Northwest Atlantic Fisheries Organization

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31st ANNUAL MEETING – SEPTEMBER 2009

FISHERIES COMMISSION'S REQUEST FOR SCIENTIFIC ADVICE ON MANAGEMENT IN 2011 AND BEYOND OF CERTAIN STOCKS IN SUBAREAS 2, 3 AND 4 AND OTHER MATTERS

Mindful of the desire to move to a risk-based approach in the management of fish stocks, Fisheries Commission with the concurrence of the Coastal State as regards to the stocks below which occur within its jurisdiction, requests the Scientific Council, in the provision of advice, to provide a range of management options as well as a risk analysis for each option as outlined in the provisions below, rather than a single TAC recommendation.

1. The Fisheries Commission with the concurrence of the Coastal State as regards the stocks below which occur within its jurisdiction, requests that the Scientific Council, at a meeting in advance of the 2010 Annual Meeting, provide advice on the scientific basis for the management of the following fish and invertebrate stocks or groups of stocks in 2011:

Northern shrimp in Div. 3M, 3LNO
Greenland halibut in SA 2 and Div. 3KLMNO

Noting that SC will meet in October of 2009, FC requests SC to update its advice for 2010, as well as to provide advice for 2011, for both shrimp stocks referenced above.

2. The Fisheries Commission with the concurrence of the Coastal State as regards the stocks below which occur within its jurisdiction, requests that the Scientific Council, at a meeting in advance of the 2010 Annual Meeting, provide advice on the scientific basis for the management of the following fish stocks according to the following assessment frequency (unless Fisheries Commission requests additional assessments) :

Two year basis	Three year basis
American plaice in Div. 3LNO	American plaice in Div. 3M
Capelin in Div. 3NO	Cod in Div. 3NO
Cod in Div. 3M	Northern shortfin squid in SA 3+4
Redfish in Div 3LN	Redfish in Div. 3O
Redfish in Div. 3M	Witch flounder in Div. 2J+3KL
Thorny skate in Div. 3LNOPs	Witch flounder in Div. 3NO
White hake in Div. 3NOPs	
Yellowtail flounder in Div. 3LNO	

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

In 2010, advice should be provided for 2011 and 2012 for thorny skate in Div. 3LNOPs, for redfish in Div. 3LN and for cod in Div. 3M and for 2011, 2012 and 2013 for redfish in Div. 3O, for cod in Div. 3NO, and for witch flounder in Div. 2J+3KL.

- In 2008, advice was provided for 2009, 2010 and 2011 for cod in Div. 3M, American plaice in Div. 3M, witch flounder in Div. 3NO, and northern shortfin squid in SA 3+4. These stocks will be next assessed in 2011. For cod in Div. 3M, the Scientific Council conducted full assessments and provided advice in 2008 and 2009 for this stock.

- In 2009, advice was provided for 2010 and 2011 for American plaice in Div. 3LNO, yellowtail flounder in Div. 3LNO, redfish in Div. 3M, white hake in Div. 3NO and capelin in Div. 3NO. These stocks will next be assessed in 2011. [see also item 12 for an additional request for American plaice in 3LNO]

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

3. The Commission and the Coastal State 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:

a) The preferred tool for the presentation of a synthetic view of the past dynamics of an exploited stock and its future development is a stock assessment model, whether age-based or age-aggregated.

b) For those stocks subject to analytical-type assessments, the status of the stocks should be reviewed and catch options evaluated in terms of their implications for fishable stock size in both the short and long term. As general reference points, the implications of fishing at $F_{0.1}$ and F_{2009} in 2011 and subsequent years should be evaluated. The present stock size and spawning stock size should be described in relation to those observed historically and those expected in the longer term under this range of options.

c) For those stocks subject to general production-type assessments, the time series of data should be updated, the status of the stock should be reviewed and catch options evaluated in the way described above to the extent possible. In this case, the level of fishing effort or fishing mortality (F) required to take two-thirds MSY catch in the long term should be calculated.

d) 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.

e) Spawning stock biomass levels considered necessary for maintenance of sustained recruitment should be recommended for each stock. In those cases where present spawning stock size is a matter of scientific concern in relation to the continuing reproductive potential of the stock, options should be offered that specifically respond to such concerns.

f) Information should be provided on stock size, spawning stock sizes, recruitment prospects, fishing mortality, catch rates and catches implied by these management strategies for the short and the long term in the following format:

I. For stocks for which analytical-type assessments are possible, graphs should be provided of all of the following for the longest time-period possible:
   - historical yield and fishing mortality;
   - spawning stock biomass and recruitment levels;
   - catch options for the year 2011 and subsequent years over a range of fishing mortality rates (for as many years as the data allow)
   - (F) at least from $F_{0.1}$ to F_{max};
   - spawning stock biomass corresponding to each catch option;
   - yield-per-recruit and spawning stock per recruit values for a range of fishing mortalities.

II. For stocks for which advice is based on general production models, the relevant graph of production as a function of fishing mortality rate or fishing effort should be provided. Age aggregated assessments should also provide graphs of all of the following for the longest time period possible:

- exploitable biomass (both absolute and relative to B_{MSY})
- yield/biomass ratio as a proxy for fishing mortality (both absolute and relative to F_{MSY})
- estimates of recruitment from surveys, if available.

III. Where analytical methods are not attempted, the following graphs should be presented, for one or several surveys, for the longest time-period possible:
- time trends of survey abundance estimates, over:
- an age or size range chosen to represent the spawning population
- an age or size-range chosen to represent the exploited population
- recruitment proxy or index for an age or size-range chosen to represent the recruiting population.
- fishing mortality proxy, such as the ratio of reported commercial catches to a measure of the exploited population.

For age-structured assessments, yield-per-recruit graphs and associated estimates of yield-per-recruit based reference points should be provided. In particular, the three reference points, actual F, $F_{0.1}$ and F_{max} should be shown.

4. Noting the Precautionary Approach Framework as endorsed by Fisheries Commission, the Fisheries Commission requests that the Scientific Council provide the following information for the 2010 Annual Meeting of the Fisheries Commission for all stocks under its responsibility requiring advice for 2011:

a) the limit and precautionary reference points as described in Annex II of the UN Fisheries Agreement indicating areas of uncertainty (for those stocks for which precautionary reference points cannot be determined directly, proxies should be provided);
b) the stock biomass and fishing mortality trajectory over time overlaid on a plot of the PA Framework (for those stocks where biomass and/or fishing mortality cannot be determined directly, proxies should be used);
c) information regarding the current Zone the stock is within as well as proposals regarding possible harvest strategies which would move the resource to (or maintain it in) the Safe Zone, including medium term considerations and associated risk or probabilities which will assist the Commission in developing the management strategies described in paragraphs 4 and 5 of Annex II in the Agreement.

5. The following elements should be taken into account by the Scientific Council when considering the Precautionary Approach Framework:

a) References to “risk” and to “risk analyses” should refer to estimated probabilities of stock population parameters falling outside biological reference points.
b) Where reference points are proposed by the Scientific Council as indicators of biological risk, they should be accompanied by a description of the nature of the risk associated with crossing the reference point such as recruitment overfishing, impaired recruitment, etc.
c) When a buffer reference point is proposed in the absence of a risk evaluation in order to maintain a low probability that a stock, measured to be at the buffer reference point, may actually be at or beyond the limit reference point, the Scientific Council should explain the assumptions made about the uncertainty with which the stock is measured.
d) Wherever possible, short and medium term consequences should be identified for various exploitation rates (including no fishing) in terms of yield, stability in yield from year to year, and the risk or probability of maintaining the stock within, or moving it to, the Safe Zone. Whenever possible, this information should be cast in terms of risk assessments relating fishing mortality rates to the trends in biomass (or spawning biomass), the risks of stock collapse and recruitment overfishing, as well as the risks of growth overfishing, and the consequences in terms of both short and long term yields.
e) When providing risk estimates, it is very important that the time horizon be clearly spelled out. By way of consequence, risks should be expressed in timeframes of 5, 10 and 15 years (or more), or in terms of other appropriate year ranges depending on stock specific dynamics. Furthermore, in

order to provide the Fisheries Commission with the information necessary to consider the balance between risks and yield levels, each harvesting strategy or risk scenario should include, for the selected year ranges, the risks and yields associated with various harvesting options in relation to B_{lim},

6. Many of the stocks in the NAFO Regulatory Area are well below any reasonable level of B_{lim} or B_{buf}. For these stocks, the most important task for the Scientific Council is to inform on how to rebuild the stocks. In this context and building on previous work of the Scientific Council in this area, the Scientific Council is requested to evaluate various scenarios corresponding to recovery plans with timeframes of 5 to 10 years, or longer as appropriate. This evaluation should provide the information necessary for the Fisheries Commission to consider the balance between risks and yield levels, including information on the consequences and risks of no action at all.

   a) information on the research and monitoring required to more fully evaluate and refine the reference points described in paragraphs 1 and 3 of Annex II of the Agreement; these research requirements should be set out in the order of priority considered appropriate by the Scientific Council;
   b) any other aspect of Article 6 and Annex II of the Agreement which the Scientific Council considers useful for implementation of the Agreement's provisions regarding the precautionary approach to capture fisheries; and
   c) propose criteria and harvest strategies for new and developing fisheries so as to ensure they are maintained within the Safe Zone.
   d) Provide, at its annual meeting in 2010, an overview of strategies to recover depleted fish stocks in the Northwest Atlantic, taking into account the proceedings of the NAFO co-sponsored "ICES PICES UNCOVER Symposium on Rebuilding Depleted Fish Stocks - Biology, Ecology, Social Science and Management Strategies" which is to take place November 3-6 2009 in Warnemünde, Germany.

7. Noting the FC Rebuilding Plan for 3NO cod adopted in September 2007, Fisheries Commission requests Scientific Council to advise, before September 2010, on possible measures the Commission may consider to ensure by-catch of cod is kept at the lowest possible level.

8. Recognizing the initiatives on vulnerable marine ecosystems (VME) through the work of the WGFMS, and with a view to completing fishery impact assessments at the earliest possible date, the Scientific Council is requested to provide the Fisheries Commission at its next annual meeting in 2010:

   a) guidance on the content of fishing plans/initial assessments for the purpose of evaluating significant adverse impacts on VMEs and identify viable risk evaluation methodologies for the standardized assessment of fishery impacts.

   b) In light of the use of existing encounter protocols in tandem with the closed areas for corals and sponges:
      i. assess new and developing methodologies that may inform the Fisheries Commission on any future review of the thresholds levels
      ii. review and report on new commercial bycatch information as it becomes available, and.
      iii. in light of i.) review the ability of the current encounter threshold values of 60 kg live coral and 800 kg sponge to detect new VME areas as opposed to cumulative catches of isolated individuals.

9. Recognizing that areas closed to all bottom fishing activities for the protection of vulnerable marine ecosystems as defined in Article 15, including inter alia:
   • Fogo Seamounts 1
   • Fogo Seamounts 2
   • Orphan Knoll
   • Corner Seamounts
   • Newfoundland Seamounts
   • New England Seamounts

   and associated protocols for vessels conducting exploratory fishing in those areas, expire on December 31, 2010.

Mindful of the call for review of the above measures based on advice from the Scientific Council, Fisheries Commission requests that Scientific Council:

a) Review any new scientific information on the Fogo Seamounts 1, Fogo Seamounts 2, Orphan Knoll, Corner Seamounts, Newfoundland Seamounts and New England Seamounts which may support or refute the designation of these areas as vulnerable marine ecosystems.
b) Review any exploratory fishing activity on the seamounts in the context of significant adverse impact to vulnerable marine ecosystems and review current exploratory fishing data collection protocols operating in the seamount closure areas as defined in Article 15 for their usefulness in providing scientific information.
c) Review the potential for significant adverse impact of pelagic, long-line and other fishing gear types other than mobile bottom gear on seamount vulnerable marine ecosystems.

10. With respect to Northern shrimp (*Pandalus borealis*) in Div. 3LNO, noting the NAFO Framework for Precautionary Approach and recognizing the desire to demonstrate NAFO's commitment to applying the precautionary approach, Fisheries Commission requests the Scientific Council to :

    a) identify F_{msy}
    b) identify B_{msy}
    c) provide advice on the appropriate selection of an upper reference point for biomass (e.g. B_{buf})

    Fisheries Commission also requests the Scientific Council to provide information on the effect of the following catch levels in 2011 of 24,000t, 27,000t and 30,000t on the projected SSB and provide risk analyses where possible.

11. In considering the possible contribution of fishery catches to changes in stock size of 3M shrimp, it is noted that catches are summed by calendar year, but the surveys are executed in the summer. Is the temporal distribution of shrimp catches through the year well enough known to allow partial contribution of year's catches to stock-size changes to be calculated? On average, what fraction of the year's catches is taken before the execution of the survey?

12. Noting the scientific advice provided in 2009 on American Plaice in Div. 3LNO, that the stock is estimated to increase and will likely surpass Blim by 2010 under all fishing mortality scenarios considered (except for Flim), Fisheries Commission requests the Scientific Council to conduct a full assessment in 2010, provide catch, biomass, and fishing mortality projections where possible, for as many years as the data will allow, at the following levels of fishing mortality: F=0; $F_{0.1}$; and F_{2009}, in addition to any projections that SC would find useful and provide a risk analysis as outlined in paragraph 5.