

PART E

Miscellaneous

CONTENTS

	Page
Agenda I. Scientific Council Meeting on Precautionary Approach, 27 April-1 May 1999	287
Terms of Reference, 27 April-1 May 1999 Meeting (<i>NAFO Sci. Coun. Rep.</i> , 1998, p. 165)	287
Agenda II. Scientific Council Meeting, 2-16 June 1999	288
Annex 1. Fisheries Commission's Request for Scientific Advice on Management in 2000 of Certain Stocks in Subareas 3 and 4	294
Annex 2. Canadian Request for Scientific Advice on Management In 2000 of Certain Stocks in Subareas 0 to 4	296
Annex 3. Denmark (Greenland) Request for Scientific Advice on Management of Certain Stocks in Subareas 0 and 1	297
Annex 4. The Proposal for Local Area Network (LAN) at the Scientific Council Meeting, 3-16 June 1999	298
Agenda III. Scientific Council Annual Meeting, 7, 13-17 September 1999	300
Agenda IV. Scientific Council Meeting, 11-17 November 1999	302
List of Research and Summary Documents, 1999	303
List of Representatives, Advisors/Experts and Observers, 1999	313
List of Recommendations in 1999	319

AGENDA I
SCIENTIFIC COUNCIL MEETING ON PRECAUTIONARY APPROACH
27 April-1 May 1999

1. Opening by the Chairman
 - i) Appointment of Rapporteur(s)
 - ii) Adoption of Agenda (see Terms of Reference below)
2. Tutorial on Software Related to Precautionary Approach
3. Reference Points for case studies:
 - a) Cod in Divisions 3NO
 - b) Yellowtail flounder in Divisions 3LNO
 - c) Shrimp in Division 3M
4. Reference Points for Other NAFO Stocks
5. Consideration of Recommendations from the May 1998 Meeting of the Joint Scientific Council and Fisheries Commission Working Group on Precautionary Approach
6. Preparation for the Joint Scientific Council and Fisheries Commission Working Group Meeting of 3-5 May 1999
7. Recommendations for the Joint Scientific Council and Fisheries Commission Working Group Meeting of 3-5 May 1999
8. Appointment of Scientific Council members to represent Scientific Council at the Joint Scientific Council and Fisheries Commission Working Group Meeting of 3-5 May 1999
9. Other Matters
10. Adoption of Report
11. Adjournment

TERMS OF REFERENCE, 27 APRIL-1 MAY 1999 MEETING
(*NAFO Sci. Coun. Rep.*, 1998, p. 165)

In accordance with the agreement at the June 1998 Meeting of the Scientific Council, the Scientific Council will meet in Spring 1999 to further address issues on the Precautionary Approach (PA). Recognizing the need to coordinate the outcome of this meeting with the views of the Fisheries Commission on the PA, the following Terms of Reference were agreed for the Scientific Council.

It was agreed that the duration be 5 working days, and the meeting should be held at a time suitable for the Fisheries Commission representatives. For the work during these 5 days, the Council agreed to the following Terms of Reference:

- 1) Hands-on with software implementation of methods relevant to PA.
- 2) Progress on development of reference points for NAFO stocks.
- 3) Address recommendations from May 1998 Meeting of the Scientific Council/Fisheries Commission.

AGENDA II
SCIENTIFIC COUNCIL MEETING, 3-16 JUNE 1999

- I. Opening (Chairman: H. P. Cornus)
 1. Appointment of rapporteur
 2. Adoption of agenda
 3. Attendance of observers
 4. Plan of work
 5. Review of LAN use at meetings (see Annex 4)
 6. Report of proxy votes (by Executive Secretary)
- II. Chairman's Report on Intersessional Activities
 1. Report on Eleventh ICES Dialogue Meeting
 2. Report on meeting of FAO and Non-FAO Regional Fishery Bodies
 3. ICES ACFM meeting May 1999
- III. Review of Scientific Council Recommendations in 1998
- IV. Implementation of Precautionary Approach (PA)
 1. Review of results of San Sebastian 27 April-5 May 1999 Meetings
 2. Future development
- V. Fisheries and Environment (STACFEN Chairman: M. Stein)
 1. Opening
 2. Chairman's introduction; report on intersessional activities
 3. Review of recommendations in 1998
 4. Invited lecture (R. R. Dickson, CEFAS, UK: "Aspects of the physical and biological response to NAO variability").
 5. Review of environmental conditions
 - a) Marine Environmental Data Service (MEDS) Report for 1998
 - b) Review of environmental studies in 1998
 - i) Results from physical oceanographic studies
 - ii) Results from interdisciplinary studies
 - c) Overview of environmental conditions in 1998
 6. Formulation of recommendations based on environmental conditions in 1998.
 7. Environmental indices (implementation in the assessment process)
 8. Russian/German data evaluation (ICNAF/NAFO data, status report)
 9. ICES/NAFO Symposium on Hydrobiological Variability, August 2001, Edinburgh, UK
 10. National representatives

11. Other matters
- VI. Fisheries Science (STACFIS Chairman: R. Mayo)
1. Opening
 2. General review
 - a) Review of recommendations in 1998
 - 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 State (Annex 1)(Shrimp in Div. 3M will be undertaken during Scientific Council Meeting 11-17 November, 1999):
 - Cod (Div. 3NO; Div. 3M)
 - Redfish (Div. 3LN; Div. 3M)
 - American plaice (Div. 3LNO; Div. 3M)
 - Witch flounder (Div. 3NO)
 - Yellowtail flounder (Div. 3LNO)
 - Shrimp (Div. 3LNO)(see also Annex 1, item 7)
 - Squid (Subareas 3 and 4) (see also Annex 1, item 3.f)
 - Greenland halibut (Subareas 2 and 3)
 - [Note also Annex 1, item 6 concerning witch flounder in Div. 2J+3KL]
 - b) Stocks within the 200-mile fishery zone in Subareas 2, 3 and 4, as requested by Canada (Annex 2)
 - Roundnose grenadier (Subareas 2 and 3)
 - [Note also Annex 2, Item 3 concerning cod in Div. 2J+3KL]
 - c) Stocks within the 200-mile fishery zone in Subarea 1 and at East Greenland as requested by Denmark on behalf of Greenland (Annex 3)(Northern shrimp in Denmark Strait and off East Greenland will be undertaken during Scientific Council Meeting, 11-17 November 1999):
 - Redfish (Subarea 1) (by species, if possible)
 - Other finfish and invertebrates (Subarea 1)
 - d) Stocks overlapping the fishery zones in Subareas 0 and 1, as requested by Canada and by Denmark on behalf of Greenland (Annexes 2 and 3) (Northern shrimp in Subareas 0 and 1 will be undertaken during Scientific Council Meeting, 11-17 November, 1999):
 - Greenland halibut (Subareas 0 and 1)
 - Roundnose grenadier (Subareas 0 and 1)
 - e) Assessment of other stocks:
 - Roughhead grenadier (Subareas 2 and 3)
 4. Research activities
 - a) Comparative fishing surveys between Canada and EU-Spain in Spring 1999
 - b) Other activities

5. Other matters
 - a) New Designated Experts
 - b) Other business
- VII. Research Coordination (STACREC Chairman: V. Shibanov)
 1. Opening
 2. Review of recommendations in 1998
 3. Fishery statistics
 - a) Progress report on Secretariat activities in 1998/99
 - i) Acquisition of STATLANT 21A and 21B reports for recent years
 - ii) Publication of statistical information
 - iii) Considerations on internet site for statistical data
 - iv) Interagency data harmonization (NAFO/FAO)
 - b) The CWP 18th Session
 - i) Considerations for CWP 18th Session, Luxembourg, 5-9 July 1999
 4. Biological sampling
 - a) Report on activities in 1998/99
 - b) Report by National Representatives on commercial sampling conducted
 - c) Report on data availability for stock assessments (by Designated Experts)
 5. Biological surveys
 - a) Review of survey activities in 1998 (by National Representatives and Designated Experts)
 - b) Surveys planned for 1999 and early-2000
 6. Non-traditional fishery resources in the NAFO Area
 - a) Distribution data from surveys
 - b) Collection of scientific data and catch statistics on elasmobranchs and other non-traditional species
 - c) Expanded species list for STATLANT 21A and B
 7. Report of the Working Group on Biological Information Database (Chairman, E. De Cardenas, EU-Spain)
 8. Review of SCR and SCS Documents
 9. Protocol for scientific data on Pilot Observer Program
 10. Format of data from Pilot Observer Program for Scientific Council purposes
 11. Other matters
 - a) Tagging activities
 - b) Conversion factors
 - c) Other business
- VIII. Publications (STACPUB Chairman: W. B. Brodie)
 1. Opening
 2. Review of recommendations in 1998
 3. Review of STACPUB membership and chairmanship

4. Review of scientific publications since June 1998
 - a) Journal of Northwest Atlantic Fishery Science
 - b) NAFO Scientific Council Studies
 - c) NAFO Statistical Bulletin
 - d) Index and Lists of Titles
 - e) Others
 5. Production costs and revenues for Scientific Council publications
 - a) Review of costs and revenues
 - b) Proposal for publication of 1999 Symposium proceedings
 6. Promotion and distribution of scientific publications
 - a) Invitational papers
 - b) Abstracts from Research Documents
 - c) NAFO Website
 - d) Scientific Citation Index (SCI)
 - e) CD-ROM versions of reports, documents
 - f) New initiatives for publications
 7. Editorial matters regarding scientific publications
 - a) Review of Editorial Board
 - b) Editorial workload related to publication of Symposium proceedings
 - c) Progress review of publication of 1998 Symposium
 - d) Review of editorial process □Scientific Council Studies
 8. Papers for possible publication
 - a) Review of proposals resulting from the 1998 Meetings
 - b) Review of contributions to the April-May 1999 meeting on Precautionary Approach
 - c) Review of contributions to the June 1999 Meeting
 9. Other matters
- IX. Arrangements for Special Sessions
1. Progress report on Special Session in 1999: Joint NAFO/ICES/PICES Symposium on "Pandalid Shrimp Fisheries □ Science and Management at the Millennium" (co-conveners: P.A.Koeller, J. Boutillier and S. Tveite)
 2. Proposal for Special Session in 2000
 3. Progress report on Special Session in 2001: Symposium on Hydrobiological Variability
- X. Future Scientific Council Meetings 1999 and 2000
1. Scientific Council Meeting and Symposium, September 1999
 2. Scientific Council Meeting in November 1999 (assessment of shrimp stocks in Div. 3M, Subareas 0+1 and Denmark Strait)
 3. Scientific Council Meeting, June 2000
 4. Scientific Council Meeting and Symposium, September 2000
 5. Scientific Council Meeting, November 2000
 6. Scientific Council Meeting, November 2001
- XI. Nomination and Election of Officers
1. Chairman Scientific Council
 2. Vice-Chairman Scientific Council
 3. Chairman STACPUB

4. Chairman STACFIS
5. Chairman STACREC

XII. Management Advice and Responses to Special Requests

1. Fisheries Commission (Annex 1)
 - a) Request for advice on TACs and other management measures for year 2000
 - Redfish in Div. 3M
 - Yellowtail Flounder in Div. 3LNO
 - Squid in Subareas 3 and 4
 - Shrimp in Div. 3M
 - Greenland Halibut in Subareas 2 and 3
 - Cod in Div. 3M
 - American Plaice in Div. 3M
 - Witch Flounder in Div. 3NO
 - b) Request for advice on TACs, and other management measures for years 2000 and 2001
 - American Plaice in Div. 3LNO
 - Cod in Div. 3NO
 - Redfish in Div. 3LN
 - c) Special requests for management advice
 - i) Precautionary measures
 - ii) Criteria for re-opening fisheries
 - iii) Squid in Subareas 3 and 4
 - iv) Stock status of witch flounder in Div. 2J+3KL
 - v) Information on shrimp stock in Div. 3LNO
 - vi) Information on guidelines and protocol of fisheries research
2. Coastal States (Annexes 2 and 3)
 - a) Request by Canada and Denmark (Greenland) on Advice for TACs and other management measures for year 2000:
 - Greenland halibut in Subareas 0 and 1
 - Roundnose grenadier in Subareas 0 and 1
 - b) Request by Denmark (Greenland) on Advice for TACs and other management measures for years 2000 and 2001
 - Redfish in Subarea 1
 - Other finfish
 - c) Special requests on advice by Denmark (Greenland): comment on multiyear advice
 - d) Request by Canada for advice for TACs for 2000 and other management measures (see section a)
 - Roundnose grenadier in Subareas 2 and 3

- e) Special requests for advice by Canada
 - i) Overall assessment for Greenland halibut throughout SA 0 to 3
 - ii) Stock status of cod in Div. 2J+3KL
 - iii) Stock structure of Greenland halibut in SA 0+1
 - iv) Effects of spatial distribution of recent annual catches on yield and SSB of Greenland halibut in SA 2 + Div. 3K and Divisions 3LMNO
 - v) Impact of by-catches in the NAFO Regulatory Area on the recovery of stocks currently under moratorium.
 - vi) Conservation measures (other than TACs based on reference points) in the context of the Precautionary Approach.
- 3. Scientific advice from Scientific Council on its own accord
 - Roughhead grenadiers in SA 2+3.
- XIII. Report of the Joint ICES/NAFO Working Group on Harp and Hooded Seals
- XIV. Review of Scientific Council working procedures/protocols
 - a) Review of Rules of Procedure
 - b) Adoption of the form of advice to PA requirements
 - c) NAFO Scientific Council observership at ICES ACFM meetings
- XV. Other Matters
 - a) Recommendations from 1998 Symposium on Growth and Maturation
 - b) FAO ACFR Working Party on Status and Trends of Fisheries
 - c) NAFO Working Group on Transparency
 - d) Other business
- XVI. Adoption of Committee Reports
 - a) STACFEN
 - b) STACFIS
 - c) STACREC
 - d) STACPUB
- XVII. Scientific Council Recommendations to General Council and Fisheries Commission
- XVIII. Adoption of Scientific Council Report
- XIX. Adjournment

**ANNEX 1. FISHERIES COMMISSION'S REQUEST FOR SCIENTIFIC ADVICE ON
MANAGEMENT IN 2000 OF CERTAIN STOCKS IN SUBAREAS 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 1999 Annual Meeting, provide advice on the scientific basis for the management of the following fish and invertebrate stocks or groups of stocks in 2000:

Redfish (Div. 3M)
Yellowtail flounder (Div. 3LNO)
Squid (Subareas 3 and 4)
Shrimp (Div. 3M)
Greenland halibut (Subareas 2 and 3)

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, 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. 3LN)
American plaice (Div. 3LNO; Div. 3M)
Witch flounder (Div. 3NO)

To implement this system of assessments in alternating years, the Scientific Council is requested to conduct the assessment of these six stocks as follows:

- In 1999, all six stocks will be assessed. The assessment advice, however, will pertain to different time periods to allow the introduction of the new scheme over the next three years.
- In 1999, advice will be provided for 2000 and 2001 for American plaice in 3LNO, cod in 3NO and redfish in 3LN. The next assessment of these stocks will thus be conducted in 2001.
- In 1999, advice will be provided for 2000 for cod in 3M, American plaice in 3M and witch flounder in 3NO. The next assessment of these stocks will be conducted in 2000 with advice provided for 2001 and 2002. These stocks will then next be assessed in 2002.

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

3. The Commission and the Coastal State request the Scientific Council to consider the following options in assessing and projecting future stock levels for those stocks listed above:
 - a) 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 $F_{0.1}$, F_{1998} and F_{max} in 2000 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.

Opinions of the Scientific Council should be expressed in regard to stock size, spawning stock sizes, recruitment prospects, catch rates and TACs implied by these management strategies for the short and the long term. Values of F corresponding to the reference points should be given. Uncertainties in the assessment should be evaluated.
 - 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. 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.
 - c) 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.

- d) Spawning stock biomass levels that might be 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.
- e) 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;
 - a graph of catch options for the year 2000 and subsequent years over a range of fishing mortality rates (F) at least from $F_{0.1}$ to F_{max} ;
 - a graph showing spawning stock biomass corresponding to each catch option;
 - 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 three reference points, actual F, $F_{0.1}$ and F_{max} should be shown.

- f) Squid (*Illex*) in Sub-areas 3 and 4 is a short-lived species such that a change in productivity could be sudden. The Fisheries Commission and Coastal States request that the Scientific Council provide advice on the approach that could be used on an ongoing basis to allow timely identification of the onset of a new productivity level (higher or lower). It is also requested that the Scientific Council advise on catch levels that would be appropriate for different levels of productivity (e.g. low, medium and high). Further, the Scientific Council is requested to evaluate the potential impacts of fisheries for squid in Subareas 3 and 4 on the portion of the squid (*Illex*) resource in Subareas 5 and 6.
4. In 1996, the Fisheries Commission requested that the Scientific Council comment on Article 6 and Annex II of the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks. 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, in their June 1999 report, the following information for the 1999 Annual Meeting of the Fisheries Commission for all stocks under its responsibility (i.e. cod in 3M and 3NO, American plaice in 3M and 3LNO, yellowtail flounder in 3LNO, witch flounder in 3NO, redfish in 3M and 3LN, Greenland halibut in SA 2+3, capelin in 3NO, shrimp in 3M and squid in SA 3+4):
- a) the limit and target precautionary reference points described in Annex II indicating areas of uncertainty;
 - b) information including medium term consideration and associated risk or probabilities which will assist the Commission to develop 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 order of priority considered appropriate by the Scientific Council; and,
 - 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.
5. The Fisheries Commission requests that the Scientific Council develop criteria to be evaluated during any consideration of possible fisheries re-openings.
6. The Fisheries Commission with the concurrence of the Coastal State requests that the Scientific Council review available information, including any Canadian assessment documentation on the stock status, and provide advice on catch levels for the 2J3KL witch flounder resource. Any information pertaining to the relative distribution of the resource within the stock area, as well as changes in this distribution over time should also be provided.
7. With regard to shrimp in Divisions 3LNO, the Fisheries Commission, with the concurrence of the Coastal State, requests that the Scientific Council:
- a) provide information on the fishing mortality on shrimp in Divisions 3LNO in recent years, as well as information on by-catches of groundfish in 3LNO shrimp fisheries;
 - b) provide information on abundance indices and the distribution of the stock in relation to groundfish resources, particularly for the stocks which are under moratorium;

- c) provide information on the distribution of shrimp in Divisions 3L, 3N and 3O, as well as describe the relative distribution inside and outside the NAFO Regulatory Area;
- d) advise on reference points and conservation measures that would allow for exploitation of this resource in a precautionary manner;
- e) identify and delineate fishing 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;
- f) provide information on annual yield potential for this stock;
- g) determine 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 Catches (TAC); and
- h) provide advice on whether shrimp found in the area of the Flemish Cap defined by the following geographical coordinates

Point	Latitude	Longitude
1	47° 20' 0	46° 40' 0
2	47° 20' 0	46° 30' 0
3	46° 00' 0	46° 30' 0
4	46° 00' 0	46° 40' 0

are considered to represent a part of the overall Flemish Cap shrimp resource, and determine the potential impact on groundfish resources in terms of by-catch of juveniles and loss of potential yield that could result from the exploitation of shrimp in that area.

8. The Scientific Council is requested to provide information on the types of fisheries research activities being conducted or that may be conducted in the future in the NAFO Regulatory Area. Further, the Scientific Council is requested to outline any guidelines and protocols which should be followed when conducting such research.

ANNEX 2. CANADIAN REQUEST FOR SCIENTIFIC ADVICE ON MANAGEMENT IN 2000 OF CERTAIN STOCKS IN SUBAREAS 0 TO 4

1. Canada requests that the Scientific Council, at its meeting in advance of the 1999 Annual Meeting of NAFO, provide advice on the scientific basis for the management of the Roundnose grenadier in Subareas 2 and 3 in 2000.

It is also suggested that, subject to the concurrence of Denmark (Greenland), the Scientific Council, prior to the 1999 Annual Meeting of NAFO, provide advice on the scientific basis for management in 2000 of the following stocks:

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

The Scientific Council has noted previously 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 (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 2000. In particular, the Council is asked to advise on appropriate TAC levels separately for SA 0+1, for SA 2+Division 3K and for Divisions 3LMNO, and to make recommendations on the distribution of fishing effort within each of these three geographic areas. The Council is asked also to provide information on present harvest patterns in terms of yield per recruit and on distributional variation of the resource in recent years.

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 those stocks listed above:
 - a) For those stocks subject to analytical dynamic-pool type assessments, the status of the stock should be reviewed and implications of fishing at $F_{0.1}$ in 2000 and subsequent years should be evaluated. The present stock size should be described in relation to those observed historically and those to be expected at the $F_{0.1}$ level in both the short and long term. In those cases where present spawning stock size is a matter of scientific concern in relation to the continuing

productive potential of the stock, management options should be considered to rebuild the spawning stock. All results should be expressed in terms of stock sizes, catch rates and TACs implied for 2000 and the long term.

- b) For those stocks subject to general production-type assessments, 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 point should be the level of fishing effort (F) which is two-thirds that calculated to be required to take the MSY catch in the long term.
- c) For those resources on which only general biological and/or catch data are available, no standard criteria on which to base advice can be established. The evidence on stock status should, however, be weighed against a strategy of optimum yield management and maintenance of stock biomass at levels of about two-thirds that of the virgin stock.

In addition to the above, the Scientific Council should also advise on any new information that may be available on the application the Precautionary Approach for those stocks.

- 3. The Scientific Council is requested to review the status of the cod stock in Divisions 2J+3KL and to provide estimates of the current size of the total and spawning biomass, together with a description of recent trends.
- 4. In 1994, the Scientific Council noted that there was ongoing research which would allow the Scientific Council to review its opinion on the stock structure question pertaining to Greenland halibut in NAFO Subareas 0+1 (1994 Redbook, pg. 102). Therefore, the Scientific Council is requested to review this information and, in particular, any tagging studies which could be used to answer the following questions: 1) is there any evidence that the Greenland halibut in Division 1A contribute to the spawning stock in Div. 0+1 (offshore)? 2) Are the current management units for Greenland halibut in NAFO Subareas 0+1 (0+1 offshore, Division 1A) biologically appropriate?
- 5. For Greenland halibut in Subarea 2+Division 3K and Divisions 3LMNO, the Scientific Council is requested to evaluate the effects on yield and stock spawning biomass of the spatial distribution of recent annual catches in relation to the spatial distribution of the stock biomass. The Scientific Council is also requested to provide information on the distribution of fishing effort for Greenland halibut by Division and by depth.
- 6. The Scientific Council is requested to evaluate the impact of by-catches in the NAFO Regulatory Area on the recovery of stocks currently under moratorium. Specifically do the by-catches of these stocks in all other fisheries in the NAFO Regulatory Area impede their recovery?
- 7. The Scientific Council has been looking at the Precautionary Approach with respect to reference points for specific species. At the May 1998 Intersessional Meeting on the Precautionary Approach, other potential measures were also identified, such as mesh size, by-catch protocols, closures, etc. Could the Scientific Council discuss and recommend specific conservation measures (other than TACs based on reference points) that the Fisheries Commission could consider in the context of the Precautionary Approach framework?

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

ANNEX 3. DENMARK (GREENLAND) REQUEST FOR SCIENTIFIC ADVICE ON MANAGEMENT OF CERTAIN STOCKS IN SUBAREAS 0 AND 1

- 1. Denmark, on behalf of Greenland, request the Scientific Council, at a meeting in advance of the 1999 Annual Meeting, provide advice on the scientific basis for the management of the following fish stocks in Subarea 1 on a two-year basis (for the years 2000 and 2001):

Redfish (by species, if possible)
 Any other stock of finfish of commercial interest, for which data allow a status report

Denmark, on behalf of Greenland, requests the Scientific Council to continue to monitor the status of these stocks annually and, should significant changes be observed in stock status, provide updated advice as appropriate.

2. Subject to the concurrence of Canada, the Scientific Council is also requested to provide advice on the scientific basis for the management of the following stocks overlapping Subareas 0 and 1:

Greenland halibut
Roundnose grenadier

In its 1993 report, the Scientific Council has noted that the offshore component of Greenland halibut in Subareas 0 and 1 was distributed equally between these Subareas. Further in its 1995 report, the Scientific Council noted that the biomass of the inshore component of this stock in Subarea 1 was unknown. The Council is therefore asked to comment on the following topics:

- a) allocation of TACs to appropriate Subareas (Subareas 0 and 1).
- b) allocation of TAC for Subarea 1 inshore areas.

For roundnose grenadier in Subarea 0+1, the advice of the Scientific Council has been constrained by the lack of scientific information, as there are no recent estimates of biomass for the entire stock area. Subject to the concurrence of Canada, the Scientific Council is requested to comment on advantages and disadvantages of a multiyear management advice for this stock.

3. Subject to the concurrence of Canada, Denmark, on behalf of Greenland, further requests that the Scientific Council of NAFO before December 1999, provide advice on the scientific basis for management of Northern shrimp (*Pandalus borealis*) in Subareas 0 and 1 in year 2000 and as many years forward as data allow.

Further, in cooperation with ICES, the Council is requested to advise on the scientific basis for management of Northern shrimp (*Pandalus borealis*) in the Denmark Strait and adjacent areas east of southern Greenland.

For Northern shrimp (*Pandalus borealis*) in Subareas 0 and 1 and in Denmark Strait the Scientific Council is requested to comment on advantages and disadvantages of a multiyear management advice.

Peder Munk Pedersen
Director
On behalf of The Ministry for Fisheries, Hunting Agriculture

ANNEX 4. THE PROPOSAL FOR LOCAL AREA NETWORK (LAN) AT THE SCIENTIFIC COUNCIL MEETING, 3-16 JUNE 1999

Hardware/Software Standard

All computer equipment that will be connected to the NAFO network during the June 1999 Meeting must conform to the following specifications:

Physical connections: Must support 10Base-T Ethernet twisted pair connection over CAT-3 or CAT-5 cabling (RJ-45)

Networking Software: Must support the native ability to communicate on a Microsoft Windows peer-to-peer network (i.e. running Windows for Workgroups 3.11, Windows '95, Windows '98, Windows NT, or the Microsoft networking client for DOS)

Application Software: If the ability to share information over the network is necessary, Microsoft Office will be the platform of choice for word-processing and spreadsheets. MS Office '97 is preferable, however, it is also downward compatible with older versions of MS Office.

File Sharing

The NAFO Secretariat will provide a central Windows '98 machine and laser printer. That machine will have the following shared directory structure:

1. One directory dedicated to each party at the table. This directory will only be accessible through the network by means of a password.

2. One working directory to be shared by all participants with global read/write access. This is designed to facilitate the sharing of information between parties.
3. One read-only directory, accessible to all, and set-up by the Secretariat for the dissemination of information. This is primarily designed to allow all parties to have access to previously completed reports and other documents.

AGENDA III
SCIENTIFIC COUNCIL ANNUAL MEETING, 7, 13-17 SEPTEMBER 1999*

- I. Opening (Chairman: H.-P. Cornus)
 1. Appointment of Rapporteur
 2. Adoption of Agenda
 3. Attendance of Observers
 4. Plan of Work

- II. Fisheries Science (STACFIS Chairman: R. K. Mayo)
 1. Opening
 2. Matters Related to Stock Assessments
 - a) Nomination of Designated Experts
 3. Other Matters
 - a) Review of SCR and SCS Documents (if needed)
 - b) Other Business

- III. Research Coordination (STACREC Chairman: V. N. Shibanov)
 1. Opening
 2. Fisheries Statistics
 - a) Progress Report on Secretariat Activities
 - i) Acquisition of STATLANT 21 data
 - ii) Publication of statistical information
 - b) Review of SCR and SCS Documents (if needed)
 - c) NAFO Observer Protocol
 - i) Report of the *Ad hoc* Working Group on NAFO Observer Protocol
 - d) Report of CWP 18th Session
 3. Other Matters
 - a) Progress Report on Biological Database Format Exchange (Cod in Divisions 3NO)
 - b) Other Business

- IV. Publications (STACPUB Chairman: W.B. Brodie)
 1. Opening
 2. Review of Scientific Publications
 - a) Status of Papers from June 1999 Meeting
 - b) Status of Papers from 1999 Symposium
 - c) Other Reviews

* **NOTE:** Meeting of 7 September 1999 will be at NAFO Headquarters, 2 Morris Drive, Dartmouth, Nova Scotia, Canada
Meeting of 13-17 September 1999 will be at Holiday Inn, Wyse Road, Dartmouth, Nova Scotia, Canada.

3. Status of Scientific Council Studies
 4. Review of Meeting with Editorial Board during 1999 Symposium
[**Note:** this item depends on arranging an *Ad hoc* Meeting between available members of STACPUB and the Editorial Board during the 8-10 September Symposium in Dartmouth.]
 5. Other Matters
- V. Management Advice and Responses to Special Requests
1. Shrimp in Divisions 3LNO (see Agenda II, Annex 1, Item 7)
 2. Intersessional information on shrimp in Div. 3M
 3. Special Requests from Concurrent Fisheries Commission Meeting
- VI. Development of Precautionary Approach
1. Review of Papers Related to Precautionary Approach
 2. Review of Meetings at San Sebastian, 27 April-5 May 1999 (see SCS Doc. 99/4; FC Doc. 99/2)
 3. Future Development
- VII. Review of Future Meeting Arrangements
1. Scientific Council Meeting, June 2000
 2. Special Session and Annual Meeting, September 2000
 3. Other Meetings in 2000 and 2001
- VIII. Future Special Sessions
1. Progress Report on Special Session in 2000
 2. Progress Report on Special Session in 2001
- IX. Scientific Council Working Procedures and Protocols
1. Review of Rules of Procedure
 - a) STACPUB Membership
 - b) Observers at Scientific Council Meetings
 2. Other Procedures or Protocols
 - a) Standard Software
 - b) Standard Database
 - c) Intermediate Stock Status Report for Stocks with a Multiyear Advice
- X. Other Matters
1. *Ad hoc* Working Group on Future Computer Requirements and Improvement of NAFO Website
 2. NAFO Scientific Council Observer at ICES ACFM
 3. Report from Scientific Council Representative at STACFAD
 4. Joint ICES/NAFO Working Group on Harp and Hooded Seals
 5. Working Group on Reproductive Potential
- XI. Adoption of Reports
1. Consideration of Report from the Symposium of 8-10 September 1999
 2. Committee Reports of Present Meeting (STACFIS, STACREC, STACPUB)
 3. Report of Scientific Council Present Meeting, 7, 13-17 September 1999
- XII. Adjournment

AGENDA IV
SCIENTIFIC COUNCIL MEETING, 11-17 NOVEMBER 1999

- I. Opening (Chairman: W. B. Brodie)
 1. Appointment of rapporteur
 2. Adoption of agenda
 3. Plan of work

- II. Fisheries Science (STACFIS Chairman: H. J. Ritz)
 1. Review of Recommendations in 1998 and 1999
 2. General environmental review
 3. Stock assessments (see Agenda II, Annexes 1, 2 and 3)
 - Shrimp (Div. 3M)
 - Northern shrimp (Subareas 0 and 1)
 - Northern shrimp (in Denmark Strait and off East Greenland)
 4. Other business

- III. Research Coordination (STACREC Chairman: R. K. Mayo)
 1. Protocol for exchange of biological data for northern shrimp stocks
 2. Other business

- IV. Formulation of Advice (see Agenda II, Annexes 1, 2 and 3)
 1. Advice for Northern Shrimp
 - Northern shrimp (Div. 3M)
 - Northern shrimp (Subareas 0 and 1)
 - Northern shrimp (in Denmark Strait)
 2. Responses to Special Requests

- V. Other Matters
 1. Meeting of November 2000
 2. Meeting of November 2001

- VI. Adoption of Reports

- VII. Adjournment

LIST OF RESEARCH AND SUMMARY DOCUMENTS, 1999

RESEARCH DOCUMENTS (SCR)

SCR No.	Serial No.	Author(s) and Title
99/1 ^a	N4042	KOELLER, P. A. Fisheries impact assessment □ a good, bad and ugly approach to precautionary shrimp stock management. (7 pages)
99/2 ^b	N4045	DE CARDENAS, E., L. MOTOS, and S. JUNQUERA. A simple method to project catches, in the absence of VPA. (10 pages)
99/3 ^a	N4046	CADRIN, S. X., and S. J. WALSH. Surplus production analysis and potential precautionary reference points for Grand Bank yellowtail flounder (NAFO Div. 3LNO). (28 pages)
99/4 ^b	N4047	BUCH, E. Oceanographic investigations off West Greenland, 1998. (13 pages)
99/5 ^a	N4048	WALSH, S. J., S. X. CADRIN, D. RIVARD, R. M. COOK, and W. B. BRODIE. Investigating parameter estimates of fishing mortality and biological reference points using research survey data: yellowtail flounder in NAFO Divisions 3LNO, a case study. (17 pages)
99/6 ^b	N4052	STEIN, M. Environmental indices □ a review on climatic variability and potential effects on marine ecosystems. (6 pages)
99/7 ^b	N4053	STEIN, M., and J. LLORET. Environmental indices □ predicting air temperatures and water temperatures in the Northwest Atlantic by time series analysis. (9 pages)
99/8 ^b	N4055	DOUGHERTY-POUPORE, T. Marine environmental data service report for 1999. (27 pages)
99/9 ^b	N4056	MORGAN, M. J., and W. R. BOWERING. Estimates of maturity of Greenland halibut from 'synoptic' surveys. (11 pages)
99/10 ^b	N4057	KISELEVA, V. M. Interannual dynamics of growth and maturity of cod on Flemish Cap in 1980-1996. (13 pages)
99/11 ^b	N4058	IGASHOV, T. M. Biological characteristics and bathymetric distribution of Greenland halibut (<i>Reinhardtius hippoglossoides</i>) of the Flemish Pass (3LM) area during the fishery of Russia in 1998. (15 pages)
99/12 ^b	N4059	STEIN, M., and V. A. BOROVKOV. Third report of joint Russian/German project "assessment of short-time climatic variations in the Labrador Sea". (4 pages)
99/13 ^b	N4060	RIKHTER, V. A. On the criteria (reference points) of biomass, and approaches to some fishery management in the North Western Atlantic Ocean. (8 pages)
99/14 ^b	N4061	SARASUA, A., H. MURUA, and E. RODRIGUEZ-MARIN. Roughhead grenadier (<i>Macrourus berglax</i>) population structure on Flemish Cap, 1998. (16 pages)

^a Scientific Council Meeting on Precautionary Approach, 27 Apr-1 May 1999

^b Scientific Council Meeting, 3-16 June 1999

SCR No.	Serial No.	Author(s) and Title
99/15 ^a	N4063	SAVARD, L., and D. G. PARSONS. A precautionary approach to assessment and management of Pandalid shrimp with application to <i>Pandalus borealis</i> in NAFO Division 3M. (11 pages)
99/16 ^b	N4065	DURBIN, P., S. JUNQUERA, and M. S. ALVAREZ. Yellowtail flounder length at maturity in the Grand Bank (1995-98). (8 pages)
99/17 ^b	N4066	STEIN, M. Climatic conditions around Greenland □1998. (16 pages, revised)
99/18 ^b	N4068	MURUA, H., A. SARASUA, E. RODRIGUEZ-MARIN. A review on roughhead grenadier (<i>Macrourus berglax</i>) population structure on Flemish Cap (NAFO Div. 3M) 1991-1998. (14 pages)
99/19 ^b	N4069	DURBIN, P., S. JUNQUERA, X. PAZ, and M. S. ALVAREZ. Data on sharks in NAFO Divisions 3LMNO: 1991-1998. (14 pages)
99/20 ^b	N4070	RITZ, H.-J., and C. STRANSKY. Assessment of redfish (<i>Sebastes marinus</i> , <i>S. mentella</i>) in NAFO Subarea 1 and ICES Div. XIVb based on survey indices, 1982-98. (22 pages)
99/21 ^b	N4071	RITZ, H.-J., and J. LLORT. Assessment of American plaice (<i>Hippoglossoides platessoides</i>) in NAFO Subarea 1 and ICES Div. XIVb based on survey indices, 1982-98. (10 pages)
99/22 ^b	N4073	VAZQUEZ, A. Results from bottom trawl survey of Flemish Cap in July 1998. (37 pages)
99/23 ^b	N4074	MORGAN, M. J., and S. J. WALSH. An update of results of tagging experiments with juvenile yellowtail flounder in NAFO Divisions 3LNO. (8 pages)
99/24 ^b	N4078	ALEKSEEV, F. E. On population structure of redfish (<i>Sebastes mentella</i> Travin) in the North Atlantic. (11 pages)
99/25 ^b	N4081	BOJE, J. Intermingling and seasonal migrations of Greenland halibut stock components in the Northwest Atlantic based on tagging studies. (13 pages)
99/26 ^b	N4082	STENSON, G. B., B. HEALEY, P. A. SHELTON, and B. SJARE. Recent trends in the population of Northwest Atlantic harp seals, <i>Phoca groenlandica</i> . (18 pages)
99/27 ^b	N4083	ENGELSTOFT, J. J., and O. A. JØRGENSEN. Biomass and abundance of demersal fish stocks off West Greenland estimated from the Greenland shrimp survey 1988-1998. (19 pages)
99/28 ^b	N4084	LILLY, G. R., P. A. SHELTON, J. BRATTEY, N. G. CADIGAN, E. F. MURPHY, and D. E. STANSBURY. An assessment of the cod stock in NAFO Divisions 2J+3KL. (141 pages)
99/29 ^b	N4085	SABORIDO-REY, F., and S. JUNQUERA. Sexual maturity and spawning biomass of the cod stock on Flemish Cap (Division 3M). (11 pages)

^a Scientific Council Meeting on Precautionary Approach, 27 Apr-1 May 1999

^b Scientific Council Meeting, 3-16 June 1999

SCR No.	Serial No.	Author(s) and Title
99/30 ^b	N4086	JØRGENSEN, O. A. Survey for Greenland halibut in NAFO Divisions 1C-1D, 1998. (25 pages)
99/31 ^b	N4087	GUNDERSEN, A. C., and W. B. BRODIE. Length-weight relationships for Greenland halibut (<i>Reinhardtius hippoglossoides</i>) in NAFO Divisions 2GHJ and 3KLMNO, 1990-1997. (21 pages)
99/32 ^b	N4089	COLBOURNE, E. B., and E. F. MURPHY. A spatial analysis of near-bottom temperatures in NAFO Subareas 2 and 3 on the Newfoundland and southern Labrador Shelves. (29 pages)
99/33 ^b	N4090	RØTZ, H.-J., and J. LLORT. Assessment of thorny skate (<i>Raja radiata</i>) in NAFO Subarea 1 and ICES Div. XIVb based on survey indices, 1982-98. (15 pages)
99/34 ^b	N4092	BOWERING, W. R. A stock status update of witch flounder in NAFO Divisions 3NO. (17 pages)
99/35 ^b	N4093	BOWERING, W. R. Distribution and abundance of witch flounder in Divisions 2J, 3K and 3L. (14 pages)
99/36 ^b	N4094	DRINKWATER, K. F., E. COLBOURNE, and D. GILBERT. Overview of environmental conditions in the Northwest Atlantic in 1998. (72 pages)
99/37 ^b	N4095	MØLLER, V., and H.-J. RØTZ. Assessment of Atlantic wolffish (<i>Anarhichas lupus</i> L.) off West and East Greenland, 1982-98. (14 pages)
99/38 ^b	N4097	BRODIE, W. B., W. R. BOWERING, M. J. MORGAN, D. POWER, and G. BOLAND. Analysis of survey data for Greenland halibut in NAFO Subarea 2 and Divisions 3KLMNO.
99/39 ^b	N4098	DE CORDENAS, E. An assessment on American plaice (<i>Hippoglossoides platessoides</i>) in Division 3M. (7 pages)
99/40 ^b	N4099	MORGAN, M. J., W. B. BRODIE, and W. R. BOWERING. An assessment of American plaice in NAFO Divisions 3LNO. (55 pages)
99/41 ^b	N4100	RØTZ, H.-J. Assessment of redfish in NAFO Subarea 1. (8 pages)
99/42 ^b	N4101	SIMPSON, M., S. J. WALSH, W. B. BRODIE, and D. MADDOCK-PARSONS. Update on cooperative surveys of yellowtail flounder in NAFO Divisions 3NO, 1996-1999. (46 pages)
99/43 ^b	N4102	HAVMAND, S., and K. ZACHARIASSEN. Preliminary results from an experiment with shrimp trawl fitted with a size selective grid. (5 pages)
99/44 ^b	N4103	WALSH, S. J., M. J. VEITCH, M. SIMPSON, and D. MADDOCK-PARSONS. Distribution, abundance, size and age composition of yellowtail flounder (<i>Pleuronectes ferruginea</i>) on the Grand Bank, NAFO Divisions 3LNO, as derived from the Canadian annual bottom trawl surveys.

^b Scientific Council Meeting, 3-16 June 1999

SCR No.	Serial No.	Author(s) and Title
99/45 ^b	N4104	TREBLE, M. Exploratory fishery results for Greenland halibut (<i>Reinhardtius hippoglossoides</i>) in NAFO Division 0A, 1996-98. (11 pages)
99/46 ^b	N4105	MCCALLLUM, B. R., and S. J. WALSH. Analysis of the performance of the Campelen 1800 Shrimp Trawl during the Annual Canadian bottom trawl surveys of Subarea 2J + Divisions 3KLMNO, 3Ps and 3LNO, 1995-98. (32 pages)
99/47 ^b	N4106	BRODIE, W. B. Analysis of data from the commercial fishery for Greenland halibut in Subarea 0.
99/48 ^b	N4107	SIMONSEN, C. S., and J. BOJE. An assessment of the Greenland halibut stock component in NAFO Division 1A inshore. (24 pages)
99/49 ^b	N4108	DAWE, E. G. Migration patterns of short-finned squid and fishery effects inferred from research survey and fishery data. (11 pages)
99/50 ^b	N4109	DAWE, E. G., P. C. BECK, and J. DREW. The fishery for short-finned squid (<i>Illex illecebrosus</i>) in NAFO Subareas 3 and 4 in 1998. (13 pages)
99/51 ^b	N4110	POWER, D. Roundnose grenadier (<i>Coryphaenoides rupestris</i>) in NAFO Subareas 2+3. (15 pages)
99/52 ^b	N4111	AVILA DE MELO, A., R. ALPOIM, and F. SABORIDO-REY. An assessment of redfish in NAFO Division 3M based on beaked redfish (<i>S. mentella</i> and <i>S. fasciatus</i>) data. (154 pages)
99/53 ^b	N4112	JØRGENSEN, O. A. Assessment of the Greenland halibut stock component in NAFO Subarea 0 + Division 1A offshore + Div. 1B-1F. (16 pages)
99/54 ^b	N4113	WALSH, S. J., and M. J. MORGAN. New information on age and growth of yellowtail flounder in Divisions 3LNO as determined from tag returns. (16 pages)
99/55 ^b	N4114	ATKINSON, D. B., M. J. MORGAN, W. B. BRODIE, B. SMITH, and G. GREGORY. Results of a 1998 Canadian industry survey for American plaice in NAFO Divisions 3LNO with comparisons to results from Canadian fall DFO survey. (9 pages)
99/56 ^b	N4115	VAZQUEZ, A., and L. MOTOS. An assessment of the cod stock in NAFO Division 3M. (25 pages)
99/57 ^b	N4116	PAZ, X., and P. DURÁN. Results from the 99 Spanish bottom trawl survey in the NAFO Regulatory Area for Divisions 3NO. (23 pages)
99/58 ^b	N4117	MORGAN, M. J., W. B. BRODIE, and D. MADDOCK PARSONS. Virtual population analyses of the American plaice stock in Divisions 3LNO from 1975 to 1997. (36 pages)
99/59 ^b	N4118	WALSH, S. J., K. S. WAHLEN, and M. SIMPSON. Preliminary analysis of spatial and temporal variation in the distribution of juvenile yellowtail flounder on the Grand Bank: investigating the methodology. (57 pages)

^b Scientific Council Meeting, 3-16 June 1999

SCR No.	Serial No.	Author(s) and Title
99/60 ^b	N4119	SIMPSON, M., and S. J. WALSH. Spatial variation in distribution and abundance of yellowtail flounder in NAFO Divisions 3LNO using geostatistics.
99/61 ^b	N4120	KULKA, D. W. A re-emerging fishery □ description of the 1998 yellowtail flounder fishery on the Grand Banks with a comparison to the historic effort.
99/62 ^b	N4121	STANSBURY, D. E., P. A. SHELTON, E. F. MURPHY, and J. BRATTEY. An assessment of the cod stock in NAFO Divisions 3NO. (46 pages revised)
99/63 ^b	N4122	WALSH, S. J., and B. MCCALLUM. The performance of the Engel (96) 145 High Lift otter trawl used in DFO/Industry Cooperative Surveys of yellowtail flounder on the Grand Banks, NAFO Divisions 3LNO. (7 pages)
99/64 ^b	N4123	JUNQUERA, S., H. MURUA, and E. DE CORDENAS. An assessment for roughhead grenadier (<i>Macrourus berglax</i>) in NAFO Subareas 2 and 3. (19 pages)
99/65 ^b	N4124	POWER, D., and D. MADDOCK PARSONS. The status of the redfish resource in NAFO Divisions 3LN. (27 pages)
99/66 ^b	N4125	HENDRICKSON, L. C. Fishery effects on spawner escapement in the Northwest Atlantic <i>Illex illecebrosus</i> stock. (8 pages)
99/67 ^b	N4126	RIVARD, D., P. SHELTON, and D. STANSBURY. Evaluating recovery time from long-term projections including uncertainties: an example for cod on southern Grand Banks (NAFO Divisions 3NO). (18 pages)
99/68 ^b	N4129	WALSH, S. J., W. B. BRODIE, M. J. MORGAN, D. POWER and M. VEITCH. The 1999 assessment of Grand Bank yellowtail flounder stock in NAFO Divisions 3LNO.
99/69 ^b	N4130	RIVARD, D., M. J. MORGAN, D. STANSBURY and W. B. BRODIE. Evaluating the impact of by-catch on the recovery of American plaice on the Newfoundland Grand Banks (NAFO Divisions 3LNO). (12 pages)
99/70 ^c	N4133	P. A. KOELLER. Relative importance of environmental and ecological factors to the management of the northern shrimp (<i>Pandalus borealis</i>) fishery on the Scotian Shelf. (22 pages)
99/71 ^c	N4139	KOELLER, P., R. MOHN, and M. ETTER. Density dependent sex-reversal in pink shrimp, <i>Pandalus borealis</i> , on the Scotian Shelf. (15 pages)
99/72 ^c	N4143	EVANS, G. T., D. C. ORR, D. G. PARSONS, and P. J. VEITCH. A non-parametric method of estimating biomass from trawl surveys, with Monte Carlo confidence intervals. (8 pages)

^b Scientific Council Meeting, 3-16 June 1999

^c Joint NAFO/PICES/ICES Symposium, 8-10 September 1999

SCR No. Serial No. Author(s) and Title

- 99/73^d N4144 RODRÍGUEZ-MARIN, F., and J. L. DEL RÍO. Length distributions and recruitment index of northern shrimp (*Pandalus borealis*) in Flemish Cap (Division 3M) in 1993-1998, as inferred from stomach contents analysis of cod (*Gadus morhua*), Greenland halibut (*Reinhardtius hippoglossoides*) and thorny skate (*Raja radiata*). (14 pages)
- 99/74^c N4145 ASCHAN, M. Spatial variability in length frequency distribution and growth of shrimp (*Pandalus borealis* Kr yer 1984) in the Barents Sea. (24 pages)
- 99/75^c N4147 BISHOP, G. H., T. M. KOENEMAN, and C. A. BOTELHO. Development of a management and stock assessment program for the pot shrimp fishery for *Pandalus platyceros* in southeastern Alaska. (17 pages)
- 99/76^c N4148 CLARK, J. E., G. H. BISHOP, and T. M. KOENEMAN. Estimation of harvest rates in the spot shrimp (*Pandalus platyceros*) pot fishery in southeast Alaska using pre- and post-fishery stock assessment surveys. (24 pages)
- 99/77^c N4149 HANNAH, R. W., and S. A. JONES. By-catch reduction in an ocean shrimp (*Pandalus jordani*) trawl from a simple modification to the trawl footrope. (11 pages)
- 99/78^c N4150 HANSEN, H. □., and M. ASCHAN. Growth performance, size and age-at-maturity of shrimp, *Pandalus borealis*, in the Svalbard area related to environmental parameters. (13 pages)
- 99/79^c N4151 BUYANOVKSY, A. I. Biology and distribution of humpback shrimp (*Pandalus hypsinotus*) in the Tatar Strait (the Sea of Japan). (13 pages)
- 99/80^c N4152 ANDERSON, P. J. Pandalid shrimp as indicator of ocean climate regime shift. (14 pages)
- 99/81^c N4153 STEVENS, B. G., and P. J. ANDERSON. An association between the anemone, *Cribrinopsis fernaldi*, and shrimps of the families Hippolytidae and Pandalidae. (7 pages)
- 99/82^c N4154 HARBO, R., L. CONVEY, J. A. BOUTILLER, and D. E. HAY. Pacific Coast shrimp trawl fisheries: new management and assessment co-management programs. (7 pages)
- 99/83^c N4155 HARBITZ, A. Use of subjective prediction in optimal stratified sampling with application to shrimp surveys in the Barents Sea. (18 pages)
- 99/84^c N4156 RAMSEIER, R. O., C. GARRITY, and D. G. PARSONS. Influence of particle organic carbon sedimentation within the seasonal sea-ice regime on the catch distribution of northern shrimp (*Pandalus borealis*). (18 pages)
- 99/85^c N4157 CARDIN, S. X. Evaluating two assessment methods for *Pandalus borealis* stocks in the Northwest Atlantic. (17 pages)
- 99/86^c N4158 TVEITE, S. Fixed stations survey for shrimp abundance indices, 15 years investigations in the Norwegian Deepes □Skagerrak. (7 pages)

^c Joint NAFO/PICES/ICES Symposium, 8-10 September 1999

^d Scientific Council Annual Meeting, 7, 13-17 September 1999

SCR No.	Serial No.	Author(s) and Title
99/87 ^c	N4159	BERENBOIM, B. I., A. V. DOLGOV, V. A. KORZHEV, and N. A. YARAGINA. Impact of cod on dynamics of shrimp stock, <i>Pandalus borealis</i> , in the Barents Sea and the use of this factor in multispecies models. (12 pages)
99/88 ^c	N4160	FU, C., and T. J. QUINN II. Analyses of harvest strategies for pandalid shrimp populations. (19 pages)
99/89 ^c	N4161	S VIGNY, J.-M., L. SAVARD, and D. G. PARSONS. Genetic characterization of the northern shrimp, <i>Pandalus borealis</i> , in the Northwest Atlantic. (16 pages)
99/90 ^c	N4162	CLARK, S. H., S. X. CADRIN, D. F. SCHICK, P. J. DIODATI, M. P. ARMSTRONG, and D. McCARRON. The Gulf of Maine northern shrimp (<i>Pandalus borealis</i>) fishery □ a review of the record. (47 pages)
99/91 ^c	N4163	IVANOV, B. G. Studies of and fishery for pandalid shrimps (Crustacea, Decapoda, Pandalidae) in Boreal Area: review on the eve of the XXI century, with special reference to Russia. (20 pages)
99/92 ^d	N4164	GIL, J., R. SANCHEZ, R. GANCEDO, and V. VALENCIA. Physical oceanographic conditions on Flemish Cap in summer 1998. (15 pages)
99/93 ^c	N4165	BOUTILLIER, J. A., and J. A. BOND. A progress report on the control of growth and recruitment overfishing in the shrimp trap fishery in British Columbia. (19 pages)
99/94 ^c	N4166	ANGEL, J. R. Management of the Canadian shrimp. (6 pages)
99/95 ^c	N4167	STEIN, M. Hydrographic and atmospheric conditions off east Greenland □ their potential effect on the distribution of shrimp (<i>Pandalus borealis</i>). (17 pages)
99/96 ^d	N4169	KULKA, D. W. Update on the by-catch in the shrimp fisheries in Davis Strait to Flemish Cap.
99/97 ^c	N4170	CARLSSON, D., O. FOLMER, P. KANNEWORFF, M. KINGSLEY, and M. PENNINGTON. A trawl survey for <i>Pandalus borealis</i> in West Greenland. (10 pages)
99/98 ^c	N4177	SAVARD, L., D. G. PARSONS, C. FU, and P. KOELLER. A precautionary approach to assessment and management of shrimp stocks in the Northwest Atlantic. (14 pages)
99/99 ^c	N4178	HVINGEL, C., and M. C. S. KINGSLEY. The uncertainty of an assessment procedure for the West Greenland stock of northern shrimp (<i>Pandalus borealis</i> Kr yer). (10 pages)
99/100 ^c	N4179	PARSONS, D. G. Forecasting fishery performance for northern shrimp (<i>Pandalus borealis</i>) in NAFO Divisions 2HJ. (13 pages)
99/101 ^c	N4180	COLBOURNE, E. Oceanographic conditions on the Flemish Cap during the summer of 1999, with comparisons to the previous year and the 1961-1990 average. (17 pages)

^c Joint NAFO/PICES/ICES Symposium, 8-10 September 1999

^d Scientific Council Annual Meeting, 7, 13-17 September 1999

^e Scientific Council Meeting, 11-17 November 1999

SCR No. Serial No. Author(s) and Title

- 99/102^d N4181 ORR, D. C., D. G. PARSONS, D. B. ATKINSON, P. J. VEITCH, and D. SULLIVAN. Information pertaining to northern shrimp (*Pandalus borealis*) and groundfish in NAFO Divisions 3LNO. (25 pages)
- 99/103^e N4182 SIEGSTAD, H. The Greenland fishery for northern shrimp (*Pandalus borealis*) on Flemish Cap, NAFO Div. 3M, in 1998 and 1999. (4 pages)
- 99/104^e N4183 SALTHAUG, A., and O. R. GODØ. Standardization of fishing power in the Norwegian shrimp trawler fleet. (6 pages)
- 99/105^e N4184 KINGSLEY, M. C. S., P. KANNEWORFF, and D. M. CARLSSON. Modification to the design of the trawl survey for *Pandalus borealis* in West Greenland waters: effects on bias and precision. (12 pages)
- 99/106^e N4185 GARABANA, D. Northern shrimp (*Pandalus borealis*) on Flemish Cap in July 1999. (16 pages)
- 99/107^e N4187 HVINGEL, C. The fishery for northern shrimp (*Pandalus borealis*) off West Greenland, 1970-1999 (16 pages)
- 99/108^e N4188 HVINGEL, C. The fishery for northern shrimp (*Pandalus borealis*) off East Greenland, Greenlandic zone, 1987-1999. (14 pages)
- 99/109^e N4189 CARLSSON, D. M., P. KANNEWORFF, and M. C. S. KINGSLEY. Stratified-random trawl survey for northern shrimp (*Pandalus borealis*) in NAFO Subareas 0+1, in 1999. (6 pages)
- 99/110^e N4190 CARLSSON, D. M., and P. KANNEWORFF. Bottom temperatures and possible effect on growth and size at sex reversal of northern shrimp in West Greenland. (7 pages)
- 99/111^e N4191 KINGSLEY, M. C. S., P. KANNEWORFF, and D. M. CARLSSON. By-catches of fish in the West Greenland shrimp survey: an initial analysis. (21 pages)
- 99/112^e N4192 SKÖLADÓTTIR, U., D. G. PARSONS, and D. ORR. The international fishery for shrimp (*Pandalus borealis*) in Division 3M (Flemish Cap), 1993-1999. (21 pages)
- 99/113^e N4193 SIEGSTAD, H. Preliminary assessment of shrimp (*Pandalus borealis*) in Davis Strait 1999 (Subareas 0+1). (21 pages)
- 99/114^e N4195 NICOLAJSEN, A. Biomass estimate, growth, length and age distribution of the northern shrimp (*Pandalus borealis*) stock on Flemish Cap (NAFO Div. 3M) in July 1999 and Faroese shrimp catches 1996-1999. (18 pages)
- 99/115^e N4196 SKÖLADÓTTIR, U. The Icelandic shrimp fishery (*Pandalus borealis*) in Denmark Strait in 1998-1999. (9 pages)
- 99/116^e N4197 SKÖLADÓTTIR, U. The Icelandic shrimp fishery (*Pandalus borealis* Kr.) at Flemish Cap in 1993-1999. (27 pages)

^d Scientific Council Annual Meeting, 7, 13-17 September 1999

^e Scientific Council Meeting, 11-17 November 1999

SUMMARY DOCUMENTS (SCS)

SCS No.	Ser. No.	Author(s) and Title
99/1 ^b	N4043	CHAMUT, P. S. Canadian request for scientific advice on management in 2000 of certain stocks in Subareas 0 to 4. (2 pages)
99/2 ^b	N4044	PEDERSEN, P. M. Denmark (Greenland) request for scientific advice on management of certain stocks in Subareas 0 and 1. (1 page)
99/3 ^a	N4049	CORNUS, H. P. Meeting of FAO and Non-FAO Regional Fishery Bodies or arrangements. FAO Headquarters, Rome, Italy, 11-12 February 1999. (3 pages)
99/4 ^a	N4050	NAFO. Report of Scientific Council Meeting on Precautionary Approach, 27 April-1 May 1999. (36 pages)
99/5 ^b	N4054	SIGAEV, I. K., V. A. RIKHTER, A. A. VASKOV, T. M. IGASHOV, and V. M. KISELEVA. Russian research report for 1998. (13 pages)
99/6 ^b	N4062	JUNQUERA, S., E. DE CORDENAS, A. VAZQUEZ, and H. MURUA. Spanish research report for 1998. (11 pages)
99/7 ^b	N4064	VALD S, E., and I. RAMOS. Cuban research report for 1998. (9 pages)
99/8 ^b	N4067	CLARK, S., and K. SOSEBEE. United States research report for 1998. (15 pages)
99/9 ^b	N4072	RÖTZ, H.-J., M. STEIN, and P. CORNUS. German research report for 1998. (5 pages)
99/10 ^b	N4075	NAFO SECRETARIAT. Tagging activities reported for the Northwest Atlantic in 1998. (3 pages)
99/11 ^b	N4076	NAFO SECRETARIAT. Provisional index and list of titles of research and summary documents of 1998. (30 pages)
99/12 ^b	N4079	NAFO SECRETARIAT. List of biological sampling data for 1998. (23 pages)
99/13 ^b	N4077	ICES/NAFO WORKING GROUP. Joint ICES/NAFO Working Group on Harp and Hooded Seals, Troms, Norway. (34 pages)
99/14 ^b	N4080	NAFO SECRETARIAT. Notes on acquisition and publications of statistics since June 1998. (2 pages)
99/15 ^b	N4087	MAHE, J.-C., and D. BRIAND. French Research report for 1998. (7 pages)
99/16 ^b	N4091	ALPOIM, R., E. SANTOS, J. VARGAS and A. M. VILA DE MELO. Portuguese Research Report for 1998. (55 pages)

^a Scientific Council Meeting on Precautionary Approach, 27 Apr-1 May 1999

^b Scientific Council Meeting, 3-16 June 1999

SCS No.	Ser. No.	Author(s) and Title
99/17 ^b	N4096	FOLMER, O. Denmark/Greenland research report for 1998. (6 pages)
99/18 ^b	N4127	SCIENTIFIC COUNCIL CHAIRMAN. Report of the NAFO Observer at the Eleventh ICES Dialogue Meeting, 26-27 January 1999 (Nantes, France). (2 pages revised)
99/19 ^b	N4128	SCIENTIFIC COUNCIL CHAIRMAN. Report of the NAFO Observer to ICES Advisory Committee on Fishery Management (ACFM), Copenhagen, Denmark, May 1999. (2 pages)
99/20 ^d	N4131	KULKA, D., and J. M. TILLMAN. Canadian Research Report for 1998. (11 pages)
99/21 ^b	N4132	NAFO. Report of Scientific Council Meeting, 3-16 June 1999. (194 pages)
99/22 ^d	N4142	CWP. Report of CWP-18 Session, Luxembourg, 6-9 July 1999. (48 pages)
99/23 ^d	N4169	NAFO. Report of Scientific Council, Annual Meeting, 7, 13-17 September 1999. (55 pages)
99/24 ^e	N4194	NAFO. Report of Scientific Council, 11-17 November 1999. (42 pages + corrigendum)

^b Scientific Council Meeting, 3-16 June 1999

^d Scientific Council Annual Meeting, 7, 13-17 September 1999

^e Scientific Council Meeting, 11-17 November 1999

LIST OF REPRESENTATIVES, ADVISERS/EXPERTS AND OBSERVERS, 1999

Meetings

CANADA

Representatives:

Atkinson, D.B.	Science Branch, Dept. of Fisheries Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1 Phone: +1-709-772-2052 □ Fax: +1-709-772-4188 □ E-mail: atkinsonb@dfo-mpo.gc.ca	A B C
Bowering, W.R.	Science Branch, Dept. of Fisheries Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1 Phone: +1-709-772-2054 □ Fax: +1-709-772-4188 □ E-mail: boweringr@dfo-mpo.gc.ca	A B C
Rivard, D.	Fisheries Research Branch, Dept. of Fisheries and Oceans, 200 Kent St., Ottawa, Ont. K1A 0E6 Phone: +1-613-990-0281 □ Fax: +1-613-954-0807 □ E-mail: rivardd@dfo-mpo.gc.ca	A B C

Advisers/Experts:

Brodie, W.B.	Science Branch, Dept. of Fisheries Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1 Phone: +1-709-772-3288 □ Fax: +1-709-772-4188 □ E-mail: brodieb@dfo-mpo.gc.ca	A B C D
Cadigan, N.G.	Science Branch, Dept. of Fisheries Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1 Phone: +1-709-772-5028 □ Fax: +1-709-772-4188	B
Campbell, J.S.	Science Branch, Dept. of Fisheries Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1 Phone: +1-709-772-2000 □ Fax: +1-709-772-6100 □ E-mail: campbell@athena.nwafc.nf.ca	B
Colbourne, E.A.	Science Branch, Dept. of Fisheries Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1 Phone: +1-709-772-6106 □ Fax: +1-709-772-5315 □ E-mail: colbourne@athena.nwafc.nf.ca	B
Dawe, E.G.	Science Branch, Dept. of Fisheries Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1 Fax: +1-709-772-4188 □ E-mail: dawee@athena.nwafc.nf.ca	B
Kulka, D.W.	Science Branch, Dept. of Fisheries Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1 Phone: +1-709-772-2064 □ Fax: +1-709-772-4188 □ E-mail: kulkad@dfo-mpo.gc.ca	B C
Lilly, G. R.	Science Branch, Dept. of Fisheries Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1 Phone: +1-709-772-0568 □ Fax: +1-709-772-4188 □ E-mail: lillyg@dfo-mpo.gc.ca	B
Maddock Parsons, D.	Science Branch, Dept. of Fisheries Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1 Phone: +1-709-772-2495 □ E-mail: maddock@athena.nwafc.nf.ca	B
Morgan, M. J.	Science Branch, Dept. of Fisheries Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1 Phone: +1-709-772-2261 □ Fax: +709-772-4188 □ E-mail: morgan@athena.nwafc.nf.ca	B
Murphy, E.F.	Science Branch, Dept. of Fisheries Oceans, Box 5667, St. John's, Nfld. A1C 5X1 Phone: +1-709-772-5479 □ Fax: +1-709-772-4188 □ E-mail: murphye@athena.nwafc.nf.ca	B
Orr, D. C.	Science Branch, Dept. of Fisheries Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1 Phone: +1-709-772-7343 □ Fax: +1-709-772-4105 □ E-mail: orrd@dfo-mpo.gc.ca	C D
Parsons, D.G.	Science Branch, Dept. of Fisheries Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1 Phone: +1-709-772-2093 □ Fax: +1-709-772-4105 □ E-mail: parsons@athena.nwafc.nf.ca	A B C
Power, D.	Science Branch, Dept. of Fisheries Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1 Phone: +1-709-772-4935 □ Fax: +1-709-772-4188 □ E-mail: power@athena.nwafc.nf.ca	B
Shelton, P.A.	Science Branch, Dept. of Fisheries Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1 Phone: +1-709-772-2341 □ Fax: +1-709-772-4188 □ E-mail: shelton@athena.nwafc.nf.ca	B
Stansbury, D.E.	Science Branch, Dept. of Fisheries Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1 Phone: +1-709-772-0559 □ Fax: +1-709-772-4188 □ E-mail: stansbury@athena.nwafc.nf.ca	A B
Veitch, P.J.	Department of Fisheries Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1 Phone: +1-709-772-4562 □ E-mail: veitchp@dfo-mpo.gc.ca	C
Walsh, S.J.	Science Branch, Dept. of Fisheries Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1 Phone: +1-709-772-5478 □ Fax: +1-709-772-4918 □ E-mail: walsh@athena.nwafc.nf.ca	B
Drinkwater, K.F.	Coastal Oceanog., Dept. of Fish. Oceans, BIO, P. O. Box 1006, Dartmouth, N.S. B2Y 4A2 Phone: +1-902-426-2650 □ Fax: +1-902-426-2256 □ E-mail: drinkwaterk@mar.dfo-mpo.gc.ca	B
Koeller, P.A.	Dept. of Fisheries and Oceans, BIO, P. O. Box 1006, Dartmouth, Nova Scotia B2Y 4A2 Phone: +1-902-426-5379 □ Fax: +902-426-1862 □ E-mail: koellerp@mar.dfo-mpo.gc.ca	A B C D

-
- A Scientific Council Meeting on Precautionary Approach, 27 Apr-1 May 1999
 B Scientific Council Meeting, 3-16 June 1999
 C Scientific Council Annual Meeting, 7, 13-17 September 1999
 D Scientific Council Meeting, 11-17 November 1999

Meetings

CANADA (continued)

Halliday, R. G.	Marine Fish Div., Dept. of Fisheries Oceans, BIO, P. O. Box 1006, Dartmouth, N.S. B2Y 4A2 Phone: +1-902-4263240 □E-mail: hallidayr@mar.dfo-mpo.gc.ca	B
Showell, M.A.	Marine Fish Div., Dept. of Fisheries Oceans, BIO, P. O. Box 1006, Dartmouth, NS B2Y 4A2 Phone: +1-902-4263501 □Fax: +1-902-426-7750 □E-mail: showellm@mar.dfo-mpo.gc.ca	B C
Moores, J.	Dept. of Fisheries Oceans, 200 Kent St., Ottawa, Ont. Phone: +1-613-990-0285 □Fax: +1-613-954-0807 □E-mail: mooresj@dfo-mpo.gc.ca	C
Narayanan, S.	Marine Envir. Data Service (MEDS), W082, 12 th Floor, 200 Kent St., Ottawa, Ont. K0A 2A0 Phone: +1-613-990-0265 □Fax: +1-613-993-4658 □E-mail: narayanans@dfo-mpo.gc.ca	B
Woodman, F.	Fisheries Resource Conser. Council, P.O. Box 2001, Station D, Ottawa, Ont. K1P 5W3 Phone: +1-613-998-0433 □Fax: +1-613-998-1146 □E-mail: info@frcc.x400.gc.ca	B
Savard, L.	Dept. of Fish. Oceans, Maurice Lamontagne Inst., Box 1000, Mont-Joli, Quebec G5H 3Z4 Phone: +1-418-775-0621 □Fax: +1-418-775-0740 □E-mail: savardl@dfo-mpo.gc.ca	C D
Treble, M.A.	Dept. of Fisheries Oceans, Freshwater Inst., 501 University Cres., Winnipeg, Man. R3T 2N6 Phone: +1-204-984-0985 □Fax: +1-204-984-2403 □E-mail: treblem@dfo-mpo.gc.ca	B

DENMARK

GREENLAND

Representative:

Siegstad, H.	Greenland Institute of Natural Resources, P. O. Box 570, DK-3900 Nuuk Phone: +299 321095 - Fax: +299 325957 - E-mail: helle@natur.gl	A B C D
--------------	---	---------

Advisers/Experts:

Carlsson, D. M.	Greenland Institute of Natural Resources, Pilestraede 52, P.O Box 2151, Copenhagen K. Phone: +45 33 69 34 57 □Fax: +45 33 69 34 06 □E-mail: danmc@inet.uni2.dk	C D
J rgensen, O.A	Greenland Institute of Natural Resources, Pilestrøde 52., P. O. Box 2151, DK-1016 Copenhagen K Phone: +45 33 69 3461 - Fax: +45 33 69 3406 - E-mail: grfioaj@inet.uni2.dk	A B
Kanneworff, P.	Greenland Institute of Natural Resources, Pilestraede 52, P.O Box 2151, Copenhagen K. Phone: +45 33 69 34 56 □Fax: +45 33 69 34 06 □E-mail: grfipka@inet.uni2.dk	C D
Simonsen, C.S.	Greenland Institute of Natural Resources, P. O. Box 570, DK-3900, Nuuk Phone: +299 32 1095 - Fax: +299 32 5957 - E-mail: claus@natur.gl	B

FAROE ISLANDS

Representative:

Nicolajsen, A.	Fiskorannsóknarstovan, Noatun, Postboks 3051, FR-1100, Torshavn Phone: +298 1 50 92 □Fax: +298 1 8264 □E-mail: aminic@frs.fo	A B C D
----------------	--	---------

ESTONIA

Representative:

Saat, T.	Representative of Estonia to NAFO, Estonian Marine Institute, 18b Viljandi Road, Tallinn, 112 16 Phone: +372 6 281 570 □Fax: +372 6 281 563 □E-mail: tsaat@sea.ee	B C
----------	--	-----

-
- A Scientific Council Meeting on Precautionary Approach, 27 Apr-1 May 1999
 B Scientific Council Meeting, 3-16 June 1999
 C Scientific Council Annual Meeting, 7, 13-17 September 1999
 D Scientific Council Meeting, 11-17 November 1999

Meetings

EUROPEAN UNION (EU)

Representatives:

Hagström, O.	European Commission DGXIV Unit C-1, Rue de la Loi 200, B-1049 Brussels, Belgium Phone: +32 2 295 7812 - Fax: +32 2 296 6046 □E-mail: ulle.hagstroem@dg14.cec.be	B C
Angot, V.	European Commission DGXIV Fisheries, Rue de la Loi 200, B-1049 Brussels, Belgium Phone: +32 2 296 6606 □Fax: +32 2 296 2338 □E-mail: veronique.angot@dg14.cec.be	B

Advisers/Experts:

Briand, D.	IFREMER, B. P. 4140, 97500 St. Pierre et Miquelon Phone: +508-41-3083 □Fax: +508-41-4936 □E-mail: brianspm@cancom.net	C
Munch-Petersen, S.	Danish Fish. Res. Institute, Charlottenlund Castle, Charlottenlund, Copenhagen, Denmark Phone: +45 33 96 33 90 □Fax: +45 33 96 33 33 □E-mail: smp@dfu.min.dk	C
Cross, D.G.	EUROSTAT, European Commission, Jean Monnet Bldg, B.P. 1907, Luxembourg (G.D.) Phone: +352 4301 37249 □Fax: +352 4301 37318 □E-mail: david.cross@eurostat.cec.be	B C
Mahé, J.-C.	IFREMER, Station de Lorient, 8, Rue François Toullec, 56100 Lorient, France Phone: +33 2 9787 3818 □Fax: +33 2 9787 3801 □E-mail: jcmahe@ifremer.fr	A B
Cornus, H.P.	Institut für Seefischerei, Palmaille 9, D-22767, Hamburg, Federal Republic of Germany Phone: +49 40 38905194 □Fax: +49 40 38905263 □E-mail: cornus.ish@bfa-fisch.de	A B C
Raetz, H.-J.	Institute of Sea Fisheries, Palmaille 9, D-22767 Hamburg, Federal Republic of Germany Phone: +49 40 389 05169 □Fax: +49 40 389 05263 □E-mail: raetz.ish@bfa-fisch.de	B C D
Stein, M.	Institut für Seefischerei, Palmaille 9, D-22767 Hamburg, Federal Republic of Germany Phone: +49 40 389 05174 □Fax: +49 40 38905 263 E-mail: stein.ish@bfa-fisch.de	B C
Avila de Melo, A.	Inst. de Investigacao das Pescas e do Mar (IPIMAR), Av. de Brasilia, 1400 Libson, Portugal Phone: +3511 302 7000 Fax: +3511-301-5948 E-mail: amelos@ipimar.pt	A B C
Alpoim, R.	Inst. de Investigacao das Pescas e do Mar (IPIMAR), Av. de Brasilia, 1400 Libson, Portugal Phone: +3511 302 7000 □Fax: +3511-301-5948 □E-mail: ralpoim@ipimar.pt	A B C
De Cardenas, E.	Institute Español de Oceanografía, Avenida de Brasil 31, 28020 Madrid, Spain Phone: +34 91 5974443 □Fax: +34 91 5974770 □E-mail: e.decardenas@md.ieo.es	A B C
Junquera, S.	Instituto Español de Oceanografía, Cabo Estay □Canido, Aptdo 1552, E-36280 Vigo (Pontevedra), Spain Phone: +34 9 86 49 2111 □Fax: +34 9 86 49 2351 □E-mail: susana.junquera@vi.ieo.es	A B C
Motos, L.	AZTI, Food Fish., Tech., Inst., Satrustegi ib. 8, 20008 Donostia-San Sebastian Basque Country, Spain Phone: +34 9 43 214124 □Fax: +34 9 43 212162 □E-mail: lorenzo@rp.azti.es	A B C
Murua, H.	AZTI, Food Fish., Tech., Inst., Satrustegi ib. 8, 20008 Donostia-San Sebastian Basque Country, Spain Phone: +34 9 43 316731 □Fax: +34 9 43 212162 □E-mail: hilario@rp.azti.es	A B
Uriarte, A.	AZTI, Food Fish., Tech., Inst., Satrustegi ib. 8, 20008 Donostia-San Sebastian Basque Country, Spain Phone: +34 9 43 316731 □Fax: +34 9 43 212162 □E-mail: andres@rp.azti.es	A
Vazquez, A.	Instituto Investigaciones Marinas, Eduardo Cabello 6, 36208 Vigo, Spain Phone: +34 9 86 23 1930 □Fax: +34 9 86 29 2762 □E-mail: avazquez@iim.csic.es	A B C
Darby, C.	Centre for Fisheries Aquaculture Science (CEFAS), Lowestoft Laboratory, Pakefield Rd., Lowestoft (Suffolk), England NR33 OHT, United Kingdom Phone: +44 1502 524 329 □Fax: +44 1502 513 865 □E-mail: c.d.darby@cefass.co.uk	B
Dickson, R.R.	Min. of Agriculture, Fish. Food, Fish. Lab., Lowestoft, Suffolk NR33 OHT United Kingdom Phone: +44 1502-424 282 □Fax: +44 1502 513 3865 □E-mail: r.r.dickson@cefass.co.uk	B

A Scientific Council Meeting on Precautionary Approach, 27 Apr-1 May 1999

B Scientific Council Meeting, 3-16 June 1999

C Scientific Council Annual Meeting, 7, 13-17 September 1999

D Scientific Council Meeting, 11-17 November 1999

Meetings

ICELAND

Representative:

Skúladóttir, U. Marine Research Institute, Skulagata 4, P. O. Box 1390, 121 Reykjavik A C D
 Phone: +354 552 0240 Fax: +354 562 3790 E-mail: unnur@hafro.is

JAPAN

Representatives:

Kawahara, S. National Research Institute of Far Seas Fisheries, 5-7-1 Orido, Shimizu 424-8633 C
 Phone: +81 543 36 6051 Fax: +81 543 35 9642 E-mail: kawahara@envo.affrc.go.jp
 Uozumi, Y. National Research Institute of Far Seas Fisheries, 5-7-1 Orido, Shimizu 424-8633 A
 Phone: +81 543 36 6037 Fax: +81 543 35 9642 E-mail: uozumi@envo.affrc.go.jp
 Yatsu, A. National Research Institute of Fisheries Science, 2-12-4 Fukuura, Kanazawa-ku, B
 Yokohama 236-8648
 Phone: +81 45-788-7633 Fax: +81 45-788-8001 E-mail: yatsua@nrifs.affrc.go.jp

LATVIA

Representative:

Kalinov, D. Mērsrags - I, Sabiedriba ar ierobežotu atbildību, 34-214 Dunties St., Rīga, LV-1005 D
 Phone: +371 7392544 Fax: +371 7392544 E-mail: kalinov-d@hotmail.com

NORWAY

Representative:

Jakobsen, T. Institute of Marine Research, P. O. Box 1870 Nordnes, N-5817 Bergen A
 Phone: +47-5523- 8636 Fax: +47-5523-8687 E-mail: tore.jakobsen@imr.no
 (or torej@imr.no)
 Salthaug, A. Institute of Marine Research, P. O. Box 1870 Nordnes, N-5817 Bergen D
 Phone: +47-5523- 8673 Fax: +47-5523-8687 E-mail: ares@imr.no

RUSSIAN FEDERATION

Representatives:

Rikhter, V.A. Atlantic Scientific Research Institute of Marine Fisheries and Oceanography (AtlantNIRO), B C
 5 Dmitry Donskoy Street, Kaliningrad 23600
 Phone: +70 112 22 5547 Fax: +70 112 21 9997 E-mail: atlant@baltnet.ru
 Shibarov, V.N. Knipovich Polar Research Institute of Marine Fisheries and Oceanography (PINRO), B C
 6 Knipovich Street, Murmansk 183763
 Phone: +7 8152 47 34 61 Fax: +47 789 10 518 E-mail: inter@pinro.murmansk.ru

Advisors/Experts:

Babayan, V.K. Russian Federal Research Institute of Fisheries Oceanography (VNIRO), 17, V. Krasnoselskaya, C
 Moscow, 107140
 Phone: +70 95 264 9532 Fax: +70 95 264 9187 E-mail: babayan@vniro.msk.su

-
- A Scientific Council Meeting on Precautionary Approach, 27 Apr-1 May 1999
 B Scientific Council Meeting, 3-16 June 1999
 C Scientific Council Annual Meeting, 7, 13-17 September 1999
 D Scientific Council Meeting, 11-17 November 1999

Meetings

RUSSIAN FEDERATION (continued)

Berenboim, B.	Knipovich Polar Research Institute of Marine Fisheries Oceanography (PINRO), 6 Knipovich Street, Murmansk 183763 Phone: +47 789 10 518 □E-mail: borisber@pinro.murmansk.ru	C
Gusev, G.V.	State Committee for Fish. of the Russ. Fed., 12 Rozhdestvensky Boul., 103031 Moscow Phone: +70 95 92 19594 □Fax: +70 95 921 3463	B
Gontchar, E.M.	Representative Russian Federation on Fisheries, Welsford Place, Ste. 2202, 2074 Robie St., Halifax, Nova Scotia, Canada B3K 5L3 Phone: +1-902-425-6270 □Fax: +1-902-423-0943	B
Okhanov, A.	Representative Russian Federation on Fisheries, Welsford Place, Ste. 2202, 2074 Robie St., Halifax, NS, Canada B3K 5L3 Phone: +1-902-425-6270 □Fax: +1-902-423-0943	C

UNITED STATES OF AMERICA (USA)**Representatives:**

Jones, C.M.	Center for Quantitative Fish. Ecol., Old Dominion Univ., 1034 W 45th St., Norfolk, VA 23701 Phone: +1-757-683-4497 □Fax: +1-757-683-5293 □E-mail: cjones@odu.edu	B
Serchuk, F.M.	National Marine Fisheries Service, NEFSC, 166 Water St., Woods Hole, MA 02543 Phone: +1-508-495-2245 □Fax: +1-508-495-2258 □E-mail: fred.serchuk@noaa.gov	A B C

Advisers/Experts:

Cadrin, S.X.	National Marine Fisheries Service, NEFSC, 166 Water St., Woods Hole, MA 02543 Phone: +508-495-2335 □Fax: +508-495-2393 □E-mail: steven.cadrin@noaa.gov	A B
Hendrickson, L.C.	Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543 Phone: +1-508-495-2285, Fax: +1-508-495-2393 - E-mail: lisa.hendrickson@noaa.gov	B
Mayo, R.K.	National Marine Fisheries Service, NEFSC, 166 Water St., Woods Hole, MA 02543 Phone: +1-508-495-2310 - Fax: +1-508-495-2393 - E-mail: ralph.mayo@noaa.gov	A B C D

NAFO SECRETARIAT

T. Amaratunga, Assistant Executive Secretary	A B C D
D. C. A. Auby, Secretary	A B C D
G. M. Moulton, Statistical/Conservation Measures Officer	B C
B. L. Marshall, Statistical Clerk	B C
C. L. Kerr, Statistical/Reception Clerk	B C

SECRETARIAT ASSISTANCE

I. Martin AZTI, Food Fish., Tech., Inst., Satrustegi ib. 8, 20008 Donostia-San Sebastian Basque Country, Spain Phone: +34 943 316 731 □Fax: +34 943 212151 E-mail: inma@rp.azti.es	A
Steinunn Vidarsdottir Marine Research Institute, Skólagaata 4, Pósthólf Box 1390, 121 Reykjavik, Iceland steinunn@hafro.is	D

-
- A Scientific Council Meeting on Precautionary Approach, 27 Apr-1 May 1999
 B Scientific Council Meeting, 3-16 June 1999
 C Scientific Council Annual Meeting, 7, 13-17 September 1999
 D Scientific Council Meeting, 11-17 November 1999.

LIST OF RECOMMENDATIONS IN 1999

The following are the specific recommendations made by the Scientific Council at its meetings through 1999 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.

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

Scientific Council Meeting on Precautionary Approach, 27 April-1 May 1999

SCIENTIFIC COUNCIL

Reference Points for Case Studies

Shrimp in Division 3M (page 11)

The Scientific Council **recommended** *investigating the use of an approach similar to that used in the HCR (Harvest Control Rules) spreadsheet to determine if the qualitative results obtained with the Traffic Light method can be linked to simple precautionary HCRs for shrimp stocks.*

Other Matters

The LAN System for Council Meetings (page 16)

The Council therefore **recommended** that:

- a) *The Secretariat should install an auto virus check, and a comprehensive virus protection set up for the LAN System for the forthcoming June 1999 Meeting.*
- b) *All computers (and software) being used on the LAN system of the June 1999 Meeting should be committed to an automatic virus check by an installed network anti-virus system, in a similar way to the one used in this meeting.*

Scientific Council Meeting, 3-16 June 1999

SCIENTIFIC COUNCIL

NOTE: All 3-16 June 1999 recommendations pertaining to the work of the Scientific Council, except those related to stocks under STACFIS, were listed in Part B, sections V, VII and VIII. These and other recommendations pertaining to all Constituent Bodies of NAFO are presented below under the relevant section and subject headings.

Special Requests for Advice by Denmark (Greenland) (page 66)

Scientific Council considers that separate TACs are appropriate for each of the three areas. In order to prevent escalating effort it is **recommended** that *a TAC for Greenland halibut in Div. 1A in each inshore area for year 2000 should not exceed the average of the catches for 1995-97; Disko Bay - 7 900 tons, Uummannaq - 6 000 tons and Upernavik - 4 300 tons.* (See also Summary Sheet)

Other Matters**Scientific Council Recommendations to General Council and Fisheries Commission****General Council** (page 81)

Scientific Council refers the following recommendations as they have cost implications and **recommended** that *these costs are included in the budgetary planning for the year 2000.*

Scientific Council noted that there is a likely intersessional meeting of the CWP during the course of year 2000 (to be decided at the CWP 18th Session in July 1999). The Council agreed that NAFO participation at that intersessional meeting is important and **recommended** that *the Assistant Executive Secretary and Chairman of STACREC represent NAFO at the next intersessional CWP meeting.*

Scientific Council **recommended** that *a complete accounting on the costs involved in maintaining and operating the NAFO website and FTP server be provided by the NAFO Secretariat to Scientific Council for consideration.*

The Scientific Council considered NAFO representation at international meetings as valuable for the Council and **recommended** that *NAFO should be represented by the Executive Secretary or the Assistant Executive Secretary at the 30 November-3 December 1999 Meeting of FAO ACFR in Rome.*

*STACFEN***ICES/NAFO Symposium on Hydrobiological Variability** (page 89)

STACFEN **recommended** that *NAFO's financial contribution to the Joint ICES/NAFO Symposium, August 2001, include the equivalent of GBP 3 500 (approximately CDN \$8 000) to cover the cost of the art exhibition.*

*STACFIS***Greenland Halibut (*Reinhardtius hippoglossoides*) in Subarea 0 and Division 1A Offshore and Divisions 1B-1F****Research Recommendations** (page 97)

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

Greenland Halibut (*Reinhardtius hippoglossoides*) in Division 1A Inshore**Research Recommendations** (pages 101 and 102)

The continuing increase in total landings of Greenland halibut in NAFO Div. 1A inshore generates concern, especially because lack of effort data from the commercial fishery impedes the assessment of the stocks. Therefore STACFIS **recommended** that *for the Greenland halibut commercial fishery in Div. 1A action should be taken to obtain measures of effort from the commercial fishery.*

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

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

Redfish (*Sebastes* spp.) in Subarea 1

Research Recommendation (page 110)

STACFIS **recommended** that *monitoring of redfish by-catch taken by the shrimp fishery in Subarea 1 should be conducted and that the results should be presented at the June 2000 Scientific Council Meeting on a length disaggregated basis.*

STACFIS **recommended** that *studies on maturation and reproduction of redfish in Subarea 1 be carried out.*

Other Finfish in Subarea 1

Research Recommendation (page 113)

STACFIS **recommended** that *monitoring of finfish by-catch taken by the shrimp fishery in Subarea 1 should be conducted and that the results should be presented at the June 2000 Scientific Council Meeting on a species by species, as well as a length disaggregated basis.*

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

Assessment Results (page 122)

STACFIS **recommended** that *the 1998 Div. 3M redfish by-catch information be presented during the November 1999 assessment of shrimp in Div. 3M and that in future the estimated numbers of redfish caught annually in the Div. 3M shrimp fishery as well as tables showing their size distribution be made available for the future June Scientific Council Meetings.*

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

Commercial fishery data (page 129)

Catch-at-age. Biological sampling data from by-catches of cod were inadequate to estimate the total removals-at-age. STACFIS **recommended** that *length and age data from by-catches of cod in Div. 3NO be presented at the June 2001 Scientific Council Meeting.*

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

Future Studies (page 137)

STACFIS again **recommended** that *(1) redfish data in Div. 3LN and 3O be analyzed further to determine if a relationship exists between Div. 3O and Div. 3LN 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.*

Reference Points (page 131)

In view of the difficulty in determining if the current low productivity will persist in the immediate future, it is **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} .*

American Plaice (*Hippoglossoides platessoides*) in Divisions 3L, 3N and 3O

Estimation of Parameters (page 141)

For American plaice in Div. 3LNO, a higher M was employed for several years in the VPA. This is a large departure from previous models and STACFIS **recommended** that *the effect of the increase in natural mortality*

and estimation of M within the ADAPT framework be explored. In recent years catch at older ages was low or nonexistent and therefore, STACFIS **recommended** that the number of ages in the catch-at-age be reduced and the effect of a plus group in the catch-at-age be explored. Previous VPAs on this stock had a severe retrospective pattern and STACFIS **recommended** that the current VPA be examined for a retrospective pattern.

Comments on Reference Points and Precautionary Approach (page 142)

STACFIS **recommended** that for American plaice in Div. 3LNO, the stock recruit relationship from VPA should be explored further.

Yellowtail Flounder (*Pleuronectes ferruginea*) in Divisions 3L, 3N and 3O

Biological studies (pages 148)

STACFIS **recommended** that new investigations into ageing techniques of yellowtail flounder be started to cross-validate the current age reading. STACFIS also **recommended** that a new tagging program for Div. 3LNO yellowtail flounder be started to gain more information on growth rates.

Reference Points (page 150)

STACFIS expressed concern about the possible effects of errors in the aging of older fish on the estimation of SSB. STACFIS **recommended** that estimation of a length based SSB be explored for Div. 3LNO yellowtail flounder.

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

Research Recommendations (page 167)

STACFIS **recommended** that for the year 2000 assessment of Greenland halibut in Subarea 2 and Div. 3KLMNO that the Canadian catch-at-age for 1998 and 1999 should be calculated, and that the total international catch-at-age for years after 1989 should be compiled, allowing exploration of age based analytical assessments.

Short-finned Squid (*Illex illecebrosus*) in Subareas 3 and 4

Research Recommendations (page 170)

For short-finned squid in Subareas 3+4, STACFIS **recommended** that:

- i) in order to evaluate effects of annually variable effort levels, data on effective fishing effort should be collected in all Subareas.
- ii) migration patterns within and between fishery areas for the total stock be investigated.
- iii) annual variability in age structure, growth rate, and maturation throughout the stock area be monitored.
- iv) additional research be carried out on the factors that affect recruitment that would assist, if taken into consideration, in forecasting the onset of high productivity period.

STACREC

Progress report on Secretariat activities in 1998/99

Consideration on internet site for statistical data (Page 181)

STACREC **recommended** that the Chairman of the Scientific Council interact with the Chairmen of the General Council and the Fisheries Commission in establishing a cooperative and integrated approach to ensure the continued development and enhancement of the NAFO Website.

Interagency data harmonization (NAFO/FAO) (page 182)

STACREC reiterated its view that the earlier these (inter-agency databases) discrepancies were detected, the easier they would be to eliminate and accordingly **recommended** that *the (error) detection exercise should be repeated at short intervals at the discretion of the NAFO and FAO Secretariats.*

Non-traditional Fishery Resources in the NAFO Area

Collection of Scientific Data and Catch Statistics on Elasmobranchs and Other Non-traditional Species (page 191)

STACREC **recommended** that *STACFIS consider appointing a Designated Expert for elasmobranch species.*

Protocol for Scientific Data on Pilot Observer Program (page 193)

STACREC **recommended** that *the ad hoc Working Group on Protocol for Scientific Data Collection should work inter-sessionally to define the type of data from the Observer Program needed for Scientific Council assessment work as requested by STACTIC during the Joint STACTIC Scientific Council Meeting at the Annual Meeting 1998, and develop a complete package of observer collection protocols, data forms, instructions and codes, for presentation to Scientific Council at the September 1999 Meeting.*

STACPUB

Review of STACPUB Membership and Chairmanship (page 195)

STACPUB **recommended** that *Rule 5.1.c.(ii). of the Rules of Procedure for the Scientific Council be revised to eliminate the words "be chaired by the [Scientific Council] Vice-Chairman, and"* STACPUB also **recommended** that *a STACPUB chairperson be elected by the Scientific Council to serve for a term of two years and shall be eligible for re-election.*

STACPUB did not reach consensus on a proposal that STACPUB conduct its business in the future in open plenary sessions (as done in STACFEN, STACFIS and STACREC) with Committee membership open to all Scientific Council members. It was therefore **recommended** that *the issue of STACPUB membership be elevated to the Scientific Council for discussion and resolution.*

Promotion and Distribution of Scientific Publications

Abstracts from Research Documents (page 197)

To facilitate the dissemination process STACPUB **recommended** that *Scientific Council Research Documents be submitted with an abstract of 250 words or less as described in the instructions for authors.* SCR documents with "white" cover will be available on the NAFO website only for internal purpose. STACPUB **recommended** that *the final SCR documents ("yellow" cover) be made available to the public through NAFO website.* Authors are requested to check that their final manuscripts sent to NAFO are error free.

NAFO Website (page 197)

STACPUB **recommended** that *NAFO Journals 22, 23 and 24 be made available through the web as soon as possible, and that access to the Journal be highlighted on the main page of NAFO website.* Further to that STACPUB **recommended** that *NAFO Journals prior to No. 22 be accessible through the web provided they are available on electronic means.*

STACPUB noting that further development of the website has been requested **recommended** that *Scientific Council request a cost accounting from the NAFO Secretariat on the costs involved in maintaining and operating the NAFO website and FTP server.*

New Initiatives for Publication (page 198)

STACPUB emphasized that information on other bodies of NAFO (General Council, Fisheries Commission) should also be accessible through the NAFO web. STACPUB therefore **recommended** that *Scientific Council Chair discuss with the NAFO Executive Secretary the inclusion on the website of the General Council and Fisheries Commission Reports*. There was further discussion on the distribution and dissemination of NAFO science through hyperlinks from the homepages of individual NAFO scientists. STACPUB therefore **recommended** that *an ad hoc Working Group of Scientific Council be formed to explore computer requirements, improvement of the NAFO website and software links to enhance external awareness of the activities of NAFO and NAFO Scientific Council*.

Scientific Council Annual Meeting, 7, 13-17 September 1999*SCIENTIFIC COUNCIL***Management Advice and Responses to Special Requests****Shrimp in Divisions 3LNO****Regarding item c) the Council responded** (page 214)

Based on these data, Scientific Council **recommended** that *if there is to be consideration of any shrimp fishery in Div. 3LNO, it be restricted to Div. 3L due to low amounts of shrimp in Div. 3NO, and the closer proximity of areas where shrimp have been found to the very important nursery areas in Div. 3NO*.

Regarding item d) the Council responded (page 214)

Scientific Council was unable, with the current data, to provide reference points related to a Precautionary Approach to exploitation of this resource. Scientific Council, however, **recommended** that *the development of any fishery in the Div. 3L area take place in a gradual manner with conservative catch limits imposed and maintained for a number of years in order to monitor stock response*.

Concern also exists regarding the role of shrimp in this area as a prey species for depressed groundfish resources and this should be considered in any discussion of possible fisheries. Scientific Council also **recommended** that *any fishery should be closely monitored through 100% observer coverage with adequate collection of data to allow for scientific evaluation of the fishery*.

Regarding item f) the Council responded (page 215)

Scientific Council **recommended** that *if there is a shrimp fishery in Div. 3L, catches be restricted to no more than 6 000 tons for a number of years until the response of the resource to this catch level can be evaluated*. In addition, Scientific Council **recommended** that *fishing effort be distributed proportional to the distribution of biomass*.

*STACREC***Report of the Ad hoc Working Group on NAFO Observer Protocol** (page 240)

STACREC **recommended** that *the Working Group on NAFO Observer Protocol communicates by e-mail with STACREC members during development of the coding and sampling procedures in order to ensure concurrence with the recommendations tabled by STACTIC for consideration during the proposed STACTIC intersessional meeting in 2000*.

STACREC **recommended** that *noting that STACTIC will call an intersessional meeting in 2000 on Observer Protocol, M. Showell (Canada) and D. Kulka (Canada) should represent Scientific Council at that meeting*

Report of CWP 18th Session (page 241)

STACREC **recommended** that *the Assistant Executive Secretary and STACREC Chairman attend the 19th Session of CWP in Noumea, New Caledonia in July 2001.*

STACREC was also informed that ICES has extended an invitation to host the CWP intersessional meeting at ICES Headquarters, Copenhagen, Denmark in February 2000. STACREC **recommended** that *the Assistant Executive Secretary and the STACREC Chairman attend the CWP intersessional meeting in Copenhagen, Denmark, in February 2000 and report on the proceedings to the Scientific Council in June 2000.*

Other Matters**Progress Report on Biological Database Format Exchange** (page 241)

STACREC **recommended** that *the Designated Expert for cod in Div. 3NO complete the spreadsheet as proposed by the Working Group on Biological Database Format Exchange using the data for this stock and present it to the Scientific Council Meeting in June 2000.*

STACPUB

Status of Scientific Council Studies (page 244)

STACPUB **recommended** that *the final issue of Scientific Council Studies using the present criteria for selection of papers, should include papers of the June 1999 Meeting selected by STACPUB, and the paper selection using the new criteria come into effect thereafter.*

Review of Meeting with Editorial Board (page 244)

STACPUB **recommended** that *the Assistant Executive Secretary take the lead in drafting editorial guidelines for Journal papers, and that STACPUB members and editors should provide input.*

With regard to increased use of the NAFO Website and putting documents into an appropriate format (e.g. pdf files), STACPUB **recommended** that *additional resources be made available to the Secretariat, or technical support obtained in the form of service contracts, to develop the website for access to NAFO Journal publications.*

Other Matters (page 244 and 245)

STACPUB **recommended** that *the blue covered SCS documents (i.e. final) containing meeting reports are distributed to Designated Experts and national representatives of the Scientific Council, in addition to the current mailing list and website circulation*

STACPUB endorsed the idea of a rotating membership, and **recommended** that *Scientific Council consider a change in its Rules of Procedure to accommodate the format of rotating membership of STACPUB.*

Therefore, regarding STACPUB membership noting that the present Rule 5.1.(c).(ii), after the modifications made in June 1999 reads "consist of five other members appointed by the Scientific Council", STACPUB **recommended** that *the following change to the Rules of Procedure be incorporated:*

Rule 5.1.(c).(ii): "consist of six other members appointed by the Scientific Council. Members would serve 3-year terms."

STACPUB was informed that a publication was being prepared by the Executive Secretary, L. I. Chepel, for publication by 2001. STACPUB **recommended** that, *any material related to ICNAF and NAFO scientific information being incorporated in the "NAFO Century book □ Northwest Atlantic Fisheries in the 20th*

Century", should be reviewed by the Scientific Council prior to publication, and that this book when completed should be placed on the NAFO website.

Scientific Council Meeting, 11-17 November 1999

SCIENTIFIC COUNCIL

Response to the Fisheries Commission (page 259)

The Scientific Council **recommended** that (for the November 2000 Meeting of the Scientific Council):

- i) *analysis of data from the EU, Faroese and the 1996 Canadian surveys be made to determine the distribution of shrimp by year, depth, size and age and to identify areas where juveniles and adults are found, and*
- ii) *analysis of the commercial fishery data be made to determine the abundance of juvenile shrimp in the total catch as well as the distribution of juveniles and adults in the catches by year, month, depth, size and age.*

Response to Fisheries Commission and Coastal States (page 260)

Scientific Council **recommended** that *Designated Experts for the three northern shrimp stocks work by correspondence to develop the "traffic light" methodology for the November 2000 Scientific Council Meeting on shrimp.*

STACFIS

Northern Shrimp (*Pandalus borealis*) in Division 3M

Research Recommendations (page 269)

STACIS **recommended** that, for northern shrimp in Div. 3M:

- *Number-at-age from the EU survey results and commercial data should be estimated to provide insight to mortality and year-class strengths.*
- *Given that the EU and Faroese surveys do not provide reliable estimates of shrimp at age two, directed research surveys should be initiated, or existing surveys should be modified (e.g. addition of a juvenile shrimp bag to the standard gear).*

Northern Shrimp (*Pandalus borealis*) in Subareas 0 and 1

Research Recommendations (pages 275 and 276)

For northern shrimp in Div. 0A and Subarea 1, STACFIS **recommended** that:

- *an analysis of the length-frequency data of shrimp in order to obtain an age composition be conducted,*
- *an analysis of the distribution of the stock and of the individual growth of shrimp be conducted in relation to environmental conditions, together with a comparison of trends and changes in mean temperatures and mean size at sex change of the shrimp,*
- *the survey strategy and design be further improved and the effect of recent changes in survey design and execution be further studied.*

Northern Shrimp (*Pandalus borealis*) in Denmark Strait**Research Recommendations** (page 279)

For northern shrimp in Denmark Strait, STACFIS **recommended** that:

- *a survey be conducted to provide fishery independent data of the stock throughout its range.*
- *standardized CPUE analyses be updated to include data from all fleets fishing in the area.*
- *commercial catch sampling of the fishery be improved to fully cover seasonal and spatial variation, so that size, sex and age composition of the catch can be accurately described.*
- *an analysis of distribution, individual growth and mean size at sex change of shrimp in relation to environmental conditions be undertaken.*

*STACREC***Protocol for Exchange of Biological Data for Northern Shrimp Stocks****Research Survey for Shrimp on Flemish Cap** (page 284)

Given the critical need to acquire information on small shrimp, STACREC **recommended** that *appropriate steps be taken as soon as possible to test the feasibility of adding a juvenile shrimp bag to the trawl used in the EU groundfish survey on Flemish Cap.*

International Database for Biological Data Related to Ageing (page 284)

Given the desirability to improve the analytical basis of northern shrimp stock assessments, and the additional information which can be derived by systematically tracking cohorts, STACREC **recommended** that *Contracting Parties submit all available commercial and survey data related to determining age of shrimp to the Designated Expert managing the international age assessment database.*