

Serial No. N5821

NAFO/FC Doc. 10/9
(ADOPTED) (Revised)

32nd ANNUAL MEETING - SEPTEMBER 2010

**FISHERIES COMMISSION'S REQUEST FOR SCIENTIFIC ADVICE ON MANAGEMENT
OPTIONS IN 2012 AND BEYOND OF CERTAIN STOCKS IN SUBAREAS 2, 3 AND 4 AND
OTHER MATTERS**

1. The Fisheries Commission with the concurrence of the Coastal State as regards to the stocks below which occur within its jurisdiction ("Fisheries Commission") requests that the Scientific Council provide advice in advance of the 2011 Annual Meeting, for the management of Northern shrimp in Div. 3M, 3LNO in 2012.

Noting that Scientific Council will meet in October of 2010 for 2012 TAC advice, Fisheries Commission requests the Scientific Council to update its advice on shrimp stocks in 2011 for 2012 TAC.

Fisheries Commission further requests that SC provide advice in accordance to Annex 1.

2. Fisheries Commission requests that the Scientific Council provide advice for the management of the fish stocks below according to the following assessment frequency (unless Fisheries Commission requests additional assessments):

Two year basis

American plaice in Div. 3LNO
Capelin in Div. 3NO
Cod in Div. 3M
Redfish in Div. 3LN
Redfish in Div. 3M
Thorny skate in Div. 3LNOPs
White hake in Div. 3NOPs
Yellowtail flounder in Div. 3LNO

Three year basis

American plaice in Div. 3M
Cod in Div. 3NO
Northern shortfin squid in SA 3+4
Redfish in Div. 3O
Witch flounder in Div. 2J+3KL
Witch flounder in Div. 3NO

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

In 2011, advice should be provided for 2012 and 2013 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 and for 2012, 2013 and 2014 American plaice in Div. 3M and witch flounder in Div. 3NO.

In 2011, advice should be provided for 2012 for 3M cod.

Fisheries Commission requests that SC provide advice in accordance to Annex 1.

The Fisheries Commission also 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 bycatches in other fisheries, provide updated advice as appropriate.

3. 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})
4. The Scientific Council is requested to provide updated information on the proportion of the 3LNO shrimp stock that occurs in 3NO.
5. With respect to 3M shrimp, the Scientific Council estimated in 2009 a proxy for B_{lim} as 85% decline from the maximum observed index levels, this is 2600 t of female biomass. In 2009 the Scientific Council estimated biomass to be below B_{lim} and recommended fishing mortality to be set as close to zero as possible.

In 2009 estimated catches reached 5000 t. The Fisheries Commission decided on a 50% effort reduction in 2010 and provisional estimated catches up to September 2010 reached 1000 t. In its 2010 advice, the Scientific Council estimated biomass to be above B_{lim} , but reiterated its previous advice to set fishing mortality as close to zero as possible. The Fisheries Commission requests the Scientific Council to evaluate if the current level of catches is compatible with stock recovery, given that improvements in biomass levels were observed through current level of catches.

6. The Fisheries Commission adopted in 2010 an MSE approach for Greenland halibut stock in Subarea 2 + Division 3KLMNO (FC Working Paper 10/7). This approach considers a survey based harvest control rule (HCR) to set a TAC for this stock on an annual basis for the next four year period. The Fisheries Commission requests the Scientific Council to:
 - a) annually monitor and update the survey slope and to compute the TAC according to HCR adopted by the Fisheries Commission according to Annex 1 of FC Working Paper 10/7.
 - b) provide guidance on what constitutes "exceptional circumstances".
 - c) provide advice on whether or not the "exceptional circumstances" provision should be applied.
7. Fisheries Commission requests the Scientific Council to identify F_{msy} , identify B_{msy} and provide advice on the appropriate selection of an upper reference point for biomass (e.g. B_{buf}) for 3LNO American Plaice, 3NO cod and 3LN redfish.
8. Fisheries Commission requests the Scientific Council to review the stock recruit relationship for 3NO cod and the historical productivity regime used in setting the B_{lim} value of 60 000t.
9. Noting that distribution and historical catches of capelin have also occurred in 3L, the Scientific Council is requested to provide the Fisheries Commission with available information on the occurrence and distribution of capelin in 3L and to advise on further research requirements.
10. Fisheries Commission requests the Scientific Council to examine the consequences resulting from a decrease in mesh size in the mid-water trawl fishery for redfish in Div. 3LN to 90mm or lower.
11. Blue whiting (*Micromesistius poutassou*) is a widely distributed species, which can be found in the open ocean as a semi-pelagic species and in shallower waters close to the bottom. Blue whiting is largely fished in the North Eastern-Atlantic by pelagic trawls. The North East Atlantic Fisheries Commission (NEAFC) defined a minimum mesh size of 35mm when fishing for blue whiting with pelagic trawls in its regulatory area. Interest is increasing for developing fishing opportunities on this stock in the NAFO Regulatory Area, specifically in the boundary with the NEAFC RA, Division 1F, sub area 2 and Division 3K.

The Fisheries Commission requests the Scientific Council to give advice on the following measures to be adopted for the blue whiting:

- a) Change in the classification of blue whiting in the species table (Annex II of NAFO CEM), from classification as a groundfish species to a pelagic species, consistent with the NEAFC classification.

b) In line with conservation and management measures in force in the NEAFC Regulatory Area, adoption of a minimum mesh size for pelagic and semi-pelagic trawls which would include in paragraph 1 of Article 13 – Gear Requirements the following:

- g) 35 mm for blue whiting in the fishery using pelagic trawls in Subarea 2 and Divisions 1F, 3K and 3M.

12. Catches of thorny skate in Div. 3LNO averaged 18 000 t between 1985 and 1991 and declined to 7 500 t in 1992-1995. Since 2000, estimated catches averaged 9 000 t. No analytical assessment has been performed and the current advice is based on the decline of the survey indices, which have been stable at low levels since 1996. However, relative fishing mortality has been relatively constant at around 17% between 1998 and 2004 and declined to 5% from 2005. Scientific Council has recommended that catches in 2011 and 2012 should not exceed the last three years average catch (approximately 5 000 t). The Fisheries Commission requests the Scientific Council to clarify the reason behind using the last three years period as the basis for the advice and to provide alternative options. In its examination, the Scientific Council should also take into account the relative stability of all survey indices since 1996 and furthermore consider the information that relative fishing mortality has declined to low levels.

13. Mindful of the NEREIDA mission, the international scientific effort led by Spain to survey the seafloor in the NAFO Regulatory Area,
 Recognizing that the Coral and Sponge Protection Zones closed to bottom fishing activities for the protection of vulnerable marine ecosystems as defined in Chapter 1 Article 16 Paragraph 3 is in place until December 31, 2011,
 Mindful of the call for review of the above measures based on advice from the Scientific Council,
 Fisheries Commission requests that Scientific Council review any new scientific information on the areas defined in Chapter 1 Article 16 Paragraph 3 which may support or refute the designation of these areas as vulnerable marine ecosystems. In the event that new information is not available at the time of the Fisheries Commission meeting in September 2011, prepare an overview of the type of information that will be available and the timeline for completion.

14. Noting the response from the Scientific Council in June 2010 regarding simulation modeling in a GIS framework: “To apply this model to the NRA, an agreed upon set of gear descriptions and tow duration/lengths for each fishing fleet segment would need to be created. Further estimation of retention efficiencies of the different commercial gears and indirect effects of fishing will be needed to model effects of serious adverse impacts.”
 The Fisheries Commission requests that the Scientific Council: 1) acquire the requisite data and apply the model to the extent possible to the NRA, and 2) consider whether the SASI model used by the US New England Fisheries Council should be incorporated into the aforementioned GIS framework as a means of integrating significant adverse impacts into the approach.

15. Recognizing the initiatives on vulnerable marine ecosystems (VME) through the work of the WGFMS, and with a view to completing and updating fishery impact assessments, the Scientific Council is requested to provide the Fisheries Commission at its next annual meeting in 2011: 1) guidance on the timing and frequency of fishing plans/assessments for the purpose of evaluating significant adverse impacts on VMEs; 2) a framework for developing gear/substrate impact assessments to facilitate reporting amongst the Contracting Parties.

Annex1 – Additional guidance in regards to questions 1 and 2.

Mindful of the desire to move to a risk-based approach in the management of fish stocks, Fisheries Commission requests the Scientific Council 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 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_{2010} in 2012 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, defined in relation to both long-term productivity regimes, and current productivity regimes to the extent these may differ. 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 2012 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.

2. Noting the Precautionary Approach Framework as endorsed by Fisheries Commission, the Fisheries Commission requests that the Scientific Council provide the following information for the 2011 Annual Meeting of the Fisheries Commission for all stocks under its responsibility requiring advice for 2012:

- 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.

3. 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 identified 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} .