

**SCIENTIFIC COUNCIL WORKSHOP ON THE PRECAUTIONARY APPROACH
TO FISHERIES MANAGEMENT
31 MAR-4 APR 2003**

- I. Opening
 1. Appointment of rapporteur
 2. Adoption of agenda
 3. Terms of reference
- II. Review of Progress on Precautionary Approach
 1. Basis for existing PA reference points for NAFO stocks
 2. Evaluation of existing Scientific Council PA framework
 3. Report of ICES SGPA meeting, 2-6 December 2002
 4. Report of ICES PA meeting, 24-26 February 2003
 5. Recent advances in other regional bodies
 6. Recent advances in Coastal States
 - III. Canada
 - IV. United States of America
- III. Review of Methods for Determining PA Reference Points
- IV. Application to NAFO Stocks
 1. Greenland halibut in Subarea 2 and Div. 3KLMNO
 2. American plaice in Div. 3LNO
 3. Cod in Div. 3NO
 4. Yellowtail flounder in Div. 3LNO
 5. Redfish in Div. 3M
 6. Cod in Div. 3M
 7. Northern shrimp in Subareas 0 and 1
- V. Recommendations
- VI. Other Business
- VII. Adoption of Report
- VIII. Adjournment

Terms of Reference

Terms of Reference for the Workshop agreed at the September 2002 Scientific Council meeting are:

- Review the basis for existing PA reference points.
- Determine appropriate methodology to calculate reference points for data-limited stocks.
- Develop or revise reference points for the following stocks:
 - Greenland halibut in SA 2 and Div. 3KLMNO
 - American plaice in Div. 3LNO
 - Cod in Div. 3NO
 - Yellowtail flounder in Div. 3LNO
 - Redfish in Div. 3M
 - Cod in Div. 3M
 - Shrimp in SA 0 and 1
- Provide guidance to Designated Experts for calculating PA reference points for all remaining stocks for which sufficient data exist

An additional term of reference calls for a re-examination of the framework initially developed by the Scientific Council in 1997.

SCIENTIFIC COUNCIL MEETING, 5-19 JUNE 2003

- I. Opening (Scientific Council Chair: R.K. Mayo)
 1. Appointment of Rapporteur
 2. Adoption of Agenda
 3. Attendance of Observers
 4. Plan of Work
 5. Report of Proxy Votes (by Executive Secretary)
- II. Review of Scientific Council Recommendations in 2002
- III. Fisheries Environment (STACFEN Chair: E. Colbourne)
 1. Opening
 2. Chairman's Introduction, Report on Intersessional Activities
 3. Agenda and Plan of Work, Appointment of Rapporteur
 4. Review of Recommendations in 2002
 5. Progress Report on Publication of Proceedings of the Mini-symposium on Hydrographic Variability in NAFO Waters 1991-2000
 6. Invited Lecture (T. Platt Bedford Institute of Oceanography Dartmouth, Nova Scotia: "Climate, Weather and the Pelagic Ecosystem")
 7. Marine Environmental Data Service (MEDS) Report for 2002
 8. Review of Environmental Studies in 2002
 - a) Physical oceanographic studies
 - b) Interdisciplinary studies
 9. Review of the Physical, Biological and Chemical Environment in the NAFO Convention Area for 2002
 10. The NAFO Annual Ocean Climate Status Summary (NAOCSS) for 2002
 11. Environmental Indices (Implementation in the Assessment Process)
 12. Formulation of Recommendations Based on Environmental Conditions in 2002
 13. Cooperative Research Programs
 - a) Russian/German assessment of short-time climate variations in the Labrador Seas
 - b) Other research programs
 14. National Representatives
 15. Other Matters
 16. Adjournment
- IV. Publications (STACPUB Chair: M. Stein)
 1. Opening
 - a) Appointment of Rapporteur
 2. Review of Recommendations in 2002
 3. Review of Publications
 - a) Journal of Northwest Atlantic Fishery Science
 - b) NAFO Scientific Council Studies
 - c) NAFO Statistical Bulletin
 - d) NAFO Scientific Council Reports
 - e) Index and Lists of Titles
 - f) Others

4. NAFO Website
 - a) Web statistics
 - b) Design of NAFO Website
 5. Promotion and Distribution of Scientific Publications
 - a) Invitational papers
 - b) CD-ROM versions of reports, documents
 - c) New initiatives for publications
 6. Editorial Matters Regarding Scientific Publications
 - a) Review of Editorial Board
 - b) Progress report of publications of Reproductive Potential WG (Journal and Studies)
 - c) Progress report of publication of 2001 Deep-sea Fisheries Symposium proceedings
 - d) Progress report of publication on 2002 STACFEN Mini-symposium on Decadal Trends
 - e) Progress report of publication of 2002 Elasmobranch Symposium proceedings
 7. Papers for Possible Publication
 8. Other Matters
- V. Research Coordination (STACREC Chair: M. J. Morgan)
1. Opening
 2. Review of Recommendations in 2002
 3. Fishery Statistics
 - a) Progress report on Secretariat activities in 2002/2003
 - i) Acquisition of STATLANT 21A and 21B reports for recent years
 - b) CWP Sessions 2003/2004
 - i) Report of 20th CWP Meeting, Seychelles, 21-24 January 2003
 - ii) Intersessional CWP Meeting 2004
 4. Research Activities
 - a) Biological sampling
 - i) Report on activities in 2002/2003
 - ii) Report by National Representatives on commercial sampling conducted
 - iii) Report on data availability for stock assessments (by Designated Experts)
 - b) Biological surveys
 - i) Review of survey activities in 2002 (by National Representatives and Designated Experts)
 - ii) Surveys planned for 2003 and early-2004
 5. FAO Fisheries Global Information System (FIGIS)
 6. NAFO Observer Program
 7. Review of SCR and SCS Documents
 8. Other Matters
 - a) Tagging activities
 - b) Conversion factors
 - c) Comparative fishing between Canada and EU-Spain
 - d) Research activities
 - e) Other business
- VI. Fisheries Science (STACFIS Chair: D. Stansbury)
1. Opening
 2. General Review
 - a) Review of recommendations in 2002
 - b) General review of catches and fishing activity
 3. Stock Assessments

- a) Stocks within or partly within the Regulatory Area, as requested by the Fisheries Commission with the concurrence of the Coastal States (Annex 1) (Northern shrimp in Div. 3M and Div. 3LNO (items 1 and 7) will be undertaken during Scientific Council Meeting October/November, 2003):
 - Cod (Div. 3NO; Div. 3M (monitor))
 - Redfish (Div. 3LN; Div. 3M; Div. 3O)
 - American plaice (Div. 3LNO; Div. 3M (monitor))
 - Witch flounder (Div. 2J and 3KL; Div. 3NO (monitor))
 - Yellowtail flounder (Div. 3LNO (monitor))
 - Northern shortfin squid in Subareas 3 and 4 (monitor)
 - Greenland halibut (Subareas 2 and 3)
 - Capelin (Div. 3NO)
 - b) Analyses pertaining to other Fisheries Commission requests (Annex 1)
 - Thorny skate (Div. 3LNO) (Item 9)
 - c) Stocks within the 200-mile fishery zone in Subareas 0 to 4, as requested by Canada (Annex 2)
 - Greenland halibut in Subareas 2 and 3 (Item 1)
 - Cod in Div. 2J and 3KL (Item 3)
 - d) Request by Denmark (Greenland) (Annex 3)
 - Roundnose grenadier in Subareas 0 and 1 (monitor) (Item 1)
 - Demersal redfish and other finfish in Subarea 1 (Item 2)
 - Greenland halibut in Div. 1A inshore (Item 3)
 - e) Stocks overlapping the fishery zones in Subareas 0 and 1 as requested by Canada and by Denmark (Greenland) (Annexes 2 and 3)
 - Greenland halibut (Subareas 0 + Division 1A Offshore and Divisions 1B-1F) (Annex 2, Item 1; Annex 3, Item 3)
 - f) Assessment of other stocks
 - Roughhead grenadier in Subareas 2 and 3
4. Other Matters
- a) New Designated Experts
 - b) Other business

VII. Management Advice and Responses to Special Requests

- 1. Fisheries Commission (Annex 1)
 - a) Request for advice on TACs and other management measures for the year 2004
 - i) Greenland halibut in Subarea 2 and Div. 3KLMNO
 - b) Request for advice on TACs and other management measures for the years 2004 and 2005
 - i) Cod in Div. 3NO
 - ii) American Plaice in Div. 3LNO
 - iii) Witch flounder in Div. 2J+3KL
 - iv) Redfish in Div. 3M
 - v) Redfish in Div. 3LN
 - vi) Capelin in Div. 3NO
 - c) Special requests for management advice (see Items 3-9)
 - i) Redfish in Div. 3O (see Item 3)
 - ii) Formulation of advice under the precautionary approach (Items 5 and 6) (note: Report of NAFO Scientific Council Workshop on the Precautionary Approach, St. John's Newfoundland, 31 March-4 April, 2003)
 - iii) Pelagic *S. mentella* (redfish) in Subareas 1-3 and adjacent ICES area (see Item 8)
 - iv) Information on thorny skates in Div. 3LNO (see Item 9)

- d) Monitoring of stocks for which multi-year advice was provided in 2002
 - i) Cod in Div. 3M
 - ii) American plaice in Div. 3M
 - iii) Yellowtail flounder in Div. 3LNO
 - iv) Witch flounder in Div. 3NO
 - v) Northern shortfin squid in Subareas 3 and 4
 - 2. Coastal States
 - a) Request by Canada for advice (Annex 2)
 - i) Greenland halibut in Subareas 2 and 3 (Item 1)
 - ii) Cod in Div. 2J and 3KL (Item 3)
 - b) Request by Denmark (Greenland) for advice (Annex 3)
 - i) Multi-year advice for demersal redfish and other finfish in Subarea 1 (Item 2)
 - ii) Roundnose grenadier in Subareas 0 and 1 (monitor) (Item 1)
 - iii) Greenland halibut in Div. 1A Inshore (Item 3)
 - c) Request by Canada and Denmark (Greenland) for advice on TACs and other management measures (Annexes 2 and 3)
 - i) Greenland halibut in Subarea 0 + Division 1A Offshore and Divisions 1B-1F
 - ii) Special requests for management advice for Greenland halibut in Subareas 0 and 1
- VIII. Future Scientific Council Meetings 2003 and 2004
- 1. Scientific Council Meeting and Special Session, September 2003 Dartmouth, Nova Scotia, Canada
 - 2. Scientific Council Meeting, October/November 2003 (assessment of shrimp stocks) Dartmouth, Nova Scotia, Canada
 - 3. Scientific Council Meeting, June 2004
 - 4. Scientific Council Meeting and Special Session, September 2004
 - 5. Scientific Council Meeting, November 2004 (assessment of shrimp stocks)
- IX. Arrangements for Special Sessions
- 1. Progress Report on Special Session in 2003: Scientific Council Workshop on Geostatistics in Fisheries.
 - 2. Topics for Special Sessions in 2004 and 2005.
- X. Reports of Working Groups
- 1. Working Group on Reproductive Potential (Chair: E. A. Trippel)
 - 2. Joint NAFO-ICES Working Group on Harp and Hooded Seals
- XI. Nomination and Election of Officers
- 1. Chairs of all Standing Committees (STACFEN, STACPUB, STACREC, STACFIS)
 - 2. Chair and Vice-Chair of Scientific Council
- XII. Review of Scientific Council Working Procedures/Protocol
- 1. Implementation of Precautionary Approach
 - a) Report of the March/April 2003 Scientific Council Workshop on PA
 - b) Further development of NAFO Scientific Council PA methodology
 - 2. NAFO Scientific Council Observership at ICES ACFM Meetings
 - 3. Analytical Basis for an Interim Monitoring Evaluation
 - 4. Facilitating Workload of Scientific Council During Annual Meeting in September
 - 5. Facilities and Technological Support

XIII. Other Matters

1. Report of 25th Session of the FAO Committee on Fisheries (COFI) Rome, Italy, 24-28 February 2003
2. Report of Regional Fishery Bodies (RFB) Meeting, Rome, Italy, 3-4 March 2003
3. Meeting Highlights for NAFO Website
4. Other Business

XIV. Adoption of Committee Reports

1. STACFEN
2. STACREC
3. STACPUB
4. STACFIS

XV. Scientific Council Recommendations to General Council and Fisheries Commission

XVI. Adoption of Scientific Council Report

XVII. Adjournment

SCIENTIFIC COUNCIL MEETING, 15-19 SEPTEMBER 2003-16 1999

- I. Opening (Chair: Ralph K. Mayo)
 1. Appointment of rapporteur
 2. Adoption of agenda
 3. Attendance of observers
 4. Plan of work
- II. Review of Scientific Council Recommendations from June 2003
- III. Fisheries Science (STACFIS Chair: Don E. Stansbury)
 1. Opening
 2. Nomination of Designated Experts
 3. Other Matters
 - a) Review of SCR and SCS documents (if necessary)
 - b) Other business
- IV. Research Coordination (STACREC Chair: M. Joanne Morgan)
 1. Opening
 2. Fisheries Statistics
 - a) Progress reports on Secretariat activities
 - i) Acquisition of STATLANT 21 data
 - ii) Publication of statistical information
 3. Research Activities
 - a) Biological sampling
 - v) Report on data availability for stock assessments (by Designated Experts)
 - b) Biological surveys
 - iii) Review of survey activities in 2002 (by National Representatives and Designated Experts)
 - iv) Surveys planned for 2003 and early-2004
 - c) Review of new process for documenting research activities
 4. FAO Fisheries Global Information System (FIGIS)
 5. NAFO Observer Program
 - a) Update on meeting of STACTIC 16-20 June, Copenhagen
 6. Archiving of Data for Assessments
 7. Other Matters
 - a) Review of SCR and SCS documents (if necessary)
 - b) Other business
- V. Publications (STACPUB Chairman: M. Stein)
 1. Opening
 2. Review of recommendations from June 2003

3. Review of Scientific Publications
 - a) Papers from June 2003 Meeting
 - b) Status of the 2001 "Deep-sea Fisheries" Symposium proceedings
 - c) Information from the 2002 Elasmobranch Symposium
 - d) Status of invitational papers (special volume of Journal)
 - e) Other Reviews
 4. Consideration of NAFO Website
 - a) Status of implementation of Journal and Council Studies on website
 - b) "restricted site" for Scientific Council
 5. Editorial Matters Regarding Scientific Publication
 6. Other Matters
- VI. Special Requests from Fisheries Commission and Coastal States
1. Update on advice for northern shrimp in Div. 3M
 2. Update on advice for northern shrimp in Div. 3LNO
- VII. Review of Future Meeting Arrangements
1. Scientific Council Meeting on shrimp, November 2003
 2. Scientific Council Meeting, June 2004
 3. Special Session and Annual Meeting, September 2004
 4. Scientific Council Meeting on shrimp, October/November 2004
 5. Scientific Council Meeting, June 2005
- VIII. Future Special Sessions
1. Proposal for Special Session 2004
 2. Topics for Special Session in 2005
- IX. NAFO Working Groups or Workshops
1. Update on activities of NAFO WG on Reproductive Potential
 2. ICES/NAFO WG on Harp and Hooded Seals
- X. Scientific Council Working Procedures and Protocol
1. Timetable and frequency of assessments
 2. Revised Precautionary Approach Framework
- XI. Election of STACFIS Chair
- XII. Other Matters
1. Consideration of Memorandum of Understanding with ICES
 2. Other business
- XIII. Adoption of Reports
1. Consideration of Report of the Geostatistics Workshop of 10-12 September 2003
 2. Committee Reports STACFIS, STACREC, STACPUB
 3. Report of Scientific Council
- XIV. Adjournment

SCIENTIFIC COUNCIL ANNUAL MEETING, 5-11 NOVEMBER 2003

- I. Opening (Chair: M. Joanne Morgan)
 1. Appointment of rapporteur
 2. Adoption of agenda
 3. Plan of work

- II. Fisheries Science (STACFIS Chair: Hilario Murua)
 1. Review of recommendations in 2002 and 2003
 2. Review of catches of shrimp
 3. Environmental review
 4. Stock assessments (Annexes 1A and B, 2 and 3)
 - Northern shrimp (Div. 3M)
 - Northern Shrimp (Div. 3LNO)
 - Northern shrimp (Subareas 0 and 1)
 - Northern shrimp (in Denmark Strait and off East Greenland)
 5. Other business

- III. Formulation of Advice (see Annexes 1A and B, 2 and 3)
 1. Advice for Northern Shrimp
 - Northern shrimp (Div. 3M)
 - Northern shrimp (Div. 3LNO)
 - Northern shrimp (Subareas 0 and 1)
 - Northern shrimp (in Denmark Strait and off East Greenland)

- IV. Other Matters
 1. Meeting of October/November 2004
 2. Meeting of October/November 2005
 3. Coordination with ICES Working Groups on Shrimp Stock Assessments

- V. Adoption of Reports

- VI. Adjournment

Northwest Atlantic



Fisheries Organization

Serial No. N4800

NAFO SCS Doc. 03/1

SCIENTIFIC COUNCIL MEETING – JUNE 2003

Fisheries Commission's Request for Scientific Advice on Management in 2004
of Certain Stocks in Subareas 2, 3 and 4

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 2003 Annual Meeting, provide advice on the scientific basis for the management of the following fish and invertebrate stocks or groups of stocks in 2004:

Shrimp (Div. 3M, 3LNO)
Greenland halibut (Subarea 2 and Div. 3KLMNO)
Capelin (Div. 3NO)

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 2003 Annual Meeting, provide advice on the scientific basis for the management of the following fish stocks on an alternating year basis:

Cod (Div. 3NO; Div. 3M)
Redfish (Div. 3M; Div. 3LN)
Yellowtail flounder (Div. 3LNO)
American plaice (Div. 3LNO; Div. 3M)
Witch flounder (Div. 2J3KL; Div. 3NO)
Squid (Subareas 3 and 4)

- In 2002, advice was provided for 2003 and 2004 for cod in 3M, American plaice in 3M, yellowtail flounder in 3LNO, witch flounder in 3NO and squid in SA 3&4. These stocks will next be assessed in 2004.
- In 2003, advice will be provided for 2004 and 2005 for cod in 3NO, American plaice in 3LNO, witch flounder in 2J3KL, redfish in 3M and redfish in 3LN. These stocks will next be assessed in 2005.

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 Fisheries Commission with the concurrence of the Coastal State requests Scientific Council, at a meeting in advance of the 2003 Annual Meeting, provide advice on the scientific basis for the management of redfish in Div. 3O including recommendations regarding the most appropriate TAC for 2004 and 2005. This stock will be assessed in alternate years thereafter.

4. 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:
- 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 management 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_{2002} in 2004 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 management options evaluated in the way described above to the extent possible. In this case, the general reference points should be the level of fishing effort or fishing mortality (F) which is calculated to be required to take the MSY catch in the long term and two-thirds of that effort level.
 - 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, management 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 TACs 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 2004 and subsequent years over a range of fishing mortality rates (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.

5. Noting the progress made by the Scientific Council on the development of a framework for implementation of the Precautionary Approach, the Fisheries Commission requests that the Scientific Council provide the following information for the 2003 Annual Meeting of the Fisheries Commission for stocks under its responsibility requiring advice for 2004, or 2004 and 2005:
 - a) the limit and target precautionary reference points as described in Annex II of the UN Fisheries Agreement indicating areas of uncertainty (when precautionary reference points cannot be determined directly, proxies should be provided);
 - b) information 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;
 - c) information on the research and monitoring required to 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;
 - d) 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;
 - e) propose criteria and harvest strategies for re-opening of fisheries and for new and developing fisheries; and
 - f) to work toward the harmonization of the terminology and application of the precautionary approach within relevant advisory bodies.
6. In addition, the following elements should be taken into account by the Scientific Council when considering the precautionary approach:

- a) 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.

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 incurred if the reference point is crossed (e.g. short-term risk of recruitment overfishing, loss of long-term yield, etc.)
- c) When a buffer reference point is proposed 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, and also the level of ‘low probability’ that is used in the calculation.
- 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 moving the stock beyond B_{lim} or B_{buf} . Whenever possible, this information should be cast

in terms of risk assessments relating fishing mortality rates to the risks of falling below B_{lim} and B_{buf} , as well as of being above F_{lim} and F_{buf} , 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} (B_{buf}) and B_{target} , and F_{lim} (F_{buf}) and F_{target} .
7. The Fisheries Commission with the concurrence of the Coastal State requests Scientific Council, at a meeting in advance of the 2003 Annual Meeting, to consider options available for the provision of annual advice as regards shrimp in Div. 3LNO and 3M in advance of the Annual Meetings.
 8. Regarding pelagic *S. mentella* redfish in NAFO Subareas 1-3, the Scientific Council is requested to review the most recent information on the distribution of this resource, as well as on the affinity of this stock to the pelagic redfish resource found in the ICES Sub-area XII, parts of SA Va and XIV and to the shelf stocks of redfish found in ICES Sub-areas V, VI and XIV, and NAFO Subareas 1-3.
 9. With respect to thorny skate in Divisions 3LNO, the Fisheries Commission with the concurrence of the Coastal State requests Scientific Council, at a meeting in advance of the 2003 Annual Meeting to provide the following:
 - a) Information on exploitation rates in recent years, as well as information on by-catches of other groundfish in the 3LNO skate fishery;
 - b) Information on abundance indices and the distribution of the stock in relation to groundfish resources, particularly for the stocks which are under moratorium;
 - c) Information on the distribution of thorny skate in Divisions 3LNO, as well as a description of the relative distribution inside and outside the NAFO Regulatory Area;
 - d) Advice on reference points and conservation measures that would allow for .exploitation of this resource in a precautionary manner;
 - e) Information on annual yield potential for this stock in the context of (d) above;
 - f) Identification and delineation of fishery areas and exclusion zones where fishing would not be permitted, with the aim of reducing the impact on the groundfish stocks which are under moratorium, particularly juveniles;
 - g) Determination of the appropriate level of research that would be required to monitor the status of this resource on an ongoing basis with the aim of providing catch options that could be used in the context of management by Total Allowable Catch (TAC); and
 - h) Information on the size composition in the current catches and comment on these sizes in relation to the size at sexual maturity.



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SCIENTIFIC COUNCIL MEETING – JUNE 2003

**CANADIAN REQUEST FOR SCIENTIFIC ADVICE ON MANAGEMENT IN 2004
OF CERTAIN STOCKS IN SUBAREAS 0 TO 4**

1. Canada requests that the Scientific Council, at its meeting in advance of the 2003 Annual Meeting of NAFO, subject to the concurrence of Denmark (on behalf of Greenland), provide advice on the scientific basis for management in 2004 of the following stocks:

Shrimp (Subareas 0 and 1)
Greenland halibut (Subareas 0 and 1)

The Scientific Council has noted previously that there is no biological basis for conducting separate assessments for Greenland halibut throughout Subareas 0-3, but has advised that separate TACs be maintained for different areas of the distribution of Greenland halibut. The Council is asked therefore, subject to the concurrence of Denmark (on behalf of Greenland) as regards Subarea 1, to provide an overall assessment of status and trends in the total stock throughout its range and comment on its management in Subareas 0+1 for 2004.

Greenland halibut in the offshore area of Division 0A+1A is currently being managed separately from the remainder of SA 0+1. However, given the bathymetry of Baffin Bay and its proximity to the NAFO boundaries of Divisions 0A, 1A and 1B, the Scientific Council is requested to:

- a) advise on whether it is more appropriate for management purposes to include Division 1B with the current management area of offshore Divisions 1A+0A or have it remain in the current management area of Divisions 0B+1B-F;
- b) advise on appropriate TAC levels for 2004, separately, for Greenland halibut in the offshore area of Divisions 0A+1A (plus Division 1B depending on the result of (a) above) and Divisions 0B+ 1C-F (plus Division 1B depending on the result of (a) above). The Scientific Council is also asked to advise on any other management measures it deems appropriate to ensure the sustainability of these resources;
- c) comment on the Greenland halibut size composition throughout SA0+1 (offshore), the potential relationship between fish in Baffin Bay and Davis Strait and the impact of harvesting on these stock components; and
- d) advise on the most appropriate protocols for the conduct of exploratory fisheries in Division 0A north of 71°30'N including precautionary catch limits.

The Council also is asked to advise on appropriate TAC levels separately – for Greenland halibut in SA 2 + Division 3K and for Divisions 3LMNO.

Scientific Council has, in the past, advised that fishing effort for Greenland halibut in SA2 + 3KLMNO should be distributed in relation to biomass. Scientific Council is requested to comment on:

- a) the current distribution of the resource between SA2 + 3K and 3LMNO and comment on how this compares with the current distribution of quota allocation; and
- b) the appropriate distribution of quota allocation if it was based on the distribution of biomass.

With respect to shrimp, it is recognized that the Council may, at its discretion, delay providing advice until later in the year, taking into account data availability, predictive capability, and the logistics of additional meetings.

2. Canada requests the Scientific Council to consider the following options in assessing and projecting future stock levels for Shrimp and Greenland halibut in Subareas 0 and 1:

- a) For those stocks subject to analytical-type assessments, the status of the stock should be reviewed and management options evaluated in terms of their implications for fishable stock size in both the short and long term. The implications of no fishing as well as fishing at $F_{0.1}$, and F_{2002} in 2004 and subsequent years should be evaluated in relation to precautionary reference points of both fishing mortality and spawning stock biomass. The present stock size and spawning stock size should be described in relation to those observed historically and those to be expected in the longer term under this range of fishing mortalities, and any other options Scientific Council feels worthy of consideration under a precautionary framework.

Opinions of the Scientific Council should be expressed in regard to stock size, spawning stock sizes, recruitment prospects, catch rates and catches implied by these management strategies for the short and long term. Values of F corresponding to the reference points should be given. Uncertainties in the assessment should be evaluated and presented in the form of risk analyses related to B_{lim} (B_{buf}) and B_{target} , and F_{lim} (F_{buf}) and F_{target} .

- b) 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 management options evaluated in the way described above to the extent possible. Management options should be within the precautionary framework.
- c) For those resources for which only general biological advice 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 management options evaluated in the way described above to the extent possible. Management options should be within the precautionary framework.
- d) Presentation of the results should include the following:
- I. For stocks for which analytical-type assessments are possible:
 - A graph of historical yield and fishing mortality for the longest time period possible;
 - A graph of spawning stock biomass and recruitment levels for the longest time period possible;
 - Graphs and tables of catch options for the year 2004 and subsequent years over a range of fishing mortality rates (F) at least from $F=0$ to $F_{0.1}$ including risk analyses;
 - Graphs and tables showing spawning stock biomass corresponding to each catch option including risk analyses;
 - Graphs showing the 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 on fishing mortality rate or fishing effort.

In all cases, the reference points, $F=0$, actual F , and $F_{0.1}$ should be shown.

3. For the cod stock in Divisions 2J + 3KL, the Scientific Council is requested to report on recent trends in the total and spawning biomass based on the most recent Stock Status Report.

P. S. Chamut
 Assistant Deputy Minister
 Fisheries Management, Department of Fisheries and
 Oceans
 Ottawa, Canada



Serial No. N4803

NAFO SCS Doc. 03/3

SCIENTIFIC COUNCIL MEETING – JUNE 2003

**DENMARK (GREENLAND) REQUEST FOR SCIENTIFIC ADVICE ON MANAGEMENT IN 2004 OF
CERTAIN STOCKS IN SUBAREAS 0 AND 1**

1. In the Scientific Council report of 2002, scientific advice on management of Roundnose grenadier in Subarea 0+1 was given as a 3-year advice (for 2003, 2004 and 2005). Denmark, on behalf of Greenland, requests the Scientific Council to continue to monitor the status of Roundnose grenadier in Subarea 0+1 annually and, should significant change in stock status be observed (e.g. from surveys), the Scientific Council is requested to provide updated advice as appropriate.
2. Advice for redfish (*Sebastes* spp.) and other finfish in Subarea 1 was in 2001 given for 2002 and 2003. Denmark, on behalf of Greenland, requests that the Scientific Council in advance of the 2003 Annual Meeting, provide advice on the scientific basis for the management of these stocks in Subarea 1 for 2004 and 2005.
3. Subject to the concurrence of Canada as regards Subarea 0, the Scientific Council is requested to provide advice on the scientific basis for management of Greenland halibut overlapping Subarea 0 and 1 in 2004, and as many years forward as data allow.

Given the bathymetry of the Baffin Bay and Davis Strait, the Scientific Council is asked to advise on whether it is more appropriate for management purposes to include Division 1B with the current management of offshore Divisions 1A+0A or have it remain in the current management area of Divisions 0B+1B-F.

The Scientific Council is asked to advise on the most appropriate protocols for the conduct of exploratory fisheries in Divisions 1A north of 74°N including precautionary catch limits.

Further, for Subarea 1A inshore, the Council is asked to provide advice on allocation of TACs distributed in the areas of Ilulissat, Uummannaq and Upernavik, respectively.

The Council is asked in its advice to assess the impact from the offshore fisheries in Baffin Bay and Davis Strait on the status and trends of the Subarea 1A inshore stock components, and *vice versa*.

4. Subject to the concurrence of Canada as regards Subarea 0, Denmark, on behalf of Greenland, further requests the Scientific Council of NAFO before December 2003 to provide advice on the scientific basis for management of Northern shrimp (*Pandalus borealis*) in Subarea 0 and 1 in 2004, and as many years forward as data allow.

The Scientific Council is asked to update the information on the distribution of Northern shrimp (*Pandalus borealis*) and provide advice on allocation of TAC's to Subarea 0 and Subarea 1.

Further, the Council is requested to advise, in co-operation with ICES, on the scientific basis for management of Northern shrimp (*Pandalus borealis*) in Denmark Strait and adjacent areas east of southern Greenland in 2004, and as many years forward as data allow.

On behalf of
The Department of Fisheries, Hunting and Agriculture
Sincerely
Amalie Jessen
Deputy Minister (acting)

Northwest Atlantic



Fisheries Organization

Serial No. N4923

NAFO SCS Doc. 03/24

SCIENTIFIC COUNCIL MEETING – SEPTEMBER 2003

Fisheries Commission's Request for Scientific Advice on Management in 2005
of Certain Stocks in Subareas 2, 3 and 4

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 2004 Annual Meeting, provide advice on the scientific basis for the management of the following fish and invertebrate stocks or groups of stocks in 2005:

Shrimp (Div. 3M, 3LNO)
Greenland halibut (Subarea 2 and Div. 3KLMNO)

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 2004 Annual Meeting, provide advice on the scientific basis for the management of the following fish stocks on an alternating year basis:

Cod (Div. 3NO; Div. 3M)
Redfish (Div. 3M; Div. 3LN; Div. 3O)
Yellowtail flounder (Div. 3LNO)
American plaice (Div. 3LNO; Div. 3M)
Witch flounder (Div. 2J3KL; Div. 3NO)
Capelin (Div. 3NO)
Northern Shortfin Squid (Subareas 3 and 4)

- In 2003, advice was provided for 2004 and 2005 for cod in 3NO, American plaice in 3LNO, witch flounder in 2J3KL, redfish in 3M, redfish in 3LN, redfish in 3O and capelin in 3NO. These stocks will next be assessed in 2005.
- In 2004, advice will be provided for 2005 and 2006 for cod in 3M, American plaice in 3M, yellowtail flounder in 3LNO, witch flounder in 3NO and northern shortfin squid in SA 3&4. These stocks will next be assessed in 2005.

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 Fisheries Commission with the concurrence of the Coastal State requests Scientific Council, at a meeting in advance of the 2004 Annual Meeting, to provide advice on the scientific basis for the management of skates in Div. 3LNO including recommendations regarding the most appropriate TAC for 2005 and 2006. This stock will be assessed in alternate years thereafter.
4. The Fisheries Commission with the concurrence of the Coastal State requests Scientific Council, at a meeting in advance of the 2004 Annual Meeting, to provide information on the status of the Greenland halibut in SA 2+ Div. 3KLMNO in relation to the Rebuilding Strategy including commentary on progress in relation to targets described in the Strategy.

5. 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:
- 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 management 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_{2003} in 2005 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 management options evaluated in the way described above to the extent possible. In this case, the following reference points should be calculated: 1) the level of fishing effort or fishing mortality (F) required to take the MSY catch in the long term; 2) two-thirds of that level; 3) 75% of that level; and 4) 85% of that level.
 - 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, management 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 TACs 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 2005 and subsequent years over a range of fishing mortality rates (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.

6. Noting the progress made by the Scientific Council on the development of a framework for implementation of the Precautionary Approach, the Fisheries Commission requests that the Scientific Council provide the following information for the 2004 Annual Meeting of the Fisheries Commission for stocks under its responsibility requiring advice for 2005, or 2005 and 2006:

- a) the limit and precautionary reference points as described in Annex II of the UN Fisheries Agreement indicating areas of uncertainty (when precautionary reference points cannot be determined directly, proxies should be provided);
- b) information 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;
- c) information on the research and monitoring required to 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;
- d) 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;
- e) propose criteria and harvest strategies for re-opening of fisheries and for new and developing fisheries; and
- f) to continue to work toward the harmonization of the terminology and application of the precautionary approach within relevant advisory bodies.

7. In addition, the following elements should be taken into account by the Scientific Council when considering the precautionary approach:

- a) 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.

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 incurred if the reference point is crossed (e.g. short-term risk of recruitment overfishing, loss of long-term yield, etc.)
- c) When a buffer reference point is proposed 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, and also the level of ‘low probability’ that is used in the calculation.
- 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 moving the stock beyond B_{lim} . Whenever possible, this information should be cast in terms of risk assessments relating fishing mortality rates to the risks of falling below B_{lim} , as well as of

being above F_{lim} and, 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} , and F_{lim} and target F reference points selected by managers.
8. Regarding pelagic *S. mentella* redfish in NAFO Subareas 1-3, the Scientific Council is requested to review the most recent information on the distribution of this resource, as well as on the affinity of this stock to the pelagic redfish resource found in the ICES Sub-area XII, parts of SA Va and XIV and to the shelf stocks of redfish found in ICES Sub-areas V, VI and XIV, and NAFO Subareas 1-3.
 9. Regarding white hake in Divisions 3NO, the Scientific Council is requested to provide the following:
 - a) Information on the fishing mortality on white hake in Divisions 3NO in recent years, as well as information on by-catches of other groundfish in the 3NO white hake fishery;
 - b) Information on abundance indices and the distribution of the stock in relation to groundfish resources, particularly for the stocks which are under moratorium;
 - c) Information on the distribution of white hake in Divisions 3NO, as well as a description of the relative distribution inside and outside the NAFO Regulatory Area;
 - d) Advice on reference points and conservation measures that would allow for exploitation of this resource in a precautionary manner;
 - e) Information on annual yield potential for this stock in the context of (d) above;
 - f) Identification and delineation of fishery areas and exclusion zones where fishing would not be permitted, with the aim of reducing the impact on the groundfish stocks which are under moratorium, particularly juveniles;
 - g) Determination of the appropriate level of research that would be required to monitor the status of this resource on an ongoing basis with the aim of providing catch options that could be used in the context of management by Total Allowable Catch (TAC); and
 - h) Information on the size composition in the current catches and comment on these sizes in relation to the size at sexual maturity.
 10. Regarding redfish in Divisions 3L, 3N and 3O, Scientific Council is requested to review all available information and provide advice regarding whether the current management units (3LN and 3O) or any alternative may be the most appropriate.



LIST OF RESEARCH DOCUMENTS (SCR) - 2003

SCR #	Ser. #	Author/Title
03/1 ^a	N4808	SHELTON, P. A. and D. RIVARD. Developing a precautionary approach to fisheries management in Canada – the decade following the cod collapses. (16 pages)
03/2 ^a	N4806	RIKHTER, V. A. On the TAC estimates compliance with some commercial fish stocks in NAFO Area: retrospective analysis and improvement possibilities. (13 pages)
03/3 ^a	N4809	BUCH, E. and M. H. RIBERGAARD. Oceanographic investigations off West Greenland 2002. (13 pages)
03/4 ^a	N4810	STEIN, M. Climatic conditions around Greenland – 2002. (29 pages)
03/5 ^a	N4811	GONZÁLEZ TRONCOSO, D. and X. PAZ. Testing methods for estimating the factor power correction obtained from the comparative fishing trial: <i>C/V Playa de Mendiña versus R/V Vizconde de Eza</i> . (8 pages)
03/6 ^a	N4812	PAZ, X., D. GONZÁLEZ TRONCOSO and E. ROMÁN. New time series for yellowtail flounder from the comparative experience between the <i>C/V Playa de Mendiña</i> and the <i>R/V Vizconde de Eza</i> in the NAFO Regulatory Area of Divisions 3NO, 1995-2002. (15 pages)
03/7 ^a	N4813	GONZÁLEZ TRONCOSO, D., X. PAZ and E. ROMÁN. Data conversions for American plaice from the surveys conducted by Spain in the NAFO Regulatory Area of Division 3NO: 1995-2002. (17 pages)
03/8 ^a	N4814	GONZÁLEZ TRONCOSO, D., E. ROMÁN and X. PAZ. Transformed results for Greenland halibut from the surveys conducted by Spain in the NAFO Regulatory Area of Divisions 3NO, 1996-2002. (14 pages)
03/9 ^a	N4815	VASKOV, A. A. and T. M. IGASHOV. Results from the Russian trawl survey on the Flemish Cap Bank (Division 3M) in 2002. (30 pages)
03/10 ^a	N4816	TAYLOR, M. H., C. BASCUNAN, J. P. MANNING and D. G. MOUNTAIN. Oceanographic conditions in NAFO Subareas 5 and 6 during 2002. (9 pages)
03/11 ^a	N4817	MORGAN, M. J. A preliminary examination of variability in condition of American plaice in NAFO Divisions 3LNO. (14 pages)
03/12 ^a	N4818	VASKOV, A. A. Distribution of redfish in Division 3O based on data from Russian trawl surveys in 1983-1993. (13 pages)
03/13 ^a	N4819	MURUA, H. A review of roughhead grenadier (<i>Macrourus berglax</i>) biology and population structure on Flemish Cap (NAFO Division 3M), 1991-2002 based on EU Flemish Cap bottom survey data. (18 pages)

^a Scientific Council Meeting, 5-19 June 2003

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03/14 ^a	N4820	COLBOURNE, E. B. and C. FITZPATRICK. Physical oceanographic conditions in NAFO Subareas 2 and 3 on the Newfoundland and Labrador Shelf during 2002. (25 pages)
03/15 ^a	N4821	RÄTZ, H.-J. and C. STRANSKY. Stock abundance indices and length compositions of demersal redfish and other finfish in NAFO Subarea 1 based on German bottom trawl survey. (28 pages)
03/16 ^a	N4823	STRANSKY, C., S. GUÐMUNDSDÓTTIR, Þ. SIGURÐSSON, S. LEMVIG, K. NEDREAAS and F. SABORIDO-REY. Age readings of <i>Sebastes marinus</i> and <i>S. mentella</i> otoliths: bias and precision between readers. (14 pages)
03/17 ^a	N4824	STRANSKY, C. Shape analysis and microchemistry of redfish otoliths: investigation of geographical differences in the North Atlantic. (10 pages)
03/18 ^a	N4825	MADDOCK-PARSONS, D., W. B. BRODIE and K. DWYER. Update on cooperative surveys of yellowtail flounder in NAFO Divisions 3LNO, 1996-2002. (21 pages, revised)
03/19 ^a	N4826	MAILLET, G. L., P. PEPIN, S. FRASER and D. LANE. Biological oceanographic conditions in NAFO Subareas 2 and 3 on the Newfoundland and Labrador Shelf during 2002. (32 pages)
03/20 ^a	N4829	JORGENSEN, O. Survey for Greenland halibut in NAFO Divisions 1C-1D, 2002. (25 pages)
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03/22 ^a	N4831	VASKOV, A., S. LISOWSKY and S. LOBODENKO. A brief review of investigations conducted by PINRO in NAFO Subareas 0, 2 and 3. (7 pages)
03/23 ^a	N4832	GONZÁLEZ, C., E. ROMÁN and X. PAZ. Food and feed chronology of American plaice (<i>Hippoglossoides platessoides</i>) in the North Atlantic. (21 pages)
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03/26 ^a	N4836	VASKOV, A. Brief review of Russian fisheries in Division 3O in 2001-2002. (5 pages)
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03/29 ^a	N4843	STORR-PAULSEN, M. Biomass and abundance of demersal fish stocks off West Greenland estimated from the Greenland shrimp survey, 1988-2002. (24 pages)

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03/31 ^a	N4846	DRINKWATER, K. F., B. PETRIE, R. G. PETTIPAS, W. M. PETRIE and V. SOUKHOTSEV. Physical oceanographic conditions on the Scotian Shelf and in the Gulf of Maine during 2002. (32 pages)
03/32 ^a	N4848	CABANAS, J. M. Hydrographic conditions on Flemish Cap in July 2002. (9 pages)
03/33 ^a	N4850	GUNDERSEN A. C. and Å. HØINES. Norwegian Fishery for Greenland Halibut, Grenadiers and Redfish in West-Greenland Waters, 2001-2002. (7 pages)
03/34 ^a	N4851	SIEGSTAD, H., H.-J. RÄTZ and C. STRANSKY. Assessment of other finfish in NAFO Subarea 1. (6 pages)
03/35 ^a	N4853	SIEGSTAD, H., H.-J. RÄTZ and C. STRANSKY. An assessment of demersal redfish in NAFO Subarea 1. (8 pages)
03/36 ^a	N4854	BRODIE, W. B. and D. POWER. The Canadian fishery for Greenland halibut in SA 2 + Divisions 3KLMNO, with emphasis on 2002. (14 pages)
03/37 ^a	N4855	GORCHINSKY, K. V. Using trawlable biomass data from Canadian bottom trawl survey in spring 2002 to estimate capelin state of the stock on the Grand Bank. (6 pages)
03/38 ^a	N4856	CERVIÑO, S. and A. VÁZQUEZ. Re-opening criteria for Flemish Cap cod: a survey-based method. (11 pages)
03/39 ^a	N4857	DEL RIO, J. L., F. GONZALEZ and D. GONZALEZ. The Spanish fishery (1998, 2000-2002) and the Spanish 3NO survey (1995-2002) in relation to the skate fishery in Divisions 3NO. (16 pages)
03/40 ^a	N4858	HEALEY, B. P., R. BOWERING and K. S. DWYER. Estimating year-class strength and total mortality for Greenland halibut from surveys in NAFO Subarea 2 and Divisions 3KLMNO. (14 pages)
03/41 ^a	N4859	TREBLE, M. A. Results of a Greenland Halibut (<i>Reinhardtius hippoglossoides</i>) Tagging Project in Cumberland Sound, NAFO Division 0B, 1997-2000. (7 pages)
03/42 ^a	N4860	SABORIDO, F. and A. VÁZQUEZ. Results from Bottom Trawl Survey on Flemish Cap of July 2002. (41 pages)
03/43 ^a	N4861	MURUA, H. Assessment of roughhead grenadier, <i>Macrourus berglax</i> , in NAFO Subareas 2 and 3. (13 pages)
03/44 ^a	N4862	ALPOIM, R. A stock status update of American plaice (<i>Hippoglossoides platessoides</i>) in NAFO Division 3M. (12 pages)
03/45 ^a	N4863	AVILA DE MELO, A., R. ALPOIM and F. SABORIDO-REY. An assessment of beaked redfish (<i>Sebastes mentella</i> and <i>S. fasciatus</i>) in NAFO Division 3M. (72 pages)

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03/48 ^a	N4866	HENDRICKSON, L. C., E. G. DAWE and M. A. SHOWELL. Interim monitoring report for the assessment of northern shortfin squid (<i>Illex illecebrosus</i>) in Subareas 3+4 during 2002. (13 pages)
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03/51 ^a	N4869	DWYER, K. S. and W. R. BOWERING. Greenland halibut (<i>Reinhardtius hippoglossoides</i>) in NAFO Subarea 2 and Divisions 3KLMNO: stock trends based on annual Canadian research vessel survey results during 1978-2002. (57 pages)
03/52 ^a	N4870	BRODIE, W. B., S. J. WALSH, D. POWER, K. S. DWYER and M. F. VEITCH. Divisions 3LNO yellowtail flounder – interim monitoring update. (18 pages)
03/53 ^a	N4871	JØRGENSEN, O. A. Assessment of Greenland halibut stock component in NAFO Subarea 0 + Division 1A offshore + Divisions 1B-1F. (17 pages)
03/54 ^a	N4872	DARBY, C. An extended survivors analyzing (XSA) of Greenland halibut in NAFO Divisions 0+1. (15 pages)
03/55 ^a	N4873	POWER, D. An assessment of the status of the redfish in NAFO Divisions 3LN. (21 pages)
03/56 ^a	N4874	MORGAN, M. J., W. B. BRODIE, D. MADDOCK PARSONS, B. P. HEALEY and D. POWER. An assessment of American plaice in NAFO Divisions 3LNO. (70 pages)
03/57 ^a	N4875	KULKA, D. W. and C. M. MIRI. The status of thorny skate (<i>Amblyraja radiata</i> Donovan, 1808) in NAFO Divisions 3L, 3N, 3O and Subdivisions 3Ps. (80 pages)
03/58 ^a	N4876	SHELTON, P. A., P. M. MACE, W. B. BRODIE and J.-C. MAHÉ. A proposal for a more flexible framework for implementing the Precautionary Approach on NAFO stocks. (25 pages)
03/59 ^a	N4878	HEALEY, B. P., E. F. MURPHY, D. E. STANSBURY and J. BRATTEY. An assessment of the cod stock in NAFO Divisions 3NO. (60 pages)
03/60 ^a	N4879	POWER, D. Distribution of redfish in NAFO Divisions 3LNO based on Canadian research surveys from 1991-2002. (8 pages)
03/61 ^a	N4880	WALSH, S. J. and W. B. BRODIE. Sensitivity analysis of survey biomass indices used to tuned ASPIC production model for Grand Bank yellowtail flounder. (23 pages)

^a Scientific Council Meeting, 5-19 June 2003

SCR #	Ser. #	Author/Title
03/62 ^a	N4881	LILLY, G. R., P. A. SHELTON, J. BRATTEY, N. G. CADIGAN, B. P. HEALEY, E. F. MURPHY, D. E. STANSBURY and N. CHEN. A summary of the February 2003 assessment of the 2J+3KL stock of Atlantic cod (<i>Gadus morhua</i>). (20 pages)
03/63 ^a	N4882	POWER, D. An assessment of the status of the redfish in NAFO Division 3O. (30 pages)
03/64 ^a	N4883	DARBY, C., J. C. MAHÉ and W. R. BOWERING. An assessment of the status of the Greenland halibut resource in NAFO Subarea 2 and Divisions 3KLMNO based on extended survivors analysis with short-and medium-term projections of future stock development. (40 pages)
03/65 ^b	N4892	ORR, D. C., P. J. VEITCH and D. J. SULLIVAN. Divisions 3LNO northern pink shrimp (<i>Pandalus borealis</i>) – interim monitoring update. (8 pages)
03/66 ^b	N4893	NICOLAJSEN, Á. and S. BRYNJOLFSSON. Young northern shrimp (<i>Pandalus borealis</i>) index for Flemish Cap (NAFO Division 3M) 2003. (4 pages)
03/67 ^b	N4894	NICOLAJSEN, Á. Biomass estimate of the northern shrimp (<i>Pandalus borealis</i>) stock on Flemish Cap (NAFO Division 3M) for 2003. (6 pages)
03/68 ^b	N4895	SKÚLADÓTTIR, U. The assessment of the international fishery for the shrimp (<i>Pandalus borealis</i>) in Division 3M (Flemish Cap), 1993-2003. (9 pages)
03/69 ^b	N4896	SKÚLADÓTTIR, U. The Icelandic shrimp fishery (<i>Pandalus borealis</i> Kr.) at Flemish Cap in 1993-2003. (7 pages)
03/70 ^c	N4909	KANNEWORFF, P. Occurrence of <i>Pandalus montagui</i> in trawl survey samples from NAFO Subareas 0+1. (4 pages)
03/71 ^c	N4910	KANNEWORFF, P. and K. WIELAND. Stratified-random trawl survey for northern shrimp (<i>Pandalus borealis</i>) in NAFO Subareas 0+1 in 2003. (26 pages)
03/72 ^c	N4911	SIEGSTAD, H. The Greenland fishery for northern shrimp (<i>Pandalus borealis</i>) in NAFO Divisions 3M and 3L in 2000-2003. (5 pages)
03/73 ^c	N4912	HVINGEL, C. Assessment, prediction and risk analysis: stock development and production of northern shrimp off West Greenland. (14 pages)
03/74 ^c	N4913	HVINGEL, C. Correction of reported past catches of northern shrimp within the Greenland EEZ to conform to a revision of reporting practices. (3 pages)
03/75 ^c	N4914	HVINGEL, C. The fishery for northern shrimp (<i>Pandalus borealis</i>) off West Greenland, 1970-2003. (26 pages)
03/76 ^c	N4915	WIELAND, K. Abundance of young (age 1, 2 and 3) northern shrimp (<i>Pandalus borealis</i>) off West Greenland (NAFO Subareas 0+1) in 1993-2003, and changes in mean size-at-age related to temperature and stock size. (22 pages)

^a Scientific Council Meeting, 5-19 June 2003

^b Scientific Council Meeting, 15-19 September 2003.

^c Scientific Council Meeting, 5-11 November 2003.

SCR No.	Serial No.	Author(s) and Title
03/77 ^c	N4918	HVINGEL, C. Data for the assessment of the shrimp (<i>Pandalus borealis</i>) stock in Denmark Strait/off East Greenland, 2003. (23 pages)
03/78 ^c	N4919	COLBOURNE, E. Oceanographic conditions on the Flemish Cap in NAFO Division 3M during the summer of 2003. (14 pages)
03/79 ^c	N4920	CASAS, J. M., and J. L. DEL RIO. The Spanish shrimp fishery on Flemish Cap (NAFO Division 3M) in 2002. (4 pages)
03/80 ^c	N4921	DEL RIO, J. M., J. M. CASAS, and D. GONZÁLEZ TRONCOSO. Northern shrimp (<i>Pandalus borealis</i>) on Flemish Cap in June 2003. (18 pages)
03/81 ^c	N4922	COLBOURNE, E. B., AND D. C. ORR. The distribution and abundance of northern shrimp (<i>Pandalus borealis</i>) in relation to bottom temperatures in NAFO Divisions 3LNO based on multi-species surveys from 1995-2003. (18 pages)
03/82 ^c	N4924	ORR, D. C., P. VEITCH, and D. SULLIVAN. An update of information pertaining to northern shrimp (<i>Pandalus borealis</i> , Krøyer) and groundfish in NAFO Divisions 3LNO. (51 pages)
03/83 ^c	N4925	SKÚLADÓTTIR, U. An update of the Icelandic shrimp fishery (<i>Pandalus borealis</i> Kr.) at Flemish Cap in 1993-2003. (20 pages)
03/84 ^c	N4926	SKÚLADÓTTIR, U. The by-catch in the shrimp fishery of Iceland at Flemish Cap in 1996-2003. (6 pages)
03/85 ^c	N4927	SKÚLADÓTTIR, U. The Icelandic shrimp fishery (<i>Pandalus borealis</i>) in the Denmark Strait in 2003. (4 pages)
03/86 ^c	N4928	KANNEWORFF, P., and K. WIELAND. Calculating a TAC for northern shrimp (<i>Pandalus borealis</i>) in West Greenland waters (NAFO Subareas 0+1). (5 pages)
03/87 ^c	N4929	NICOLAJSEN, Á. Biomass estimate, growth, length and age distribution of the northern shrimp (<i>Pandalus borealis</i>) stock on Flemish Cap (NAFO Division 3M) in June 2003. (11 pages)
03/88 ^c	N4930	BAKANEV, S. V. The Russian shrimp fishery (<i>Pandalus borealis</i>) on the Flemish Cap, NAFO Division 3M, in 1993-2003. (9 pages)
03/89 ^c	N4931	GUDMUNSDOTTIR, A. A Short note on modelling in S-plus the standardized CPUE for northern shrimp (<i>Pandalus borealis</i>) in Division 3M. (5 pages)
03/90 ^c	N4932	GUDMUNSDOTTIR, A., and Á. NICOLAJSEN. Standardized CPUE indices for Shrimp (<i>Pandalus borealis</i>) in Division 3M (Flemish Cap) 1993-2003. (6 pages)
03/91 ^c	N4933	SKÚLADÓTTIR, U. An update of the assessment of the international fishery for shrimp (<i>Pandalus borealis</i>) in Division 3M (Flemish Cap), 1993-2003 in November 2003. (14 pages)

^a Scientific Council Meeting, 5-19 June 2003

^b Scientific Council Meeting, 15-19 September 2003.

^c Scientific Council Meeting, 5-11 November 2003.



LIST OF SUMMARY DOCUMENTS (SCS) - 2003

SCS #	Ser. #	Author/Title
03/1 ^a	N4800	FISHERIES COMMISSION. Fisheries Commission's request for scientific advice on management in 2004 of certain stocks in Subareas 2, 3 and 4. (4 pages)
03/2 ^a	N4802	CHAMUT, P. S. Canadian request for scientific advice on management In 2004 of certain stocks in Subareas 0 to 4. (2 pages)
03/3 ^c	N4803	JESSEN, A. Denmark (Greenland) request for scientific advice on management in 2004 of certain stocks in Subareas 0 and 1. (1 page)
03/4 ^a	N4804	NAFO SECRETARIAT (D. AUBY). Tagging activities reported for the Northwest Atlantic in 2002 and early-2003. (9 pages)
03/5 ^a	N4805	NAFO. Report of NAFO Scientific Council Workshop on the Precautionary Approach to Fisheries Management. (60 pages)
03/6 ^a	N4807	RIKHTER, V. A., I. K. SIGAEV, A. VASKOV, K. GORCHINSKY, T. IGASHOV, S. LOBODENKO, S. MELNIKOV and N. SHAKURO. Russian research report for 2002. (31 pages)
03/7 ^a	N4815	VARGAS, J., R. ALPOIM, E. SANTOS, and A. M. AVILA DE MELO. Portuguese research report for 2002. (53 pages)
03/8 ^a	N4822	RÄTZ, H.-J., M. STEIN, and C. STRANSKY. German research report for 2002. (5 pages)
03/9 ^a	N4827	NAFO SECRETARIAT (B. MARSHALL). Provisional index and list of titles of research and summary documents of 2002. (1 page + excel file)
03/10 ^a	N4833	TREBLE, M., S. COSENS, and D. PARMITER-RICHARDS. Canadian research report for 2002. (25 pages)
03/11 ^a	N4837	GONZALEZ, F., J. L. DEL RIO, A VÁZQUEZ, H. MURUA and E. ROMÁN. Spanish Research Report for 2002. (26 pages)
03/12 ^a	N4838	NAFO SECRETARIAT (G. MOULTON). Historical nominal catches for selected stocks. (7 pages)
03/13 ^a	N4839	NAFO SECRETARIAT (G. MOULTON). Notes on acquisition and publications of statistics since June 2002. (2 pages)

^a Scientific Council Meeting, 5-19 June 2003

SCS #	Ser. #	Author/Title
03/14 ^a	N4840	NAFO SECRETARIAT (C. KERR). List of biological sampling data, 2002. (1 page + excel file)
03/15 ^a	N4847	SOSEBEE, K. A. and W. L. GABRIEL. United States research report for 2002. (16 pages)
03/16 ^a	N4849	SIEGSTAD, H. and R. P. FRANSEN. Denmark/Greenland research report for 2002. (7 pages)
03/17 ^a	N4851	GONZALEZ, F. and D. POWER. A report on the deliberations of the ICES North-Western Working Group, 2003. (12 pages)
03/18 ^a	N4877	FAO. Report of the Third Meeting of Regional Fishery Bodies. (20 pages)
03/19 ^a	N4884	NAFO. Report of Scientific Council, 5-19 June 2003 Meeting. (194 pages)
03/20 ^b	N4897	NAFO. Available data from the Commercial Fisheries related to stock assessment (2002), Inventory of biological surveys conducted in 2002 and planned for 2003 and early-2004. (11 pages)
03/21 ^b	N4898	NAFO. Report of Scientific Council, 15-19 September 2003 Meeting. (43 pages)
03/22 ^b	N4899	NAFO. Report of the Workshop on Mapping and Geostatistical Methods for Fisheries Stock Assessment. (35 pages, revised)
03/23 ^b	N4900	SCIENTIFIC COUNCIL. Proposed NAFO Precautionary Approach Framework (September 2003). (5 pages)
03/24 ^b	N4923	FISHERIES COMMISSION. Fisheries Commission's Request for Scientific Advice on Management in 2005 of Certain Stocks in Subareas 2, 3 and 4. (4 pages)
03/25 ^c	N4934	NAFO. Scientific Council Meeting Report, 5-11 November 2003. (58 pages)
02/26 ^c	N4935	NAFO SECRETARIAT. A Compilation of Research Vessel Surveys on a Stock-by-stock Basis. (14 pages)

^a Scientific Council Meeting, 5-19 June 2003

^b Scientific Council Meeting, 15-19 September 2003.

^c Scientific Council Meeting, 5-11 November 2003.

LIST OF RECOMMENDATIONS IN 2003

The following are the specific **recommendations made by the Scientific Council** at its meetings in 2003 besides those made with respect to scientific advice on stocks considered. The recommendations with respect to stock advice appear in the stock-by-stock Summary Sheets presented in this publication. Recommendations listed under the Standing Committees were **endorsed** by the Scientific Council.

All recommendations listed here were **adopted** by the Scientific Council and are presented as they appear in this publication under the relevant sections.

Scientific Council Meeting, 5-19 June 2003 Meeting

SCIENTIFIC COUNCIL

VII. MANAGEMENT ADVICE AND RESPONSES TO SPECIAL REQUESTS

2. Coastal States

- c) **Request by Canada and Denmark (Greenland) for Advice on TACs and Other Management Measures** (Annexes 2 and 3)

Responses Specific to Requests by Canada

Given the bathymetry of Baffin Bay and its proximity to the NAFO boundaries of Div. 0A, 1A and 1B it would have been more appropriate to set the TAC for Div. 0A+1AB. Scientific Council therefore **recommended** that Div. 1B be included in the management area with Div. 0A and 1A.

XII. REVIEW OF SCIENTIFIC COUNCIL WORKING PROCEDURES/PROTOCOL

1. Implementation of Precautionary Approach

- a) **Report of the March/April 2003 Scientific Council Workshop on PA**

Scientific Council endorsed this proposal and **recommended** that *a Study Group on the estimation of limit reference points be established. Peter Shelton (Canada) was named as a co-Chair with other co-Chairs to be selected from among the 2003 PA Workshop participants, and the Co-Chairs explore with colleagues possible themes for a Study Group working session in 2004.*

- b) **Further Development of NAFO Scientific Council PA Methodology**

Having adopted this revised PA framework, the Scientific Council **recommended** that: *a meeting of the Joint Fisheries Commission/Scientific Council Working Group on the Precautionary Approach be held to discuss the implementation of the revised PA framework.*

XIII. OTHER MATTERS

4. Other Business

The Council noted these events will ideally have invited experts or speakers, and the Council **recommended** that *the estimated \$10 000 should be allocated from the 2004 budget, to accommodate the costs of the 2 proposed upcoming events of the Scientific Council.*

FISHERIES ENVIRONMENT (STACFEN)

STACFEN made no formal recommendations during this 2003 meeting.

PUBLICATIONS (STACPUB)

STACPUB made no formal recommendations during this 2003 meeting.

RESEARCH COORDINATION (STACREC)

3. Fishery Statistics

a) Progress Report on Secretariat Activities in 2002/2003

STACREC noted that a number of countries were failing to report the absence of fishing activities but that such reports were essential for a complete record of NW Atlantic catches. Accordingly STACREC **recommended** that *the Notes for Completion of STATLANT 21A and 21B questionnaires be revised to include the requirement for national authorities to report the absence of fishing activities.*

b) CWP Sessions 2003/2004

ii) CWP Intersessional Meeting, 2004

Continuing the usual practice, STACREC **recommended** that *the Deputy Executive Secretary attend the CWP Intersessional Meeting to be held in 2004.*

6. NAFO Observer Program

STACREC **recommended** *the observer data be collected and archived on a set by set basis in a format consistent with SCS Doc. 00/23, as adopted by the Fisheries Commission, including all identifiers but that the data be made available to users without any identification of vessel name or country. Rather a unique identifier will be associated with each vessel and country and the user will not have access to the key to this code.*

7. Review of SCR and SCS Documents

STACREC **recommended** that *in 2004 the summed abundance and biomass based on conversion of the length frequencies be presented for American plaice, cod, Greenland halibut and yellowtail flounder in the Div. 3NO surveys conducted by EU-Spain, and these be compared to the estimates from the method used to convert the CPUE.*

FISHERIES SCIENCE (STACFIS)

2. General Review of Catches and Fishing Activity

Given the present reduced catches, these have the potential to represent a significant portion of the overall catch of a particular stock and species and the inability to assign these catches could impact the assessments. As such, STACFIS **recommended** that *the NAFO Secretariat write Contracting Parties to remind them that all catches should be apportioned as to species and area where caught.*

A. STOCKS OFF GREENLAND AND IN DAVIS STRAIT

Greenland Halibut (*Reinhardtius hippoglossoides*) in Subarea 0 and Division 1A Offshore and Divisions 1B-1F

Research Recommendations

STACFIS **recommended** that *the investigations of the by-catch of Greenland halibut in the shrimp fishery in Subareas 0 and 1 should be continued and the results should be made available before the assessment in 2003.*

STACFIS **recommended** that *the CPUE series from Div. 0B should be updated.*

STACFIS **recommended** that *a survey is carried out in the northern part of the Baffin Bay (north of the areas which have been surveyed in 2001) in order to investigate the distribution of Greenland halibut in the area.*

Greenland Halibut (*Reinhardtius hippoglossoides*) in Division 1A Inshore

Research Recommendations

It was noted that in 2001 an annual gill net survey with small mesh net was started in the Disko Bay in order to estimate relative year-class strength of pre recruits to the fishery. STACFIS **recommended** that *results from the gill net survey for Greenland halibut Div. 1A be presented for review in June 2004.*

Voluntary logbooks were introduced in 1999 but have only covered a small proportion of the landings due to poor return rates. STACFIS **recommended** that *authorities consider means to ensure a higher return rate of inshore logbooks from the Greenland halibut commercial fishery in Div. 1A.*

STACFIS **recommended** that *investigations of by-catch of juvenile Greenland halibut in the commercial shrimp fishery in Subareas 0+1 be continued.*

STACFIS **recommended** that *the discard rate of 'small Greenland halibut' in Div. 1A be investigated.*

Demersal Redfish (*Sebastes* spp.) in Subarea 1

Research Recommendation

STACFIS **recommended** that *the species composition and quantity of redfish discarded in the shrimp fishery in Subarea 1 be quantified.*

STACFIS **recommended** that *determination of maturity of redfish caught during surveys in Subareas 1 be carried out.*

Other Finfish in Subarea 1

Research Recommendation

STACFIS **recommended** that *the species composition and quantity of other finfish discarded in the shrimp fishery in Subarea 1 be quantified.*

B. STOCKS ON THE FLEMISH CAP

Redfish (*Sebastes mentella* and *Sebastes fasciatus*) in Division 3M

Assessment Results

In order to assist in developing possible approaches to achieve this, STACFIS **recommended** that *information on the distribution on shrimp and small redfish (<12 cm) in Div. 3M be compiled for review during the June 2004 meeting of Scientific Council.*

STACFIS **recommended** that *an update of the Div. 3M redfish by-catch information be compiled on an annual basis, including the estimated weights and numbers of redfish caught annually in the Div. 3M shrimp fishery as well as tables showing their size distribution.*

American Plaice (*Hippoglossoides platessoides*) in Division 3M

Future Studies

STACFIS **recommended** that *for American plaice in Div. 3M current initiatives aiming at reconciling age determination from different age readers be continued.*

C. STOCKS ON THE GRAND BANK

Cod (*Gadus morhua*) in Divisions 3N and 3O

Reference Points

In view of the difficulty in determining if the current low productivity will persist in the immediate future, it was **recommended** that *for cod in Div. 3NO the Scientific Council review in detail the biological reference points in the context of the PA framework when the SSB has reached half the current estimate of B_{lim} .*

Redfish (*Sebastes mentella* and *Sebastes fasciatus*) in Divisions 3L and 3N

Stick Structure

STACFIS **recommended** that *(1) redfish data in Div. 3LN and Div. 3O be analyzed further to determine if a relationship exists between Div. 3LN and Div. 3O that may help in the interpretation of the indices of abundance; and (2) data be examined to evaluate the appropriateness of Div. 3LN and Div. 3O as management units for redfish.*

Capelin (*Mallotus villosus*) in Divisions 3N and 3O

Research Recommendation

STACFIS **recommended** that *initial investigations to evaluate the status of capelin in Div. 3NO utilize trawl acoustic surveys to allow comparison with the historical time series.*

Redfish (*Sebastes mentella* and *Sebastes fasciatus*) in Division 3O

Stock Structure

STACFIS again **recommended** that *(1) redfish data in Div. 3LN and Div. 3O be analyzed further to determine if a relationship exists between Div. 3LN and Div. 3O that may help in the interpretation of the indices of abundance; and (2) data be examined to evaluate the appropriateness of Div. 3LN and Div. 3O as management units for redfish.*

D. WIDELY DISTRIBUTED STOCKS

Roughhead Grenadier (*Macrourus berglax*) in Subareas 2 and 3

Research Recommendation

STACFIS recommended that further investigations into yield-per-recruit analysis by sex be carried out for roughhead grenadier in SA 2 and 3.

Greenland Halibut (*Reinhardtius hippoglossoides*) in Subarea 2 and Divisions 3KLMNO

Recommendation

It is recommended that in future assessments of Greenland halibut in Subarea 2 + Div. 3KLMNO the details of the calculation of the catch at age in the final year be provided for review.

Scientific Council Meeting, 15-19 September 2003

SCIENTIFIC COUNCIL

X. SCIENTIFIC COUNCIL WORKING PROCEDURES/PROTOCOL

2. Revised Precautionary Approach Framework

b) Limit Reference Point Study Group (LRP)

Scientific Council **recommended** that a Study Group on the estimation of limit reference points be established. Peter Shelton (Canada) was named as a co-Chair with other co-Chairs to be selected, and the Co-Chairs explore with colleagues possible themes for a Study Group working session in 2004.

RESEARCH COORDINATION (STACREC)

The **recommendations** made by STACREC for the work of the Scientific Council as **endorsed** by the Council are as follows:

4. FAO Fisheries Global Information System (FIGIS)

STACREC **recommended** that a draft version of Annex 2 (the section most pertinent to NAFO) of the FIGIS (I think this should actually be FIRMS) Partnership Arrangement should be prepared in advance of the June 2004 Scientific Council Meeting for review at that meeting.

6. Archival of Data Utilized in Stock Assessments

STACREC **recommended** that the Designated Experts would be asked to place electronic versions of their stock assessment data (including time series of catch, survey indices, numbers at age, catch at age, weights at age, and maturity at age) on the server, in formats currently available, at the Scientific Council meetings. The data files provided should be annotated and include all survey indices available and catches in aggregate form. The Secretariat will archive these data following Scientific Council Meetings and make them available to members of the Scientific Council thereafter.

7. Others Matters

b) Other Business

STACREC noted the tuna data were not required for the work of the Scientific Council, and STACREC **recommended** that *the Secretariat need not report tuna catches in the data tabulations prepared at NAFO and that CWP (and FAO) will be informed that tuna catches will no longer be recorded in the STATLANT 21 data.*

PUBLICATIONS (STACPUB)

The **recommendations** made by STACPUB for the work of the Scientific Council as **endorsed** by the Council are as follows:

3. Review of Scientific Publications

b) Status of the 2001 "Deep-sea Fisheries" Symposium"

STACPUB **recommended** that *the 23 papers currently ready be placed on the NAFO Website by the beginning of October 2003, as part of Volume 31, ensuring a 2003 publication date.*

e) Other Reviews

STACPUB **recommended** that *hard copy and web versions of Scientific Council Studies No. 37 be issued shortly.*

STACPUB **recommended** that *for the Scientific Council Reports, the Secretariat return to printing its reports on a calendar year basis, and that color printing be used where warranted in Scientific Council Reports. The Scientific Council Reports for calendar year 2003 should therefore be printed as the next "Redbook".*

4. Considerations of NAFO Website

a) Status of Implementation of Journal and Council Studies on Website

STACPUB was informed that all Journal and Studies issues have been scanned and are available on CD. STACPUB **recommended** that *all scanned versions of the Journal and Studies be placed on the NAFO website as soon as possible, as this is a vital reference tool for users.*

6. Other Matters

Scientific Council Studies contains publications such as workbooks and workshop reports, and STACPUB concluded that this material must be made available in print. Therefore, STACPUB **recommended** that *Scientific Council Studies continue to be produced in printed versions recognizing the number of hard copies has been reduced.*

Scientific Council Meeting, 5-11 November 2003***FISHERIES SCIENCE (STACFIS)*****III. STOCK ASSESSMENTS****1. For Northern shrimp in Division 3M**

- *biological and CPUE data from all fleets fishing for shrimp in the area, be submitted to Designated Experts by 1 October 2004.*
- *a more detailed conversion document including information on the geometry and behaviour of the trawls and detailed calculations of the conversion for shrimp be presented at the September 2004 meeting.*
- *indices of stock size be presented with error bars where possible.*

2. For Northern shrimp in Divisions 3LNO

- *biological and CPUE data from all fleets fishing for shrimp in the area, be submitted to Designated Experts by 1 October 2004.*

3. For Northern shrimp in Subareas 0 and 1

- *sampling of catches by observers – essential for assessing age, size, sex composition, fecundity and frequency of spawning of the stock – be re-established in Subarea 1.*

4. For Northern shrimp in Denmark Strait and off East Greenland

- *a survey series be established, to provide fishery independent data of the stock throughout its range.*
- *sampling of catches by observers – essential for assessing age, size, sex composition, fecundity and frequency of spawning of the stock – be re-established in the Greenland EEZ and improve in the Icelandic EEZ..*