceptional circumstances (Anon 2020). 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 in 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 2024-2026 that came from running the MP in 2022.

2 Examining evidence for the existence of exceptional circumstances in 2024

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 (e.g. Patterson, 2024) and national reports in 2024 do not identify any unusual or recent changes in characteristics of the stock or fishery. The grid type trolling index (juveniles) has been low in recent years, but increased slightly in 2024 (Itoh, 2024a). Age specific CPUE signals were above the low levels observed in the early 2000s (Takahashi and Itoh, 2023; Patterson, 2024).

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.

2.2.1 Close-kin data

The Close-kin data were updated in 2024 (Farley et al., 2024a). Tissue sample and otolith collection activities in Indonesia have been disrupted in recent years (Farley et al, 2024a), with very few adult samples collected. Only the juvenile samples, are available for the 2022 season, and these were genotyped to update the number of detected HSP (total 232) and POPs (total 123). As discussed in the 2020 review of the metarules, the lack of adult samples in the 2022 season does not trigger exceptional circumstances because the MP will still operate with the available data. The close-kin data are essential for operation of the MP (next run scheduled for 2025) and are also a key data set in the stock assessment because these data provide information on adult abundance, mortality and productivity. The number of POPs and HSP are within the range expected from the OMs updated in 2023 (Figure 1).

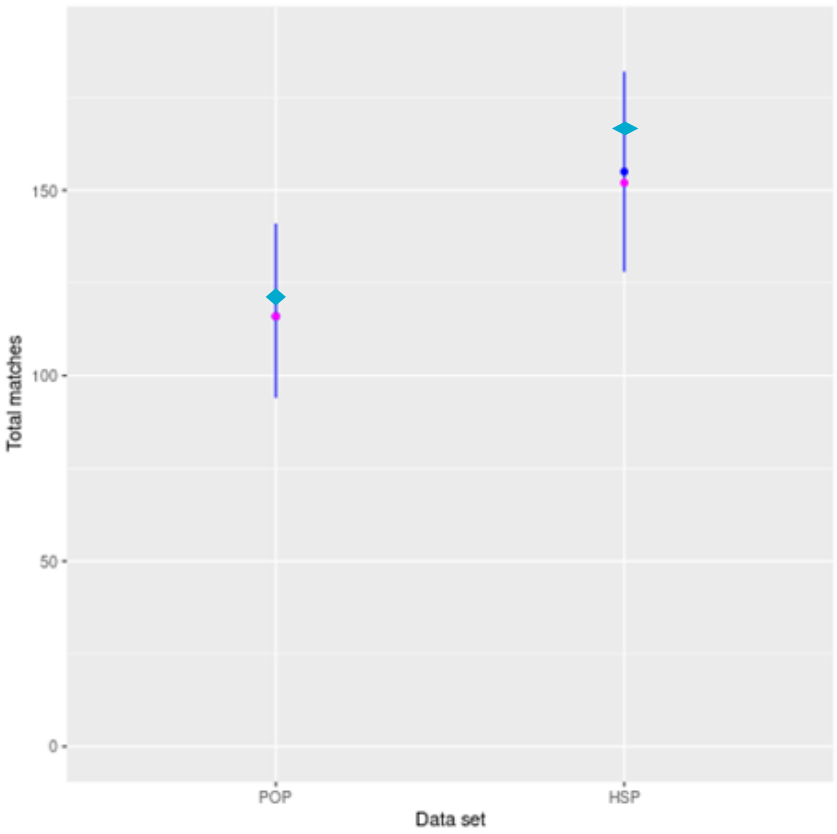

Figure 1 The expected number of POPs and HSPs from the reconditioned OMs in 2023 (blue dot and confidence interval), the available observed data through to 2022 (magenta dot), and the observed data updated in 2024 (pale blue diamond). The total matches for HSP exclude matches in the same year.

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. Tissue collection in the tagging and harvest sampling phases of the program have all progressed well. This year there have been delays in genotyping the data to estimate abundance for the 2022 age-2 cohort and the final estimate of abundance is not yet available for the ESC (Preece et al., 2024). The final estimate will be provided to the CCSBT as soon as it is available. A preliminary, but incomplete, estimate indicates that abundance will be well above the limit levels (corresponding with low recruitments observed in the 2000s) used in the MP. Both the 2022 and 2023 abundance estimates will be available for running the MP in 2025.

2.2.3 CPUE series

A new standardised Japanese longline CPUE series (GAM model) was adopted in 2022 (Anon., 2022). The new GAM model resolved exceptional circumstances identified in 2019, however, the CPUE point for 2022 has also raised concerns about the impact of unfished squares on the standardisation (Anon., 2023a). The Japanese longline fishery has been contracting over time with fewer strata fished and fewer sets within strata (Itoh, 2024b; Hoyle, 2023). The sensitivity test comparing age-5 plus index and the age-4 plus base case, indicates a strong impact of age 4 fish on the estimates in recent years (see Figure 34 in Itoh and Takahashi, 2024), and the retrospective

tests also indicates the impact that new data has on the latest estimates. Despite these uncertainties, the CPUE index is indicating positive rebuilding of the stock, with the index in the recent 5 years at similar levels as the early 1970s at the start of the series. The 2019-2024 CPUE index values are within the 95% confidence interval range of projected CPUE values from operating models used in the MSE in 2019 (see Figure in Takahashi and Itoh, 2024), and therefore do not trigger exceptional circumstances.

2.3 Population dynamics

There are no substantial changes in our knowledge or understanding of the SBT population dynamics compared to the OM conditioning used to test and tune the Cape Town Procedure in 2019. The 2023 assessment indicated that the probability of rebuilding to the target level of relative Total Reproductive Output (TRO) is slightly better than the target (51% compared to target of 50%) (Hillary et al, 2023). The estimated TRO in 2035 is on the target at $0.3TRO_0$. The median current level of depletion is 0.23 which is above the initial rebuilding target of 20% of initial TRO. Fishing mortality (F) is less than half the $F_{MSY.}$ The rate of stock size increase is well within the range explored in the robustness testing of the MP.

2.4 Fishery or fishing operations

There were no major changes in most fisheries and fishing operations in 2023 reported in national reports and the Japanese fishing operation paper (Itoh, 2024). There has been a shift in areas fished by the Indonesian longline fishery from Area 1 to Area 2 (Setyadjia et al 2022, Sadiyah et al 2023, Satria et al 2024) and a large increase in the number of Indonesian vessels reporting SBT catch (Anon 2024).

The Indonesian fishery has reported a large increase in catch from area 2 and corresponding decrease in catch from the spawning ground (area 1). While these changes do not trigger exceptional circumstances, there remains uncertainty in the length composition of SBT landed by the Indonesian longline fishery from statistical area 1 (spawning ground area), which is important for monitoring changes in the spawning population. Farley et al (2021) noted that that the size data from the two sources available (catch monitoring and CDS) provided different age composition results for the five years compared and recommended further work to examine the uncertainties identified and to refine and improve the quality control of the catch monitoring program. Davies et al (2023) provided an updated description of the current issues and Indonesia has developed an SRP proposal for work that is currently underway (Davies et al 2023).

2.5 Catch relative to TAC

Reported catches for the 2023 fishing season are below the current TAC (Anon., 2024). The recent estimates of potential Un-Accounted Mortality (UAM) from Non-Cooperating Non-Members (NCNM) (Edwards and Hoyle, 2023) are within the range that the Cape Town Procedure has been designed to be robust to (Anon., 2019).

3 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 set 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 UAM accounted for in MP testing, and 6) if there are likely to be impacts on the performance of the SBT rebuilding plan as a result.

Based on this review no exceptional circumstances have been identified and, therefore, the recommended TAC for 2024-2026 (from running the MP in 2022) should remain unchanged. However, it is possible that additional exceptional circumstances may be identified at the ESC's annual review of stock and fishery indicators.

There are several potential current risks that may need to be considered in future. Fully reinstating the close-kin sample collection project in Indonesia is essential to ensure these data are available in future for the CTP, and progress is being made to address this. There remains some uncertainty in the recent high point in the 2022 CPUE index and the effects on the index from spatial contraction and increasing number of unfished areas. Continuous improvements in data collection apply to all fisheries to reduce uncertainties, in particular in catch monitoring programs and provision of accurate length frequency data.

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.

References

Anon. (2019) Report of the Tenth Operating Model and Management Procedure Technical Meeting. 24 - 28 June 2019, Seattle, USA

Anon. (2020) Report of the Twenty Fifth Meeting of the Scientific Committee. 7 September 2020, Online.

Anon. (2022) Report of the Twelfth Operating Model and Management Procedure Technical Meeting. 20 – 24 June 2022, Hobart, Australia

Anon. (2023a) Report of the Thirteenth Operating Model and Management Procedure Technical Group. 26 – 30 June 2023, Seattle, USA

Anon. (2024) Secretariat Review of Catches. CCSBT-ESC/2409/04

Davies C, Satria F, Farley J, Sadihya L, Suadela P, Sulistyaningsih R, Setyadji B, and Mardi S. (2023) SBT catch monitoring and capacity building for biological sampling of spawning ground catches in Indonesia. CCSBT-ESC/2308/14

Edwards C.T.T and Hoyle S.D. (2023) Estimates of unreported SBT catch by CCSBT non-cooperating non-member states between 2007 and 2020. CCSBT-ESC/2308/BGD 01

Farley, J., Sulistyaningsih, R., Setyadji, B., Mardi, S., Davies, C. (2021) Review of data to estimate the length and age distribution of SBT in the Indonesian longline catch. CCSBT-ESC/2108/07.

Farley J, Eveson P, Gunasekera R. (2024a) Update on the SBT close-kin tissue sampling, processing and kin-finding 2024. CCSBT-ESC/2409/09.

Hillary R, A Preece, N Takahashi, C Davies, T Itoh. 2023. The SBT stock assessment in 2023. CCSBT-ESC/2308/16.

Hoyle S. (2023) Mitigating the effects of increasing effort concentration by developing indices based on data from multiple fleets. CCSBT-ESC/2308/32

Itoh T. (2024a) Trolling indices for age 1 southern bluefin tuna: update of the grid type trolling index in 2024. CCSBT-ESC/2409/24.

Itoh, T. (2024b) Change in operation pattern of Japanese southern bluefin tuna longliners in the 2023 fishing season. CCSBT-ESC/2409/20.

Itoh T and Takahashi N. 2024. Update of CPUE abundance index using GAM for southern bluefin tuna in CCSBT up to the 2023 data. CCSBT-ESC/2409/21

Sadiyah L, Setyadji B, Mardi S, Hernuryadin Y, Suadela P, Budiarto A, Patmiasih S, Pratiwi I, Satria F. (2023) Indonesia's tuna longline fishery interacted with Southern Bluefin Tuna in 2022. CCSBT-ESC/2308/SBT Fisheries – Indonesia.

Satria F, Sadiyah L, Setyadji B, Mardi S, Hernuryadin Y, Suadela P, Budiarto A and Patmiasih S. 2024. Indonesia's tuna longline fishery interacted with Southern Bluefin Tuna in 2023. CCSBT-ESC/2408/SBT Fisheries – Indonesia

Setyadjia, B., Hartatya, H., Sri Patmiarsihb and P Suadela. 2022. Preliminary Analysis on Catch of Southern Bluefin Tuna (Thunnus maccoyyi) by Fishing Area from Indonesian Tuna Longline Fleet. CCSBT-ESC/2208/Info 01.

Takahashi N and Itoh T. (2023) Summary of Fisheries and Scientific Survey Indicators of Southern Bluefin Tuna Stock in 2023. CCSBT-ESC/2308/22

Takahashi N and Itoh T. (2024) A check of operating model predictions from the viewpoint of implementation of the management procedure in 2024. CCSBT-ESC/2409/25

Patterson, H. (2024) Fisheries indicators for the southern bluefin tuna stock 2023–24. CCSBT-ESC/2409/16.

Preece AL, Bradford R, Eveson JP, Hartog J. (2024) Update on the Gene-tagging program 2024 and RMA request. CCSBT-ESC/2409/10.

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