

Northwest Atlantic Fisheries Organization



Report of the NAFO Joint Commission-Scientific Council Working Group on Risk-Based Management Strategies (WG-RBMS) Meeting

17-18 August 2022
Halifax, Nova Scotia

NAFO
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Report of WG-RBMS,
17 -18 August 2022

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17-18 August 2022
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1. Opening by co-Chairs, Fernando González-Costas (European Union) and Ray Walsh (Canada)

The meeting was opened by the co-Chairs Fernando González-Costas (European Union) and Ray Walsh (Canada) at 09:30 hours (UTC/GMT -3 hours in Halifax, Nova Scotia) on Wednesday, 17 August 2022.

The co-Chairs welcomed participants attending in person and virtually. This included representatives from Canada, European Union, Japan, Norway, Ukraine, United Kingdom, United States of America, as well as the NAFO Scientific Council (SC) Chair and invited experts on Precautionary Approach Framework on Fisheries Management (Annex 1).

2. Appointment of Rapporteurs

The NAFO Secretariat (Ricardo Federizon, Senior Fisheries Management Coordinator and Tom Blasdale, Scientific Council Coordinator) were appointed co-Rapporteurs of this meeting.

3. Adoption of Agenda

The provisional agenda as previously circulated (NAFO 22-164) was revised prior to the start of the meeting (Annex 2).

4. Greenland halibut in NAFO Divisions 2+3KLMNO

WG-RBMS noted that, with respect to the Exceptional Circumstances (EC) arising from missing the survey data, during the 2021 Annual Meeting the Commission provided direction to the Scientific Council on the application of the Harvest Control Rule (HCR) in 2022 to provide advice for 2023.

Subsequently, in response to Commission request #2 (see COM Doc. 21-20, also SCS Doc. 22-01), SC advises that EC are not occurring. Total Allowable Catch (TAC) for 2023 derived from the HCR is 15 156 tonnes which is 5% lower than the 2022 TAC (see SCS Doc. 22-18).

As no additional ECs were identified, and in accordance with the EC protocol (NAFO Conversation and Enforcement Measures [CEM] Annex I.G), WG-RBMS noted that no further action was required at this meeting.

5. Redfish in NAFO Divisions 3LN

In response to Commission request # 9 (see COM Doc. 21-20, also SCS Doc. 22-01), SC advises that catches for 2023 should not exceed their current level of 11 500 tonnes (see SCS Doc. 22-18).

Noting that the application of the Risk-based Management Strategy and the HCR as outlined in Annex I.H of the NAFO CEM expires in 2022, and that a new Management Strategy Evaluation (MSE) process for 3LN redfish is ongoing (see below), the WG **recommends** the deletion of Article 10.bis and its associated Annex I.H of the NAFO CEM (see agenda item 10).

6. MSE processes for 2+3KLMNO Greenland halibut and 3LN redfish

In September 2021, the Commission requested SC to initiate the first steps in both the 2+3KLMNO Greenland halibut and 3LN redfish MSE processes during 2021-2022 (see COM Doc. 21-20, also SCS Doc. 22-01). In June 2022, SC reported on this progress in these processes (see SCS Doc. 22-18).

6.1 Update on Progress (Commission Request #4)

Available survey data were compiled and reviewed for 2+3KLMNO Greenland halibut. SC noted that *“within-survey coverage has been an issue for many of the surveys and conflicting patterns in disparate survey indices were highlighted.”*

For 3LN redfish, catch data were reviewed in addition to the survey data. *“There was some evidence of difference in the length composition in 3L versus 3N, both in the commercial and survey redfish catches”*. Also, *“the ASPIC-based MSE adopted in 2014 was updated with most recent data and exploration of production model formulations continues. Work has been initiated on the development of length-based models that will include both survey and commercial length frequencies.”*

SC considered that it was premature to finalize data inputs for both processes before further investigations could be considered.

6.2 Discussion on next steps/workplan

Given the update above and in consideration of the SC resource and capability gaps and prioritization issues (see SCS Doc. 22-20 – *Scientific Council 5-year Work Plan 2022*), a MSE workplan for 2023 outlining the timeline and target deliverables for the two MSE process was developed (COM-SC RBMS WP 22-07). The WG **recommends** that the Commission approve the workplan (see agenda item 10 and Annex 3).

7. Review of the NAFO PA Framework

In 2021, the Commission requested SC to continue progression on the review of the NAFO Precautionary Approach (PA) Framework in accordance with the PA Framework review work plan approved in 2020 contained in NAFO COM-SC Doc. 20-04 (see COM Doc. 21-20). In June 2022, SC reported on its progress (see SCS Doc. 22-18).

7.1 Update on Progress (Commission Request #7)

In responding to this request, SC at its meeting in June 2022 came up with these conclusions and recommendations based on the progress of its continuing work:

- The Precautionary Approach to have three zone (e.g. collapsed, cautious, and healthy zones) with associated reference points: B_{lim} based on unacceptable or irreversible outcomes, and B_{target} based on optimal yield objectives.
- The selection of an adaptable F_{target} based in approaches similar to F_{eco} (e.g. adjusting target F based on ecosystem conditions), as well as a “soft limit” for B_{lim} which would help to account for both ecosystem considerations and a more stable estimation of uncertainties.
- The updated PA Framework to have clearly identified default probability levels to be used for advice unless otherwise specified.
- The stocks managed with MSE may not require the estimation of all reference points, but performance metrics and objectives used in MSE development need to be consistent with the PA.

In addition, SC meet in July 2022 to finalize and summarize the main conclusions and recommendations made by the SC Precautionary Approach Working group (PA-WG) which are detailed in SCS Doc. 22-02 and SCS Doc. 22-15. The meeting clarified some elements of the PA Framework: B_{lim} , acceptable risk of falling below B_{lim} , F_{msy} and F_{target} , B_{msy} , response to falling stock size, highly variable stocks/escapement strategy, ecosystem considerations, and recovery plans. Also discussed were alternative PA Frameworks that reflect the main recommendations and conclusions of the PA-WG. The meeting results are documented SCS Doc. 22-19 and were presented in the WG-RBMS PA Framework Workshop which was held in 15-16 August 2022 (see below).

7.2 Discussion of the Results of the PA Framework Workshop and Next Steps

The WG-RBMS PA Framework Workshop which was held in 15-16 August 2022. There were 45 workshop participants including NAFO scientists, external experts, managers, and the representatives from the fishing industry. They participated in their personal capacity. The purpose of the workshop was to gather input from fisheries managers, policy advisors and stakeholders on potential revisions or additions to NAFO's PA Framework, in view of informing the Commission's consideration of a revised PA Framework. The results and conclusions of the workshop is contained in COM-SC RBMS-WP 22-05 (see Annex 4).

The WG summarized these conclusions as follows:

- The analysis of the current NAFO PA Framework indicated that, if fully implemented, the current framework can deliver on many NAFO objectives. However, there may be ways to improve the current framework's effectiveness and better align it with the revised NAFO Convention.
- The conclusions of the PA Framework Revision workshop support the basic ideas of the current NAFO PA Framework, in particular the definition of the boundary reference points (B_{lim} and F_{lim}) as well as the pre-agreed management actions that are conditional on stock status and fishing status.
- The workshop also discussed possible revisions, clarifications, and additions to the current Framework such as: The establishment of a F_{target} as well as the possible implementation of an intermediate biomass reference point or multiple biomass reference points that are between B_{lim} and B_{msy} .
- The conclusions also recognise that stock recovery plans may be needed in some special cases, however, they should not be an explicit component of the framework.
- It was noted that different (or at least more flexible) approaches will be needed with respect to application of the PA Framework for stocks with sporadic/episodic recruitments, both short-lived (e.g. capelin) and longer-lived (e.g. redfish) stocks.

The WG-RBMS PA Framework Workshop arrived at a series of general conclusions toward updating the NAFO PA Framework, but further work is required in order to formalize proposals on what a revised NAFO PA Framework could look like. This follow-up work, building upon the results from the 1st PA Framework workshop, would;

1. Develop a small set of revised PA Frameworks based on the conclusions of the workshop. These revised PA Frameworks would consider plausible choices for zones, reference/operational points, proxies, and probability levels based on the discussion and conclusions from the 1st PA Framework workshop.
2. Apply in an illustrative way the revised PA Framework to selected NAFO stocks, and as much as possible examine how the SC advice may have differed under the revised PA Frameworks.

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3. Select the revised PA Frameworks and/or the key features within those frameworks that will need to be considered for the development of simulation testing (e.g. reference points, proxies, risk levels, HCRs, etc), as well as the generalized life histories that would be considered in the simulation testing exercise.

Given the update above and in consideration of the SC resource and capability gaps and prioritization issues (see SCS Doc. 22-20 – *Scientific Council 5-year Work Plan 2022*), a revised workplan outlining the timeline was developed (COM-SC RBMS WP 22-05). The WG **recommends** that the Commission approve the workplan (see agenda item 10 and Annex 5).

The PA work is expected to be undertaken during the regular July 2023 WG-RBMS meeting, and it is expected to be informed by any progress on this matter emerging from the intersessional WG-RBMS meeting in the spring of 2023, as well as the work done by SC and its PA-WG.

8. Implementation of 2018 Performance Review Panel recommendations

The co-Chairs recalled Recommendations 2, 3 and 27 of the 2018 Performance Review Panel (see COM WP 21-17) and updated the status of implementation to “*Completed*”.

The Working Group also noted Recommendation 26 which states “*NAFO makes all working documents publicly available, unless otherwise requested by a Contracting Party or subject to confidentiality rules*”. The Working Group reiterated its general support for ongoing efforts to enhance transparency while mindful of confidentiality constraints, e.g., catch data.

9. Other Matters

SC Workload. The SC Chair re-iterated the issue of heavy workload among its members, which is not sustainable. The document SCS 22-05 *Scientific Council 5-year Plan 2022* was recalled highlighting the workload, including among others, the work on PA Framework, EAF, MSE and the resource gaps in completing the tasks. SC appealed to the WG to be cognizant of this predicament when formulating recommendations to the Commission.

10. Recommendations

The working group agreed to the following conclusions and recommendations:

In regard to the review of the Precautionary Approach (PA) Framework:

1. **WG-RBMS supports the conclusions reached at the PA Framework Workshop (COM-SC RBMS-WP 22-05)**
2. **WG-RBMS recommends that the Commission approve the updated workplan for the revision of the NAFO Precautionary Approach Framework (COM-SC RBMS-WP 22- 06)**

In regard to ongoing MSE processes for 3LN Redfish and 2+3KLMNO Greenland halibut:

3. **WG-RBMS recognizes the Scientific Council workload and the progress that has been made to date. It recommends that both processes continue to advance in parallel, to the extent possible, including approving the 2023 workplan (COM-SC RBMS-WP 22-07).**

In regard to 3LN Redfish:

4. **WG-RBMS recommends deleting the text of NAFO CEM Article 10 bis, Redfish Conservation Plan and Harvest Control Rule, and the associated Annex I.H., noting that a new Management Strategy for this stock is currently under development.**

11. Adoption of the Report

The report was adopted via correspondence.

12. Adjournment

The meeting was adjourned at 11:30 hours (UTC/GMT -3 hours Time in Halifax, Nova Scotia) on 18 August 2022.

Annex 1. List of Participants

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Annex 2. Agenda

1. Opening by co-Chairs, Fernando González-Costas (European Union) and Ray Walsh (Canada)
2. Appointment of Rapporteur
3. Adoption of Agenda
4. Greenland Halibut in NAFO Divisions 2+3KLMNO
Scientific Council advice on the 2023 TAC, Harvest Control Rule and Exceptional Circumstances Protocol (Commission Request #2)
5. Redfish in NAFO Divisions 3LN.
Scientific Council advice including evaluation of impacts according to the performance statistics (Commission Request #9)
6. MSE processes for 2+3KLMNO Greenland halibut and 3LN redfish
 - 6.1 Update on Progress (*Commission Request #4*)
 - 6.2 Discussion of Next Steps/ Workplan
7. Review of the NAFO PA Framework
 - 7.1 Update on Progress (*Commission Request #7*).
 - 7.2 Discussion of the Results of the PA Framework Workshop and Next Steps
8. Implementation of 2018 Performance Review Panel Recommendations
9. Other Matters
10. Recommendations
11. Adoption of the Report
12. Adjournment

Annex 3. 2023 Management Strategy Evaluation Workplan
(COM-SC RBMS-WP 22-07)

DATE	NAFO BODY	GHL MSE	3LN REDFISH
Early 2023	SC	Finalize data series to be used for the MSE	Finalize data series to be used for the MSE
April 2023	WG-RBMS (1)	Schedule finalized and proposed to the Commission; propose conceptual initial Candidate Management Procedures (CMPs); identify management objectives/ performance statistics	Schedule finalized and proposed to the Commission; initiate discussion on management objectives, conceptual initial CMPs, potential OMs, and performance statistics.
June 2023	Scientific Council	Proposal and review and finalization of Operating Models (OMs) to be used; consensus required at this time; preliminary application of initial CMPs.	Proposal and review of OMs to be used
July 2023	WG-RBMS (2)	Finalize CMPs; refinement of performance statistics including risk tolerances and constraints	Continued progress on OMs, development of performance statistics; development of CMPs.,
1) Timelines are notional and subject to revision based on workload, capacity and unanticipated problems.			
2) Contracting Parties are encouraged to submit proposed initial CMPs, management objectives and performance statistics for consideration in advance of the April WG-RBMS meeting.			

Annex 4. PA Framework Workshop Conclusions (COM-SC RBMS-WP 22-05)

PA Framework Conclusions (numbering does not imply priority)

1. Blim should represent seriously impaired productivity (e.g., the point of impaired recruitment), derived from stock-recruitment information if possible or proxies (e.g., 30-40% Bmsy, Brecover; depending on available information).
 - a. Management should be based on very low risk of $B < B_{lim}$ (e.g., 5-10% risk, defined by managers).
 - b. Recent and projected stock trajectory (and other information like age structure, environmental conditions, etc.) should be considered for determining appropriate management actions to achieve low risk of $B < B_{lim}$.
2. Many PA systems have implemented the UN 1995 Straddling Stocks Agreement by defining $F_{lim} = F_{msy}$, recognizing that $F_{lim} = F_{msy}$ is not directly associated with Blim or impaired productivity.
3. Uncertainty and risk need to be addressed in the PA Framework, and the framework needs to be implemented with the information available (e.g., buffers require defined limit reference points and estimates of uncertainties or proxies; risk evaluation requires limit reference points and projected uncertainty).
4. F_{target} can be defined using several alternatives: a fraction of F_{msy} (~80-85% F_{msy}), risk of $F > F_{lim}$, a F lower than F_{msy} that produces nearly MSY (e.g., 90-95%MSY), $F_{40\%MSP}$, or $F_{0.1}$.
 - a. F_{eco} as a target needs more development and communication with managers.
5. B_{target} is not needed in the framework, but B_{msy} is necessary as a performance statistic to meet principle b of the NAFO Convention (*"to ensure that fishery resources are maintained at or restored to levels capable of producing maximum sustainable yield"*)
6. The PA Framework could benefit from an intermediate biomass reference point or multiple biomass reference points that are between Blim and Bmsy so that management actions can be implemented earlier as the stock approaches Blim.
 - a. Intermediate biomass reference points can be derived from uncertainty in the assessment (e.g., B_{buf}), a multiple of Blim (e.g., $B_{isr} = 2B_{lim}$ proposed for 3NO cod), a fraction of Bmsy, or impairment of ecological role.
 - b. Management action would be based on a probability of falling below the intermediate reference points, and the risk tolerance would be greater for higher biomass reference points.
7. The PA Framework requires pre-agreed management actions that are conditional on stock status and fishing status.
 - a. As examples, the current NAFO PA Framework has pre-agreed management actions:
 - i. in the Safe Zone, *"select and set fishing mortality from a range of F values that have a low probability of exceeding F_{lim} ..."*;
 - ii. in the Overfishing Zone, *"reduce F to below F_{buf} "*;

- iii. in the Cautionary Zone, *“The closer stock biomass is to Blim, the lower F should be below Fbuf to ensure that there is a very low probability that biomass will decline below Blim within the foreseeable future”*;
 - iv. in the Danger Zone, *“Reduce F to below Fbuf. The closer stock biomass is to Blim, the lower F should be below Fbuf to ensure that there is a very low probability that biomass will decline below Blim within the foreseeable future”*; and
 - v. in the Collapse Zone, *“F should be set as close to zero as possible”*.
- b. Prescribed management actions can be qualitative (e.g., reduce F when B approaches Blim) or applying a functional harvest control rule (target F a function of B)
 - c. Performance testing of the PA Framework requires formulaic management actions (e.g., a function of stock biomass)
 - d. Flexibility will be needed for implementation, because a single HCR is not expected to be appropriate for all NAFO stocks.
8. PA Framework should promote rebuilding of depleted stocks.
- a. Stock recovery plans may be needed when the general PA Framework is not effective, but they should not be an explicit component of the framework.
9. Flexibility will be needed to implement the PA Framework for short-lived stocks or stocks with sporadic recruitment.
- a. An escapement strategy could be based on Blim but might require flexibility in risk tolerance.
 - b. Effective management of long-lived stocks with sporadic recruitment needs further development.
10. Participants highlighted the need for a follow-up meeting of manager and scientists to further discuss the concepts considered at the initial workshop. The objective of the meeting would be to present some additional information that could help inform the development of a proposed revision of the NAFO PA Framework.

Annex 5. NAFO Precautionary Approach Framework Revision - Revised Workplan
(COM-SC RBMS-WP 22-06)

- Review of and proposal for ToRs related to mapping objectives: ToRs 1a, 1c and 1g.
Deadline for results to SC: June 2021
- Present results to WG-RBMS after the June SC
- Review of and proposal for ToRs related to structural aspects and quantification of uncertainty and risk. Deadline for results to SC: ToRs 1b, 1d, 1e and 1f.
Deadline for results November 2021
- The work in the previous bullet points would need to cover the data continuum, so that the framework could be applied to all NAFO stocks (data rich and data poor).
- Consider broad associated implications for stocks managed using a Management Procedure (HCR) based on a MSE.
- Workshop - (including the group of scientists and managers and stakeholders), around March 2022, to address the entire ToR and make a proposal of revision of the NAFO PA Framework (to be later reviewed by the WG-RBMS).
Note: Delayed until August 2022.
- WG-RBMS 2022, reviewed the latest SC progress report (June 2022) on the PAF, as well as, the conclusions from the 1st PAF workshop (August 2022); and, prepared a revised workplan.
- SC to prepare additional information to inform discussion at WG-RBMS in 2023.
- Time for Contracting Parties internal discussions and further work if required
- WG-RBMS July 2023, review additional information from SC and propose draft revised framework
- Provisional draft framework to be considered by the NAFO Commission in September 2023, for endorsement in advance of simulation testing.
- SC June 2024, complete simulation testing
- WG-RBMS 2024, review the results of SC simulation testing and recommend revised PA Framework to Commission
- Sept 2024, Commission decision on adoption of revised PA Framework