Northwest Atlantic Fisheries Organization

Serial No. N6996

NAFO/COM Doc. 19-29
[Adopted]

41st ANNUAL MEETING OF NAFO - SEPTEMBER 2019

The Commission's Request for Scientific Advice on Management in 2021 and Beyond of Certain Stocks in Subareas 2, 3 and 4 and Other Matters

Following a request from the Scientific Council, the Commission agreed that items 1, 2, 7, 8 and 11 should be the priority for the June 2020 Scientific Council meeting.

1. The Commission requests that the Scientific Council provide advice for the management of the fish stocks below according to the assessment frequency presented below. In keeping with the NAFO Precautionary Approach Framework (FC Doc. 04/18), the advice should be provided as a range of management options and a risk analysis for each option (rather than a single TAC recommendation) and the actual risk level should be decided upon by managers.

Yearly basis	Two-year basis	Three-year basis
Cod in Div. 3M Northern shrimp in Div. 3M	Redfish in Div. 3M Northern shrimp in Div. 3LNO Thorny skate in Div. 3LNO Witch flounder in Div. 3NO Redfish in Div. 3LN White Hake in Div. 3NO	American Plaice in Div. 3LNO American Plaice in Div. 3M Capelin in Div. 3NO Northern shortfin squid in SA 3+4 Redfish in Div. 3O Yellowtail flounder in Div. 3LNO Greenland halibut in Div. 2+3KLMNO Cod in Div. 3NO Splendid alfonsino in SA 6

To implement this schedule of assessments, the Scientific Council is requested to conduct a full assessment of these stocks as follows:

In 2020, advice should be provided for 2021 for Cod in 3M and Northern shrimp in 3M. With respect to Northern shrimp in 3M, SC is requested to provide its advice to the Commission prior to the 2020 Annual Meeting.

In 2020, advice should be provided for 2021 and 2022 for: Thorny Skate in 3LNO,

In 2020, advice should be provided for 2021, 2022 and 2023 for: American Plaice in 3M,

Advice should be provided using the guidance provided in **Annexes A or B as appropriate**, or using the predetermined Harvest Control Rules in the cases where they exist, currently Greenland halibut 2+3KLMNO.

The Commission also requests the Scientific Council to continue to monitor the status of all other stocks annually and, should a significant change be observed in stock status (e.g. from surveys) or in bycatch in other fisheries, provide updated advice as appropriate.

2. The Commission requests the Scientific Council to conduct an update assessment of Greenland halibut in Subarea 2+Div 3KLMNO and to compute the TAC using the agreed HCR and determine whether exceptional circumstances are occurring. If exceptional circumstances are occurring, the exceptional circumstances protocol will provide guidance on what steps should be taken.

3. The Commission requests that Scientific Council continue its evaluation of the impact of scientific trawl surveys on VME in closed areas, and the effect of excluding surveys from these areas on stock assessments.

4. The Commission requests the Scientific Council to implement the steps of the Action plan relevant to the SC and in particular the tasks identified under section 2.2 of the Action Plan, for progression in the management and minimization of Bycatch and discards (COM Doc. 17-26), giving priority in 2020 to the identification of discard species/ stocks listed in Annex I.A. and Annex I.B of the NCEM with high survivability rates.

5. The Commission requests the Scientific Council to continue to refine its work under the Ecosystem Approach and report on these results to both the WGEAFFM and WGRBMS.

6. In relation to the assessment of NAFO bottom fisheries in 2021, the Scientific Council should:

   - Assess the overlap of NAFO fisheries with VME to evaluate fishery specific impacts in addition to the cumulative impacts;
   - Consider clearer objective ranking processes and options for objective weighting criteria for the overall assessment of significant adverse impacts and the risk of future adverse impacts;
   - Maintain efforts to assess all of the six FAO criteria (Article 18 of the FAO International Guidelines for the Management of Deep Sea Fisheries in the High Seas) including the three FAO functional SAI criteria which could not be evaluated in the current assessment (recovery potential, ecosystem function alteration, and impact relative to habitat use duration of VME indicator species).
   - Continue to work on non-sponge and coral VMEs (for example bryozoan and sea squirts) to prepare for the next assessment.

7. The Commission requests Scientific Council to conduct a re-assessment of VME closures by 2020, including area #14.

8. The Commission requests the Scientific Council to continue progression on the review of the NAFO PA Framework.

9. The Commission requests Scientific Council continue to work with WG- BDS and the Secretariat to identify areas and times where bycatch and discards of Greenland sharks have a higher rate of occurrence. This work will support WG-BDS in developing appropriate management recommendations, including safe handling practices for live release of Greenland sharks, for consideration by the Commission at its 2021 Annual Meeting.

10. The Commission requests Scientific Council to continue to develop a 3-5 year work plan, which reflects requests arising from the 2019 Annual Meeting, other multi-year stock assessments and other scientific inquiries already planned for the near future. The work plan should identify what resources are necessary to successfully address these issues, gaps in current resources to meet those needs and proposed prioritization by the Scientific Council of upcoming work based on those gaps.

11. The Commission requests that Scientific Council do an update assessment for 3LN redfish and five year projections (2021 to 2025) to evaluate the impact of annual removals at 18 100 tonnes against the performance statistics from NCEM Annex I.H: If this level of catch does not result in fulfilling these performance statistics, SC should advise the level of catch that would.

12. The Commission request that the Scientific Council present the Ecosystem Summary Sheet for 3LNO for presentation to the Commission at the 2020 Annual Meeting.

13. The Commission request the Scientific Council review submitted protocols for a survey methodology to inform the assessment of Splendid Alfonsino. The Scientific Council to report on the outcome of this work at next Commission annual meeting.

14. The COM request that the results of the stock assessment and the scientific advice of Cod 2J3KL (Canada), Witch 2J3KL (Canada) and Pelagic *Sebastes mentella* (ICES Divisions V, XII and XIV; NAFO 1) to be presented to the Scientific Council (SC), and request the SC to prepare a summary of these assessments to be included in its annual report.

15. The Commission to ask the Scientific Council to advise on the possible sustainable management methods for northern shrimp in Div. 3M, including quota, fishing effort, periods, reporting or other technical measures. This advice should be provided before the intersessional work by the end of this year.

16. The Commission requests Scientific Council to continue to monitor and provide updates resulting from relevant research related to the potential impact of activities other than fishing in the Convention Area (for example via EU ATLAS project), and where possible to consider these results in the on-going modular approach concerning the development of Ecosystem Summary Sheets.

17. The Commission requests the Scientific Council to provide advice on gear, including sorting grids, area and time-based measures that can be used to protect and improve the productivity of the 3M Cod stock.

18. The Commission requests the Scientific Council to provide information to the Commission at its next annual meeting on sea turtles, sea birds, and marine mammals that are present in NAFO Regulatory Area based on available data.

ANNEX A: Guidance for providing advice on Stocks Assessed with an Analytical Model

The Commission request the Scientific Council to consider the following in assessing and projecting future stock levels for those stocks listed above. These evaluations should provide the information necessary for the Fisheries Commission to consider the balance between risks and yield levels, in determining its management of these stocks:

1. For stocks assessed with a production model, the advice should include updated time series of:

   - Catch and TAC of recent years;
   - Catch to relative biomass;
   - Relative Biomass;
   - Relative Fishing mortality;
   - Stock trajectory against reference points; and
   - Any information the Scientific Council deems appropriate.

   Stochastic short-term projections (3 years) should be performed with the following constant fishing mortality levels as appropriate:

   - For stocks opened to direct fishing: 2/3 F_{msy}, 3/4 F_{msy} 85% F_{msy}, 75% F_{2019}, F_{2019}, 125% F_{2019},
   - For stocks under a moratorium to direct fishing: F_{2019}, F = 0.

   The first year of the projection should assume a catch equal to the agreed TAC for that year.

   Results from stochastic short-term projection should include:

   - The 10%, 50% and 90% percentiles of the yield, total biomass, spawning stock biomass and exploitable biomass for each year of the projections
   - The risks of stock population parameters increasing above or falling below available biomass and fishing mortality reference points. The table indicated below should guide the Scientific Council in presenting the short-term projections.

				Limit reference points													
				P(F>F_{lim})			P(B<B_{lim})				P(F>F_{msy})			P(B<B_{msy})			P(B2022 > B2018)
F in 2019 and following years*	Yield 2020 (50%)	Yield 2021 (50%)	Yield 2022 (50%)	2020	2021	2022	2020	2021	2022		2020	2021	2022	2020	2021	2022	
2/3 F_{msy}	t	t	t	%	%	%	%	%	%		%	%	%	%	%	%	%
3/4 F_{msy}	t	t	t	%	%	%	%	%	%		%	%	%	%	%	%	%
85% F_{msy}	t	t	t	%	%	%	%	%	%		%	%	%	%	%	%	%
F_{msy}	t	t	t	%	%	%	%	%	%		%	%	%	%	%	%	%
0.75 X F_{2018}	t	t	t	%	%	%	%	%	%		%	%	%	%	%	%	%
F_{2018}	t	t	t	%	%	%	%	%	%		%	%	%	%	%	%	%
1.25 X F_{2018}	t	t	t	%	%	%	%	%	%		%	%	%	%	%	%	%
F=0	t	t	t	%	%	%	%	%	%		%	%	%	%	%	%	%

2. For stock assessed with an age-structured model, information should be provided on stock size, spawning stock sizes, recruitment prospects, historical fishing mortality. Graphs and/or tables should be provided for all of the following for the longest time-period possible:

   - Historical yield and fishing mortality;
   - Spawning stock biomass and recruitment levels;
   - Stock trajectory against reference points; and
   - Any information the Scientific Council deems appropriate.

   Stochastic short-term projections (3 years) should be performed with the following constant fishing mortality levels as appropriate:
   - For stocks opened to direct fishing: $F_{0.1}$, F_{max}, 2/3 F_{max}, 3/4 F_{max}, 85% F_{max}, 75% F_{2019}, F_{2019}, 125% F_{2019},
   - For stocks under a moratorium to direct fishing: F_{2019}, F = 0.

   The first year of the projection should assume a catch equal to the agreed TAC for that year.

   Results from stochastic short-term projection should include:
   - The 10%, 50% and 90% percentiles of the yield, total biomass, spawning stock biomass and exploitable biomass for each year of the projections
   - The risks of stock population parameters increasing above or falling below available biomass and fishing mortality reference points. The table indicated below should guide the Scientific Council in presenting the short-term projections.

				Limit reference points														
				P(F.>F_{lim})			P(B<B_{lim})			P(F>F0.1)			P(F>F_{max})			P(B2022 > B2018)
F in 2019 and following years*	Yield 2020	Yield 2021	Yield 2022	2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022	
F0.1	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
F_{max}	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
66% F_{max}	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
75% F_{max}	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
85% F_{max}	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
0.75 X F_{2018}	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
F_{2018}	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%
1.25 X F_{2018}	t	t	t	%	%	%	%	%	%	%	%	%	%	%	%	%

ANNEX B. Guidance for providing advice on Stocks Assessed without a Population Model

For those resources for which only general biological and/or catch data are available, few standard criteria exist on which to base advice. The stock status should be evaluated in the context of management requirements for long-term sustainability and the advice provided should be consistent with the precautionary approach.

The following graphs should be presented, for one or several surveys, for the longest time-period possible:

a) time trends of survey abundance estimates
b) an age or size range chosen to represent the spawning population
c) an age or size-range chosen to represent the exploited population
d) recruitment proxy or index for an age or size-range chosen to represent the recruiting population.
e) fishing mortality proxy, such as the ratio of reported commercial catches to a measure of the exploited population.
f) Stock trajectory against reference points

And any information the Scientific Council deems appropriate.