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**NAFO Scientific Council pre- WG-RBMS Meeting  
July 14, 2023, via Webex**

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## NAFO Scientific Council pre- WG-RBMS Meeting

July 14, 2023, via Webex

**Chair: Karen Dwyer**

### 1. Opening

Scientific Council met by Webex to discuss and finalize work arising from the 2023 June SC meeting, to be presented to WG-RBMS meeting scheduled to take place from 17-20 July 2023. The Scientific Council Chair opened the meeting at 08:05 Halifax time (UTC/GMT-3) on 14 July 2023. Participants attended from Canada, the EU, Japan, the Russian Federation and the USA. A full participants list is presented in Appendix I. The SC Coordinator and Fisheries Coordinator were appointed as rapporteurs.

### 2. MSE work

#### a) Greenland Halibut

The Chair noted that this is an update on work that was scheduled for the June SC meeting but, due to issues with Canadian survey conversion factors, it was necessary to delay completion until the present meeting. Paul Regular (Canada) reported that a meeting this week investigated conversion factors for the new Canadian survey vessels, and concluded that we will be unable to use spring 3LNO survey in this MSE. Provisional conversion factors can be used for autumn surveys, but operating models will need to be adapted to account for the additional uncertainty in survey indices.

Paul Regular presented an update on the Management Strategy Evaluation (MSE) for Greenland halibut in NAFO Subarea 2 and Divisions 3KLMNO following the results of the Scientific Council meeting that took place from 02-15 June 2023. Paul highlighted that the link to the dashboard for the SSM results of the OMs and CMPs is available in the presentation for information. The group thanked Paul for the presentation of the dashboard and recommended highlighting this to RBMS, and further explaining it for background information during the WG-RBMS meeting scheduled to take place from 17-20 July 2023.

Paul reported that the selection of OMs began with the 4 primary OMs from the last MSE, and added in alternatives using different survey series and life history options, bringing the total number to 15. These cover a range of plausibility scenarios and span a range of life-history, fishery, and survey assumptions (e.g., 8 year with low recruitment, 8 years with increased M, 110% TAC, as well as new alternatives based on limited or no Canadian survey data).

The most important OM options will be those considered to be the most plausible, and we would expect these to meet all of the performance criteria. The most extreme OMs will be of a “stress test” nature, with an expectation that they may fail some of the performance statistics.

One of the most extreme OMs, which lacks Canadian survey data in the future, is considered to be a very extreme scenario rather than something we realistically think will happen. Concerns were raised that this shows too much pessimism regarding the Canadian surveys, and so perhaps should be dropped. This will be discussed further during the coming WG-RBMS meeting.

Paul requested the group to review the proposed performance statistics from the April WG-RBMS meeting, which will be finalized during the July meeting, to ensure their accuracy.

Paul noted that the CMP being considered is the current combined slope and target MP. Though on the agenda, there was insufficient time to discuss a conceptual CMP proposed by Science (Canada).

Doug Butterworth (Japan) presented the results for Greenland halibut Candidate Management Procedure Trials for the final SCAA reference set trials. The group noted that the MP is behaving as expected, especially under the base case.

The group agreed that Paul and Doug (Rebecca) should present an overview of the results with some overarching conclusions, and with enough information so that the managers have the background that everything has been thoroughly reviewed without overwhelming them with the technical details. It was noted that it is important to ensure enough information is available so that the managers will feel comfortable with moving along with the base case.

## **b) Redfish**

Andrea Perreault (Canada) presented an update on the Management Strategy Evaluation for Redfish in NAFO Divisions 3LN following the results of the Scientific Council meeting that took place from 02-15 June 2023.

### ***i) Impacts of break in continuity of Canadian Spring RV survey***

Andrea noted that no conversion factors are available for Canadian spring survey, so that one of the three historical time series will be broken, and she showed the results of correlations between the survey series to see whether the EU and Canadian surveys capture the same trends. For surveys in 3N, there is very high correlation between EU and Canadian surveys (Doug pointed out that this correlation will need to be taken into account in the projections going forward); however, the correlation between EU and Canadian 3L spring surveys was low (approximately 0.3)

A SPiCT model was run with and without the spring series, and showed very similar model fits and trends; although without the spring survey, the view of the stock was noted to be slightly more pessimistic.

The overall conclusion is that the break in the continuity in the Canadian spring RV survey should not have a substantial impact on the current MSE workplan.

## **3. Precautionary Approach Working Group (PAWG)**

### **a) New example Div 3NO witch flounder**

A document on the reference points and alternatives for PA frameworks for 3NO witch flounder was presented to the group. The additional case study was prepared, as only one of the three stocks for the case studies looked at in June was in the danger/recovery zone, which is the zone for which management actions differ among the three options. The group agreed that having more examples would be better to facilitate the discussions and decision making for the WG-RBMS meeting next week.

It was noted that the 90%  $F_{msy}$  line in the figure for option 3 was mis-labeled, and should in fact be the 40<sup>th</sup> percentile of the  $F_{msy}$  distribution. It was further noted that the table in the document is incomplete at present and will require the addition of quantitative management actions; however, the group agreed to finalize the document as is, without adding the additional work of including the qualitative examples, and to forward the document to the WG-RBMS for discussion in the meeting taking place from 17-20 July 2023.

Adolfo suggested checking that this new example won't change any of the grey box lessons learnt from the June meeting, but it was confirmed by several participants that nothing will have changed.

Doug asked for confirmation that, where advice is given in relation to a ratio (e.g.  $B/B_{msy}$ ), we have avoided using absolute values unless great care is taken to explain how they are calculated. It was confirmed that ratios are used throughout. However, when turning the F values into actual TACs q values will have to be used to calculate appropriate advice values.

### **b) Discussion on index only stocks and initial considerations for analysis**

The group reflected on the issue of the index-based stocks in NAFO and how it has been determined that they are not fitting neatly into the PA frameworks that have been developed. The group agreed this issue requires further discussion in the Scientific Council during the simulation testing phase. Since this will be largely a science-based discussion, no substantive input is expected from RBMS at this stage, but the WG-RBMS will need to be made aware of this issue as it may result in unforeseen delays in the current workplan.

### **c) Discussion on testing of PA simulations**

Mariano Koen-Alonso (Canada) provided a presentation on simulation testing of the candidate precautionary approach frameworks for NAFO outlining a more generic process as one approach to implement simulation testing of the candidate PA frameworks.

Model selection and parameterization will allow us to simulate a range of different types of stock life history etc., while HCRs to be tested will be the rules defined within the alternative frameworks. The idea is to see how the frameworks perform for a range of different population parameters. Estimation of reference points is a separate issue and will not be addressed in this exercise. Mariano has produced these simulations in the R environment, implemented with a Schaefer surplus production model. Going forward we will need other models, eg. age structured, to look at different types of stock.

Rajeev Kumar (Canada) provided an additional presentation on an alternative approach to simulation modelling using specific stocks as examples.

The group discussed the pros and cons of both options and noted that there may need to be a PA Working Group discussion on a way forward on how to use both methods, if possible, within the current timeline. Several participants commented that the two approaches are complementary, with the generic approach allowing a wide range of life histories to be explored, while specific cases could be looked at as a second stage, noting the need to ensure that we don't end up doing full MSEs for every stock.

Mariano, Rajeev and Divya will continue to work toward a satisfactory outcome, and discussions can continue on the way forward in the context of project time-lines. If more time will be required to apply both approaches, this will be raised this with WG-RBMS.

#### **4. Other business**

No other business was discussed.

#### **5. Closing**

The meeting closed at 11:00.

**APPENDIX I. LIST OF PARTICIPANTS**

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**APPENDIX II. NAFO SCIENTIFIC COUNCIL PRE- WG-RBMS MEETING AGENDA**

14 July 2023  
via Webex

**Agenda (Virtual SC meeting July 14)**

1. Opening
2. MSE work
  - a. Greenland Halibut
    - i. OM finalization (complete at this meeting?)
    - ii. Review CMPs (including a new one proposed by Science (Canada))
    - iii. Finalize performance statistics including risk tolerances and constraints
  - b. Redfish
    - i. Impacts of break in continuity of Canadian Spring RV survey
    - ii. Presentation for RBMS:
      1. Further work on the OMs
      2. Development of performance statistics
      3. Initial discussion of CMPs
    - iii. Workplan discussion
3. PAWG
  - a. New example Div 3NO witch flounder
  - b. Discussion on index only stocks and initial considerations for analysis
  - c. Discussion on testing of PA simulations
4. Other business
5. Closing

