

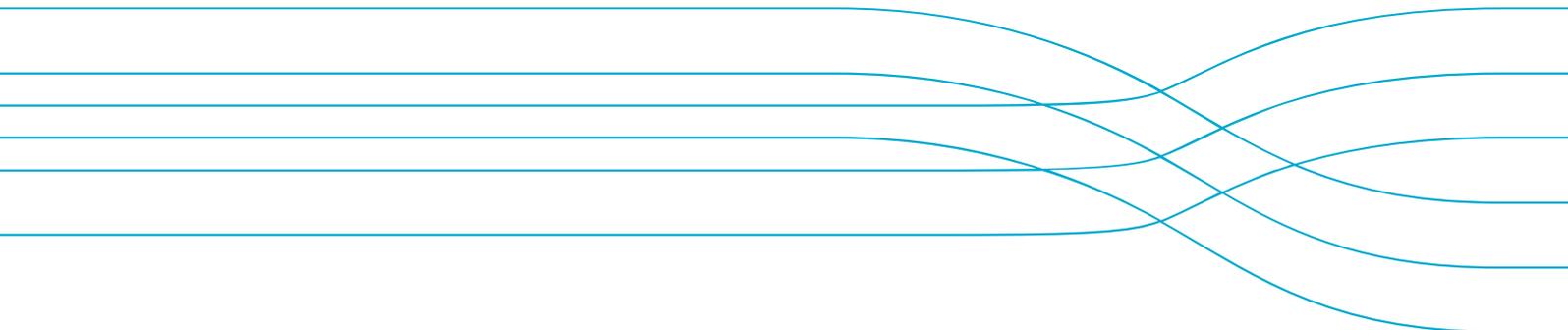


Meta-rules and exceptional circumstances considerations

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Abstract

The meta-rules for the CCSBT Management Procedure (MP) include an annual review of the input monitoring series for the MP and fishery and stock indicators, which is intended to identify conditions and/or circumstances that may represent a substantial departure from which the MP was tested, termed “exceptional circumstances”, and where appropriate recommend the required action. In 2016, the ESC will review MP implementation in the context of both: i) the TAC set in 2013 for the 2017 quota year, and ii) the TAC for the 2018-2020 block, which is scheduled to be recommended at the 2016 meeting of the ESC.

Issues of potential concern in 2016 include: 1) the high 2016 data point in the aerial survey index monitoring-series; 2) the unresolved shift in selectivity in the Indonesian fishery since 2013; 3) evidence that total catches (members and non-members) are greater than the TAC (either annually or over the quota block). The 2016 aerial survey index, while outside the bounds of the reference and robustness tests conducted during MP testing, is outside the bounds in a positive direction and, in this respect, is not cause for immediate action with respect to current TACs. The second issue, is of continuing concern, but not for the operation of the MP; rather for the monitoring of the spawning stock, close-kin sample collection and the impact on OM conditioning and advice on stock status. Some progress has been made by the Extended Commission on the latter issue, and the ESC will need to advise on their potential impact on TAC setting and consideration for the 2017 stock assessment and MP testing.

1 Introduction

The meta-rules for the CCSBT Management Procedure (MP) includes a review of the input monitoring series for the MP and fishery and stock indicators (annual), periodic assessments of the status of the stock via reconditioned operating models (3 year intervals), and in depth review of the MP performance (6 years intervals), to determine whether there is evidence for exceptional circumstances and decide what, if any, action should be taken to deviate from the TAC recommended by the MP (Attachment 10 of the 2013 ESC report (Anon 2013)).

The annual review of the MP input series, stock and fishery indicators is intended to identify conditions and/or circumstances that may represent a substantial departure from which the MP was tested, termed “exceptional circumstances”, and where appropriate recommend the required action. In 2016, the ESC will review MP implementation in the context of both: i) the TAC set in 2013 for the 2017 quota year, and ii) the TAC for the 2018-2020 block, which is scheduled to be recommended at the 2016 meeting of the ESC.

Issues of potential concern in 2016 include: 1) the high 2016 index for the aerial survey monitoring-series; 2) the unresolved shift in selectivity in the Indonesian fishery since 2013; and 3) evidence that total catches (members and non-members) are greater than the TAC (either annually or over the quota block). These issues will need to be considered by the ESC and principles and process for action agreed, if required. Some actions are already underway to address the latter two issues by members and the Extended Commission, which will be reported to the ESC and/or the Extended Commission.

These same issues will also need to be considered in terms of the data required and the potential impact on re-conditioning operating models and associated work on the development of a new MP and the 2017 stock assessment. Additional exceptional circumstances may be identified at the ESC following review of stock and fisheries indicators.

As the ESC will be recommending a TAC in 2016 for the 2018-2020 TAC block, there is also concern regarding whether previously un-accounted catches will be adequately accounted for in members and non-member’s TACs, but these catch amounts have not yet been specified. These data will be also needed for the reconditioning of the OMs in 2017 (historical and future intended catch quantities).

2 Meta-rules and exceptional circumstances

As noted above, the meta-rules include a 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,
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, and
3. “Principles for action” that determine how recommendations from the management procedure might be altered, if at all, based on the most recent reconditioning of the OM.

The Meta-rules process as adopted by CCSBT can be found at Attachment 10 of the 2013 ESC report (Anon 2013).

3 Progress on issues identified by the 2015 ESC

At the 2015 ESC annual review of the MP implementation, the lack of information on recent recruitment and implications for the MP were major issues for consideration (Anon 2015). These were resolved by the CCSBT by recommending the scientific aerial survey (for at least 2016 and 2017) and undertaking the gene-tagging pilot study in 2016, as recommended by the ESC. The CCSBT plans to run the aerial survey in 2017 and start the on-going gene-tagging recruitment monitoring program. By 2019 the ESC aims to have developed a new MP that uses the gene-tagging juvenile absolute abundance estimates as a recruitment index.

The 2015 ESC also noted the cumulative effect of all potential catches above the TAC, i.e. member and non-member catches and unaccounted mortalities, and re-iterated its request to the Extended Commission to take steps to quantify all sources of unaccounted SBT mortality. A review of SBT in the China Market and an updated analysis on potential non-member catches (Edwards et al, 2016) will be provided to the 2016 ESC. Member catches were noted to be in excess of the TAC in 2013 and 2014 and the Extended Commission was urged all members to ensure adherence to its TACs. Preliminary reported catches for 2015 do not exceed the 2015 TAC (CCSBT, 2016).

Accounting for sources of additional mortalities from members in the TAC has also progressed, with the Extended Commission redefining member's "attributable catches". Members agreed to continue research on these attributable sources of mortality and report on their attributable catches to the ESC and CC, commencing in 2016.

The Commission also plans to account for non-member catches through a "direct approach" in 2016. This will involve setting aside from the MP recommended TAC an allowance to account for non-member catches before allocating the remainder of the TAC for the 2018-2020 block to members (CCSBT 2015). If implemented as described, this approach will be operating outside of the MP processes and, therefore will be untested. Two alternative approaches to account for additional mortality are being considered in 2016 for TAC recommendations under a new MP (i.e. the 2019 decision and beyond) (Preece et al, 2016).

4 Exceptional circumstances in 2016 and potential severity for MP

The following items may represent exceptional circumstances and will be reviewed by the ESC in 2016:

- 1) the historically high estimate of juvenile relative abundance for 2016 from the aerial survey,
- 2) the unresolved shift in selectivity in the Indonesian fishery since 2013,
- 3) continuing concern that total fishing mortality (from members and non-members) are greater than the TAC recommended by the MP.

Further exceptional circumstances may also be identified at the ESC as part of the annual review of stock and fishery indicators.

In considering the potential for exceptional circumstances arising from these issues, 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 Reference and Robustness sets of OMs), 3) the fishery or fishing operations have changed substantially, 4) total removals are greater than the MP recommended TACs, and 5) if there are likely to be impacts on the performance of the SBT rebuilding plan as a result.

The events are considered individually, however, the implications of the combination of events for the performance of the MP and the ability of the ESC to provide robust advice on the status and trends of the stock should also be considered.

4.1 Aerial Survey relative abundance estimate in 2016

The 2016 aerial survey estimate of juvenile relative abundance is the highest point in the time series (see Farley and Eveson, 2016). There is no information on the 2015 juvenile relative abundance, because the aerial survey was not run and the selectivity of the LL1 longline fleet has shifted back towards older age classes in recent years. The 2014 index was also high, relative to all other years. The 2016 data point is outside the range of values for which the MP was tested in 2011. It follows that this index value represents “exceptional circumstances”.

As the direction of the exceptional index value is positive and there was no evidence of unusual conditions for operation of the aerial survey, there is no apparent reason to review the 2017 TAC (set in 2013).

Hillary et al (2016) review the data and operation of the MP in 2016 for the 2018-2020 TAC block, and conclude that the MP operation is not affected by the high data point, and therefore can be used to calculate the recommended TAC. The MP has been designed with a “cap” which limits the change in TAC from one 3 year block to the next. This cap or TAC change limit is set to 3000t. The

3000t cap was reached in the preliminary calculation of the recommended TAC from the MP in 2016. An analysis of MP outputs for alternative values for the 2016 aerial survey data point, given that all other input data remain the same, indicates that the recommended TAC would remain the same (i.e. at the 3000t cap) unless the 2016 aerial survey data point was lower than the very low point recorded 5 years ago, in 2012 (see Appendix 1 for these results).

Hence, in considering the second stage of the meta-rules process for the 2018-2020 TAC block, we conclude that there is no “exceptional impact” resulting from this high data point on the operation of the MP or the TAC advice arising from it. Therefore there is no need to engage step three of the process to alter the TAC recommendations in light of the high 2016 index from the aerial survey.

In the context of the 2017 reconditioning of operating models, however, these two recent high values of the index (2014 and 2016) are likely to be highly influential on projections in the short term, as was the case for most recent stock assessment (in the case of the 2014 index value). These will be supplemented by the 2017 aerial survey estimate which will be included in the reconditioning of operating models and in the 2017 stock assessment advice. The ESC will need to reevaluate the implications of these recent aerial survey indices at that time.

4.2 Changes in the Indonesian fishery selectivity

Since 2013, unusually large numbers of small fish have been recorded in the Indonesian catch monitoring data from Benoa, Bali (see Farley et al, 2016). It is not known whether these fish were caught on or off the spawning ground, and/or whether these data indicate a substantial shift in the selectivity of the Indonesian fishery. Attempts have been made to match the catch monitoring data with additional fishery data provided by Indonesia, but linking the records has proved difficult. Further data analyses are planned, but at this stage the issue is unresolved.

The potential shift in selectivity does not affect the data inputs to the MP, but may indicate changes in the operation of the Indonesian fishery that were not included in the OM used at the time of testing the MP. The advice from 2015 regarding this issue remains the same for the 2017 TAC recommendation and the 2018-2020 TAC recommendation: the potential change in selectivity is of concern but the immediate implications for the operation of the MP are insufficient on their own to constitute to recommend modification to the MP recommendation. The previously recommended action should continue to be pursued so that the shift may be addressed in the next reconditioning of the operating models in 2017 (Davies et al, 2015).

4.3 Total fishing mortalities exceeding the TAC

As noted previously (Davies et al, 2015), the design and simulation testing of the MP assumed that all removals from the stock were accounted for, i.e. the implementation of the TAC was exact. In 2014, the ESC evaluated the impacts of potential un-accounted mortalities from a variety of sources on stock status and the rebuilding plan (Anon 2014). The results indicated that, for the scenarios examined, there was likely to be little impact on current stock status; but if the total mortalities were as large as those considered in the ‘added-catch scenario’ (Anon 2014), and they continued into the future, then the impacts on the performance of the MP rebuilding plan may be substantial. The ESC 2014 noted that the added catch scenario was potentially plausible given the

available data, analysis and reports. The ESC could only use simple scenarios (i.e. the level and trajectory of potential un-accounted mortality) in these scenario analyses because there is very limited data or information on the specifics of the potential member and non-member unaccounted mortalities.

In 2014 the ESC agreed that the scenarios considered for potential unaccounted mortalities, if they were in fact occurring, triggered exceptional circumstances. The ESC did not recommend urgent management action on the level of the TAC at the time, but did request that the Commission make provision of more informative data on unaccounted mortalities a priority. The 2015 ESC reiterated its request to the Extended Commission to take steps to quantify all sources of unaccounted SBT mortality. Little new data has become available since this request was made, however, some new data will be presented in 2016 (see below).

In addition to the uncertainties in member and non-member catches, total reported catches by members have been greater than the global TAC in recent years. The global TAC was reported to have been exceeded by 485 t in 2013 and 354 t in 2014 (Anon, 2015). Final figures for 2015 are not yet available, but preliminary figures indicate that members' reported catches didn't exceed the 2015 TAC (CCSBT, 2016).

We consider this issue in the context of the 2017 TAC (recommended in 2013), and note that it is probable that total fishing mortalities (from member reported catches, non-member unaccounted mortalities, additional member "attributable" catches, uncertainties in catches that may or may not be attributed) have exceeded the 2015 TAC, and this may impact the performance of the rebuilding plan. This is an on-going exceptional circumstance that the EC is addressing through two key actions: members have agreed to start accounting for "attributable catches" from 2016, although full accounting will not occur until 2018, and the EC has agreed to take account of non-member catch in the setting of future TACs (discussed in Preece et al, 2016).

For the 2016 recommendation for the 2018-2020 TAC block, the quantities of non-member catches and new components of member's attributable catches that will be accounted for in future TAC setting decisions by the EC have not yet been specified. If the catch quantities to be attributed to total catch by members and/or the allocation for non-member catches do not account for the total fishing mortality, then the potential for impact on the rebuilding plan for SBT will remain.

Actions have been taken to estimate some of these quantities. A market review of SBT in China has been commissioned by the secretariat and results will be presented at the 2016 ESC. Two papers in 2015 attempted to quantify potential levels of non-member UAM in the Pacific and Indian Oceans by indirect methods (Chambers and Hoyle, 2015; Hoyle and Chambers, 2016). These methods have been updated in 2017 and extended to the Atlantic Ocean (Edwards et al, 2016). There are substantial uncertainties and assumptions made in these analyses. Papers have been presented in 2015 on uncertainties in members catches (Jeffriess, 2015; Itoh and Takeda, 2015; Patterson and Hansen, 2014.) and may be updated for consideration in 2016. These issues have been discussed in the past but remain unresolved. For members' newly defined catches that will become "attributable", quantities for each catch component will need to be specified, even though there may be little information on the actual catch quantities. These catches will also need to be specified for the reconditioning of operating models in 2017 so that their potential impact on the most recent estimates of stock and fishery dynamics can be considered in light of the

original MP testing conditions. The 2016 ESC will need to consider whether, or not, it will provide additional advice to the EC on this particular exceptional circumstance in the context of the 2018-2020 TAC MP recommendation, given the limited progress with resolving the substantial uncertainties associated with total mortalities for the SBT stock.

5 Conclusions

Through the meta-rules process we have examined the high aerial survey data point in 2016, the potential shift in selectivity in the Indonesian fishery, and the potential for fishing mortality to be greater than the TAC. The impacts of these issues have been considered for the 2017 TAC (recommended in 2013) and the 2016 recommendation for the 2018-2020 TAC block.

The high aerial survey data point does not affect running of the MP in 2016 but may affect future population dynamics estimates, which will be examined in the full stock assessment scheduled for 2017.

The Indonesian selectivity change remains unresolved. Similarly, this does not directly impact on the running of the MP in 2016, but will need to be addressed prior to the 2017 reconditioning of operating models.

The potential for fishing mortalities to continue to be greater than the TAC is of concern for the 2017 TAC recommendation. Action has been taken by the EC and members will account for their attributable catches from 2016 onwards, and an allowance for non-member catches will be made in the next TAC block (2018-2020).

For the 2016 recommendation for the 2018-2020 TAC block, the uncertainty in whether total fishing mortality will exceed the TAC remains a concern. At present, the new components of catches that will be attributed to the members have not been specified, and the adjustment to take account of non-member catches has not yet been specified. The ESC is not in a position to determine with confidence if total catches (all forms of member and non-member) will be greater than TAC.

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Appendix 1. Bali Procedure experimental runs with alternative aerial survey data points

The Bali Procedure was updated in July 2016 to incorporate the new data and update the qratio value. The preliminary run of the MP is documented in Hillary et al, 2016.

To test the impact of the high 2016 Aerial Survey data point, a range of alternative values were used in the Bali Procedure to examine whether the recommended TAC was sensitive to the value of this data point. All other data used in the Bali Procedure were unchanged, i.e. the full aerial survey time-series was not re-analysed, and the index was not re-standardised, and the qratio value was not updated to include this alternative aerial survey value.

Results:

2016 data point set to	AS value	TAC increase from 2013
Original 2016 estimate	1065.5126	3000t
Same as 2014 estimate	558.7715	3000t
Same as 2012 estimate	109.3264	3000t
lower	100.0	2850t

These test results show that for alternative values of the 2016 aerial survey data point, there is no change in the TAC recommendation (because there is a cap in place at 3000t) until the value becomes lower than the low value observed in 2012. Therefore this single high point in 2016, by itself, is not affecting the TAC recommendation.

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