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Northwest Atlantic
Fisheries Organization
(NAFO)



Annual Report
2000

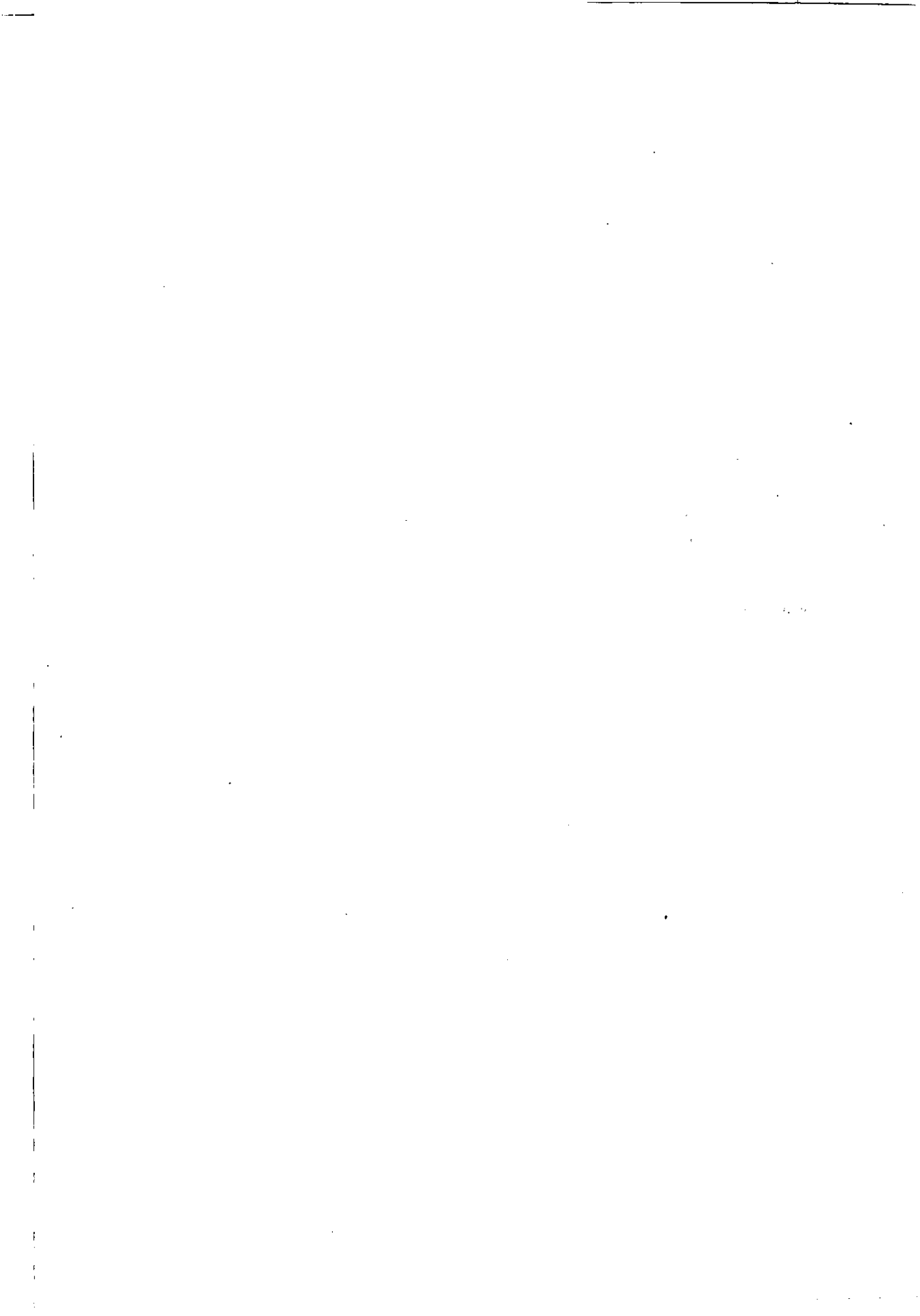
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Preface

This Annual Report for the year 2000 is submitted to the Contracting Parties of NAFO in accordance with the provisions of Article V.4 of the Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries. The Report consists of four major parts reflecting the annual activities of NAFO's constituent bodies – the General Council, the Fisheries Commission, the Scientific Council, and the Secretariat as the summary proceedings and decisions through 2000. Full reports of the General Council and Fisheries Commission meetings held during the year are published in a separate edition – "Meeting Proceedings of the General Council and Fisheries Commission for 2000", and the proceedings of the Scientific Council are published in the "Scientific Council Reports, 2000". The Annual Report includes a summary of meetings, scientific, statistical, financial and other appropriate information pertaining to the activities of the Organization and fisheries in the Regulatory Area.

L. I. Chepel
Executive Secretary



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Introduction.

The Northwest Atlantic Fisheries Organization (NAFO)* operates under provisions of the Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries signed in Ottawa, Canada, on 24 October 1978 and entered into force on 1 January 1979. Canada is the country-depositary for the Convention.

The principle objectives of NAFO set forth by the Convention are to contribute through consultation and cooperation to the optimum utilization, rational management and conservation of the fishery resources of the Convention Area. To carry out its mission, NAFO was structured into the following four constituent bodies: the General Council, the Scientific Council, the Fisheries Commission, and the Secretariat. The first three constituent bodies meet at least once annually, while NAFO business between meetings would be coordinated through the Secretariat.

The following NAFO meetings were held during 2000: (1) Joint Scientific Council and Fisheries Commission Working Group on Precautionary Approach (Brussels, Belgium, 29 February-02 March); (2) Working Group on Allocation of Fishing Rights (Washington, D.C., USA, 28-30 March); (3) Meeting on Shrimp Stocks in the Regulatory Area (Washington, D.C., USA, 27 March); (4) Working Group on Dispute Settlement Procedures (DSP) (Copenhagen, Denmark, 29-31 May); (5) Standing Committee on International Control (Dartmouth, Canada, 27-29 June); (6) STACTIC Technical Working Group on Communications (Dartmouth, Canada, 30 June); (7) Scientific Council Meeting (Dartmouth, Canada, 1-15 June); (8) Workshop on Assessment Methods (Boston, Mass., USA, 13-15 September); (9) Scientific Council Annual Meeting, 13-22 September, Boston, MA, USA; (10) Scientific Council Meeting (Copenhagen, Denmark, 8-15 November).

The Scientific Council reviewed and assessed the status of 19 fish stocks in the NAFO Regulatory and Convention Areas. The scientific advice and recommendations from the Scientific Council were presented to the Fisheries Commission with recommendation that major groundfish stocks are continuing to be at low abundance and there should not be a direct fishery for those stocks in 2001. The Scientific Council reported biomass increases for Greenland halibut in Divisions 2J+3KLMNO and Yellowtail flounder in Div. 3LNO. The Joint Scientific Council/Fisheries Commission Working Group on Precautionary Approach evaluated and discussed a precautionary approach (PA) to NAFO-managed stocks and proposed PA steps in the fields of "harvest strategies", "conservation and enforcement measures" and "research/monitoring" for two model stocks – Cod in Div. 3NO, Yellowtail flounder in Div. 3LNO.

The Fisheries Commission considered the Scientific Council recommendations and agreed on joint international measures and actions for the conservation and utilization of the fishery resources in the Regulatory Area. For all stocks scientific advice on levels of harvest was adopted. "No direct fishery" in 2001 was applied to the following stocks: Cod in Divisions 3M and 3L (that portion within the Regulatory Area) and 3NO, Redfish in Div. 3LN, American plaice in Divisions 3M and 3LNO, Witch flounder in Div. 3NO and 3L (that portion within the Regulatory Area) and Capelin in 3NO.

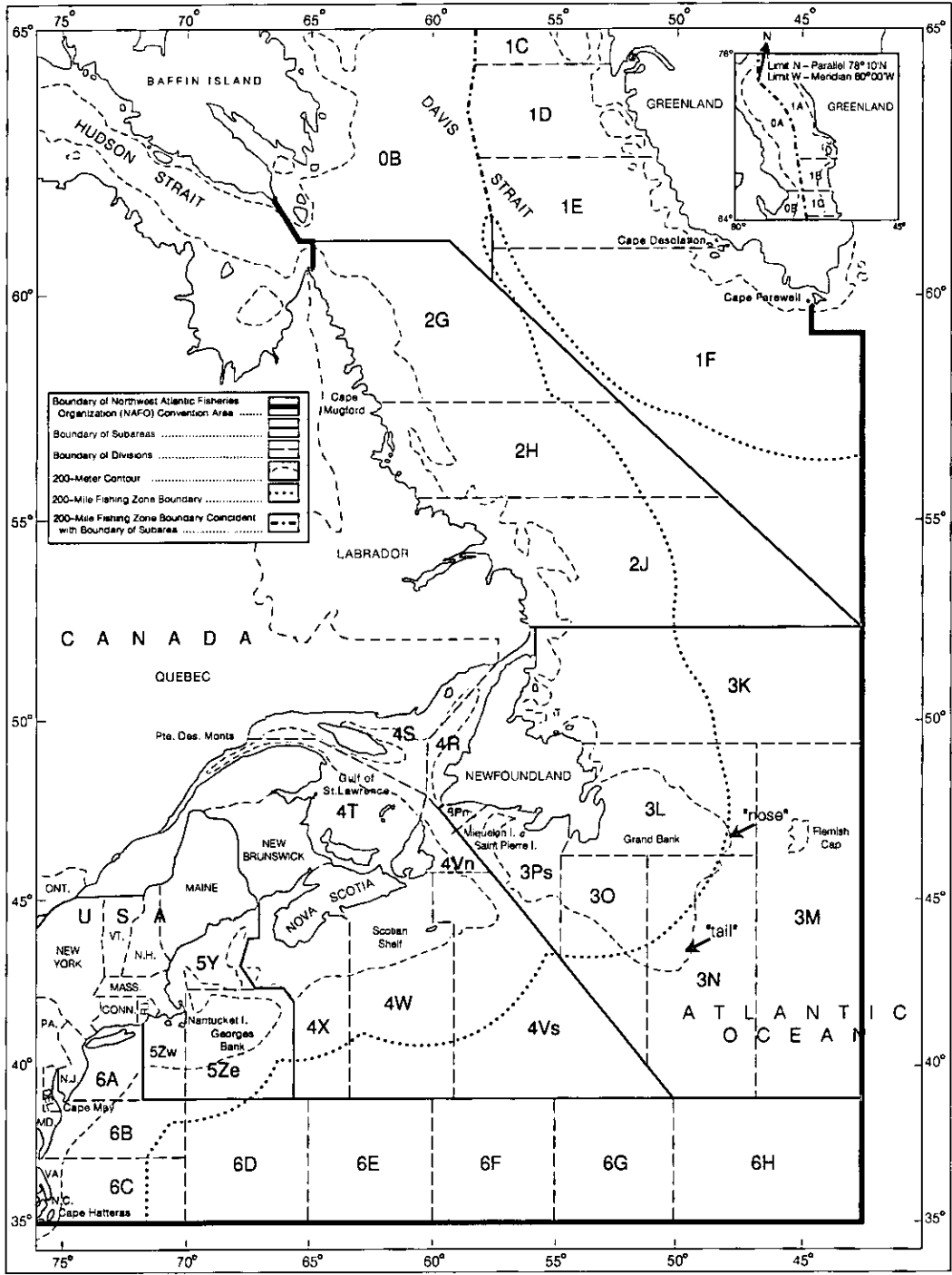
*NOTE: The predecessor of NAFO was ICNAF through the years 1950-1978 based on the International Convention for the Northwest Atlantic Fisheries.

New conservation and enforcement measures were agreed: to avoid excessive incidental catch a new fishing strategy will apply by changing fishing areas, etc.; regulation of the shrimp fishery on the Flemish Cap in Division 3M will continue in 2001 by effort allocation Scheme and other regulatory measures; the Program for Observers and Satellite Tracking was modified to integrate the hail system with the satellite tracking and vessel monitoring systems (VMS).

The General Council deliberated several outstanding issues regarding internal and external NAFO policy on the following terms: To further undertake the study of the impact of the FAO International Plans of Action on Illegal, Unregulated and Unreported (IUU) Fishing on NAFO at its next Annual Meeting; to continue appropriate actions to deter NCP activity in the NAFO Area.

The President of NAFO signed diplomatic démarches to the Non-Contracting Party flag-States whose vessels have fished in the NAFO Regulatory Area in recent years, namely Belize, Honduras, Panama and Sierra Leone.

The Convention Area to which the Convention on Future Multilateral Cooperation in the Northwest Atlantic applies





**Structure of the Northwest Atlantic Fisheries Organization (NAFO) in 2000
(as at 22nd Annual Meeting, September 2000)**

Contracting Parties

Bulgaria, Canada, Cuba, Denmark (in respect of the Faroe Islands and Greenland), Estonia, European Union (EU), France (in respect of St. Pierre et Miquelon), Iceland, Japan, Republic of Korea, Latvia, Lithuania, Norway, Poland, Romania, Russia, Ukraine and United States of America (USA).

President

E. Oltuski (Cuba)

Constituent Bodies

General Council	Bulgaria, Canada, Cuba, Denmark (in respect of the Faroe Islands and Greenland), Estonia, EU, France (in respect of St. Pierre et Miquelon), Iceland, Japan, Korea, Latvia, Lithuania, Norway, Poland, Romania, Russia, Ukraine and USA.	<i>Chairman</i> – E. Oltuski (Cuba) <i>Vice-Chairman</i> – P. Chamut (Canada)
Scientific Council	Bulgaria, Canada, Cuba, Denmark (in respect of the Faroe Islands and Greenland), Estonia, EU, France (in respect of St. Pierre et Miquelon), Iceland, Japan, Korea, Latvia, Lithuania, Norway, Poland, Romania, Russia, Ukraine and USA.	<i>Chairman</i> – W. B. Brodie (Canada) <i>Vice-Chairman</i> – R. Mayo (USA)
Fisheries Commission	Canada, Cuba, Denmark (in respect of the Faroe Islands and Greenland), Estonia, EU, France (in respect of St. Pierre et Miquelon), Iceland, Japan, Korea, Latvia, Lithuania, Norway, Poland, Russia, Ukraine and USA.	<i>Chairman</i> – P. Gullestad (Norway) <i>Vice-Chairman</i> – D. Swanson (USA)

Standing Committees

General Council	Standing Committee on Finance and Administration (STACFAD)	<i>Chairman</i> – G. F. Kingston (EU) <i>Vice-Chairman</i> – J.-P. Plé (USA)
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General Council (cont'd)	Standing Committee on Fishing Activity of Non-Contracting Parties in the Regulatory Area (STACFAC)	<i>Chairman</i> – J.-P. Plé (USA) <i>Vice-Chairman</i> – D. Silvestre (France in respect of St. Pierre et Miquelon)
Scientific Council	Standing Committee on Fishery Science (STACFIS)	<i>Chairman</i> – H.-J. Rätz (EU)
	Standing Committee on Research and Coordination (STACREC)	<i>Chairman</i> – R. Mayo (USA)
	Standing Committee on Publications (STACPUB)	<i>Chairman</i> – O.A. Jørgensen (Denmark- Greenland)
	Standing Committee on Fisheries Environment (STACFEN)	<i>Chairman</i> – M. Stein (EU)
Fisheries Commission	Standing Committee on International Control (STACTIC)	<i>Chairman</i> – D. Bevan (Canada)

Secretariat

Executive Secretary	L. I. Chepel
Assistant Executive Secretary	T. Amaratunga
Administrative Assistant	F. D. Keating
Secretary to Executive Secretary	B. J. Cruikshank
Accounting Officer	S. M. Goodick
Desktop Publishing/Documents Clerk	F. E. Perry
Statistical/Conservation Measures Officer	G. M. Moulton
Graphic Arts/Printing Technician	R. A. Myers
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Secretary to Assistant Executive Secretary	D.C.A. Auby
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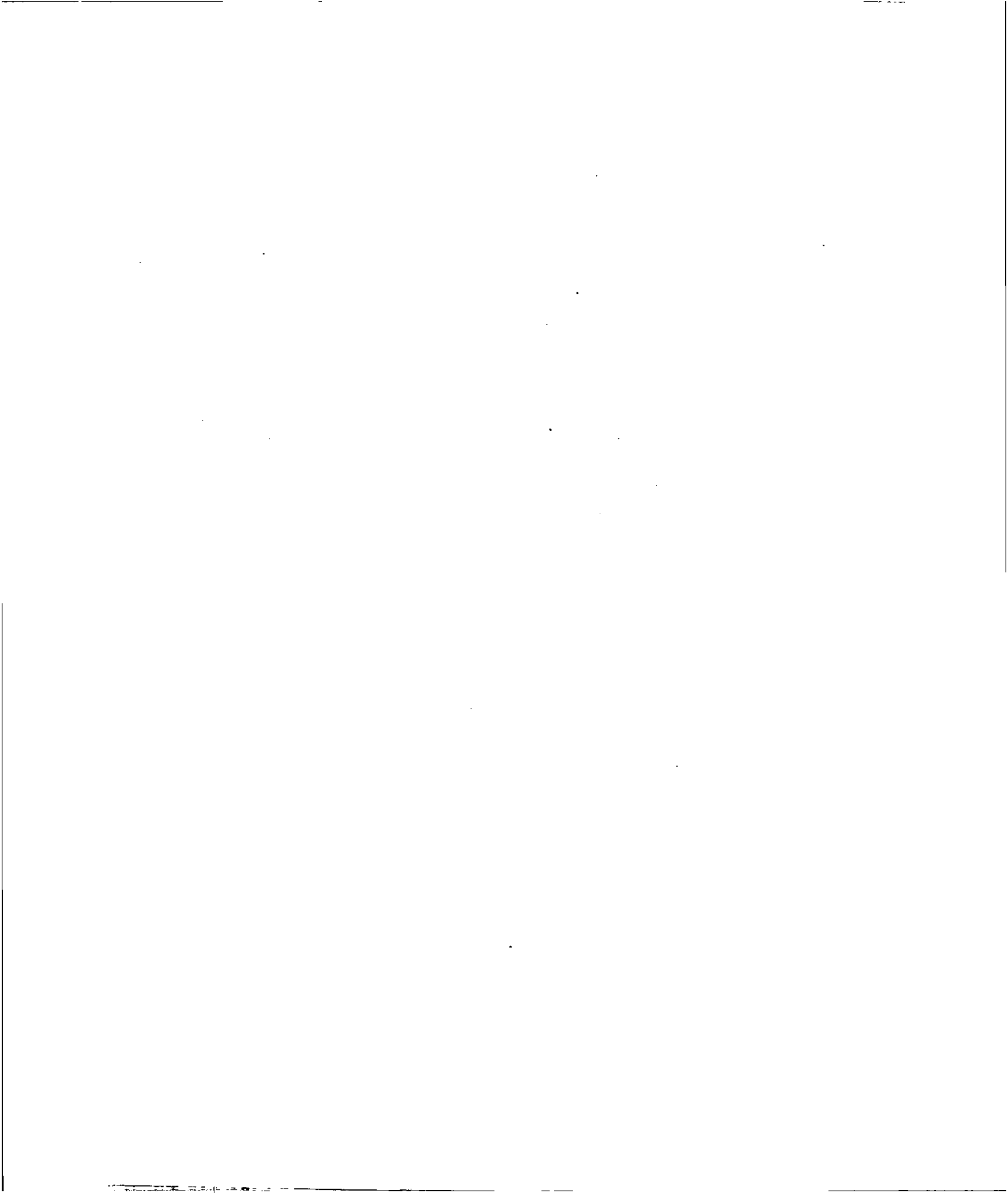
PART I
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Activities of the General Council in 2000

List of Meetings

The following meetings were held under the authority of the General Council:

- Meeting on Shrimp Stocks in the Regulatory Area; US State Department, Washington, D.C., USA, 27-30 March.
- Working Group on Allocation of Fishing Rights to Contracting Parties of NAFO; US State Department, Washington, D.C., USA, 28-30 March.
- Working Group on Dispute Settlement Procedures (DSP); Eigtveds Pakhus, Copenhagen, Denmark, 29-31 May.
- The General Council and its subsidiary bodies (STACFAD and STACFAC); 22nd Annual Meeting, Hilton Back Bay, Boston, MA, USA, 18-22 September.



Major Documents of the General Council in 2000

<u>Serial No.</u>	<u>GC Doc. No.</u>	<u>Title</u>
N4212	00/1	Report - 1999 – On the Scheme to Promote Compliance by Non-Contracting Party Vessels with the Conservation and Enforcement Measures
N4290	00/2	Report of the Working Group on Allocation of Fishing Rights to Contracting Parties of NAFO, 28-30 March 2000, Washington, D.C., USA
N4291	00/3	Report of the Meeting on the Shrimp Stocks in the Regulatory Area, 27-30 March 2000, Washington, D.C., USA
N4292	00/4	Report of the Working Group on Dispute Settlement Procedures (DSP), 29-31 May 2000, Copenhagen, Denmark
N4293	00/5	Administrative Report and Financial Statements for the fiscal year ending 31 December 2000 (as of 31 July 2000)
N4321	00/6	Schedule of NAFO Meetings, 2001
N4348	00/7	Report of the General Council, 22nd Annual Meeting, 18-22 September 2000, Boston, MA, USA



Meeting on Shrimp Stocks in the Regulatory Area 27-30 March 2000, Washington, D.C., USA

The Meeting was held in accordance with the decision taken by the General Council at the 21st Annual Meeting, September 1999 (GC Doc. 99/9, Part I, item 4.12). Complete proceedings are presented in GC Doc. 00/3 and in the NAFO Meeting Proceedings (General Council and Fisheries Commission), 2000.

Opening Procedures

The Chairman was Mr. H. Koster (EU). The following Contracting Parties were present: Canada, Denmark (in respect of Faroes and Greenland - F&G), Estonia, European Union (EU), France (in respect of St. Pierre et Miquelon - SPM), Iceland, Japan, Latvia, Lithuania, Norway, Poland, Russia, United States of America (USA) (Annex 1).

P.E. Moran (USA) was elected as Rapporteur.

The agenda was adopted as attached (Annex 2).

Management systems for shrimp in the Regulatory Area

Discussing the current effort allocation system for 3M shrimp, some Parties expressed the opinion that such a system of management could not succeed because it failed to take into account the ability of vessels to improve productivity and, thus, catch levels. It was noted that a TAC system provided concrete, scientifically based limits on catch that made such considerations unnecessary. Other delegates supported a continued use of the effort system, pointing out that it is premature to shift to TAC system, as any consideration on factors which caused the failure of current system including overfishing by Contracting Parties or one Party under the objection or "flag hopping" had not been conducted yet. The opinion was expressed that with proper regulation and reporting (e.g., through enhanced monitoring) the effort allocation system could be made effective.

Parties expressed a broad variety of opinions regarding possible future TAC-based allocation schemes for 3M shrimp. While it was generally agreed that any new TAC system should use as its basis elements of the current management scheme, there was a lack of consensus regarding which elements should be used and how they should be applied.

Particular concern was expressed regarding on how historical harvests (and opportunities for harvest) should be reflected in future TAC allocations, including the possible use of historic catch versus allocated fishing days. While there was broad support for the use of historical catch, there was no consensus on how such catches should be translated into TAC allocations. It was also pointed out that the current overall over harvest in the fishery would have to be taken into account in designing a new system and that any new scheme should not reward Parties that had undermined the efforts of the current effort scheme. Again, there was a lack of consensus regarding how such considerations should be reflected in a new scheme.

After considerable discussion, the Chair concluded that Parties appeared to be considering four (4) options regarding possible elements of a future TAC allocation scheme, and presented his working paper for consideration and comments.

- Under Option A, a basis for quota allocation can be derived as follows:

- 1) allocation will be based on the highest catch in one of the years 1993, 1994 or 1995 (until August 1995)
- 2) or alternatively
 - For Contracting Parties with a track record in the period 1 January 1993 to 31 August 1995 the catch figure will be at least 1600 (400 x average catch per day (mt?))
 - For Contracting Parties with no track record in the period 1 January 1993 to 31 August 1995, the basis will be at least 400 (100 x average catch per day (mt?))

- Under Option B, there are two (2) suboptions:

B₁ - Catches for the period 1996-1999 with the adjusting of the catch figures of the Contracting Parties which are inconsistent with the fishing pattern (e.g. the catches of Contracting Parties which exceeded their allocated fishing days those catches were adjusted to the allocated fishing effort).

B₂ - Catches for the period 1997-1998 with elimination of the years 1996 and 1999 with "extreme" catches.

- Under Option C, there are two (2) suboptions:

C₁ - the sum of the catches for the whole observation period, 1993-1999. In future probable scenario, if decided, the relative share of each Contracting Party would be applied on 90% of the TAC, and the remaining 10% would be set aside as OTHERS quota.

C₂ - the sum of the catches for a short reference period (1997,1999). As in C₁, the relative share of each Contracting Party would be applied on 90% of the TAC and, remaining 10% would be set aside as OTHERS quota.

- Under Option D, the allocation principle would be based on % of allocated fishing days (under present effort allocation scheme).

Report to the Fisheries Commission

It was agreed that the Chair's Working Paper relating to the 3M shrimp fishery would be further revised as appropriate and used as the basis for continued discussion at the 2000 NAFO Annual Meeting. It was also agreed that advice would be sought from the Fisheries Commission on what future actions (if any) should be taken by the group with regard to 3M shrimp allocations.

With regard to 3L shrimp, it was agreed that all three options for future TAC management should be presented to the Fisheries Commission at the 2000 NAFO Annual Meeting for further discussion and advice on how to proceed.

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 B. J. Cruikshank, Senior Secretary

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Annex 2. Agenda

1. Opening by Chairman (H. Koster-EU)
2. Adoption of Agenda
3. Appointment of Rapporteur
4. Management system(s) for shrimps in the Regulatory Area
 - Current management system for 3M shrimp
 - Possible TAC-based quota allocation systems for 3M shrimp
 - Possible quota allocation systems for 3L shrimp
5. Report to the Fisheries Commission
6. Other matters
7. Adjournment of the Meeting

**Working Group on Allocation of Fishing Rights
to Contracting Parties of NAFO
28-30 March 2000, Washington, D.C., USA**

The Working Group on Allocation of Fishing Rights to Contracting Parties of NAFO convened in accordance with the decision taken by the General Council at the 21st Annual Meeting, September 1999 (GC Doc. 99/9, Part I, item 4.12). Complete proceedings of the meeting are presented in GC Doc. 00/2 and in the NAFO Meeting Proceedings (General Council and Fisheries Commission), 2000.

Opening Procedures

The Chairman was Mr. H. Koster (EU). The following Contracting Parties were present at the meeting: Canada, Denmark (in respect of Faroes and Greenland - F&G), Estonia, European Union (EU), France (in respect of St. Pierre et Miquelon - SPM), Iceland, Japan, Latvia, Lithuania, Norway, Poland, Russia, United States of America (USA) (please see Annex 1 of previous meeting).

Mr. P.E. Moran (USA) was elected as Rapporteur.

The agenda was adopted as attached (Annex 1).

The Chair requested to examine the qualifying and allocation criteria outlined in his working paper from the previous meeting (1999).

Initial discussion on this topic focused on the sources and nature of both types of criteria. While it was generally agreed that Article XI of the NAFO Convention provided the primary basis for both qualification and allocation criteria within the Organization, some Parties also expressed support for the consideration of relevant provisions of the 1995 UN Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks to guide NAFO's allocation process. There was general agreement among those present that any lists of qualifying and allocation criteria should not be prioritized in any way or considered exhaustive. It was also agreed that qualification should not be considered the right for an allocation.

Regarding qualifying criteria, it was generally agreed that Contracting Parties wishing to be eligible for allocations should be in "good standing" and "interested", although there was some question as to how such standing should be established. It was agreed Contracting Parties who are members of the Fisheries Commission and may exercise the right to vote (based on NAFO Convention) would be considered eligible for allocations.

On qualifying criteria, a number of those present spoke in favor of the inclusion of a criterion relating to overwhelming economic dependence, although there was some concern how such dependence might be substantiated. The view was expressed that, even if it were possible to quantify dependency, it remained doubtful whether this was a suitable criterion in a situation where all Contracting Parties were in principle entitled to be treated on an equal footing. In addition, one Party suggested that special geographic considerations should be taken into account. It was also clarified that Contracting Parties who are members of the Fisheries Commission and may exercise the right to vote must only fulfill one of the various criteria relating to "interest" in order to be considered eligible for allocations.

Regarding allocation criteria, there was general support for the view that allocation criteria should reflect the principle of equity.

A general support was for the inclusion of an allocation criterion relating to reference fishing patterns during a representative reference period. It was pointed out that such a criterion is, comparatively, easier to quantify.

A number of other considerations were discussed with regard to allocation criteria. There was strong support for the inclusion of a reference to Article XI(4) of the NAFO Convention, which relates to allocation within the Organization. It was also generally agreed that considerations from the qualifying criteria relating to contributions to research and data collection and overwhelming dependence on fisheries should be included in the allocation criteria as well. One Party suggested that other contributions to NAFO should also be considered. In addition, arguments were made by some Parties that there should be a specific reference to the needs of small coastal communities.

There was also some discussion relating to the possibility of setting aside fishing opportunities for vessels of non-Contracting Parties that have demonstrated a high degree of cooperation with NAFO. It was generally agreed that, given the basic qualifying criterion of Contracting Party status, such opportunities could not be considered to be a formal part of the allocation procedure. Instead, it was suggested that such opportunities could be considered by the Fisheries Commission on an ad hoc basis.

Exploration of possible margins to accommodate requests for fishing opportunities in connection with stocks under TAC

Some Parties stated that the current status of most stocks within NAFO made consideration of reallocations particularly difficult. Others generally supported the idea that repeated underutilization of allocations should result in reallocation, although concern was expressed that there might be valid reasons that such underutilization might take place.

The Chair noted that constant reviews of allocations could threaten stability within the Organizations, but agreed that a reasonable review process in conjunction with the use of transfers (in the short term) could be useful.

Regarding possible allocations of the "Others" quotas (for those Contracting Parties without direct allocations), there was general agreement that an "Others" quota is desirable, but concern was expressed regarding how changes to the amount of such allocations would effect country-specific allocations. Parties again noted that the current status of NAFO stocks made such discussions difficult. One Party stated that fishing from "Others" quotas was difficult due to practical issues relating to planning and preparation. There was some support for the idea that NAFO might regulate allocations within the "Others" category to ensure a minimum level of allocation available to all eligible Parties.

The Chair summarized the issues relating to reallocation and the use of an "Others" quota, noting that there was no consensus that fishing opportunities for those without country-specific allocations should come from already allocated fish. Thus, such a system could currently only be recommended for new fisheries on a case-by-case basis. He stated that as stocks increase biologically the Fisheries Commission must decide if it is possible to look at increases to "Others" quotas. The Chair urged the Working Group to consider the needs of all Contracting Parties with regard to fishing opportunities in NAFO.

Allocation of the bloc quota

The Representative of Latvia presented the result of an informal meeting between those NAFO Parties that share the bloc quota (Estonia, Latvia, Lithuania, and Russia). The Chairman of the Working Group, H. Koster, was present at that meeting. It was tentatively agreed that all involved Parties would meet before the 2000 NAFO Annual Meeting with the goal reporting to the Commission presenting a proposal for allocations of the current bloc quotas. The Parties further considered that three issues should be reviewed during the up-coming meeting: 1) all relevant stocks to be discussed for further allocation of the block quota; 2) the appropriate reference period to be used in determining block quota percentage shares; and 3) principles to be used for determining percentage share allocations.

Report to the Fisheries Commission

One representative noted the difficult nature of the tasks facing the Working Group and suggested that the Fisheries Commission should consider a timetable with benchmarks for addressing the allocation issues facing the organization. It also was suggested that the issue of allocation of new stocks should be a high priority in such considerations. After a brief discussion, it was agreed that the Working Group should recommend that the Fisheries Commission reflect in view of the work done thus far by the Working Group and suggest when it might be appropriate to meet again.

"Flag-hopping"

The Representative from the EU presented information and expressed grave concern regarding the practice of "flag hopping". He clarified that preliminary information indicated that vessels of one Contracting Party appeared to be seeking permission from their government to arrange for double flagging with another Contracting Party. This permission was then being used in conjunction with chartering or other similar arrangements to allow these vessels to operate (apparently at their convenience) under two flags. He stated that such a practice endangers the NAFO quota system by weakening the link between NAFO quota beneficiaries and harvesting vessels.

There was general agreement that the practice of flag hopping could have a negative effect on the NAFO allocation system and many Parties called for an examination of the current NAFO rules regarding bareboat charters.

Annex 1. Agenda

1. Opening by Chairman (H. Koster-EU)
2. Adoption of Agenda
3. Appointment of Rapporteur
4. Development of a broad strategy of allocation of future fishing opportunities for stocks not currently Allocated (see Annex 11 of NAFO/GC Doc. 99/4, "Interpretive notes by the Chair attempting to clarify discussions on Agenda points 6 and 7," and Annex 2 of NAFO/GC Doc. 99/4, "Terms of Reference")
 - Qualifying criteria
 - Allocation criteria
5. Exploration of possible margins to accommodate requests for fishing opportunities in connection with the stocks under TAC (see Annexes 2 and 11 of NAFO/GC Doc. 99/4)
 - Re-utilization, re-allocation
 - Allocation of or to the "Others" quota
6. Allocation of block quota
7. Report to the Fisheries Commission
8. Other Matters
9. Adjournment

**Working Group on Dispute Settlement
Procedures (DSP)
29-31 May 2000, Copenhagen, Denmark**

The Working Group convened in accordance with the decision taken by the General Council at the 21st Annual Meeting, September 1999 (item 4.8 of the General Council Report, GC Doc. 99/9). Complete proceedings of the meeting are presented in GC Doc. 00/4 and in the NAFO Meeting Proceedings (General Council and Fisheries Commission), 2000.

Opening Procedures

The Chairman was Mr. Stein Owe (Norway). The following Contracting Parties were present at the meeting: Canada, Denmark (in respect of Faroe Islands and Greenland), Estonia, European Union, France (in respect of St. Pierre and Miquelon), Iceland, Japan, Latvia, Lithuania, Norway and the United States of America (Annex 1).

Mr. Staffan Ekwall (EU) was appointed Rapporteur.

The Provisional Agenda was adopted as attached (Annex 2).

- 4. Examination of the desirability and, as appropriate, the development of procedures for the settlement of disputes between NAFO Contracting Parties**
a) by implementing in a NAFO context the 1995 UN Agreement and UNCLOS dispute settlement procedures, and b) by including additional measures if needed.

The Chairman presented his paper which was meant as an attempt to move the discussion forward.

The Working Group discussed several papers-proposals presented by the Chairman, Denmark (in respect of Faroe Islands and Greenland) and European Union.

As an attempt to summarise the outcome of the first round of discussions, the Chairman presented his paper modified by the meeting and which contains text and alternatives in brackets, reflecting the current level of agreement and views expressed to-date in the Working Group (Annex 3).

The paper, as a Consolidated Text of the Working Group discussions was referred to the General Council.

Annex 1. List of Participants

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NAFO SECRETARIAT

L. I. Chepel, Executive Secretary
B. Cruikshank, Senior Secretary

Annex 2. Agenda

1. Opening by Chairman, S. Owe (Norway)
2. Appointment of Rapporteur
3. Adoption of Agenda
4. Examination of the desirability and, as appropriate, the development of procedures for the settlement of disputes between NAFO Contracting Parties:
 - a) by implementing in a NAFO context the 1995 UN Agreement and UNCLOS dispute settlement procedures, and
 - b) by including additional measures if needed.
5. Report to the General Council
6. Other Matters
7. Adjournment

Annex 3. Settlement of Disputes within NAFO

CONSOLIDATED TEXT

New Paragraph 4 of Article XII (If NAFO Dispute Settlement Procedures are not incorporated as amendments to the NAFO Convention this provision may possibly be adopted in another form.)

On request of any Contracting Party, a Member of the Fisheries Commission, which has presented an objection to a proposal in accordance with Article XII (1) or given notice of its intention not to be bound by a measure in accordance with Article XII (3), shall within [...] days give a statement of the reasons for its objection or notice and a declaration of its intentions following the objection or notice, including a description of any measures it intends to take or has already taken for the conservation and management [, including control and enforcement measures.] of the fish stock or stocks concerned. [The declaration and post-objection behaviour may be challenged through dispute settlement procedures.]

(New) Article...

1. Contracting Parties shall cooperate in order to prevent disputes.
2. If any dispute arises between two or more Contracting Parties concerning the interpretation or application of this Convention, those Contracting Parties shall consult among themselves with a view to resolving the dispute, or to having the dispute resolved by negotiation, inquiry, mediation, conciliation, *ad hoc* panel procedures, arbitration, judicial settlement or other peaceful means of their own choice.
3. Where a dispute concerns the interpretation or application of a proposal adopted by the Fisheries Commission pursuant to Article XI or matters related thereto, the parties to the dispute may submit the dispute to an *ad hoc* panel constituted in accordance with procedures adopted by the General Council. The Contracting Parties that so agree shall within [...] days of the notification of the dispute to the Executive Secretary proceed to an exchange of views concerning the constitution of the panel and the resolution of the dispute through the panel.

Where a dispute has been submitted to *ad hoc* panel procedures, the panel constituted in accordance with provisions adopted by the General Council shall at the earliest possible opportunity confer with the Contracting Parties concerned and shall endeavour to resolve the dispute expeditiously. Within x weeks after being constituted the panel shall present a report to the Contracting Parties concerned and through the Executive Secretary to the other Contracting Parties. The report shall as far as possible include any recommendations which the panel considers appropriate to resolve the dispute.

Where a dispute has not been resolved through agreement between the Contracting Parties following the recommendations of the *ad hoc* panel it may be referred, on request of one of the Contracting Parties, to a binding DSP as provided in para. 5.

4. Where the parties to a dispute have agreed to submit the dispute to *ad hoc* panel procedures, they may agree at the same time to apply provisionally the relevant proposal adopted by the Commission until the report of the panel is presented or the dispute is resolved, whichever occurs first.

[Pending the settlement of a dispute according to para. 5 the parties to the dispute shall, if one of these Contracting Parties so desire, apply provisionally any recommendation made by a panel where the Contracting Parties had agreed an *ad hoc* panel procedure.] *or* [The parties to a dispute may agree to apply provisionally any recommendation made by a panel pending the settlement of the dispute according to para 5.] That provisional application shall cease when the Contracting Parties agree on arrangements of equivalent effect, when a court or tribunal to which the dispute has been submitted in accordance with para 5 has taken a provisional or definitive decision or, in any case, at the date of expiration, if applicable, of the proposal of the Fisheries Commission.

[5. If the Contracting Parties do not agree to any other peaceful means to resolve a dispute, or no settlement has been reached by recourse to these means, the dispute shall be referred, if one of the Contracting Parties concerned so requests, to binding dispute settlement procedures. Such procedures concerning the interpretation and application of this Convention shall be governed *mutatis mutandis* by the provisions relating to the settlement of disputes set out in Part XV of United Nations Convention on the Law of the Sea of 10 December 1982 (1982 UN Convention) or[, where the dispute concerns one or more straddling stocks,] by the provisions set out in Part VIII of the United Nations 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 of 4 August 1995 (1995 UN Agreement)[, whether or not the parties to the dispute are also State parties to these instruments].]

[6. A court, tribunal or panel to which any dispute has been submitted under this Article shall apply the relevant provisions of this Convention, of the instruments referred to in para. 5, as well as generally accepted standards for the conservation and management of living marine resources and other rules of international law not incompatible with the said instruments, with a view to ensuring the conservation [and optimum utilization] of the fish stocks concerned.]

OR (instead of 5 and 6)

[A Contracting Party may refer any dispute concerning the interpretation or application of the Convention to DSP.

The Contracting Parties agree to apply the 1995 UN Agreement provisionally both to straddling stocks and discrete stocks that occur in the NAFO Regulatory Area, whether or not the Contracting Parties are party to the Agreement.]

General Council Annual Meeting
18-22 September 2000, Boston, Massachusetts, USA

The Twenty-Second Annual Meeting of the General Council was convened at the Hilton Back Bay, Boston, MA, USA. Complete proceedings of this Meeting are presented in GC Doc. 00/7 and in NAFO Meeting Proceedings (General Council and Fisheries Commission), 2000.

Opening Procedures (items 1-5 of the Agenda)

The meeting was opened by the Chairman of the General Council, Enrique Oltuski (Cuba).

The Representatives of sixteen (16) Contracting Parties were present: Canada, Cuba, Denmark (in respect of the Faroe Islands and Greenland-DFG), Estonia, European Union, France (in respect of St. Pierre et Miquelon), Iceland, Japan, Republic of Korea, Latvia, Lithuania, Norway, Poland, Russia, Ukraine and the United States of America (Annex 1). Two (2) Contracting Parties - Bulgaria and Romania were absent.

An observer was admitted from NAMMCO.

The Honorable Rolland A. Schmitt, Deputy Assistant Secretary of International Affairs of the United States Department of Commerce, welcomed the NAFO delegates to Boston and the United States of America on behalf of his Government (Annex 2). Mr. Schmitt emphasized that the United States attaches great importance to NAFO as a successful regional fisheries management organization, both in its present conservation and management activities and its future ones.

The meeting appointed the Executive Secretary as Rapporteur.

The Provisional Agenda was adopted as attached (Annex 3).

**Supervision and Coordination of the Organizational, Administrative
and other Internal Affairs** (items 6-7)

The membership and Contracting Parties' credentials were reported by the Executive Secretary. The total membership of 18 Contracting Parties and 16 members of the Fisheries Commission were noted. The credentials of 220 NAFO delegates were notified to the NAFO Secretariat before 18 September 2000.

With regards to Bulgaria and Romania participation in NAFO business, it was noted that two Contracting Parties, Canada and Ukraine, held communication with those members. There was indication from Bulgaria to start their process of reinstatement in NAFO, and Romania advised on its disinterest in NAFO participation and intention of eventual withdrawal.

Coordination of External Relations (items 8-10)

Under item 8, "Communication with the United Nations", the Chairman noted the NAFO paper (GF/00-344 of 11 June 00) presented to the UN Secretariat regarding "Large-scale pelagic drift-net fishing, unauthorized fishing in zones of national jurisdiction and on high seas, fisheries by-catch and discards, and other developments". The NAFO paper was developed through consultations and approval by NAFO members.

Under item 9, "FAO International Plans of Action on the Management of Fishing Capacity, Shark Fishery and Incidental Catch of Seabirds in Longline Fisheries", the heads of delegations decided at a separate meeting to recommend to Contracting Parties that their reports to FAO on this subject should be copied to the NAFO Secretariat, and the NAFO Secretariat, in turn, would circulate those reports to all Contracting Parties.

Item 10, "NAFO participation at other International Organizations", was presented by the Executive Secretary informing that Canadian observers represented NAFO at the FAO Consultations on CITES (1975 Convention on International Trade in Endangered Species of Flora and Fauna) and NASCO (North Atlantic Salmon Conservation Organization). The observer reports were circulated to the meeting.

Assistant Executive Secretary, T. Amaratunga, took part in FAO Working Party on Status and Trends of Fisheries (November 1999). His report was delivered to the Scientific Council June Meeting (SCS Doc. 00/15).

Fishing Activities in the Regulatory Area Adverse to the Objectives of the NAFO Convention (items 11-13)

Under item 11, "Consideration of non-Contracting Parties activities in the NAFO Regulatory Area and agreement on the task of STACFAC at the current meeting", the Chairman of STACFAC, J-Pierre Plé (USA) briefed the Meeting on the status of STACFAC activity and actions. He was optimistic on the latest non-activity by former non-Contracting Parties (NCPs) in the NAFO Regulatory Area, but urged the meeting to maintain NAFO's steady actions against illegal fishing by NCPs. He noted a new trend of re-flagging/double flagging that posed danger of revival of NCP fishing in the Regulatory Area. The meeting agreed that STACAFAC should continue its work and then report to the General Council.

Under item 12, the General Council adopted STACFAC recommendations:

- Démarches, in the form of letters signed by the President of NAFO should be sent to Belize, Honduras, Panama, and Sierra Leone.
- to circulate to the secretariats of ICCAT, NEAFC, and CCAMLR reports of non-Contracting Party fishing activity in the NAFO Regulatory Area, and request such organizations to share reports of non-Contracting Party fishing activity in their respective areas with NAFO.
- to submit reports by Contracting Parties at the next Annual Meeting on what legal, administrative and practical action they have taken to implement the Scheme.
- to undertake study of the impact of the proposed International Plan of Action on Illegal, Unregulated and Unreported (IUU) Fishing on NAFO at its next Annual Meeting.

New officers elected by STACFAC: Chairman, Mr. Daniel Silvestre (France-SPM), and Vice-Chairperson, Nadia Bouffard (Canada).

Item 13, "Report of Working Group on Dispute Settlement Procedures (GC Doc. 00/4)", was presented to the meeting by the W.G. Chairman, Mr. Stein Owe (Norway). He summarized the discussions in a consolidated text of a proposal for a future DSP. The proposal contains text and alternatives in brackets reflecting the current level of views expressed to-date in the Working Group. He thought that progress was made to move further discussions. The European Union

Representative noting the priority of this issue for the EU delegation, supported the DSP Report and thought that Contracting Parties should continue discussions to resolve this subject.

The General Council decided to continue DSP discussions and call an intersessional Working Group in Dartmouth, N.S., Canada, 24-26 April 2001.

Finance (items 14-15)

The Chairman of STACFAD, F. Kingston (EU) delivered its report to the General Council on 22 September and noted the following:

- The Auditors Report 1999 was circulated to Heads of Delegations on 15 April 2000, and this report was recommended by STACFAD for adoption;
- The NAFO Secretariat was represented at the Pension Society Meeting (the International Fisheries Commissions Society, IFCPS, of North America) by two staff members, and its report was reviewed at STACFAD. It was noted with satisfaction that a new set of investment guidelines for an improved asset unit of the Canadian Pension Plan Funds has been introduced during 1999/2000. These guidelines see a switch from 100% Guaranteed Investment Certificates (GIC's) to an asset unit of 50% equities and 50% bonds providing for a more stable investment base and return on investments.
- The Executive Secretary was instructed to provide to the General Council a proposal not later than 31 December 2000 regarding the financing of the Automated Hail and Satellite Tracking System. A full report on the status of the spending under this budget item and implementation of the Automated Hail and Satellite Tracking System should be delivered at the 23rd Annual Meeting 2001.
- The basic budgetary items of the NAFO Secretariat were agreed as follows:
 - the budget for 2001 to be adopted in the amount of \$1,389,000 Cdn.;
 - the Accumulated Surplus Account be maintained at a level not less than \$75,000 Cdn in order to fulfil NAFO's financial obligations in early 2001 until contributions are received;
 - the contributions from Bulgaria and Romania be deemed uncollectible and these amounts be applied against the Accumulated Surplus;
 - \$200,000 Cdn be allocated for the proposed Automated hail and Satellite Tracking System with a note that STACFAD was extremely concerned with the lack of information (from STACTIC and Fisheries Commission) upon which the Committee could properly evaluate this amount.
- STACFAD recommended that Contracting Parties continue attempts to contact Bulgaria and Romania in order to ascertain whether they intend to participate in NAFO and to inform them of their outstanding contributions. Such information should be exchanged to all Contracting Parties through the NAFO Secretariat.
- The Committee recommended to the General Council that Contracting Parties be urged to submit their fishery statistics (STATLANT 21A and 21B) to the NAFO Secretariat on time to ensure the ongoing integrity of the NAFO statistical database and scientific recommendations on fish stocks.

- The dates of next Annual Meetings were recommended as follows:

2001	-	Scientific Council	-	12-21 September
	-	General Council	-	17-21 September
	-	Fisheries Commission	-	17-21 September
2002	-	Scientific Council	-	11-20 September
	-	General Council	-	16-20 September
	-	Fisheries Commission	-	16-20 September
2003	-	Scientific Council	-	10-19 September
	-	General Council	-	15-19 September
	-	Fisheries Commission	-	15-19 September

The venue of the 23rd Annual Meeting 2001 will be in Cuba.

The venue of the 24th Annual Meeting 2002 was proposed by the European Union Delegation in concurrence with Spanish delegates to be held in Spain. The meeting accepted this proposal and the Chairman thanked the European Union and the Government of Spain for this invitation.

The General Council reviewed the STACFAD recommendations and adopted the 2001 budget and report as a whole.

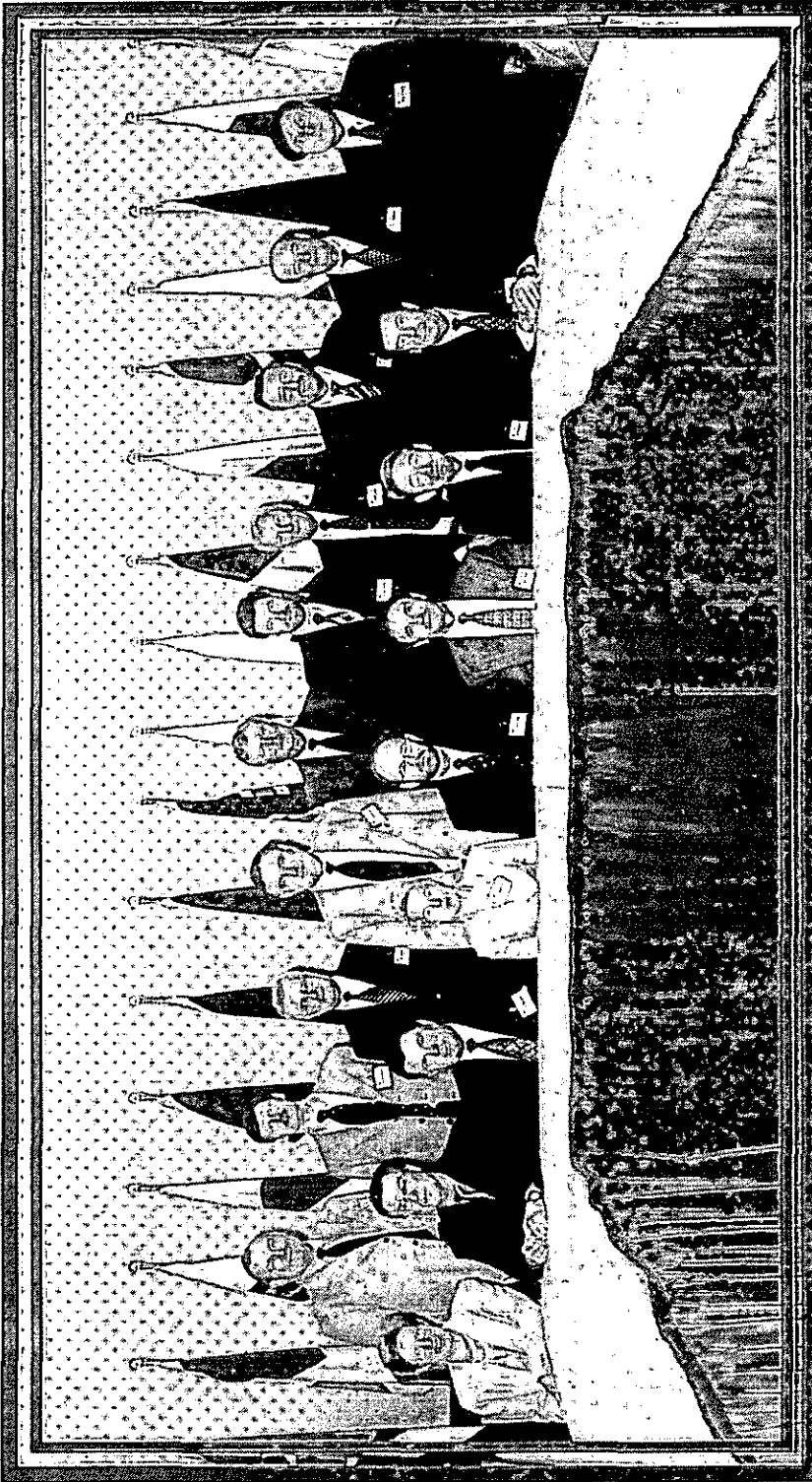
Closing Procedures (items 16-19)

Item 16, "Time and Place of Next Annual Meeting", was reported by STACFAD (above).

The draft Press Release was circulated to the Heads of Delegations and then finalized by the Secretariat incorporating the comments from Contracting Parties (Annex 4).

The list of actions and decisions by the General Council at the 22nd Annual Meeting is attached in Annex 5.

22nd Annual Meeting, Boston, USA
September 2000



Heads of Delegation: (L-R) Seated: P. Kurkul (USA), P. Chamut (Canada), V. Chernik (Ukraine), K. Mäthbaum (Estonia), P. Gulltesund (Norway), L. Chapel (Exec. Sec.), K. Yonezawa (Japan), G. Grignon (France-St. Pierre and Miquelon)
(L-R) Standing: E. Lemche (Denmark-Greenland), A. Kristiansen (Denmark-Faroe Islands), Z. Gandera (Poland), A. Raudonius (Lithuania), T. Asgeirsson (Iceland), N. Riekstins (Latvia), J. Baisre (Cuba), E. Mastracchio (EU), V. Izmailov (Russia), S.-J. Yoo (Korea)

NAFO Delegates, Boston, September 2000



Cuban Delegates: (L-R):
L. Albelo Leon,
R. Espinosa,
V. Sarda Espinosa



(L-R): F. Serchuk (USA)
D. Swanson



Estonian delegates: (L-R): A. Soome, T. Saat, L. Vaarja, J. Pollu



(L-R): L. Chepel (Executive Secretary), R. Derkacs (Latvia), N. Riekstins (Latvia)



Coffee Break

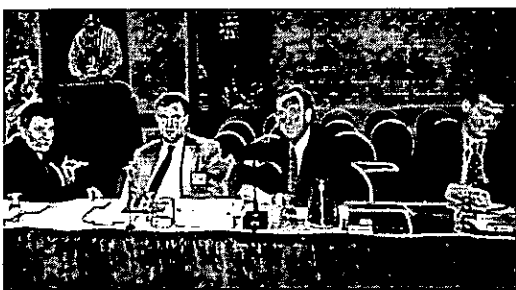
NAFO Delegates, Boston, September 2000



Canadian Delegates: (L-R): E. McCurdy, P. Chamut



Coffee Break



(L-R): V. Chernik (Ukraine), A. Raudonius (Lithuania), V. Vaitiekunas (Lithuania)



STACFAD delegates (L-R): (Standing) - R. Derkaes, S. Goodick, S. Segura, M. Stein, G. Goussev, Y. Ochi
(Seated) - F. Keating, N. Brajevich, A. Thomson, F. Kingston, L. Lind, Y. Kashio

NAFO Delegates, Boston, September 2000



Two Chairmen: Left: Peter Gullestad (Fisheries Commission)
Right: Bill Bredie (Scientific Council)



Estonian Delegation: (L-R): L. Vaarja, T. Roose, K. Mithlbaum, T. Saat, A. Soome



Republic of Korea: (L-R): S.-J. Yoo, Y. S. Jung



Delegation of Denmark(Faroes and Greenland) at work: (L-R): A. Kristiansen, M. Nedergaard,
E. Lemche, E. Rosing

Annex 1. List of Participants

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**Annex 2. Speech of the Honorable Rolland A. Schmitt
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Good afternoon, Mr. President, Distinguished Delegates, Ladies and Gentlemen, and a special hello to the many friends and colleagues that I recognize at this NAFO meeting.

As you continue your tour of the world's great seaports of the North Atlantic at annual meetings of NAFO, it is my honor and sincere privilege to welcome you to Boston and the United States of America. I am delighted that we are able to host the Twenty-second Annual Meeting in city with a 400 year history and tradition of seafaring and fishing. Legend has it that long ago one could nearly walk across the bay on the backs of cod, a condition that today is but a memory as we work toward rebuilding stocks and achieving sustainable fisheries. But Boston is not only a feature in America's seafaring and fishing history, it is the cultural center that was home to Ralph Waldo Emerson, Henry Wadsworth Longfellow, James Russell Lowell, and Henry David Thoreau. It is presently home to more than forty colleges and universities, including Harvard, Boston University, Tufts, and MIT--in fact, it has the largest concentration of institutions of higher learning in the United States. With cobblestones underfoot and skyscrapers overhead, Boston welcomes the world as the gateway to New England and the United States. It is, in the words of Charles Dickens, "what the whole United States should be."

A second reason it gives me such pleasure to welcome you here is the great importance we attach to NAFO as a successful regional fisheries management organization, both in its present conservation and management activities and its future ones. It is true that we have encountered our share of problems and challenges, but the more important point is that we are addressing them responsibly. It is with some degree of pride that the United States has joined NAFO. It is often too easy to stay outside a regional fisheries management body and criticize its efforts without taking the responsible step to join and support the organization from within and seek improvements as a member.

NAFO's Convention Area extends south to Cape Hatteras, North Carolina, and its Regulatory Area to the same point seaward of the U.S. exclusive economic zone. With its fishing history, the United States has a real interest in the stocks presently managed by NAFO as well as those NAFO may decide to manage in the future. This interest is manifested in the human and financial resources we invest in NAFO's activities and the commitment I give you today that we will continue making these investments.

My third reason for welcoming you is that NAFO is stepping up to meeting the challenges posed by an unprecedented suite of global fisheries agreements reached in the last decade that collectively prescribe a new ethic for fisheries management. Starting with the imperatives articulated in 1992 by Agenda 21 of the United Nations Conference on Environment and Development, we have collectively responded with: the Food and Agriculture Organization of the United Nations (FAO) Compliance Agreement of 1993; the Code of Conduct for Responsible Fisheries of 1995; the United Nations Fish Stocks Agreement of 1995; the FAO's international plans of action implementing its Code of Conduct in respect of sharks, seabirds, and fishing capacity in 1999; the Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean in 2000; and the emerging Convention on the Conservation and Management of Fishery Resources in the South East Atlantic Ocean. Yes, fisheries managers throughout the world have been active in the quest for improved fishing conditions and sustainability of our fisheries resources.

NAFO has taken up a number of the principles contained in these agreements and given them, or is in the process of giving them, expression in a manner consistent with its mission, *including*: the duty to cooperate to achieve effective conservation and management, standard requirements for the collection and sharing of data, the precautionary approach, measures taken by port states, dispute settlement, and transparency.

Finally, I welcome you because this meeting will grapple with issues in a manner that will again advance NAFO's reputation as an organization that meets challenges and succeeds. Here we will continue making decisions that take serious account of future as well as present generations in charting a course toward achieving and maintaining sustainable and responsible fisheries. In a time when the world focuses on measures to address illegal, unregulated, and unreported (IUU) fishing, NAFO will point to its innovative and successful efforts to address this problem. I hope I will see many of you in Rome next month as we bring our collective focus and wisdom to bear at the FAO's meeting on IUU fishing. Concerning IUU fishing, I envision that, in a context in which the international community is taking steps to ensure that all fishing vessels, from whatever home port, are bound to abide by the same rules, NAFO will continue striving to make its rules equitable, predictable, transparent, and responsive to the interests of all relevant partners.

On a personal note, for those who do not know, we have bid our farewells to Andy Rosenberg. It was my pleasure to have Andy as my deputy when I headed the National Marine Fisheries Service, and no one could ask for a more talented and competent partner. Even though Andy has returned to the halls of the academy, he will nevertheless join the U.S. delegation later this week. I am equally proud of our new head of delegation Patricia Kurkul, who I had the privilege to recommend for her current position as Regional Administrator of our Northeast Region, for the National Marine Fisheries Service. Yes, the United States is in good hands and committed to the challenges of NAFO.

And finally, to you, Mr. Chairman, we compliment you in your new position and we wish you *good luck in your term*. I again welcome all of you to Boston and the United States, wishing you fair weather and winds, and extending every good wish for a successful and productive meeting. Welcome.

Thank you, Mr. Chairman.

Annex 3. Agenda

I. Opening Procedure

1. Opening by Chairman, E. Oltuski (Cuba)
2. Appointment of Rapporteur
3. Adoption of Agenda
4. Admission of Observers
5. Publicity

II. Supervision and Coordination of the Organizational, Administrative and Other Internal Affairs

6. Review of Membership
 - a) General Council
 - b) Fisheries Commission
 - c) Reports from Contracting Parties on their communication with Bulgaria and Romania
7. Administrative Report

III. Coordination of External Relations

8. Communication with the United Nations (Resolution 53/33 - 24 November 1998)
9. FAO International Plans of Action on the Management of Fishing Capacity, Shark Fisheries and Incidental Catch of Seabirds in Longline Fisheries
10. NAFO Participation at other International Organizations
 - a) FAO Consultation on the Suitability of the CITES Criteria for Listing Commercially Exploited Aquatic Species (28-30 June 2000).
 - b) FAO ACFR (Committee on Fisheries Research) Working Party on Status and Trends of Fisheries (29 November 1999)
 - c) NASCO Meeting, 2000
 - d) NAMMCO Annual Meeting, 2000
 - e) The Technical Consultation on Illegal, Unregulated, and Unreported Fishing, 2-6 October 2000, Rome, Italy
 - f) FAO Committee on Fisheries Meeting, 26 February to 2 March 2001, Rome, Italy

IV. Fishing Activities in the Regulatory Area Adverse to the Objectives of the NAFO Convention

11. Consideration of non-Contracting Party activity in the NAFO Regulatory Area and agreement on the task of STACFAC at the current meeting
12. Report of STACFAC at the Annual Meeting and decisions on actions

13. Report of the Working Group on Dispute Settlement Procedures (DSP)
14. Report of the Working Group on the Allocation of Fishing Rights
15. Report of the Meeting on Shrimp Stocks

V. Finance

16. Report of STACFAD at the Annual Meeting
17. Adoption of the Budget and STACFAD recommendations for 2001

VI. Closing Procedure

18. Time and Place of Next Annual Meeting
19. Other Business
20. Press Release
21. Adjournment

Annex 4. Press Release

1. The 22nd Annual Meeting of the Northwest Atlantic Fisheries Organization (NAFO) was held in Boston, Massachusetts, USA, during 18-22 September 2000, under the chairmanship of Enrique Oltuski (Cuba), President of NAFO. The NAFO constituent bodies - General Council, Fisheries Commission and Scientific Council convened their sessions at the Boston Back Bay Hilton.
2. The meeting was attended by 220 participants from sixteen Contracting Parties - Canada, Cuba, Denmark (in respect of Faroe Islands and Greenland), Estonia, European Union, France (in respect of St. Pierre et Miquelon), Iceland, Japan, Republic of Korea, Latvia, Lithuania, Norway, Poland, Russia, Ukraine and United States of America.
3. Prior to the 22nd Annual Meeting, the following NAFO meetings were held during 2000: (1) Joint Scientific Council and Fisheries Commission Working Group on Precautionary Approach (Brussels, Belgium, 29 February-02 March); (2) Working Group on Allocation of Fishing Rights (Washington, D.C., USA, 28-30 March); (3) Meeting on Shrimp Stocks in the Regulatory Area (Washington, D.C., USA, 27 March); (4) Working Group on Dispute Settlement Procedures (DSP) (Copenhagen, Denmark, 29-31 May); (5) Standing Committee on International Control (Dartmouth, Canada, 27-29 June); (6) STACTIC Technical Working Group on Communications (Dartmouth, Canada, 30 June); (7) Scientific Council Meeting (Dartmouth, Canada, 1-15 June); (8) Workshop on Assessment Methods (Boston, Mass., USA, 13-15 September).
4. The Scientific Council, under the chairmanship of Bill Brodie (Canada), reviewed and assessed the status of 19 fish stocks in the NAFO Regulatory and Convention Areas. The scientific advice and recommendations from the Scientific Council were presented to the Fisheries Commission with recommendation that major groundfish stocks are continuing to be at low abundance and there should not be a direct fishery for those stocks in 2001. The Scientific Council reported biomass increases for Greenland halibut in Divisions 2J+3KLMNO and Yellowtail flounder in Div. 3LNO. The Joint Scientific Council/Fisheries Commission Working Group on Precautionary Approach evaluated and discussed a precautionary approach (PA) to NAFO-managed stocks and proposed PA steps in the fields of "harvest strategies", "conservation and enforcement measures" and "research/monitoring" for two model stocks - Cod in Div. 3NO, Yellowtail flounder in Div. 3LNO.
5. The Fisheries Commission, under the chairmanship of P. Gullestad (Norway), considered the Scientific Council recommendations and agreed on joint international measures and actions for the conservation and utilization of the fishery resources in the Regulatory Area. For all stocks scientific advice on levels of harvest was adopted.

The Commission agreed to impose "no direct fishery" in 2001 on the following stocks: Cod in Divisions 3M and 3L (that portion within the Regulatory Area) and 3NO, Redfish in Div. 3LN, American plaice in Divisions 3M and 3LNO, Witch flounder in Div. 3NO and 3L (that portion within the Regulatory Area) and Capelin in 3NO. The Quota Table for 2001 was adopted (Attachment 1).

With respect to management measures for cod in 2J3KL, Contracting Parties other than Canada expressed their serious concern that management measures for this stock may not be consistent throughout its range in the Convention Area in the year 2000.

New conservation and enforcement measures were agreed:

- To avoid excessive incidental catch a new fishing strategy will apply by changing fishing areas, etc.
 - Concerning the shrimp fishery on the Flemish Cap in Division 3M, it was decided that the existing effort allocation Scheme in the shrimp fishery and all other regulatory measures should continue, and that the fishing days should be 90% of maximum number of those observed by Contracting Parties for their vessels in one of the years during 1993-1995.
 - The Program for Observers and Satellite Tracking was modified to integrate the hail system with the satellite tracking and vessel monitoring systems (VMS), which will be in force as of January 1, 2001.
 - Regulatory measures for chartering vessels between Contracting Parties were modified, including more precise guidelines for notification and charter arrangements, and a provision that the catch of the chartered vessel be added to the catch statistics of the Contracting Party to whom fishing possibilities have been allocated.
6. The General Council, under the chairmanship of E. Oltuski (Cuba), deliberated several outstanding issues regarding internal and external NAFO policy on the following terms:
- Standing Committee on non-Contracting Party Fishing Activity in the Regulatory Area (STACFAC) shall undertake the study of the impact of the FAO International Plans of Action on Illegal, Unregulated and Unreported (IUU) Fishing on NAFO at its next Annual Meeting.
 - The issue of Dispute Settlement Procedures will be deliberated at the General Council in the near future.
 - Although there were no sightings of non-Contracting Party (NCP) fishing in the NAFO Regulatory Area in 2000, the consensus was to continue appropriate actions to deter NCP activity in the NAFO Area.
 - The President of NAFO signed diplomatic démarches to the Non-Contracting Party flag-States whose vessels have fished in the NAFO Regulatory Area in recent years, namely Belize, Honduras, Panama and Sierra Leone.
7. The following elections of NAFO officers took place:

Chairman of Standing Committee on Fishing Activities of non-Contracting Parties in the Regulatory Area (STACFAC) (STACFAC)	- Daniel Silvestre (France in respect of St. Pierre et Miquelon)
Vice-Chairman of Standing Committee on Fishing Activities of non-Contracting Parties in the Regulatory Area (STACFAC)	- Nadia Bouffard (Canada)
Chairman of the Standing Committee on Fisheries Environment (STACFEN)	- Manfred Stein (EU)

QUOTA TABLE. Total allowable catches (TACs) and quotas (metric tons) for 2001 of particular stocks in Subareas 3 and 4 of the NAFO Convention Area. The values listed include quantities to be taken both inside and outside the 200-mile fishing zone, where applicable.

Contracting Party	Cod		Redfish		American plaice		Yellowtail		Witch		Capelin		G. halibut		Squid (<i>Illex</i>) ^{3,5}		Shrimp
	Div. 3M	Div. 3NO*	Div. 3M	Div. 3LN*	Div. 3M*	Div. 3LNO*	Div. 3LNO	Div. 3NO*	Div. 3NO*	Div. 3NO*	Div. 3LMNO	Subareas 3+4	Subareas 3+4	Div. 3L			
1. Canada	0	0	500	0	0	0	12675 ⁷	0	0	0	4 446	N.S. ⁴	5 000				
2. Cuba	0	-	1750	0	-	-	-	-	0	0	-	510	67				
3. Denmark (Faeroe Islands and Greenland)	0	-	69	-	-	-	-	-	-	-	-	-	67				
4. European Union	0	0	3100	0	0	0	260 ⁷	-	0	0	16 406	N.S. ⁴	67				
5. France (St. Pierre et Miquelon)	-	-	69	-	-	-	-	-	-	-	-	453	67				
6. Iceland	-	-	-	-	-	-	-	-	-	-	-	-	67				
7. Japan	-	-	400	-	-	-	-	-	0	0	3 038	510	67				
8. Korea	-	-	69	-	-	-	-	-	-	-	-	453	67				
9. Norway	0	-	-	-	-	-	-	-	0	0	-	-	67				
10. Poland	0	-	-	-	-	-	-	-	0	0	-	227	67				
11. Estonia	-	-	-	-	-	-	-	-	-	-	-	-	67				
12. Latvia	0	0	13 850 ¹	0	0	0	-	0	0	0	-	1 133 ¹	67				
13. Lithuania	-	-	-	-	-	-	-	-	-	-	-	-	67				
14. Russia	-	-	-	-	-	-	-	-	-	-	3 779	-	67				
15. Ukraine	-	-	69	-	-	-	-	-	-	-	-	453	67				
16. United States of America	0	0	124	0	0	0	65 ⁷	0	0	0	1 971 ⁵	794	67				
17. Others	-	-	-	-	-	-	-	-	-	-	-	-	0				
Total Allowable Catch	*	*	5 000 ⁶	*	*	*	13 000 ⁸	*	*	*	29 640	34 000	6 000				

¹ Quotas to be fished by vessels from Estonia, Latvia, Lithuania and the Russian Federation. The provisions of Part I, Section A.3 of the NAFO Conservation and Enforcement Measures shall apply.

² The opening date for the Squid (*Illex*) fishery is 1 July.

³ Any quota listed for squid may be increased by a transfer from any "coastal state" as defined in Article 1, paragraph 3 of the NAFO Convention, provided that the TAC for squid is not exceeded. Transfers made to Contracting Parties conducting fisheries for squid in the Regulatory Area shall be reported to the Executive Secretary, and the report shall be made as promptly as possible.

⁴ Not specified because the allocation to these Contracting Parties are as yet undetermined, although their sum shall not exceed the difference between the total of allocations to other Contracting Parties and the TAC.

⁵ Of which no more than 40% (788 t) may be fished before 1 May 2001 and no more than 80% (1577 t) may be fished before 1 October 2001.

⁶ Each Contracting Party shall notify the Executive Secretary bi-weekly of catches taken by its vessels from this stock. Not more than 2500 tons may be fished before July 1, 2001. The Executive Secretary shall notify without delay all Contracting Parties of the date on which, for this stock, accumulated reported catch taken by vessels of the Contracting Parties is estimated to equal 50 and then 100 percent of the TAC for that stock.

⁷ Contracting Parties shall inform the NAFO Executive Secretary before 1 December 2000 of the measures to be taken to meet the advice of the NAFO Scientific Council.

⁸ The provisions of Part I, Section A.5c) of NAFO Conservation and Enforcement Measures shall apply.

*No directed fishing - The provisions of Part I, Section A.5a and c) of NAFO Conservation and Enforcement Measures shall apply.

**Annex 5. List of Decisions and Actions by the General Council
(22nd Annual Meeting, 18-22 September 2000)**

Substantive issue	Decision/Action (GC Doc. 00/7, Part I: item)
1. FAO International Plans of Action on the Management of Fishing Capacity, Shark Fishery and Incidental Catch of Seabirds in Longline Fisheries	Agreed: Contracting Parties report to FAO shall be sent in copy to the NAFO Secretariat, which in turn would circulate the reports to other Contracting Parties; item 3.2.
2. NAFO Observers at international meetings, FAO, Rome: - Technical Consultation on Illegal, Unregulated and unreported Fishing - FAO Fisheries Committee Meeting	Represented by: - Delegate of Canada, October 2000 - Delegate of Iceland, Feb-Mar, 2001; item 3.3
3. Report of STACFAC - New Diplomatic Demarches to Belize, Honduras, Panama and Sierra Leone	Discussed: items 4.1-4.6 Agreed/signed; item 4.4
4. Working Group on Dispute Settlement Procedures (DSP) - Intersessional meeting of the Working Group	Discussed: item 4.7 Decided to meet in Dartmouth, N.S., Canada, 24-26 April 2001; item 4.7
5. Election of Officers: - Chairman of STACFAC - Vice-Chairman of STACFAC	Daniel Silvestre (France-SPM) Nadia Bouffard (Canada)
6. Budget for 2001 - Hail and VMS Automated System	Adopted \$1,389,000 Cdn; item 5.2d, 5.5 - \$200,000 Cdn
7. Venue of 24 th Annual Meeting, 2002	Agreed: Spain, 11-20 September 2002; item 5.4



PART II
(pages 69 to 134)

Activities of the Fisheries Commission in 2000

List of Meetings

The following meetings were held under the authority of the Fisheries Commission:

- Joint Fisheries Commission and Scientific Council Working Group on Precautionary Approach; Albert Borschette Conference Centre, Brussels, Belgium, 29 February – 2 March.
- Standing Committee on International Control (STACTIC); Holiday Inn, Dartmouth, N.S., Canada, 27-29 June.
- STACTIC Technical Working Group on Communications; Holiday Inn, Dartmouth, N.S., Canada, 30 June.
- The Fisheries Commission and its subsidiary body (STACTIC); 22nd Annual Meeting, Hilton Back Bay, Boston, MA, USA, 18-22 September.



Major Documents of the Fisheries Commission in 2000

<u>Serial No.</u>	<u>FC Doc. No.</u>	<u>Title</u>
N4204	00/1	Conservation and Enforcement Measures
N4207	00/2	Report of the Joint Scientific Council and Fisheries Commission Working Group on Precautionary Approach, 29 February - 2 March 2000, Brussels, Belgium
N4229	00/3	Status of Proposals and Resolutions of NAFO (as of July 2000)
N4294	00/4	Report of the Standing Committee on International Control (STACTIC), 27-29 June 2000, Dartmouth, N.S., Canada
N4295	00/5	Report of the STACTIC Technical Working Group on Communications, 30 June 2000, Dartmouth, N.S., Canada
N4298	00/6	Summary of Inspection Information for 1999
N4301	00/7	Decisions on Management Measures for 2001 in the NAFO Convention Area by the Coastal State, Canada, pursuant to the provisions of Article XI(3) of the NAFO Convention
N4311	00/8	Amendment to the Conservation and Enforcement Measures - Part VI.A.1(a)
N4312	00/9	Amendment to the Conservation and Enforcement Measures - Part I.I (3L Witch)
N4313	00/10	Amendment to the Conservation and Enforcement Measures - Part I.F (3L Cod)
N4314	00/11	Management Measures for Shrimp in Div. 3M
N4315	00/12	Amendment to the Conservation and Enforcement Measures - Part I.B (Chartering Arrangements) and I.G (3M Shrimp)
N4316	00/13	Proposal to amend the NAFO Conservation and Enforcement Measures with a view to introducing satellite based vessel monitoring and related measures

N4317	00/14	Formats for the Electronic Transmission of NAFO Hails from Contracting Parties to the NAFO Secretariat
N4318	00/15	Proposal to amend the NAFO Conservation and Enforcement Measures Regarding Incidental Catch Limits
N4319	00/16	Proposal to amend the NAFO Conservation and Enforcement Measures Regarding Part VII - Port Inspections
N4320	00/17	Proposal to amend the Conservation and Enforcement Measures - Part I.H - Other Measures - Management Measures for Shrimp in Div. 3LNO
N4323	00/18	Protocol for Determining Productivity of the Short-Finned Squid Resource in NAFO Subareas 3+4
N4324	00/19	Review of data on shrimp catches and fishing days
N4327	00/20	Fisheries Commission's Request for Scientific Advice on Management in 2002 of Certain Stocks in Subareas 3 and 4, including supplementary questions on Division 3M Shrimp for 2001
N4347	00/21	Report of the Fisheries Commission, 22nd Annual Meeting, Boston, MA, USA, 18-22 September 2000

**Joint Fisheries Commission/Scientific Council Working
Group on Precautionary Approach (PA)
29 February – 2 March 2000, Brussels, Belgium**

The Working Group was organized in accordance with the decision taken by the Fisheries Commission at the 21st Annual Meeting, September 1999 (item 3.21 of the Fisheries Commission Report, FC Doc. 99/15). Complete proceedings of this Meeting are presented in FC Doc. 00/2 and in the NAFO Meeting Proceedings (General Council and Fisheries Commission), 2000.

Opening Procedures

The Co-Chairmen were W. B. Brodie and J. Baird (Canada). Representatives from Canada, Denmark (in respect of the Faroe Islands and Greenland), European Union, Iceland, Japan, Norway, Russian Federation and the United States of America and observers from NEAFC were present (Annex 1).

T. Amaratunga, Assistant Executive Secretary, was appointed Rapporteur.

The agenda was adopted as attached (Annex 2).

Harmonization of Concepts and Terminology

Delegates exchanged their national experience with the PA and concepts. It was noted that to this date, no formulations of the PA framework have been accepted by international fisheries organizations. However, several elements of the PA have been implemented by various management authorities.

The WG on PA agreed that there are several broad similarities between the ICES and NAFO versions of the PA. The biomass limits (defined as B_{lim} in both frameworks), are virtually the same, although B_{lim} is also used in ICES as an indication of biomass below which recruitment is unknown. The biomass buffers (B_{pa} in ICES, B_{buf} in NAFO) generally correspond to a level of biomass at which there is a high probability of being above B_{lim} . However, the harvest control rules in the current formulations are different - the NAFO Scientific Council framework suggests no fishing below B_{buf} , whereas the ICES framework indicates a reduced fishing mortality below B_{pa} . The WG on PA concluded that determination of harvest control rules is the role of managers. In the NAFO context, it is the Fisheries Commission's responsibility to determine appropriate harvest strategies corresponding to reference biomass levels. The WG on PA preferred the B_{buf} term as opposed to B_{pa} .

The NAFO Scientific Council framework proposes that F_{lim} should be set no higher than F_{msy} , based on its interpretation of UNFSA. The ICES framework does not make specific reference to F_{msy} . The WG on PA did not reach agreement on which formulation was more appropriate. Differences of opinion may be related to experiences with fish stocks in the Northwest Atlantic as regards to their response to exploitation vs the Northeast Atlantic. Consequently seeking harmonization at this time may be premature.

**Operationalizing the Precautionary Approach into the Management
Plans for Three Model Stocks
(Cod in Div. 3NO, Yellowtail flounder in Div. 3LNO, Shrimp in Div. 3M)**

A paper entitled "Considerations for the implementation of the Precautionary Approach into the Management Plans of Stocks Managed by the Northwest Atlantic Fisheries Organization (NAFO) - a discussion paper prepared by Canada" was presented by the Canadian delegation. This paper was prepared to focus the discussions on the implementation of the precautionary approach, taking into account the elements of the resolution adopted by the Fisheries Commission. It outlined the progress made on the two model stocks used to first explore ways of implementing the precautionary approach, namely cod in Div. 3NO, and yellowtail flounder in Div. 3LNO. The document proposed additional steps for implementation of the precautionary approach for these stocks. For these stocks, the document provided a history of the precautionary approach and proposed practical steps to consider in its implementation under the headings of "harvest strategies and reference points", "conservation and management measures", and "research and monitoring".

It was noted that the proposed steps in the implementation of a PA did not include specific reference to harvest control rules. The need to address harvest control rules in an implementation plan was noted. The WG on PA agreed on a number of steps in the implementation of the Precautionary Approach for these two model stocks. These steps include objectives to restore and maintain stocks at a level that can support sustainable fishery and management strategies to achieve such goals. The Scientific Council emphasized on the objectives of data collection and analyses of the state of stocks.

The WG on PA did not consider the next steps for the implementation of the PA for shrimp in Div. 3M. It was noted that work by the Scientific Council related to a precautionary approach is ongoing and will be reviewed again in November 2000, prior to the 2001 fishing season.

Implementation Plan for the Precautionary Approach to Other NAFO Stocks

The template for an implementation plan developed for the model stocks was applied to one other stock managed by NAFO, namely American plaice in Div. 3LNO. The situation for this stock is similar to that of cod in Div. 3NO in the sense that the stock is at a very low level, much below the biomass limit reference point.

The implementation of the PA will, no doubt, take time but a detailed *implementation* plan could help in channeling future efforts directed at the precautionary approach. It is suggested that similar detailed plans be developed for other stocks under the management of the NAFO Fisheries Commission.

For other stocks, the management objectives should be identified by the Fisheries Commission and should include, but not be limited to, the rebuilding and maintenance of stock biomass at a level that can support sustainable fisheries and produce stable yields.

As a general rule for all NAFO stocks, the Fisheries Commission should specify management strategies and ensure that data collection and analysis is carried out in support of the PA. If necessary, additional supportive management measures should be specified.

Consideration of Criteria for Reopening a Fishery in Light of the Precautionary Approach

Stocks under moratoria have been characterized by a very low spawning stock biomass and a reduced age-range. There is often a concern that the level of spawner biomass reached corresponds to a level where the chance of producing good year-classes is greatly reduced.

Once recovery has begun and spawner biomass has reached a level sufficient to allow consideration of reopening of the fishery, under a PA this reopening must be consistent with a strategy of continued stock rebuilding.

The discussion related to stocks under moratorium has necessarily focused on the strategy to reach the first benchmark to rebuilding, i.e. B_{lim} . In order to monitor the progress of stock rebuilding, milestones should be established so as to permit a review of the stock trajectory in relation to reference points within reasonable timeframes.

For the stock currently under moratorium, the other elements of a PA (i.e. other than B_{lim}), have not received detailed attention. Key considerations in the decision of re-opening include the determination of B_{lim} , the determination of the fishing mortality (F) at re-opening, the probability of continued growth in the stock, the trade-offs between yield/probability of growth in the stock and the risks that the stock could actually fall (again) below a pre-determined limit.

The other elements of a PA will need to be defined. Also, any reopening of commercial activity should only be contemplated under specific conditions. In particular, increased focus on additional conservation measures such as limitations on by-catch is required in order to afford the resource the best chance of recovery.

As such, additional technical management measures may be specified, including but not limited to, the following:

1. *Protection of Spawners:*

Management should incorporate controls to limit the catch during the main spawning periods in order to ensure the best possible spawning success. Information can be made available from scientists to guide managers in this regard. Scientists can also provide information regarding spawning areas for possible protection as well (see above).

An important conservation objective should be to allow development of a full age-range in the spawner population in order to promote the best possible stability in annual recruitment.

2. *Protection of Pre-recruits (Area Closures):*

Specific areas that have been clearly identified as significant nursery areas should be closed, as appropriate, for a specified time so as to minimize the mortality on small fish. In addition, other management measures to protect small fish should be considered.

3. *Concerns with By-catch:*

Fisheries for other species that might result in by-catch of the species under consideration must be conducted in such a manner so as to keep by-catch at the lowest possible level. This would necessitate careful review of possible management strategies including adequate monitoring.

4. *Concerns with By-catch of Other Species:*

Fisheries for the directed species that might result in bycatch of other species, especially those under moratorium, must be conducted in such a manner so as to keep bycatch at the lowest possible level. This would necessitate careful review of possible management strategies including adequate monitoring.

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Annex 2. Agenda

1. Opening (Co-Chairmen Bill Brodie and Jim Baird, Canada)
2. Appointment of rapporteur
3. Adoption of Agenda
4. Harmonization of concepts and terminology
 - a) Report of CWP Intersessional Meeting – February 2000
 - b) Discussion of an EU paper
 - c) Contracting Parties' experience with the application of the Precautionary Approach
5. Operationalizing the Precautionary Approach into the Management Plans for Three Model Stocks
6. Implementation Plan for the Precautionary Approach to other NAFO Stocks
7. Consideration of changes or additions to the Fisheries Commission's Request to the Scientific Council to reflect the precautionary approach
8. Consideration of Criteria for reopening a fishery in light of the Precautionary Approach
9. Consideration of additional supportive management measures to complement the application of the Precautionary Approach
10. Other Matters
11. Adoption of report
12. Adjournment

Standing Committee on International Control (STACTIC) 27-29 June 2000, Dartmouth, N.S., Canada

Complete proceedings of this meeting are presented in FC Doc. 00/4 and in the NAFO Meeting Proceedings (General Council and Fisheries Commission), 2000.

Opening Procedures

The Chairman was Mr. David Bevan (Canada). Representatives from the following Contracting Parties were present: Canada, Cuba, Denmark (in respect of Faroe Islands and Greenland), Estonia, the European Union, Iceland, Japan, Norway, Russian Federation and the United States of America (Annex 1).

Mr. Andrew Thomson (European Union) was appointed rapporteur.

The Agenda was adopted as attached (Annex 2).

Program for Observers and Satellite Tracking

The Meeting discussed proposals for collecting by-catches and discards (Denmark) and other scientific data by NAFO observers.

Canadian delegate made a presentation of a Scientific Council proposal for a harmonised NAFO Observer Data System (NAFO SCS Doc. 00/23). An ad hoc working group of NAFO Scientists had worked inter-sessionally and prepared a series of four draft collection forms and associated documentation designed to capture the basic information required for assessing removals from stocks in the Regulatory Area and presented to STACTIC in September 1999. STACTIC in turn requested that the Scientific Council produce a data description for these forms.

The Scientific Council Observer Working Group reviewed the progress of this work in June 2000. At this time, two separate initiatives were reported, namely a Canadian initiative for a database, which has been capturing observer data since 1998, and a European Union form set, which was a catch-tracking system designed by the European Union NAFO inspectors. There was a high degree of overlap in the European Union system with the one formulated by the Scientific Council working group. However, there were also additional elements in the European Union system not required by NAFO. In essence, the only item not in the European Union system was the length frequency catch data retrieval.

The representative from Denmark (in respect of Faroe Islands and Greenland) was concerned at giving observers too many tasks. The Canadian representative noted that in Canada observers had been carrying out scientific tasks along with control functions since the late 1970s. Furthermore, with 100% observer coverage, control observers would only be required to take two or three samples per week occupying six to nine hours of their time. This could easily be achieved with adequate efficiency. The Japanese representative was able to support this proposal. In view of the overall discussion, the Parties agreed that it was the element of length-frequency catch data retrieval, which should be considered as the only additional scientific element for the observers.

Amendments to existing Program:

The Parties recognized that there was a need to ensure that observers were able to perform the duties, which had been established for them, in an independent and impartial manner. After

considerable further deliberations, the Parties agreed that a new amendment proposed by the Chairman could replace that proposed by Norway and would be inserted at the end of point A.1(a) of the existing Program for Observers and Satellite Tracking. The amendment would read as follows:

"Observers are not to perform duties, other than those described in Sections 3, 4 and 5 below."

Observer Manual:

The delegates took full account of the paper presented from the Scientific Council meeting of June 2000 (NAFO SCS Doc. 00/23 as referred to above). They noted that the information contained in the EU proposal encompassed the information set out in the Scientific Council document. The representative of the European Union explained that the codes used in the European Union paper were the standard ISO and FAO international codes, with the primary methodology taken from the North Atlantic format. This enabled the Contracting Parties to avoid being locked into a single system. The representative of the United States was able to endorse document SCS 00/23 meeting the scientific requirements of the observer manual. The representative of Japan supported the use of document SCS 00/23 as an observer manual.

However after some protracted discussion, it was concluded that Contracting Parties should examine and evaluate both the paper from the European Union and document SCS 00/23 prior to the Annual Meeting. This would enable a finalised discussion to take place at the Annual Meeting.

Possible Amendments to Conservation and Enforcement Measures Regarding Juvenile Fish

The representative of Canada introduced two proposals to amend the existing Conservation and Enforcement Measures in respect of juvenile fish. He also referred to an information note which went into further detail on the issue of Greenland halibut.

The measures proposed by Canada were:

1. Increase in the mesh size from 130mm to 145mm for all principal groundfish in the Regulatory Area (with redfish and capelin being excluded).
2. Restriction on the directed fishing for Greenland halibut in Divisions 3LNO to be prohibited at depths of less than 400 metres. The 400-metre contour would be delineated by a number of fixed co-ordinates to be determined.

In order to reflect the urgency of the need for scientific information on the Greenland halibut fishery, it was agreed to reformulate the request to the Scientific Council to evaluate the effect of mesh size and by-catch of minimum size and biomass of Greenland halibut available to the commercial fishery over the whole distribution area of this species, in depth strata of 0-99 metres, 100-199 metres, 200-299 metres, 300-399 metres, 400-599 metres, 600-799 metres and 800-1,000 metres.

Other Matters

Review of submissions on shrimp catches and effort days:

The meeting on shrimp stocks held in Washington D.C. in March 2000 requested that STACTIC examine possible new information on shrimp fishing activity in the NAFO Regulatory Area. This would allow for any newly updated data to be provided to the Fisheries Commission before the 2000 Annual Meeting.

The Executive Secretary introduced a paper on the allocations of days, used days and catches as discussed at the Washington D.C. meeting and as revised for the STACTIC meeting. Any data received since the shrimp meeting had been incorporated. However, it was noted that the data contained in this paper was still open to modification.

The Chairman referred to the compilation of shrimp catches in area 3M prepared by the Executive Secretary. This was the best available data and it was therefore suggested that this data be forwarded to the Fisheries Commission.

Possible follow-up to the Working Group on the Precautionary Approach:

The Chairman referred to the report of the Joint Scientific Council and Fisheries Commission Working Group on the Precautionary Approach held in Brussels from 29 February to 2 March 2000 (FC Doc. 00/2). In particular, he noted that STACTIC needs to examine the report and decide on what steps should be taken next. The report is as yet not adopted by the Fisheries Commission and will be examined by them at the meeting in September 2000.

The Chairman noted that the proposal had endeavoured to pre-empt the discussion at the forthcoming Annual Meeting and acknowledged the need at this stage to have further guidance from the Fisheries Commission.

Charters / "Flag hopping":

The Canadian representative noted that at the last Annual Meeting, new rules on chartering had been adopted under Part I.B of the Conservation and Enforcement Measures. This had led to a pilot project on chartering for 2000 and resulted in a charter between Poland and the Russian Federation. Clarification of this project was requested. Did it comply with the Conservation and Enforcement Measures? Were catch statistics available from the charter? The Executive Secretary indicated that information on this charter had been received from the authorities of both Contracting Parties.

On the separate subject of flag hopping, the representative of the European Union wanted to flag this issue, which, he felt, needs to be addressed in detail at a later stage. The European Union wanted to restate its concerns about the practice of vessel owners from one Contracting Party seeking double registry agreements with other Contracting Parties. It was noted that double-flag vessels are flagless and that this was of concern to Contracting Parties.

Possible harmonisation of port inspection reports:

The representative of the European Union introduced a paper, which would lead to possible harmonisation of port inspection reports by the Contracting Parties under Part VII of the Conservation and Enforcement Measures. He explained the existing disparities in terms of delay

experienced by the European Union, the increased practice of vessels landing in ports of other Contracting Parties and thus the difficulties in obtaining port inspection reports in good time. Harmonised port inspection would ensure a better exchange of information as well as improved data flow.

It was agreed that this was a good starting point for discussion.

New developments / possible overhaul of the Conservation and Enforcement Measures:

The representative of the European Union explained that in the opinion of his delegation, it was necessary for all Contracting Parties to be aware that there may need to be a complete overhaul of the Conservation and Enforcement Measures. These measures had evolved over a number of years and clearly needed to be consolidated. Furthermore, there were newer and more recent developments in international fisheries, such as the 1995 UN Agreement on Straddling Fish Stocks and the FAO Compliance Agreement, which should be examined with a view to reviewing the NAFO measures.

The Parties recognised the enormous task ahead of NAFO and agreed to address this issue at the Annual Meeting.

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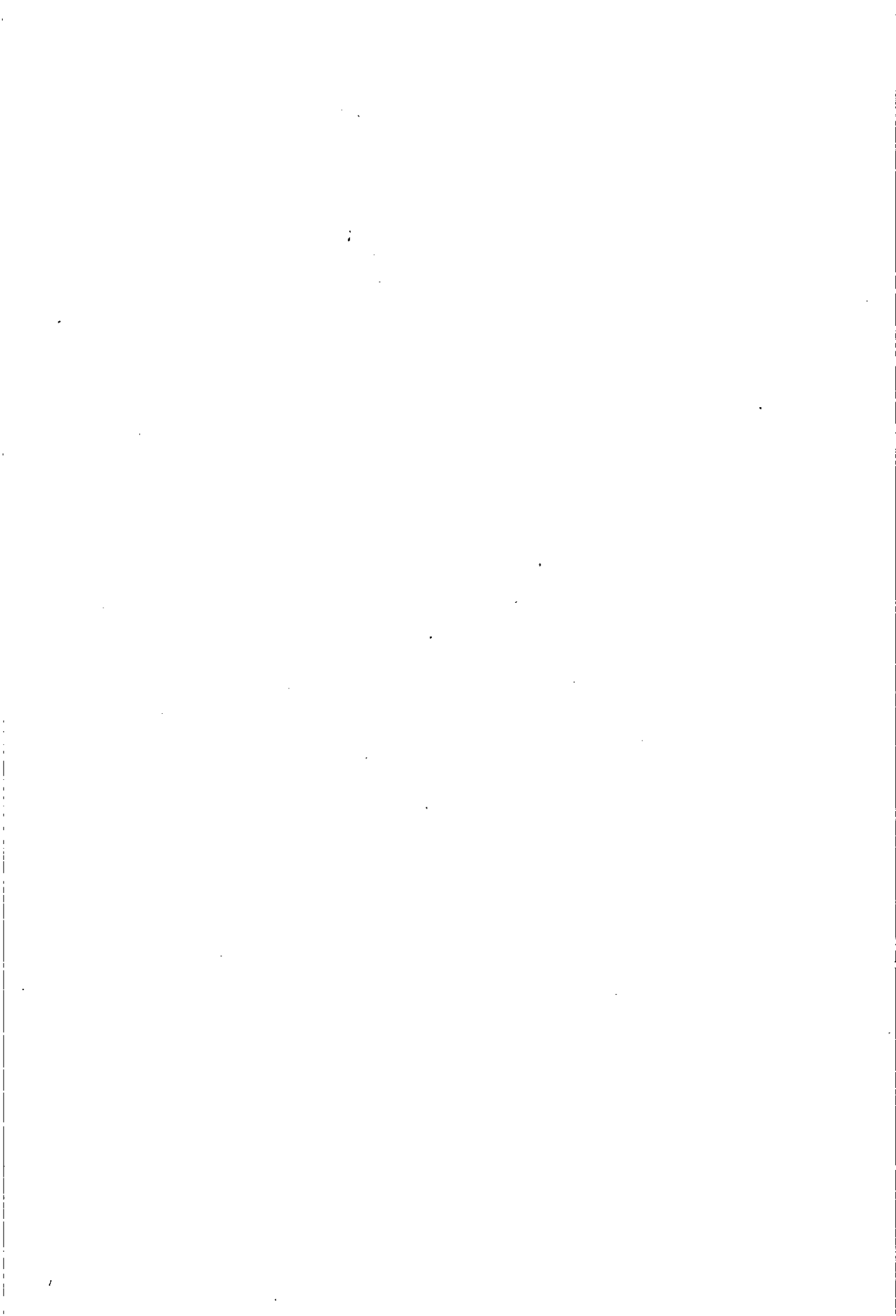
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Annex 2. Agenda

1. Opening by the Chairman (D. Bevan - Canada)
2. Appointment of Rapporteur
3. Adoption of Agenda
4. Program for Observers and Satellite Tracking
 - (a) scientific requirements
 - (b) amendments to existing program
 - (c) observer manual
5. Possible amendments to Conservation and Enforcement Measures regarding juvenile fish
6. Other matters
 - a) Review of Submissions on shrimp catches and effort days
 - b) Possible follow-up to the Working Group on the Precautionary Approach
 - c) Charters: "Flag hopping"
 - d) Possible harmonization of port inspection reports
 - e) Preparation of the review and, as appropriate, the revision of the "Program for Observers and Satellite Tracking"
 - f) New developments/possible overhaul of the Conservation and Enforcement Measures
7. Adjournment



**STACTIC Technical Working Group
on Communications
30 June 2000, Dartmouth, N.S., Canada**

Complete proceedings of this meeting are presented in FC Doc. 00/5 and in the NAFO Meeting Proceedings (General Council and Fisheries Commission), 2000.

Opening Procedures

The Meeting was opened by the Executive Secretary at 1010 on 30 June. The Contracting Parties represented were Canada, Denmark (in respect of Faroe Islands and Greenland), Estonia, the European Union, Iceland, Japan and Russia (Annex 1).

Mr. F. Wieland (EU) was elected by consensus as Chairman.

Dr. K. Patterson (EU) was appointed Rapporteur.

The Agenda was adopted as attached (Annex 2).

Consideration of a More Effective Hail System

5.1 Background

The Executive Secretary briefly reviewed the history of the NAFO hail system noting that after an extended consultation process, the existing hail report format had been agreed on in 1991 and incorporated in the Conservation and Enforcement Measures. In 1998 standardized formats for the electronic transmission of hails and satellite tracking reports for reporting from satellite systems were agreed for implementation in the NAFO Regulatory Area. At present, however, few Contracting Parties provide information in this latter format: principally Iceland and Norway. Other Contracting Parties still use previous hail system format.

The hail system was reported to be working effectively, but is a manual system based on old-fashioned technology which is causing an excessive workload for the NAFO Secretariat. An automated, internet-based system would be preferred, and a proposal was prepared by the NAFO Secretariat.

This proposal was presented by a representative of the company "Software Kinetics" (Provider). This proposal involves communication of encrypted data (using a Pretty Good Privacy (PGP) protocol) over the internet, protecting the content and origin of hail messages. A firewall would also be used for the Secretariat site. An MS-Access database would be designed to store and access the data.

The claimed advantages of this system were:

- The general availability of Internet access
- The low cost of communication
- The minimal dependence upon particular technologies as no proprietary protocols are used.

The Executive Secretary briefly presented a general overview of the current NAFO procedures of receiving reports (by facs., e-mail, and new file transfer protocol from EU) at the NAFO Secretariat. Incoming reports are processed manually. Once daily, the NAFO secretariat compiles and circulates reports to parties with inspection presence (by e-mail to Canada, by CUTE FTP to

EU (lately, temporary arrangements due to Y2K problems with X25). Most vessels in NAFO area are EU vessels and so most data is presently sent by internet. It was stressed that was an important decision that the hail system (used for enforcement purposes) should be managed by an impartial party: the NAFO Secretariat. NAFO system is however old fashioned, too labour intensive and should be updated to use modern systems.

The EU delegate presented their proposal indicating a list of changes to part III.E of NAFO Conservation and Enforcement Measures which will be required on replacing the present hail system with a satellite-based system. The system proposed was based on the existing North Atlantic VMS. A 6hr reporting frequency is proposed, as used in East Atlantic, and includes conditions for the security and storage of data. The transition would be simple, as is based on introducing technology now already used by the fleets. Fisheries Monitoring Centres (FMCs) of Contracting Parties are already established to use this system.

The representatives of Denmark (in respect of Faroe Islands and Greenland) and Norway thought the EU paper was a very good starting point for discussions. The NAFO system should be identical to the NEAFC system.

The EU representative noted that the Secretariat could develop a facility to receive reports in several different protocol. Denmark concurred, and urged the Secretariat to explore more widely the availability of commercial communications software. It was questioned whether the Secretariat has appropriate finances. The Chair noted that about CAN \$ 35 000 has been allocated to this topic. Denmark considered a much higher budget would be required, possibly up to CAN \$150 000. A trained computer expert such as a database administrator working part time for the Secretariat could be required to maintain the system at the NAFO Secretariat.

A consensus was reached that an automation of the hail system would be required. A distinction was made between data flows:

- from vessel to Contracting Party
- from Contracting Party to NAFO Secretariat
- from NAFO Secretariat to Contracting Parties with inspection presence.

It remained open whether all three data streams required automating.

There were different views, focussing on the relative desirability of X-25 based systems or of internet SMTP. The group concluded that further reflection on the issues was needed, but it was agreed that:

- Confidential treatment of data is an issue of main importance. In particular, Japan noted that 6hr reporting is more detailed than existing requirements and may involve greater confidentiality requirements. Japan also required further discussion of the issue of confidentiality of fishing positions, both with respect of fishing vessels and of the NAFO Secretariat. Denmark noted further concern about security and confidentiality and will make a proposal on this topic in due course.
- The NAFO Secretariat is to be asked to review the existing NEAFC communications and data distribution system with a view to its possible applicability in the NAFO regulatory area. This could be aided by a visit by the NAFO Secretariat to the NEAFC Secretariat to review the operation of the existing NEAFC system.

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Annex 2. Agenda

1. Opening of Meeting
2. Election of Chairman
3. Appointment of Rapporteur
4. Adoption of Agenda
5. Consideration of a more effective hail system or a satellite-based vessel monitoring system
 - (a) Background Summary
 - (b) appropriate means on communication of reports
 - (c) security and confidentiality of reports
 - (d) means to ensure compliance with applicable measures
6. Other matters
7. Adjournment

**Fisheries Commission Annual Meeting
18-22 September 2000, Boston, Massachusetts, USA**

The Twenty-Second Annual Meeting of the Fisheries Commission was convened at the Hilton Back Bay, Boston, MA, USA. Complete proceedings of this Meeting are presented in FC Doc. 00/21 and in NAFO Meeting Proceedings (General Council and Fisheries Commission), 2000.

Opening Procedures (Agenda items 1-5)

The meeting was called to order by the Chairman, Mr. P. Gullestad (Norway) at 0915 hrs on 19 September 2000. Representatives from the following Contracting Parties were present: Canada, Cuba, Denmark (in respect of the Faroe Islands and Greenland), Estonia, the European Union (EU), France (in respect of St. Pierre et Miquelon), Iceland, Japan, the Republic of Korea, Latvia, Lithuania, Norway, Poland, Russia, Ukraine and the United States of America (Annex 1).

Mr. Patrick E. Moran (United States) was appointed Rapporteur.

The agenda was adopted as attached (Annex 2).

Administrative (item 6)

Review of Membership was discussed at the opening session of the General Council (under provisions of Article XIII.1 of the NAFO Convention).

Conservation and Enforcement Measures (items 7-14)

With respect to Agenda item 7, Scientific Council Chair W. B. Brodie (Canada) presented the Report of the Joint Fisheries Commission/Scientific Council Working Group Meeting on the Precautionary Approach (PA), 29 February – 2 March 2000, Brussels, Belgium (NAFO/FC Doc. 00/2).

The Working Group concluded that no formulations of the precautionary approach have been accepted by international fisheries organizations, although some elements of the approach have been implemented by various management authorities.

The report of the Joint Working Group was adopted. Discussion followed on whether the working group should continue its work. The Representative of Canada, supported by the United States, strongly supported continued work and adoption of the recommendations of the working group. Canada proposed that NAFO adopt a three-year pilot project (beginning in 2001) during which the work already done relevant to the three model stocks would be operationalized and more stocks would be considered for future implementation. The Representative of the European Union (EU) and others, however, stated that much more work needed to be done before decisions could be taken regarding implementation of the precautionary approach. He noted inconsistencies between the NAFO model and that of NEAFC, and the lack of agreement among Contracting Parties regarding fundamental elements of the precautionary approach. It was suggested that the Working Group should not meet in 2001, so that some of these issues might be addressed by the Fisheries Commission and bilaterally.

With a view to making further progress on the implementation of the Precautionary Approach, it was agreed that a small group of technical experts will meet in the first half of 2001 to advance

future work in the Fisheries Commission Working Group. The small meeting will be organized by the European Community.

With respect to Agenda item 8, the Report of the STACTIC June Meeting was presented to the Fisheries Commission.

With respect to Agenda item 9, Inspection and Control Measures in the NAFO Regulatory Area, Contracting Parties generally supported continued use and enhancement of the NAFO vessel monitoring system (VMS).

The Fisheries Commission agreed that provisions on secure and confidential treatment of the electronic reports and messages transmitted in accordance with the NAFO Conservation and Enforcement Measures should be addressed at the STACTIC intersessional meeting.

With respect to Agenda item 10, the report of the March 2000 meeting of the Working Group on the Allocation of Fishing Rights in Washington, D.C. was delivered to the Meeting.

Discussions following the report of the March 2000 allocation intersessional focused on the utility of continued work by the Working Group. The Representative of Denmark (in respect of the Faroe Islands and Greenland) noted that his delegation was among those who have pressed for an early review of the present allocation key. While discussions in the Working Group have been fruitful thus far, there is a lack of political will among Contracting Parties to move the issue forward. He therefore suggested that once stocks begin to recover, allocative issues should be addressed in due time. Thus, he suggested that the Working Group should not meet in 2001. This view was supported by the Representatives of Iceland, the EU, Latvia, Russia, and Norway. The Representatives of the United States, Canada, France (in respect of St. Pierre and Miquelon), and Korea, on the other hand, expressed strong support for continued work. Particular concern was noted that allocation issues pertaining to new stocks must be dealt with in a timely manner. Following further discussion, the Report of the March 2000 Allocation Working Group meeting was adopted and it was decided that the Working Group would not meet in 2001.

Regarding Agenda item 10(a), the March 2000 Meeting on Shrimp Stocks in Washington, D.C., Contracting Parties expressed a variety of views regarding possible scenarios for future management of NAFO shrimp stocks. Some Parties supported a switch to TAC-based management, while others called for continuation of an effort-based management scheme. The Representative of Denmark (in respect of the Faroe Islands and Greenland) emphasized the importance of this issue to his country and called for a special meeting of the Fisheries Commission early next year so that decisions could be taken on 3L and 3M shrimp management in time for the 2001 shrimp fishing season. Canada, the United States, and others supported this proposal, citing strong conservation concerns relating to the 3M shrimp stock. However, other Parties supported the view that management issues relating to these stocks should be dealt with at this annual meeting, in order to ensure that measures are in place for the upcoming season. A great deal of dissatisfaction was also expressed by the Representatives of Iceland, Latvia, Norway, and the EU regarding the confusion surrounding the historical data for the 3M shrimp fishery. The Representative from the Ukraine noted that, under no circumstances, should any NAFO members be forced to accept zero TACs in this fishery. The report of the March 2000 meeting on NAFO shrimp stocks was adopted.

After further discussion, it was agreed that the current measures in place for 3M shrimp should be updated for use during the 2001 fishing season. Thus, the measures as outlined in FC Doc. 00/11 were adopted. Additionally, it was agreed that a working group should meet, possibly on 27 March 2001, in Copenhagen, Denmark, to review shrimp catch statistics according to the guidance

provided in FC Doc. 00/19. It was also agreed that a special meeting of the Fisheries Commission should be called during 28-29 March 2001 in Copenhagen, Denmark, to examine alternatives for future management and allocation of NAFO shrimp stocks. Following a request for clarification by the Representative of the United States, it was generally agreed that the special fisheries commission meeting is to be part of the on-going broader allocation discussions. In addition, there was general agreement that further discussions on the broader allocation issue should take place during the 23rd Annual Meeting meeting.

With respect to Agenda item 11, Review of the provisions on chartering operations in the NAFO Regulatory Area, there was general agreement that there was a need to clarify the rules relating to chartering operations in the NAFO Regulatory Area. Concern was expressed regarding the confusion during 2000 over the use of allocated 3M shrimp fishing days through chartering operations (transfers of fishing days) and, in response to a question by the Representative of the EU, the NAFO Executive Secretary attempted to clarify the steps taken in approving requests for transfers of fishing days for use in chartering operations during 2000. There was general agreement that, in future cases where there is doubt regarding appropriate steps to be taken, the Executive Secretary should consult with the appropriate Chairman.

Concern was also expressed regarding the possible use of non-Contracting Party vessels reflagged through bareboat chartering operations. A number of Contracting Parties noted that effort in the 3M shrimp fishery continues to increase, creating levels of mortality beyond that recommended by the Scientific Council. After some discussion, the Fisheries Commission requested that STACTIC attempt to clarify the rules regarding chartering operations and report back at this meeting. The resulting document (FC Doc.00/12) was adopted for 2001.

Regarding Agenda item 12, Increase in inspection presence in the NAFO Regulatory Area, the Representatives of Canada and the EU expressed concern regarding the lack of inspection presence of other Contracting Parties in the NAFO Regulatory Area. Although the EU (supported by Canada) tabled a proposal to introduce rules concerning obligatory inspection presence, no action was taken in this regard. It was requested that this issue be addressed more fully at the 2001 NAFO Annual Meeting. It was agreed that the current measures in place for inspection presence should be continued for 2001.

With respect to Agenda item 13, the report of STACTIC at the Annual Meeting, there were a number of recommendations adopted by the Fisheries Commission: modification of formats including VMS system in NAFO hail reports; scientific requirements of the Observer Program; harmonization of port inspection reports (verification of catches, logbook records, mesh size, etc.); the course of action for the NAFO Conservation and Enforcement Measures review (til June 30/01).

With respect to Agenda item 14, Canadian Management Measures for 2J3KL Cod in 2000, the Representative of the EU strongly objected to the 7000 mt inshore fishery that took place in Canada in 2000. He noted his concern that, given the Canadian fishery, the management measures in place are not consistent throughout the range of this stock. The concerns of the EU were echoed by a number of the Contracting Parties present.

The Representative of Canada stated that Canada has the right to set TACs for the 2J3KL cod stock within Canadian waters and clarified that this was a small scale, highly regulated fishery. He noted the domestic process in place to recommend TACs and regulate this fishery, and pointed out that the data provided through this fishery is an important contribution to the conservation of this stock. Additionally, the Canadian delegate emphasized the current and historical importance

of this fishery to the Canadian people and insisted that Canada would never do anything to endanger the stock.

Conservation of Fish Stocks in the Regulatory Area
(items 15-19)

The Scientific Council advice is summarized in the table below: (additional information in Annex 3 – Summary Table of Stocks in the NAFO Convention Area)

ADVICE FOR 2001

Shrimp 3M	Not to exceed 30,000mt
Redfish 3M	3,000-5,000mt
Cod 3M	No directed fishery, lowest possible by-catch
American plaice 3M	No directed fishery, lowest possible by-catch
Witch flounder 3NO	No directed fishery, lowest possible by-catch
Cod 3NO	No directed fishery, lowest possible by-catch
American plaice 3LNO	No directed fishery, lowest possible by-catch
Redfish 3LN	No directed fishery, lowest possible by-catch
Witch Flounder 2J3KL	No directed fishery, lowest possible by-catch
Yellowtail flounder 3LNO	13,000mt
Squid (<i>Illex</i>) 3+4	19,000-34,000mt
Greenland halibut 2+3KLMNO	Not to exceed 40,000mt

ADVICE FOR 2002

Cod 3M	No directed fishery, lowest possible by-catch
American plaice 3M	No directed fishery, lowest possible by-catch
Witch flounder 3NO	No directed fishery, lowest possible by-catch

The Commission considered in full detail the scientific recommendations on stock-by-stock basis. There were several outstanding issues regarding shrimp fishery, Greenland halibut, Cod 2J+3KL, protection of juvenile fish and restriction by-catches, which Contracting Parties discussed in plenary sessions and at Heads of Delegation meetings.

All NAFO Contracting Parties strongly supported the establishment and full implementation of measures to protect juveniles and reduce bycatch, such as:

- a) mesh size increases;
- b) depth restrictions;
- c) area closures; or
- d) other effective measures.

It was agreed that the moratorium in place for 3L cod should continue. The European Union reiterated his Party's dissatisfaction regarding Canadian activities with regard to the inshore component of this fishery.

On quota distribution, a final agreement was reflected in a Quota Table 2001 (Annex 4).

A new fishery was noted as developing for Redfish (*Sebastes mentella*) in Division 1F of the NAFO Regulatory Area. The Representative of Denmark (in respect of the Faroe Islands and Greenland) noted that this pelagic "spillover stock" is managed by the NEAFC and also falls within the national jurisdiction of some NAFO Contracting Parties. He stated that there was a

need to discuss possible scenarios for management and suggested that NAFO might agree to implement management measures adopted by NEAFC for this stock in the NAFO Regulatory Area. At the very least, NAFO should adopt a 100mm mesh size for this fishery. The Representatives of Norway, Russia, Iceland, and the EU supported this proposal, but the Representative of Canada pointed out that there is a need to clarify all measures that might apply to this stock before this proposal could be considered properly. The United States clarified that, since this could be considered a new fishery, it must be understood that any agreements pertaining to this stock should not prejudice on-going discussions relating to allocation of new fisheries.

It was agreed to invite NEAFC to participate in a Joint NEAFC/NAFO Working Group to discuss various issues pertaining to this situation with a view to developing a compatible management approach to the pelagic *Sebastes mentella* stock. This Joint Working Group should meet during 13-14 February 2001 in Reykjavik, Iceland.

The request for advice from the Scientific Council for 2001 was adopted (Annex 5).

Closing Procedures (items 20-22)

With respect to Agenda item 21, Other Business, the Chairman of the Fisheries Commission noted that a proposal had been circulated by the Ukraine for a chartering operation for 3M shrimp. The Representative of the Ukraine spoke to this proposal, noting that its text was based on the newly negotiated language guiding this process. He asked that, given the time constraints involved, Contracting Parties consider this proposal at this meeting and vote accordingly. However, following comments by Contracting Parties, it was decided that the proposal of the Ukraine should be considered according to established procedures.

List of Decisions and Actions by the Fisheries Commission is attached in Annex 6.

Summary of provisional information on fishing activities and utilization of the fishery resources in the NAFO Regulatory Area in 2000 and the number of vessels in 1991-2000 are attached in Annexes 7-8.

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Annex 2. Agenda

I. Opening Procedure

1. Opening by the Chairman, P. Gullestad (Norway)
2. Appointment of Rapporteur
3. Adoption of Agenda
4. Admission of Observers
5. Publicity

II. Administrative

6. Review of Commission Membership

III. Conservation and Enforcement Measures

7. Report of the Brussels Working Group on Precautionary Approach (PA)
8. Report of STACTIC June Meeting
9. Inspection and Control Measures in the NAFO Regulatory Area
10. Report of the Working Group on the Allocation of Fishing Rights
 - a) Report of the Meeting on Shrimp Stocks
11. Review of the provisions on chartering operations in the NAFO Regulatory Area
12. Increase of inspection presence in the NAFO Regulatory Area
13. Report of STACTIC at the Annual Meeting
14. Canadian Management Measures for 2J3KL Cod in 2000

IV. Conservation of Fish Stocks in the Regulatory Area

15. Summary of Scientific Advice by the Scientific Council
16. Management and Technical Measures for Fish Stocks in the Regulatory Area, 2001
 - 16.1 Cod in Div. 3M
 - 16.2 Redfish in Div. 3M
 - 16.3 American plaice in Div. 3M
 - 16.4 Shrimp in Div. 3M
17. Management and Technical Measures for Fish Stocks Straddling National Fishing Limits, 2000
 - 17.1 Cod in Div. 3NO

- 17.2 Redfish in Div. 3LN
- 17.3 American plaice in Div. 3LNO
- 17.4 Yellowtail flounder in Div. 3LNO
- 17.5 Witch flounder in Div. 3NO
- 17.6 Capelin in Div. 3NO
- 17.7 Squid (*Illex*) in Subareas 3 and 4
- 17.8 Shrimp in Div. 3LNO
- 17.9 Greenland halibut in Div. 3LMNO
- 17.10 If available in the Regulatory Area:
 - i) Cod in Div. 2J3KL
 - ii) Witch flounder in Div. 2J3KL
- 17.11 Redfish in Division 1F

18. Formulation of Request to the Scientific Council for:

- a) Scientific advice on the management of fish stocks in 2002

19. Transfer of Quotas Between Contracting Parties

V. Closing Procedure

20. Time and Place of the Next Meeting

21. Other Business

22. Adjournment

Annex 3. Summary Table of Stocks in the NAFO Convention Area

Stocks, Subareas & Divisions	Comments by the Scientific Council (Scientific Council reports 1999-2000)	Management	
		Fisheries Commission	Coastal State Canada & Denmark (Greenland)
1. Stocks in Subareas 2-4			
Cod 3M	No analytical assessment was presented. The stock remains at a very low level; no directed fishery in 2000/2001 and 2002.	Moratorium (since 1999)	-
Cod 3N & 3O	No analytical assessment was presented. The stock remains close to its historical low level with weak representation from all year-classes; no directed fishery in 2000-2001.	Moratorium (since 1995)	Moratorium
Cod 2J+3KL	The stock as a whole remains at a very low level; the biomass is very small with few mature fish.	Moratorium (since 1993)	Moratorium and limited inshore fishery (7,000mt)
Redfish 3M	The decline in stock biomass appears to have halted, it is still unclear as to whether there has been actual increase; the recommended catch in 2001 be in the range of 3000-5000 mt	TAC- 5,000	-
Redfish 3LN	No analytical assessment was possible. The stock appears to be at very low level; no directed fishery in 2001 and 2002.	Moratorium (since 1998)	Moratorium
Am. plaice 3M	No analytical assessment was possible. Biomass at very low level; no directed fishery in 2001 and 2002.	Moratorium (since 1996)	-
Am. plaice 3LNO	Canadian spring and autumn surveys showed a large decline in biomass since the mid-1980s; the stock remains low compared to historic levels; no directed fishery in 2000 and 2001.	Moratorium (since 1995)	Moratorium
Yellowtail flounder 3LNO	The stock size has increased over the past year (1999); the TAC should not exceed 13,000 mt.	TAC-13,000	-
Witch flounder 3NO	No analytical assessment was possible. Stock remains at a low level; no directed fishery in 2001 and 2002.	Moratorium (since 1995)	Moratorium
Witch flounder 2J3KL	The stock has been declining rapidly since 1984/1985; the 1995-98 average biomass is about 5% of 1981-84 average.	Moratorium (since 1995)	Moratorium

Stocks, Subareas & Divisions	Comments by the Scientific Council (Scientific Council reports 1999-2000)	Management	
		Fisheries Commission	Coastal State Canada & Denmark (Greenland)
<u>1. Stocks in Subareas 2-4 (continued)</u>			
Greenland halibut 2+3KLMNO	The stock appears to be recovering due to good recruitment and low fishing mortality but the biomass of fish over 60 cm is still low; the TAC for 2001 should not exceed 40,000 mt.	TAC-40,000 29,640 (Reg. Area)	10,360 (200-mile zone)
Capelin 3NO	No assessment was possible; no directed fishery in 2000 and no advice for 2001.	Moratorium (since 1993)	inshore fishery
Short-finned squid Subareas 3 & 4	Biomass and recruitment estimates were not available; the resource has remained at a low level; TAC be set between 19,000 – 34,000 mt.	TAC-34,000	-
Shrimp 3M	No analytical assessment was available; no estimate of stock.	Effort regulation (since 1997)	-
Shrimp 3LNO	No estimates of absolute stock size; restriction of fishery to 3L due to the overlap with young groundfishes.	TAC 3L – 6,000	-
<u>2. Additional potential resources in the Regulatory Area</u>			
Roughhead grenadier Subareas 2 & 3	No assessment; no data and state of stock unknown.	N/A	N/A
Elasmobranches Subareas 0-6	17 species; no scientific assessment data available. First detailed NAFO Report in Scientific Council Reports 2000, pp 173-174.	N/A	N/A
Redfish Div. 1F	No assessment available.	N/A	N/A
<u>3. Stocks off Greenland and in Davis Strait</u>			
Coastal State - Denmark (Greenland)			
Greenland halibut 0+1A	Biomass stable at approx. 64,000t (1999).	-	TAC-11,000
Greenland halibut 1A inshore	Three areas: Disko Bay / Uummannaq / Upernavik.	-	TACs-7,900 / 6,000 / 4,300
Roundnose Grenadier Subarea 0 and 1	Low level since 1993.	-	-

Stocks, Subareas & Divisions	Comments by the Scientific Council (Scientific Council reports 1999-2000)	Management	
		Fisheries Commission	Coastal State Canada & Denmark (Greenland)
3. <u>Stocks off Greenland and in Davis Strait</u> (continued)			
Redfish Subarea 1	Mixture golden and deepwater redfish; stocks are depleted; pre-recruits abundant.	-	TAC-19,000
Other finfish	Am. plaice, Atlantic spotted wolffishes, skate, lumpsucker, Atlantic halibut, sharks – no assessment available.	-	-
Northern Shrimp Subareas 0 and 1	No estimates of absolute size of stock; recruitment and biomass estimates in 2000 highest observed.	-	TAC-85,000
Northern Shrimp Denmark Strait	No estimates of absolute size of stock; general increasing trend in biomass.	-	TAC-9,600

Annex 4. Quota Table for 2001

QUOTA TABLE: Total allowable catches (TACs) and quotas (metric tons) for 2001 of particular stocks in Subareas 3 and 4 of the NAFO Convention Area. The values listed include quantities to be taken both inside and outside the 200-mile fishing zone, where applicable.

Contracting Party	Cod		Redfish		American plaice		Yellowtail		Witch	Capelin	G. halibut	Squid (<i>Illex</i>) ^{2,3}		Shrimp
	Div. 3M	Div. 3NO*	Div. 3M	Div. 3LN*	Div. 3M*	Div. 3LNO*	Div. 3LNO	Div. 3NO*				Div. 3LNO*	Div. 3LMNO	
1. Canada	0	0	500	0	0	0	12675 ⁷	0	0	0	4 446	N.S. ⁴	5 000	
2. Cuba	0	-	1750	0	-	-	-	-	-	0	-	510	67	
3. Denmark (Faroe Islands and Greenland)	0	-	69	-	-	-	-	-	-	-	-	-	67	
4. European Union	0	0	3100	0	0	0	260 ⁷	-	0	0	16 406	N.S. ⁴	67	
5. France (St. Pierre et Miquelon)	-	-	69	-	-	-	-	-	-	-	-	453	67	
6. Iceland	-	-	400	-	-	-	-	-	-	0	3 038	510	67	
7. Japan	-	-	69	-	-	-	-	-	-	0	-	453	67	
8. Korea	0	-	-	-	-	-	-	-	0	0	-	-	67	
9. Norway	0	-	-	-	-	-	-	-	0	0	-	227	67	
10. Poland	0	-	-	-	-	-	-	-	-	-	-	-	67	
11. Estonia	0	0	13 850 ¹	0	0	0	-	0	0	0	-	1 133 ¹	67	
12. Latvia	-	-	-	-	-	-	-	-	-	-	-	-	67	
13. Lithuania	-	-	-	-	-	-	-	-	-	-	3 779	-	67	
14. Russia	-	-	-	-	-	-	-	-	-	-	-	-	67	
15. Ukraine	-	-	-	-	-	-	-	-	-	-	-	-	67	
16. United States of America	0	0	69	-	-	-	-	-	-	-	-	453	67	
17. Others	0	0	124	0	0	0	65 ⁷	0	0	0	1 971 ⁵	794	0	
Total Allowable Catch	*	*	5 000 ⁶	*	*	*	13 000 ⁸	*	*	*	29 640	34 000	6 000	

¹ Quotas to be fished by vessels from Estonia, Latvia, Lithuania and the Russian Federation. The provisions of Part I, Section A.3 of the NAFO Conservation and Enforcement Measures shall apply.

² The opening date for the Squid (*Illex*) fishery is 1 July.

³ Any quota listed for squid may be increased by a transfer from any "coastal state" as defined in Article 1, paragraph 3 of the NAFO Convention, provided that the TAC for squid is not exceeded. Transfers made to Contracting Parties conducting fisheries for squid in the Regulatory Area shall be reported to the Executive Secretary, and the report shall be made as promptly as possible.

⁴ Not specified because the allocation to these Contracting Parties are as yet undetermined, although their sum shall not exceed the difference between the total of allocations to other Contracting Parties and the TAC.

⁵ Of which no more than 40% (788 t) may be fished before 1 May 2001 and no more than 80% (1577 t) may be fished before 1 October 2001.

⁶ Each Contracting Party shall notify the Executive Secretary bi-weekly of catches taken by its vessels from this stock. Not more than 2500 tons may be fished before July 1, 2001. The Executive Secretary shall notify without delay all Contracting Parties of the date on which, for this stock, accumulated reported catch taken by vessels of the Contracting Parties is estimated to equal 50 and then 100 percent of the TAC for that stock.

⁷ Contracting Parties shall inform the NAFO Executive Secretary before 1 December 2000 of the measures to be taken to meet the advice of the NAFO Scientific Council.

⁸ The provisions of Part I, Section A.5c of NAFO Conservation and Enforcement Measures shall apply.

*No directed fishing - The provisions of Part I, Section A.5a and c of NAFO Conservation and Enforcement Measures shall apply.

**Annex 5. Fisheries Commission's Request for Scientific Advice
on Management in 2002 of Certain Stocks in Subareas 3 and 4,
including supplementary questions on Division 3M Shrimp for 2001**

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 2001 Annual Meeting, provide advice on the scientific basis for the management of the following fish and invertebrate stocks or groups of stocks in 2002:

Redfish (Div. 3M)
Yellowtail flounder (Div. 3LNO)
Squid (Sub-areas 3 and 4)
Shrimp (Div. 3M, 3LNO)
Greenland halibut (Sub-areas 2 and 3KLMNO)
Capelin (Div. 3NO)

2. The Fisheries Commission with the concurrence of the Coastal State as regards the stocks below which occur within its jurisdiction, requests that the Scientific Council, at a meeting in advance of the 2001 Annual Meeting, provide advice on the scientific basis for the management of the following fish stocks on an alternating year basis:

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

To implement this system of assessments in alternating years, all stocks were assessed in 1999 but advice pertained to different time periods to allow the introduction of the new scheme over time. Consequently:

- In 2000, advice was provided for 2001 and 2002 for cod in 3M, American plaice in 3M and witch flounder in 3NO. These stocks will then next be assessed in 2002.
- In 2001, advice will be provided for 2002 and 2003 for American plaice in 3LNO, cod in 3NO and redfish in 3LN. The next assessment of these stocks will thus be conducted in 2003.

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 in assessing and projecting future stock levels for those stocks listed above:
 - a) The preferred tool for the presentation of a synthetic view of the past dynamics of an exploited stock and its future development is a stock assessment model, whether age-based or age-aggregated.
 - b) For those stocks subject to analytical-type assessments, the status of the stocks should be reviewed and management options evaluated in terms of their implications for fishable stock size in both the short and long term. As general reference points, the implications of fishing at $F_{0.1}$ and F_{2000} in 2002 and subsequent years should be evaluated. The present

stock size and spawning stock size should be described in relation to those observed historically and those expected in the longer term under this range of options.

- c) For those stocks subject to general production-type assessments, the time series of data should be updated, the status of the stock should be reviewed and management options evaluated in the way described above to the extent possible. In this case, the general reference points should be the level of fishing effort or fishing mortality (F) which is calculated to be required to take the MSY catch in the long term and two-thirds of that effort level.
- d) For those resources for which only general biological and/or catch data are available, few standard criteria exist on which to base advice. The stock status should be evaluated in the context of management requirements for long-term sustainability and the advice provided should be consistent with the precautionary approach.
- e) Spawning stock biomass levels considered necessary for maintenance of sustained recruitment should be recommended for each stock. In those cases where present spawning stock size is a matter of scientific concern in relation to the continuing reproductive potential of the stock, management options should be offered that specifically respond to such concerns.
- f) Information should be provided on stock size, spawning stock sizes, recruitment prospects, fishing mortality, catch rates and TACs implied by these management strategies for the short and the long term in the following format:
 - I. For stocks for which analytical-type assessments are possible, graphs of all of the following for the longest time-period possible:
 - historical yield and fishing mortality;
 - spawning stock biomass and recruitment levels;
 - catch options for the year 2002 and subsequent years over a range of fishing mortality rates (F) at least from $F_{0.1}$ to F_{max} ;
 - spawning stock biomass corresponding to each catch option;
 - yield-per-recruit and spawning stock per recruit values for a range of fishing mortalities.
 - II. For stocks for which advice is based on general production models, the relevant graph of production as a function of fishing mortality rate or fishing effort. Age-aggregated assessments should also provide graphs of all of the following for the longest time-period possible:
 - exploitable biomass (both absolute and relative to B_{MSY})
 - yield/biomass ratio as proxy for fishing mortality (both absolute and relative to F_{MSY})
 - estimates of recruitment from surveys, if available.
 - III. Where analytical methods are not attempted, the following graphs should be presented, for one or several surveys, for the longest time-period possible:
 - time trends of survey abundance estimates, over:
 - an age or size range chosen to represent the spawning population
 - an age or size-range chosen to represent the exploited population
 - recruitment proxy or index for an age or size-range chosen to represent the recruiting population.
 - fishing mortality proxy, such as the ratio of reported commercial catches to a measure of the exploited population.

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

- g) For squid (*Illex*) in Sub-areas 3 and 4, the Scientific Council is requested to advise on the level of TAC in high abundance years and on the criteria which could be reliably used to forecast changes in productivity under an annual management regime. Scientists are encouraged to further analyze available data toward developing other possible indicators that could be used under an in-season management regime for squid, recognizing that the practical use of such indicators would require that they be available as early in the season as possible.
- h) For shrimp in 3M, the Fisheries Commission notes that information to date from the commercial fishery in 2000 is showing relatively high catch rates. In light of this apparent change in stock status, the Scientific Council is requested to review information from the 2000 fishery at its November 2000 meeting and to evaluate the impact on this resource of removals in year 2001 and 2002 corresponding to 25,000 t, 30,000 t, 35,000 t and 40,000 t respectively. Furthermore, the Scientific Council is requested at its November 2000 meeting to evaluate, on the basis of the best data available, whether the provision for a Div. 3M shrimp closure in FC Working Paper 99/16 (Rev.) would be a precautionary approach-based measure and, if so, whether proposed area and timing of the closure are appropriate.
4. The results described in Section 3 should include information about the reliability of the results. To this end, the following information should be included in a synoptic form:
- Parameter uncertainty in assessments, possibly as confidence intervals
 - Robustness of assessments to alternative assumptions or data series
 - Illustration of conflicts in data series
- This information may be accompanied by quality statements giving the opinion of the Scientific Council about the reliability of the various data series for particular purposes.
5. Noting the progress made by the Scientific Council on the development of a framework for implementation of the Precautionary Approach, the Fisheries Commission requests that the Scientific Council provide the following information for the 2001 Annual Meeting of the Fisheries Commission for stocks under its responsibility requiring advice for 2002, or 2002 and 2003:
- a) the limit and target precautionary reference points described in Annex II of the UN Fisheries Agreement indicating areas of uncertainty (when precautionary reference points cannot be determined directly, proxies should be provided);
 - b) information including medium term considerations and associated risk or probabilities which will assist the Commission 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 the order of priority considered appropriate by the Scientific Council;
 - d) any other aspect of Article 6 and Annex II of the Agreement which the Scientific Council considers useful for implementation of the Agreement's provisions regarding the precautionary approach to capture fisheries;
 - e) propose criteria and harvest strategies for re-opening of fisheries and for new and developing fisheries; and

- f) to work toward the harmonization of the terminology and application of the precautionary approach within relevant advisory bodies.
6. In addition, the following elements should be taken into account by the Scientific Council when considering the precautionary approach:

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

References to "risk" and to "risk analyses" should refer to estimated probabilities of stock population parameters falling outside biological reference points.

- b) Where reference points are proposed by the Scientific Council as indicators of biological risk, they should be accompanied by a description of the nature of the risk incurred if the reference point is crossed (e.g. short-term risk of recruitment overfishing, loss of long-term yield, etc.)
- c) When a buffer reference point is proposed in order to maintain a low probability that a stock, measured to be at the buffer reference point may actually be at or beyond the limit reference point, the Scientific Council should explain the assumptions made about the uncertainty with which the stock is measured, and also the level of 'low probability' that is used in the calculation.
- d) Wherever possible, short and medium term consequences should be identified for various exploitation rates (including no fishing) in terms of yield, stability in yield from year to year, and the risk or probability of moving the stock beyond B_{lim} or B_{buf} . Whenever possible, this information should be cast in terms of risk assessments relating fishing mortality rates to the risks of falling below B_{lim} and B_{buf} , as well as of being above F_{lim} and F_{buf} , the risks of stock collapse and recruitment overfishing, as well as the risks of growth overfishing and the consequences in terms of both short and long term yields.
- e) When providing risk estimates, it is very important that the time horizon be clearly spelled out. By way of consequence, risks should be expressed in timeframes of 5, 10 and 15 years (or more), or in terms of other appropriate year ranges depending on stock specific dynamics. Furthermore, in order to provide the Fisheries Commission with the information necessary to consider the balance between risks and yield levels, each harvesting strategy or risk scenario should include, for the selected year ranges, the risks and yields associated with various harvesting options in relation to B_{lim} (B_{buf}) and B_{target} , and F_{lim} (F_{buf}) and F_{target} .
7. The Fisheries Commission, with the concurrence of the Coastal State, requests 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 for 2002 and 2003. 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.

8. The Scientific Council is requested to review all available information from both research vessel surveys and commercial catches on the relative biomass and geographic distribution of the following unregulated species/stocks occurring within the NAFO Regulatory Area: monkfish (*Lophius americanus*), wolffishes (*Anarhichas lupus*, *A. minor*, *A. denticulatus*), thorny skate (*Amblyraja radiata*), black dogfish (*Centroscyllium fabricii*), eelpouts (*Lycodes spp.*), longfin hake (*Urophycis chesteri*), and orange roughy (*Hoplostethus atlanticus*).
9. The Scientific Council is requested to evaluate the distribution of the fishable biomass of the main commercial species of fish in relation to depth (in 100-m intervals). Separate values should be provided a) for fish above and below the length of 50% maturity and b) for fish above and below the current minimum landing size.
10. The Fisheries Commission also requests, with the concurrence of the Coastal State, that the Scientific Council evaluate the likely future medium-term development for Greenland halibut in 2+3KLMNO, Yellowtail flounder in 3LNO, American plaice in 3LNO (if possible) and cod in 3NO, under the following assumed constraints:
 - a) Closure of targeted Greenland halibut fishery in depths less than 200, 500 and 800 meters or any other depths considered appropriate. These cases, which will have to make a reasonable assumption on the redirection of effort so removed onto the remaining depth strata, should be compared with evaluation of current fishing practices.
 - b) Subject to the above, likely future medium-term consequences (5 to 10 years) for the yield, spawning biomass, exploitable biomass and recruitment, stating the relevant biological assumptions.
 - c) The scenarios should be explored for a range of fishing effort assumptions corresponding to:
 - i) Maintaining overall fishing effort at the same levels as estimated in the last year for which good information is available.
 - ii) Increases or decreases of +/- 30% in fishing effort from this value.
 - iii) Additional scenarios as considered appropriate by the scientific Council.In these scenarios, the Scientific Council should evaluate whether these fishing strategies provide adequate long-term protection to juvenile fish to allow maintenance of the spawning biomass at an appropriate level.
11. The Scientific Council is requested to review the distribution of juvenile American plaice and update the distribution of yellowtail flounder based on results from comprehensive research surveys. The Scientific Council is also requested to delineate further the areas of juvenile concentration in the Southeast Shoal area and its surroundings.
12. Regarding redfish in NAFO Division 1F, the Scientific Council is requested to review all available information on the distribution of this resource over time, as well as on the affinity of this stock to the pelagic redfish resource found in the ICES Sub-area XII, parts of SA Va and XIV or to the redfish found in NAFO Sub-areas 1-3.
13. With regard to shrimp in Divisions 3LNO, the Fisheries Commission, with the concurrence of the Coastal State, requests that the Scientific Council provide information on the geographical distribution of this resource, as well as describe the relative and seasonal distribution inside and outside the NAFO Regulatory Area.

14. The Fisheries Commission requests the Scientific Council to provide information on the long-term effects of increasing mesh size from 130 mm to 145 mm in yield-per-recruit and stock spawning biomass-per recruit for Greenland halibut in 2+3KLMNO and in reducing by-catch of other species in that fishery. The Scientific Council is also requested to evaluate the medium term consequences in terms of yield and stock size of any such changes in mesh size.
15. The Fisheries Commission requests the Scientific Council to provide advice regarding the methodology for scientific research on fish stocks under moratoria.

**Annex 6. List of Decisions and Actions by the Fisheries Commission
(22nd Annual Meeting, 18-22 September 2000)**

Substantive Issue	Decision/Action (FC Doc. 00/21, Part I: item)
1. Precautionary Approach (management NAFO stocks)	Discussed: items 3.1-3.8 Decided to convene a group of technical experts in 2001, which will consider new recommendations to the Fisheries Commission.
2. Allocation of Fishing Rights	Discussed: items 3.13-3.14 No further decision/action was taken.
3. Management of NAFO shrimp stocks	Discussed: items 3.16-3.18 Decided to convene a special meeting of the Fisheries Commission 28-29 March 2001 in Copenhagen.
4. Chartering Operations	Adopted: amendment to regulations, item 3.20 and Annex 8 (FC Doc. 00/12)
5. Conservation and Enforcement Measures: (STACTIC Report) - Formats for hail/VMS system - Scientific requirements for observers - Incidental catch - Harmonization of port inspection reports - Overhaul of NAFO Conservation and Enforcement Measures	Discussed: items 3.22-3.28 Adopted: item 3.23 Adopted: item 3.24 Adopted: item 3.25 Adopted: item 3.26 Agreed: item 3.27
6. TAC's and Regulatory Measures for major stocks in the Regulatory Area: - Cod 2J3KL in the Regulatory Area - Cod 3M - Cod 3NO - Redfish 3M - Redfish 3LN - American plaice 3M - American plaice 3LNO - Yellowtail 3LNO - Witch 3NO - Witch 2J3KL (in the Reg. Area) - Capelin 3NO - Greenland halibut - Squid (<i>Illex</i>) - Shrimp in Div. 3L - Shrimp in Div. 3NO	Discussed/Adopted: items 4.1-4.30 no directed fishery no directed fishery no directed fishery 5,000 mt no directed fishery no directed fishery no directed fishery 13,000 mt no directed fishery no directed fishery no directed fishery 13,000 mt no directed fishery no directed fishery no directed fishery no directed fishery 29,640 mt 34,000 mt 6,000 mt no directed fishery
7. Schedule I – Quota Table 2001	Adopted: item 4.28
8. Request to the Scientific Council for Scientific Advice on Management of Fish stocks in 2002	Adopted: item 4.29

**Annex 7. Fishing Activity and Utilization of Fish Resources
in the NAFO Regulatory Area
2000**

(provisional catch data from NAFO hail reports)

Contracting Party	No. of Vessels (see App.I)	Catches MT: Quota / Catch / %							
		Redfish 3M			Gr. halibut 3LMNO			Shrimp 3M	
		Quota	Catch	%	Quota	Catch	%	Vessels	Catch
Canada	6	500	5	1	3890	1520 ^c	39	2	618
Cuba	1	1750	-	-	-	-	-	1	46
Denmark	-	69	-	-	-	-	-	-	-
Faroes	8	-	-	-	-	986 ^d	57	6	7745
Greenland	7	-	-	-	-	-	-	6	1638
Estonia	12	(13850) ^a	632	5	-	177 ^d	10	10	12196
European Union	48	3100	1338	43	14355	14349	100	10	1662
France (SPM)	-	69	-	-	-	-	-	-	-
Iceland	8	-	-	-	-	412 ^d	24	8	8912
Japan	2	400	31	8	2658	2513	95	1	114
Korea	-	69	-	-	-	-	-	-	-
Latvia	4	(13850) ^a	-	-	-	200 ^d	12	3	3102
Lithuania	7	(13850) ^a	-	-	-	21 ^d	1	5	3528
Norway	6	-	-	-	-	-	-	5	2633
Poland	1	-	-	-	-	-	-	1	316
Russia	28	(13850) ^a	1809	13	3307	3332	101	12	7078
United States	-	69	-	-	-	-	-	-	-
Others	-	124	-	-	1725	1796	104	-	-
TOTAL	138	5000^b	3815	76%	25935	20510	79%	70	49588

^a Block quota. (Estonia, Latvia, Lithuania, Russia)

^b This is a "specifically agreed" TAC (which is less than the sum of national alloctions). Each Contracting Party shall notify the Executive Secretary bi-weekly of catches taken by its vessels from this stock. Not more than 2500 tons may be fished before July 1, 2000. The Executive Secretary shall notify without delay all Contracting Parties of the date on which, for this stock, accumulated reported catch taken by vessels of the Contracting Parties is estimated to equal 50 and then 100 percent of the TAC for that stock.

^c Does not include catches in Canadian zone.

^d Others Quota.

General Remarks on Fishery and Enforcement Measures:

There was a quota transfer of 3M Redfish from Canada to Japan, 370 mt, in 2000 (NAFO GF/00-726, 1 Dec 00).

NAFO hail report system was a main tool for the Secretariat to supervise the shrimp fishery effort and to monitor the general disposition of fishing vessels in the Regulatory Area. This system worked reasonably well except some cases of mis/under/reporting of "Exit-Entry(s)", which would be very important in the case of shrimp fishing effort estimates. In such cases, the NAFO Secretariat would work with the Contracting Party involved to verify hail reports.

According to the provisions Part I.F.4(g) of the Conservation and Enforcement Measures, "...The number of fishing days should be counted from the hail reports of vessels fishing for shrimp and shall include the days of entry or moves into Div. 3M and the area defined in footnote 1 and the days of moves or exit from Div. 3M and the area defined in footnote 1". With regards to the term of "fishing days", a question was asked by some Contracting Parties to clarify this term considering such probable scenarios on the fishing ground like a broken engine, technical and crew accidents, heavy weather, etc., which could prevent fishery.

Appendix 1

Contracting Party	Name of Vessel
Canada	Acadienne Gale II Baffin Run Cape John Genny and Doug Line Fisher Newfoundland Otter
Cuba	Rio Cuyaguaje
Denmark (Faroes)	Arctic Viking Borgin Hogifossur Hviltenni Ljosafelli Ocean Castle Sjurdarberg Vesturvon
Denmark (Greenland)	Kiliutaq Nicoline C Polar Amaroq Polar Arfivik Polar Nattoralik Polar Siglir Regina C
Estonia	Andvari Heltermaa Kopu Lindi Lomur Lootus Lootus II Merike Orvar Sonar Tahkuna Taurus
European Union	Ana Maria Gandon Ancoura D'Ouro Arcay Area Cova Atlantic Peace Aveirense Bieramar Tres Brites Calvao Cidade de Amarante Codeside Coimbra Dorneda Eridianus Esperanza Menduina Fornax Freiremar Uno Garoya II Gemini Hermanos Gandon Cuatro

Contracting Party	Name of Vessel
EU (cont'd)	Jose Antonio Nores Joana Princesa Lutador Maria Eugenia G Moradina Nuevo Virgen de la Barca Nuevo Virgen de Lodairo Pascoal Atlantico Patricia Nores Patricia Sotelo Pedra Rubia Pesca Vaqueiro Pescaberbes Dos Playa de Cativa Playa de Menduina Playa de Rodas Playa de Sartaxens Playa de Tambo Puente Pereiras Cuatro Punta Robaleira Puente Sabaris Rio Orxas Santa Cristina Santa Isabel Santa Mafalda Santa Marina Solsticio Xinzo
Iceland	Askur Baldur Arni Bliki Eldborg Orri Petur Jonsson Rauoinupur Sunna
Japan	Anyo Maru No. 7 Shinkai Maru
Latvia	Arnarborg Atlass Freija Otto
Lithuania	Cape Circle Cape Ice Maironis Sekme Svalbakur Treimani Utena
Norway	Ingar Iversen Nordoybas Nordstar Olympic Prawn Polaris Volstad Viking
Poland	Esther

Contracting Party	Name of Vessel
Russia	Andrey Markin
Russia	Bizon
(cont'd)	Bootes
	Dimas
	Eyborg
	Granat
	Gornostaevka
	Kadri
	Kapitan Naumov
	Kobrin
	Maroanjoca
	Matrioska
	Merak
	Mozdok
	Murman
	Obva
	Odoevsk
	Okeanator
	Olchan
	Olga
	Onezhskiy
	Oyra
	Polessk
	Semenovsk
	Stakfell
	Tynda
	Vest Rumb
	Viking

**Annex 8. Number of Fishing Vessels for the NAFO Regulatory Area
during 1991-2000**

Contracting Party	2000		1999		1998		1997		1996 Total	1995 Total	1994 Total	1993 Total	1992 Total	1991 Total
	PRA	OTH	PRA	OTH	PRA	OTH	PRA	OTH						
Canada	2	4	3	3	4	4	4	4	8	15	13	32	2	8
Cuba	1	-	1	-	-	-	-	-	-	-	3	4	12	12
Greenland	6	1	1	-	2	-	2	-	6	4	6	12	1	-
Estonia	10	2	9	-	7	-	5	-	6	7	7	10	-	-
EU	-	48	2	48	2	41	-	44	46	61	72	84	95	48
Faroes	6	2	6	1	7	2	7	1	15	12	14	17	7	8
France (SP)	-	-	-	1	-	1	1	2	-	-	-	-	-	-
Iceland	8	-	11	-	11	-	14	-	39	20	10	1	-	-
Japan	-	2	-	2	-	2	2	2	2	3	3	4	4	4
Latvia	3	1	3	-	2	-	2	-	4	4	7	18	-	-
Lithuania	5	2	5	-	6	-	5	-	6	3	4	7	-	-
Norway	5	1	2	-	2	-	2	-	15	27	19	20	-	-
Poland	1	-	1	-	1	-	1	-	-	-	-	-	-	-
Russia	12	16	5	4	-	3	1	4	21	29	20	25	-	-
Total	59	79	49	59	44	53	44	57	168	185	178	234	121	80
Grand Total	138		108		97		101		168	185	178	234	121	80

NOTE: Information is taken from hail reports received at the Secretariat and is provisional as some vessels fish for shrimp (PRA) and other species (OTH), but these vessels have only been counted once. For 1991-1996, figures are "total" as there were no target species reported for these years.

PART III
(pages 135 to 199)

Activities of the Scientific Council in 2000

List of Meetings

The following meetings were held under the authority of the Scientific Council:

- Scientific Council/Fisheries Commission Working Group on Precautionary Approach; Albert Borschette Conference Centre, Brussels, Belgium, 29 February - 2 March.
- Scientific Council Regular Meeting; Alderney Landing, Dartmouth, N.S., Canada, 1-15 June.
- "Workshop on Assessment Methods"; Hilton Back Bay, Boston, Massachusetts, USA, 13-15 September.
- Scientific Council Annual Meeting; Hilton Back Bay, Boston, Massachusetts, USA, 18-22 September.
- Scientific Council Meeting (shrimp); ICES Headquarters, Copenhagen, Denmark, 8-15 November.



**Scientific Council/Fisheries Commission Working Group
on Precautionary Approach (PA)
29 February - 02 March 2000, Brussels, Belgium**

Chairman: W. B. Brodie and Co-Chair J. Baird (Canada)
Rapporteur: T. Amaratunga, Assistant Executive Secretary

The summary of the Working Group report was provided in Part II of this publication under the Fisheries Commission activities (Joint Scientific Council/Fisheries Commission Working Group, please see page 73). Under this Scientific Council part, some additional information is available.

In 2000, there were two meetings concerning the Precautionary Approach (PA): the CWP Intersessional Meeting of the Working Group on Precautionary Approach Terminology during 14-16 February at ICES Headquarters, Copenhagen, Denmark (SCS Doc. 00/7), and the Joint Scientific Council and Fisheries Commission Working Group on Precautionary Approach (FC Doc. 00/2) during 29 February-2 March, Brussels, Belgium.

At the Working Group on Precautionary Approach Terminology, the Chairman was W. B. Brodie – Chairman of the NAFO Scientific Council. Representatives of Fisheries and Agricultural Organization (FAO), International Commission for the Conservation of Atlantic Tunas (ICCAT), International Council for the Exploration of the Sea (ICES), and NAFO attended.

The Working Group produced several detailed comparisons on the terminology and concepts in the PA frameworks that are in use or being developed within the three scientific agencies (NAFO, ICES, ICCAT). The Working Group concluded that although specific interpretations of the United Nations Fish Stock Agreement (UNFSA) guidelines differed, the objectives of these three scientific agencies share these common elements:

Reference points should be chosen in such a way as to allow managers to operate a fishery to take sustainable yields close to the estimated long-term maximum. Reference points should generally lead to stock dynamics, which satisfy these conditions, in order of priority: a) Low probability of recruitment over fishing, b) The choice of thresholds should be made so as to avoid a recruitment collapse or to minimize risk when approaching an area where the stock dynamics are poorly known.

The PA ref. points of ICES, the Buf ref. pts. of NAFO, and the $Threshold$ concept of ICCAT all refer to the same idea, i.e. to provide a buffer or safety margin to ensure that there is a high probability that the $Limit$ ref. points on biomass or fishing mortality will not be reached. There are a number of other initiatives on the PA underway in various organizations and national departments. Thus, even if it were possible, the Working Group concluded that it may be premature to recommend a common approach to the PA. In many cases, work on the PA is very much in the exploratory stage.

The Joint Scientific Council and Fisheries Commission Working Group on Precautionary Approach, which took place 29 February-02 March in Brussels, Belgium, was the third such meeting of this Working Group, and the full report is contained in FC Doc. 00/2. The main agenda items dealt with:

- harmonization of concepts and terminology
- operationalizing the PA into the management plans for three model stocks
- implementation plan for the PA for other NAFO stocks
- consideration of changes or additions to the Fisheries Commission request to Scientific Council to reflect the PA
- consideration of criteria for reopening a fishery in light of the PA

- consideration of additional supportive management measures to complement the application of the PA.

Under harmonization, the joint Working Group concluded that although no formulations of the PA framework had been accepted by international fisheries organizations, including NAFO Fisheries Commission, several elements of the PA have been implemented by various management authorities. There are several broad similarities between the ICES and NAFO versions of the PA, and the Working Group preferred NAFO's B_{buf} term as opposed to B_{pa} .

The WG concluded that determination of harvest control rules is the role of managers. In the NAFO context, it is the Fisheries Commission's responsibility to determine appropriate harvest strategies corresponding to reference biomass levels.

The NAFO Scientific Council framework proposes that F_{lim} should be set no higher than F_{msy} , based on its interpretation of the United Nations Fish Stock Agreement (UNFSA). The ICES framework does not make specific reference to F_{msy} . The Working Group did not reach agreement on which formulation was more appropriate. Differences of opinion may be related to experiences with fish stocks in the Northwest Atlantic as regards to their response to exploitation vs the Northeast Atlantic. It was observed much work is happening on PA nationally in many Contracting Parties, and seeking complete harmonization at this time may be premature.

Under operationalizing/implementing the PA, the Working Group noted that the three model stocks were cod in Div. 3NO, yellowtail flounder in Div. 3LNO, and shrimp in Div. 3M, and that ongoing work on the PA for the shrimp stock in Div. 3M would be examined at the Scientific Council Meeting in November 2000. The following is an example of an action plan for implementing the PA. Similar plans were proposed by the Working Group for cod in Div. 3NO, and American plaice in Div. 3LNO (the latter as an example of an implementation plan for other NAFO stocks). The proposed plans also included additional supportive management measures to complement application of the PA.

For Yellowtail Flounder in 3LNO:

Objectives: The action plan for implementation of a PA should include the eight objectives discussed at the Joint Scientific Council/Fisheries Commission Working Group meeting in May 1999:

- 1) Maintain harvest levels that will continue to rebuild and maintain the stock biomass above the rebuilt biomass level.
- 2) Continue with a comprehensive suite of management measures.
- 3) Ensure a conduct of the fishery in a manner that will not jeopardize recovery of other stocks in the area which are currently under moratorium, specifically cod in Div. 3NO and American plaice in Div. 3LNO.
- 4) Performance measures of interest to the managers could be expressed in terms of biomass and its trajectory and where it is with respect to the reference level and catch levels. With respect to catch, the performance measure was: cumulated yield, yield trajectories and trends (in particular, to identify declining trends).
- 5) It was noted that production models do not permit determination of all reference points. It should be ensured that data are available for scientists to move toward using age-structured modeling.
- 6) Despite these limitations, production modeling is a tool that could be used to start to evaluate real F limits and could be used to provide insight to what will happen if there are lower or higher fishing mortality levels.
- 7) There is a need to develop "target" biomass levels that could be higher than the biological limits so as to take into account management objectives including economic considerations.
- 8) Endorse the work of the Scientific Council in its attempts to develop a better understanding of the stock-recruit relationship.

Management Strategies

- 1) As a management objective, Fisheries Commission should maintain SSB at a level that will continue the probability of good recruitment and maintain the stock at a level that will support a sustainable fishery.
- 2) Given that the present estimate of F_{buf} is in the same range as the $2/3 F_{\text{MSY}}$ value used in past requests from Fisheries Commission, the value of 11% for exploitation rate could continue to be used by Fisheries Commission as a basis for establishing catch levels until such time as Scientific Council may recommend an alternative.
- 3) Fisheries Commission requests Scientific Council to give priority to work aimed at calculation of possible biological reference points as appropriate including age-based models and any other applicable stock evaluation methodologies.
- 4) Fisheries Commission shall, as appropriate, review and revise these management measures and strategies based on any new advice provided by Scientific Council.

Data Collection/Analyses

- 1) Scientific Council and Fisheries Commission should encourage continuation of multiple annual surveys in support of stock assessment
- 2) Contracting Parties should ensure that appropriate data are collected and that scientists utilize stock evaluation techniques that allow for estimation of stock size and exploitation rates, risk assessment procedures, and a fuller evaluation of reference points.
- 3) Scientific Council continues efforts to develop a better understanding of the stock-recruit relationship.
- 4) Scientific Council and Contracting Parties continue to monitor expansion of the range into Div. 3L.
- 5) Scientific Council and Contracting Parties continue to monitor recruitment as well as trends in weight-at-age.
- 6) Scientific Council review and update, as necessary, information on spawning locations and timing.
- 7) Scientific Council provide updated information to the Fisheries Commission regarding the distribution of juvenile yellowtail flounder in relation to adult distribution.

Supportive Management Measures/Good Practices

- 1) Fisheries Commission should take steps to minimize the catch of juveniles, and ensure that the total catches of yellowtail flounder are in accordance with the target exploitation rate. Some measures that could be considered to achieve this objective are:
 - Review of current directed fisheries for the determination of specific yellowtail flounder by-catch problems so that remedies can be applied.
 - A revision of conservation and technical measures that only permit by-catch that is truly incidental in nature.
 - Closure of specific areas for specific periods of time identified as: a) nursery areas, and b) areas where high concentrations of juveniles are found.
- 2) Fisheries Commission explore the utility of closure periods to protect spawners as well as the utility of closures of areas identified as spawning locations.

Under consideration of criteria for reopening a fishery in light of the PA, the Working Group noted that stocks under moratoria have been characterized by a very low spawning stock biomass and a reduced age-range. There is often a concern that the level of spawner biomass reached corresponds to a level where the chance of producing good year-classes is greatly reduced. Once recovery has begun and spawner biomass has reached a level sufficient to allow consideration of reopening of the fishery, under a Precautionary Approach this reopening must be consistent with a strategy of continued stock rebuilding.

The discussion related to stocks under moratoria has necessarily focused on the strategy to reach the first benchmark to rebuilding, i.e. B_{lim} . In order to monitor the progress of stock rebuilding, milestones should be established so as to permit a review of the stock trajectory in relation to reference points within reasonable time frames. For the stocks currently under moratorium, the

other elements of a precautionary approach (i.e. other than B_{lim}), have not received detailed attention. Key considerations in the decision of re-opening include the determination of B_{lim} , the determination of the fishing mortality (F) at re-opening, the probability of continued growth in the stock, the trade-off between yield/probability of growth in the stock and the risks that the stock could actually fall (again) below a pre-determined limit.

The other elements of a PA will need to be defined. Also, any reopening of commercial activity should only be contemplated under specific conditions. In particular, increased focus on additional conservation measures such as limitations on by-catch is required in order to afford the resource the best chance of recovery.

As such, additional technical management measures may be specified including, but not limited to the following:

a) *Protection of Spawners:*

Management should incorporate controls to limit the catch during the main spawning periods in order to ensure the best possible spawning success. Information can be made available from scientists to guide managers in this regard. Scientists can also provide information regarding spawning areas for possible protection as well (see above).

An important conservation objective should be to allow development of a full age-range in the spawner population in order to promote the best possible stability in annual recruitment.

b) *Protection of Pre-recruits (Area Closures):*

Specific areas that have been clearly identified as significant nursery areas should be closed, as appropriate, for a specified time so as to minimize the mortality on small fish. In addition, other management measures to protect small fish should be considered.

c) *Concerns with By-catch:*

Fisheries for other species that might result in by-catch of the species under consideration must be conducted in such a manner so as to keep by-catch at the lowest possible level. This would necessitate careful review of possible management strategies including adequate monitoring.

d) *Concerns with By-catch of Other Species:*

Fisheries for the directed species that might result in by-catch of other species, especially those under moratoria, must be conducted in such a manner so as to keep by-catch at the lowest possible level. This would necessitate careful review of possible management strategies including adequate monitoring.

Scientific Council Meeting
1-15 June 2000, Dartmouth, N.S., Canada

Chairman: W. B. Brodie (Canada)

Rapporteur: T. Amaratunga, Assistant Executive Secretary

The Scientific Council report was published as NAFO/SCS Doc: 00/24 and in Scientific Council Reports, 2000.

Representatives attended from: Canada, Cuba, Denmark (Faroe Islands and Greenland), Estonia, European Union (EU), Japan, Norway, Russian Federation and United States of America (USA) (Annex 1). Observers were present from ICES.

The agenda was adopted (Annex 2).

The LAN (local area network) system connecting all participants' computer terminals was in place for this meeting.

FISHERIES ENVIRONMENT

Annual air temperatures throughout the Northwest Atlantic were above normal in 1999 with new record highs set in the region from southern Labrador to the Gulf of Maine, including Newfoundland and the Gulf of St. Lawrence.

While ice formed on schedule or slightly later-than-usual, the warm temperatures during the winter results in an early disappearance and shorter ice duration in 1999 than normal off southern Labrador, Newfoundland and in the Gulf of St. Lawrence. Little to no ice reached the Scotian Shelf.

During 1999, the number of icebergs to reach south of 48°N decreased dramatically relative to 1998 (from 1,384 to 22) and was the lowest number of icebergs in over 20 years.

Temperatures off Newfoundland and Labrador during 1999 were warmer-than-normal throughout most of the water column.

The area of CIL (Cold Intermediate Layer) water was below normal from southern Labrador to the Grand Bank. This resulted in the CIL volume during the summer and autumn of 1999 being the lowest on record.

Deep-water temperatures on the Scotian Shelf (Emerald Basin) increased by upwards of 2-3°C from 1998 levels. Temperature increases were also recorded in Georges Basin in the Gulf of Maine and the southwestern Scotian Shelf. The warm temperatures in the deep basins on the Scotian Shelf and in the Gulf of Maine are due to the on-shelf penetration of Warm Slope water from the shelf break region.

The cold Labrador Slope water observed in 1998 along the shelf edge off the Scotian Shelf retracted to its normal position around the Laurentian Channel. Along the Middle Atlantic Bight and Scotian Shelf it was replaced by Warm Slope water and represents a return to conditions that have generally persisted since the 1970s.

Warmer than normal waters were observed over substantial portions of the bottom and at intermediate waters over the northeastern Scotian Shelf for the first time since the mid-1980s.

Both the shelf/slope front and the north wall of the Gulf Stream moved northward during 1999. While the Stream still remained south of its long-term mean, the Shelf/Slope front moved north of its climatological mean position.

The meeting focused upon the possible effect of temperatures on catchability and whether this could explain the improved cod catches on the Grand Banks that were reported. Opinions were divided but it was noted that the number of cod collected was still very low. It was suggested that a similar analysis comparing bottom-temperatures and distributions should be performed with yellowtail flounder since they have been very abundant in recent years. It was stated that when the yellowtail flounder abundance was low, they were confined to the Southeast Shoal of the Grand Bank but have been spreading into the southern areas of Div. 3L. It was also noted that temperature might effect not only distribution or catchability, but also growth. This had been discussed in a previous NAFO meeting in regards to warming around Iceland. No specific recommendations were felt to be required at this time, however.

The joint Russian/German Project "Assessment of short-time climatic variations in the Labrador Sea" reported to the meeting on the relationship between physical variables (air temperatures, winds and SSTs-surface salinity and temperature) and cod recruitment off West Greenland and Iceland were analysed. Results included a significant relationship between wind and recruitment of West Greenland cod. During April, northerly winds off southern Greenland and easterly winds in the Denmark Strait favour higher recruitment. During summer, easterly winds west of Iceland favour good recruitment.

FISHERY SCIENCE

The Standing Committee on Fisheries Science (STACFIS) continued its initiative (from 1999) to assess the stocks in geographical order of four (4) regions: a) Greenland and Davis Strait; b) Flemish Cap; c) Grand Bank and Subareas 2+3; d) widely distributed stocks in Subarea 3+4 - Grenadiers, Greenland halibut, Squid and Cod in 2J3KL.

A brief summary of general fishery trend of NAFO Regulatory Area in 2000 is demonstrated in the following table:

(from NAFO monthly reports)

2000

Contracting Party	Cod 3M		Redfish 3M		Yellowtail 3LNO		G. halibut 3LMNO	
	Quota	Catch	Quota	Catch	Quota	Catch	Quota	Catch
1. Bulgaria	-	-	-	-	-	-	-	-
2. Canada	0	0	500	5	9750	4953	3 890	1520
3. Cuba	0		1750		-		-	
4. Denmark (Faroe Islands and Greenland)	0	0	69	0	-	0	-	986
5. European Union	0	30	3100	1349	200	867	14 355	11 317
6. France (St. Pierre et Miquelon)	-		69		-		-	-
7. Iceland	-	0	-	0	-	0	-	117
8. Japan	-	0	400	31	-	0	2 658	2 513
9. Korea	-		69		-		-	
10. Norway	0	0	-	0	-	0	-	0
11. Poland	0	0	-	0	-	0	-	0
12. Estonia		0		632		0		0
13. Latvia	0 ¹	0	13850 ¹	0		0		200
14. Lithuania		0		0		0		21
15. Russia		5		1809		212	3 307	3 332
16. United States of America	-		69		-		-	
17. Others	0		124		50		1 725	
TAC and Catch	0	35	5000 ²	3826	10000	6032	25 935	20 006
% of utilization of TAC	-			77		60		77

¹"Block quota"

² This is a specific TAC (less than the sum of national allocations) with the following conditions: Each Contracting Party shall notify the Executive Secretary bi-weekly of catches taken by its vessels from this stock. Not more than 2500 tons may be fished before July 1, 2000. The Executive Secretary shall notify without delay all Contracting Parties of the date on which, for this stock, accumulated reported catch taken by Contracting Parties is estimated to equal 50 then 100 percent of the TAC for that stock.

The provisional data from the above table indicate that major allocated stocks were under-exploited. This trend has been indicative for all previous period (during 90s).

Assessment of Fish Stocks

The Scientific Council and Fisheries Commission during the Annual Meeting of September 1999 agreed to consider certain stocks on an alternating basis. This section presents those stocks for which the Scientific Council provided scientific advice for the year 2001.

Redfish (Sebastes spp.) in Division 3M

There are 3 species of redfish which are commercially fished on Flemish Cap: deep-water redfish (*Sebastes mentella*), golden redfish (*Sebastes marinus*) and Acadian redfish (*Sebastes fasciatus*). The present assessment evaluates the status of the Div. 3M beaked redfish stock, regarded as a management unit composed of two populations from two very similar species (*Sebastes mentella* and *Sebastes fasciatus*). The reason for this approach is that evidence indicates this is by far the dominant redfish group on Flemish Cap.

Scientific Council concluded that while the decline in stock biomass appears to have halted, it is still unclear as to whether there has been any actual increase. The total stock and spawning stock are currently at a low level compared to the earlier period in the time series. At the current low

fishing mortality, and with growth of the relatively strong 1989-90 year-classes, stock and spawning biomass should gradually increase.

The Council was unable to advise on a specific TAC for year 2001, however, in order to maintain relatively low fishing mortalities so as to promote stock recovery, Scientific Council recommends that catch for Div. 3M redfish in year 2001 be in the range of 3 000-5 000 tons.

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

The stock is mainly concentrated on the southern Grand Bank and is recruited from the Southeast Shoal area nursery ground, where the juvenile and adult components overlap in their distribution.

Based on 5 additional surveys since the 1999 assessment, the current view is that the stock size has increased over the past year. The stock biomass is perceived to be at the level of that seen in the mid-1980s.

The TAC for the year 2001 should not exceed 13 000 tons, based on the projection of $F=2/3 F_{msy}$ and an assumed catch of 11 000 tons in the year 2000.

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

The stock occurs mainly at depths shallower than 400 m on Flemish Cap. Catches are taken mainly by otter trawl, primarily in a by-catch fishery of the Contracting Parties since 1992.

No analytical assessment as possible.

There should be no directed fishery on American plaice in Div. 3M in years 2001 and 2002. By-catch should be kept at the lowest possible level.

Witch Flounder (*Glyptocephalus cynoglossus*) in Divisions 3N and 3O

The stock mainly occurs in Div. 3O along the deeper slopes of the Grand Bank. It has been fished mainly in winter and springtime on spawning concentrations.

Catches exceeded the TAC by large margins during the mid-1980s. The catches during 1995-98 ranged between 300-600 tons including unreported catches. The 1999 catch was 800 tons, the highest since 1994.

No analytical assessment was possible with current data.

There should be no directed fishing on witch flounder in the years 2001 and 2002 in Div. 3N and 3O to allow for stock rebuilding. By-catches in fisheries targeting other species should be kept at the lowest possible level.

Cod (*Gadus morhua*) in Division 3M

The cod stock on Flemish Cap is considered to be a discrete population.

Catches exceeded the TAC from 1988 to 1994, however, were below the TAC from 1995 to 1998. Large numbers of small fish were caught by the trawl fishery in most recent years. By-catches were estimated to be low in the shrimp fishery since 1993. The fisheries since 1996 were very small compared with previous years. In 1999 the fishery was closed, virtually all the catch was taken by vessels from non-Contracting Parties.

An analytical assessment was presented.

The stock biomass and spawning stock biomass at the beginning of 2000 remain at a very low level and is mainly composed by fish 6 and 7 years old. Fish younger are scarce due to the lower recruitment in last four years.

It was recommended that there be no directed fishery for cod in Div. 3M in the years 2001 and 2002. Also, by-catch of cod in fisheries directed to other species on Flemish Cap should be kept at the lowest possible level.

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

The Greenland halibut stock in Subarea 2 and Div. 3KLMNO is considered to be part of a biological stock complex which includes Subareas 0 and 1.

Catches increased sharply in 1990 due to a developing fishery in the Regulatory Area in Div. 3LMN and continued at high levels during 1991-94. The catch was only 15 000 to 20 000 tons per year in 1995 to 1998 as a result of lower TACs under management measures introduced by the Fisheries Commission. The catch in 1999 was estimated to be 24 000 tons, the highest since 1994. Catches have been well below TACs during 1995-99.

Above average recruitment indicated for the 1990-95 year-classes. The 1996 to 1998 year-classes appear to be average to below average. However, the comparability of the estimated may be significantly influenced by the change in survey gear in 1995.

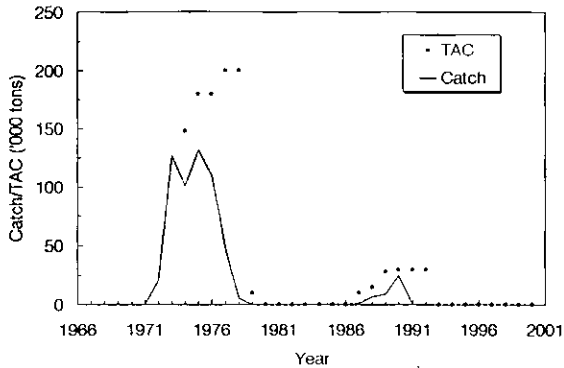
As the dynamics of the population are still uncertain, it is not possible to determine which method provides the best absolute estimate of biomass. Most survey indices of biomass increased from 1996 to 1999.

The current assessment is considered uncertain. There is a high level of uncertainty associated with the estimate of the 1994 and 1995 year-classes, and these year-classes are not yet represented in the catches. In addition, the high exploitation of immature fish and the low abundance of sexually mature fish (>60 cm) is indicative of a situation of significant biological risk, although this risk cannot be quantified at present. In the light of these uncertainties, Scientific Council recommends a stepwise approach to increasing the TAC. For 2001, Scientific Council recommends the catch should not exceed 40 000 tons.

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

Within the NAFO Regulatory Area, the capelin spawning occurs in the area of the Southeast Shoal in Div. 3N

The fishery was closed during 1979-86 and again since 1993.



No recent data available. Scientific Council was informed that some recent research survey data were collected by Canada, but these have not been reviewed by Scientific Council.

No assessment was possible.

For several years, the Scientific Council was not in a position to provide advice for capelin Div. 3NO due to absence of data. The Scientific Council proposed that it will give no advice until appropriate data are available.

No advice possible by the Scientific Council.

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

The northern short-finned squid is an annual species (1-year life cycle) that is considered to comprise a unit stock throughout its range in the Northwest Atlantic Ocean, from Newfoundland to Florida including NAFO Subareas 3-6.

Catches in Subareas 3+4 increased during the late-1970s, averaging 81 000 tons during 1976-81, and peaking at 162 000 tons in 1979. Catches in Subareas 3+4 declined to 100 tons in 1986, ranged between 600 and 11 000 tons during 1987-95, increased to 15 800 tons in 1997, and declined to 300 tons in 1999. A TAC for Subareas 3+4 was first established in 1975 at 25 000 tons but was increased in 1978, 1979 and 1980. The Subareas 3+4 TAC remained at 150 000 tons during 1980-98 and was set at 75 000 tons for 1999 and 34 000 tons for 2000.

The Scientific Council is unable to advise on a specific level of catch for year 2001. However, based on available information (including an analysis of the upper range of yields that might be expected under the present low productivity regime), the Council advises that the TAC for year 2001 for short-finned squid in Subareas 3+4 be set between 19 000 tons and 34 000 tons.

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

Roughhead grenadier are distributed throughout Subareas 2 and 3 in depths between 300-2000 m. This is an unregulated species.

There is no directed fishery for roughhead grenadier and most of the catches are taken as by-catches in the Greenland halibut fishery in Subareas 2 and 3. Roughhead grenadier is taken mainly in Div. 3LMN Regulatory Area. At the beginning of the Greenland halibut fishery in Subarea 3 of the Regulatory Area in 1988, the grenadier catches were systematically misreported as roundnose grenadier. Since 1997 the roughhead catches have been correctly reported, but the mis-reporting

problem is not still solved in the statistics prior 1996. The level of catches remains uncertain in Subareas 2 and 3 before the start of the Greenland halibut fishery in the Regulatory Area.

Because of limited time series, limited coverage and various vessels/gears conducting these surveys, the information is of limited value in determining resource status. It is not possible to provide an estimate of the absolute size of the stock.

Assessment/Advice on fish stocks at the request of Coastal States

a) Request by Canada

Cod (Gadus morhua) in Divisions 2J, 3K and 3L

Cod in these Divisions are considered a single stock complex. However, there is considerable evidence of sub-stock structure. Historically, many of the cod migrated between the offshore and the inshore. There are at present very few cod in the offshore compared to any time prior to 1993. Denser aggregations exist in the inshore from southern Div. 3K to the southern boundary of the stock. Tagging studies indicate that the inshore of Div. 3KL is inhabited by at least two groups of cod; a northern resident group that inhabits southern Div. 3K and northern Div. 3L and a migrant group that moves into southern Div. 3L from Subdiv. 3Ps from spring to autumn.

The rapid decline in the resource in the early-1990s led to reduced TACs and eventually to a moratorium on commercial fishing in 1992. A food/recreational fishery was permitted in 1992-94, 1996, 1998 and 1999 but not in 1995 and 1997. Catches also came from sentinel surveys in 1995-99 and an index or test fishery in 1998. The commercial fishery was reopened in 1999 with a TAC of 9 000 tons for the inshore only.

Stock status was estimated based on research vessel indices, sentinel survey data, acoustic studies in limited areas and a mark-recapture study in the inshore. An analytical assessment was not attempted.

The biomass index for the offshore area from the autumn research vessel survey in Div. 2J and 3KL declined abruptly in the early-1990s. The 1999 estimate is very low compared to the 1980s. The biomass index from the spring research vessel survey in Div. 3L in 1999 is also very low compared to the 1980s.

In the inshore, exploitation rates calculated from tag return data indicate a biomass of at most 55 000 tons in Div. 3K and northern Div. 3L in 1999. An unquantified additional biomass was available in southern Div. 3L, but much of this migrated seasonally from Subdiv. 3Ps. Acoustic studies of Smith Sound (northern Div. 3L) in winter of 2000 when cod are aggregated produced estimates of about 22 000 tons. No additional large aggregations were found in northern Div. 3L and southern Div. 3K during this survey.

Standardized catch rates calculated from limited fishing throughout the inshore of Div. 2J and Div. 3KL with commercial gears (the sentinel surveys) revealed patterns that differed with gear; in gillnets there was an increase from 1995 to 1998 and a decline in 1999, whereas in line trawls there was an increase from 1995 to 1997 and a decline to 1999.

The stock as a whole remains at a very low level. Year-classes recruiting in the 1990s have been extremely weak.

In the offshore there are no signs of recovery. The biomass is very small with few mature fish.

In the inshore, the biomass in Div. 3K and northern Div. 3L was estimated from mark-recapture experiments to be at most 55 000 tons. Additional biomass exists in southern Div. 3L, but much of this migrates seasonally into Div. 3L from Subdiv. 3Ps.

b) Request by Denmark (for Greenland)

Greenland Halibut (*Reinhardtius hippoglossoides*) in Division 1A, inshore

The inshore stock is dependent for recruitment on immigration from the offshore nursery grounds in Div. 1A and 1B and the spawning stock in Davis Strait. Only sporadic spawning seems to occur in the fjords, hence the stock is not considered self-sustainable. The fish remain in the fjords, and do not appear to contribute back to the offshore spawning stock. This connection between the offshore and inshore stocks implies that reproductive failure in the offshore spawning stock for any reason will have severe implications for the recruitment to the inshore stocks.

The stock components in all three areas consist of a large number of age groups.

Disko Bay: indices of abundance have been relatively stable since 1993.

Uummannaq: indices of abundance have been relatively stable since 1993.

Upernavik: There is indication of growth over-fishing of the stock components in the traditional fishing areas around Upernavik and up to 73.45°N (Giesecke Ice fjord). In the northern parts of the district, where new fishing grounds are exploited, data are insufficient to determine the status of the resource.

Scientific Council still considers that separate TACs are appropriate for each of the three areas.

Assessments indicate that there has been no improvement in stock status in any of the three areas. Therefore, Scientific Council concludes that there be no change in the TACs recommended for 2000. The TAC for 2001 for each of the inshore areas are therefore recommended to be: Disko Bay 7 900 tons, Uummannaq 6 000 tons, and Upernavik 4 300 tons.

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

The Greenland halibut stock in Subarea 0 + Div. 1A offshore and Div. 1B-1F is part of a common stock distributed in Davis Strait and south to Subarea 3.

Due to an increase in offshore effort, catches increased from 2 000 tons in 1989 to 18 000 tons in 1992 and have remained at about 10 000 tons annually since.

The age composition in the catches in Div. 0B and 1B-1F, where most of the fishery takes place, has been stable in recent years. Although the survey series from Subarea 1 in 1987-95 is not directly comparable with the series from 1997-99, the decline in the stock observed in Subarea 1 until 1994 has stopped and the stock seems to be back at the level in the late-1980s and early-1990s. The relationship between Greenland halibut in both Div. 0A (offshore) and 1A (offshore), and remaining areas is unknown and needs to be thoroughly investigated.

It was recommended TAC for year 2001 should not exceed 11 000 tons for Div. 0B and 1B-1F where the fishery primarily has taken place since it began.

Special Requests for Management Advice

a) Squid (*Illex*) in Subareas 3 and 4

The Fisheries Commission requested the Scientific Council to: *develop an in-season indicator of productivity level based on results from the annual July survey of the Scotian Shelf and any other source of data.* If it is not considered possible to develop an in-season indicator, the Scientific Council is requested to: *comment on the research that would be required to develop such an indicator.* The Scientific Council is also requested to: *review the protocol outlined in FC Working Paper 99/18 and to advise on possible modifications to ensure its applicability on the long term, including a level of TAC which would be applicable during the high productivity regime.*

Scientific Council noted in 1999 that it may be possible to identify the onset of a new productivity regime based on marked changes in (a) survey abundance and biomass indices; (b) the average size of squid in the population; and (c) environmental conditions which persist for two or more years. For an in-season predictive model to be of practical value it should be based on early-season indices that are simple and readily available.

Scientific Council was unable to advise on any modification to the protocol for determining productivity of the short-finned squid resource in NAFO Subareas 3+4 to ensure its applicability on the long term. Furthermore the Scientific Council is not in a position to advise on a specific level of TAC which would be applicable during the high productivity regime.

b) By-catches in the Shrimp Fishery

By-catch rates of Greenland halibut in Subareas 2 and 3 in Canadian shrimp vessels greater than 500 GRT calculated for combined grates (22 and 28 mm) in 1997, 1998, 1999 was 12.5, 9.9 and 5.9 kg/hr, respectively. Indication from analysis of age disaggregation shows that no more than 1.5% of any cohort was removed by the offshore shrimp fleet in this period. Theoretical losses computed from yield-per-recruit analysis showed that total loss due to shrimp by-catch mortality in this fishery in 1997, 1998, 1999 were 449 tons, 275 tons and 202 tons, respectively. The loss for each year will be distributed over the 17-year life span of the fish.

c) By-catches – Technical Measures

No specific technical management measures aimed at reducing catches of juvenile fish were evaluated. A number of examples were discussed during the assessments of various stocks (mesh size, exclusion grates, etc.). Scientific Council noted that a document on codend mesh selection studies was presented (SCR Doc. 00/49), and that there was a considerable amount of valuable information contained in this paper. As well, Scientific Council noted that research vessel surveys should provide useful data in delineating distributions of species, including juveniles. In addition, the data could also be used to delineate areas where by catches would probably occur, and areas where such by-catches would be unlikely. An example using Canadian autumn survey data in Div. 3LNO suggested that by-catches of yellowtail flounder in a fishery for Greenland halibut would be expected to be extremely low, given that there is very little overlap in the depth distribution of these species.

Elasmobranchs in Subareas 0-6

The Fisheries Commission requested the Scientific Council to: *summarize all available information from the Convention Area on catches of elasmobranchs by species and by the smallest geographic scale possible, and to review available information from research vessel surveys on the relative biomass and geographic distribution of elasmobranchs by species, and to quantify the extent of*

exploitation on these resources. Further, the Scientific Council was requested to: *initiate work leading to the development of precautionary reference points.*

Common name	Old Scientific name	Proposed (new) scientific name
Little Skate	<i>Raja erinacea</i>	<i>Leucoraja erinacea</i>
Arctic Skate	<i>Raja hyperborea</i>	<i>Amblyraja hyperborea</i>
Barndoor Skate	<i>Raja laevis</i>	<i>Dipturus laevis</i>
Winter Skate	<i>Raja ocellata</i>	<i>Leucoraja ocellata</i>
Spinytail Skate	<i>Raja spinicauda</i>	<i>Bathyraja spinicauda</i>
Thorny Skate	<i>Raja radiata</i>	<i>Amblyraja radiata</i>
Smooth Skate	<i>Raja senta</i>	<i>Malacoraja senta</i>

It is anticipated that these proposed scientific names will be accepted as the official names of these species by the American Fisheries Society (AFS) Names of Fishes Committee, and will be published in the 2000 edition of the AFS publication, "Common and Scientific Names of Fishes from the United States and Canada".

Geographic distribution of elasmobranches in the Northwest Atlantic:

Subareas 0+1: Thorny skate (*Amblyraja radiata*), Arctic skate (*Amblyraja hyperborea*) and Greenland shark (*Somniosus microcephalus*) are the common elasmobranchs distributed throughout Subareas 0 and 1. A survey in Div. 0A in October 1999 showed thorny skate were distributed primarily at depths <751m in the area of Davis Strait and Arctic skate was distributed primarily at depths >501m throughout Davis Strait and Baffin Bay.

Subarea 2: No information is available.

Subarea 3: Thorny skate are distributed throughout Subarea 3 and perform seasonal migrations, tending to move into deeper water along the shelf edge during winter-spring. Analyses of distribution of thorny skate in the Canadian bottom trawl surveys (Div. 3LNO and Subdiv. 3Ps) suggest that in the past a greater abundance of skates was distributed further to the north in Div. 3K and 3L than is currently found. Recent Canadian surveys indicate that about 20% of the overall biomass in Div. 3LNO and Subdiv. 3Ps is found in the NAFO Regulatory Area. The information from commercial catches indicates that barndoor skate (*Dipturus laevis*) may be more widely distributed than reflected by research survey data and perhaps continuously distributed along deep slope waters of the Northwest Atlantic. Apparent changes in abundance as observed from research surveys may in part reflect periods of expansion and contraction in to and out of the shallower waters within its range.

Subarea 4: No information is available.

Subareas 5+6: There are 33 species documented including large and small sharks and stingrays. Of the 12 species examined for patterns in distribution, 11 exhibited large seasonal shifts in distribution from south to north or offshore to inshore as water temperatures warmed. The exception to this was chain dogfish (*Scylliorhinus retifer*) that generally remained in deep slope waters year round.

Winter skate (*Leucoraja ocellata*) are most abundant in the Georges Bank and Southern New England offshore regions, with few fish caught in the Gulf of Maine or Mid-Atlantic regions. Little skate (*Leucoraja erinacea*) are abundant in the inshore and offshore areas in all regions of the northeast USA coast, but are most abundant on Georges Bank and in the Southern New England region.

Barndoor skate are most abundant in the Gulf of Maine, Georges Bank, and Southern New England offshore regions, with very few fish caught in inshore (<27m depth) waters or the Mid-Atlantic region. Historically barndoor skate were found in inshore waters to the tide-line, and in depths as great as 400m off Nantucket.

Thorny skate and smooth skate (*Malacoraja senta*) are most abundant in the Gulf of Maine and Georges Bank offshore regions, with very few fish caught in inshore (<27m depth) areas, and in the Southern New England and Mid-Atlantic regions. Clearnose skate (*Raja eglanteria*) and rosette skate (*Raja garmani*) are most abundant in the Mid-Atlantic region, with very few fish caught in Southern New England and no fish caught in other regions.

Spiny dogfish (*Squalus acanthius*) migrate from offshore southern waters (south of Georges Bank) to the Gulf of Maine and into Canadian waters as far north as Newfoundland in the summer and autumn.

Biomass: Absolute biomass and recruitment estimates for elasmobranch species are not available for any Subarea. However, relative biomass and abundance indices were available for Subareas 3, 5 and 6. Survey biomass indices for thorny skate showed increasing trends in recent years in Subarea 3 but has declined to historic lows in Subareas 5+6.

For the aggregate skate complex in Subareas 5 and 6, biomass remained relatively constant from 1963 to 1980, then increased significantly to peak levels in the mid-to late-1980s. The index of skate complex biomass then declined steadily until 1994, but recently began to increase again. The large increase in skate biomass in the mid- to late-1980s was dominated by winter and little skate. The biomass of large-bodied skates (>100 cm maximum length; barndoor, winter, and thorny) has steadily declined since the mid-1980s and the recent increase in aggregate skate biomass has been due to an increase in small-bodied skates (<100 cm maximum length; little, clearnose, rosette, and smooth). All large-bodied skates (winter, barndoor, and thorny) and all primary skate species in the Gulf of Maine (thorny and smooth) are currently at low biomass.

Biomass of spiny dogfish in Subareas 5+6 increased from the late-1970s to the early-1990s, but has declined over the past 5 years. This change is largely due to a decline in mature female (>80 cm) biomass.

Fishery and Catches: There are directed fisheries for skate in Subareas 3, 4, 5 and 6. An unregulated non-Canadian directed fishery outside 200 miles began in Div. 3N in 1985 and a regulated directed Canadian fishery began inside 200 miles in Div. 3LNO and Subdiv. 3Ps in 1994. Thorny skate is the targeted species in Subarea 3 with total catches in the order of 9 000 to 12 000 tons since 1997.

Thorny, winter skate and porbeagle (*Lamna nasus*) are fished in Div. 4V. This fishery is regulated through quota controls established by Canada.

A number of skate species are harvested in Subareas 5 and 6. Composition varies by area but catches are primarily dominated by winter skates and little skates in most areas. Average catches in the mid-1980s increased to 5 000 tons, mostly due to by-catch in USA fisheries. In the late-1980s, an unregulated directed fishery for skates (primarily large skate wings) developed and catches increased to 13 000 tons. Total catches for the skate complex in Subareas 5 and 6 reached a peak in 1998 at 17 000 tons due to a demand for bait and were comprised mainly of smaller bodied species.

Catches of spiny dogfish in Subareas 2-6 increased from very low levels in the early-1960s to an average of 24 000 tons in the 1970s. Catches then declined to by-catch levels in the mid-1980s, but

increased sharply, reaching 28 300 tons in 1996 before declining through the late-1990s. The fishery directed towards spiny dogfish in Subareas 5 and 6 is presently under regulation.

Elasmobranchs such as thorny skate, Arctic skate, barndoor skate, Greenland shark, and black dogfish (*Centroscyllium fabricii*) are also taken as by-catch in other fisheries in Subareas 0 to 6.

RESEARCH ACTIVITIES AND COORDINATION

Scientific Surveys

Very limited surveys were conducted during 2000 in the NAFO Regulatory Area, mostly by the Coastal States (Canada, Denmark-Greenland and USA), and the European Union (groundfish survey in Subarea 3). The USA research vessels were deployed in Subarea 4-6 (in 200-mile zone). The summary of biological surveys and sampling is presented in the Scientific Council Report (SCS Doc. 00/24, pp. 61-66).

CWP (Coordinating Working Party on Fishery Statistics) Meeting, 10-11 February 2000

The discussions centred on a proposal from the CWP 18th Session to produce a CD-ROM of Integrated Catch Statistics using the FAO FISHSTAT Plus software. It was agreed that this CD-ROM would integrate the STATLANT A data (or their equivalent) from Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR), Fisheries Committee for the Eastern Central Arctic (CECAF), Fisheries and Agriculture Organisation (FAO), General Fisheries Council for the Mediterranean (GFCM), International Commission for the Conservation of Atlantic Tunas (ICCAT), International Council for the Exploration of the Sea (ICES) and NAFO and that, in selecting data for this integrated data file, priority would be given initially to ICCAT data (for tuna species), then regional agency data and finally to FAO data. As well as the integrated data-file the CD-ROM would contain the individual data-bases of the agencies. It was anticipated that the draft CD-ROM version would be available in time for the NAFO Annual Meeting in September 2000, for review and comments by NAFO members.

Internet Site for Statistical Data

D. Cross (EU) reported on collaboration between NAFO, EUROSTAT and FAO in reformatting the NAFO STATLANT 21A data files for preparing a user-friendly database for consultation on the NAFO website. The FAO FISHSTAT Plus software was used to demonstrate a preliminary version of the software which, when fully developed, would be made available for down-loading from the NAFO internet site. STACREC welcomed this development which was considered to be a useful extension of services to data users and thanked EUROSTAT and FAO for their collaboration in this work.

Interagency Data Harmonization (NAFO/FAO)

The Assistant Executive Secretary reported that although in the last year there had been no formal exercise to detect discrepancies between the NAFO and FAO databases, the close collaboration between the two organisations and the exchange of data between them has contributed significantly to the harmonisation of the data. The development of the FISHSTAT Plus database is also enhancing this process.

Joint NAFO-ICES Working Group on Harp and Hooded Seals

The Council was presented with a status report on the Northwest Atlantic Harp Seals by G. Stenson (Canada). An assessment of the status of harp seals in the Northwest Atlantic was carried out by the National Marine Mammal Peer Review Committee (Canada) in April 2000. Marine Mammal scientists from Canada, the United States and Greenland participated. The Committee reviewed recent data on removals, reproductive rates and estimates of pup production obtained from surveys carried out in 1999. They also reviewed the results of a population model that incorporated information from all of these sources to estimate population trajectories for the period 1960-2000.

Northwest Atlantic harp seals are harvested in Canadian and Greenland waters. After a period of reduced catches during 1983-95, reported Canadian catches increased significantly to between 240 000 and 280 000 since 1996. Greenland catches have increased steadily since the mid-1970s and are currently estimated to be over 100 000. Total removals of harp seals was estimated by including reported catches, estimates of by-catch in the Newfoundland lumpfish fishery and estimates of seals killed but not recovered during the harp seal hunts in Canada and Greenland. Total removals have been relatively stable since 1997, at around 465 000 seals annually.

Pregnancy rates of harp seals in the Northwest Atlantic have varied considerably since the 1950s. The percentage of mature females that were pregnant increased from the mid-1950s (85%) to the mid-1960s (95%). It then dropped from approximately 90% in the early-1980s to only 70% during the early-1990s. It appears to have increased slightly (72%) in the mid-1990s. The age at which females become sexually mature has also changed. In the early-1950s the average age at which they matured was 5.8 years, whereas in the early-1980s it was 4.6 years. By the mid-1990s it had increased to approximately 5.6 years.

The most recent estimate of harp seal pup production in the Northwest Atlantic was obtained from surveys conducted by Canada in March 1999. Extensive reconnaissance flights were carried out to find the whelping concentrations and monitor their movements. Both visual and photographic surveys were conducted to estimate pup production. The total number of pups born was estimated to be approximately $998\ 000 \pm 200\ 000$.

The population model indicates that the harp seal population declined during the 1960s, reached a minimum of less than 2 million in the early-1970s, and then increased steadily until 1996. Due to the large harvests in recent years, the population has been stable since then at the highest values in the time series. The total population in 2000 was estimated to be approximately 5.2 million with a 95% C.I. of 4.0- 6.4 million). The uncertainty associated with the estimates of pup production are accounted for in the confidence intervals. Additional uncertainty associated with the reproductive rates, total removals and the age of catches have not been included, and therefore these confidence intervals are underestimates of the total uncertainty.

Although an increase in pup production is apparent in both the model and survey estimates since the early-1980s, the population size has stabilized over the past four years due to large catches of young animals. The impact of these catches on pup production is expected to become apparent in coming years.

Estimates of prey consumption by harp seals in Div. 2J+3KL were presented to the June 1999 Meeting of the Scientific Council. Although consumption has not been recalculated using the new population estimates, it is not likely to differ significantly, since the recent estimates of population size are very close to the estimates used previously.

NAFO Fishery Statistics

List of countries that have not submitted STATLANT 21A and 21B data through 1994-98.

STATLANT 21A					STATLANT 21B				
1994	1995	1996	1997	1998	1994	1995	1996	1997	1998
USA	USA	USA	USA	Faroe Is. USA	USA	Faroe Is. USA	Faroe Is. USA	Faroe Is. USA	Faroe Is. USA

The Scientific Council regretted this situation, noting the work of the Scientific Council is seriously jeopardized and the publication of the Statistical Bulletin is seriously delayed, and **recommended** that the *Executive Secretary write to the national delegates of the USA and Denmark (in respect of Faroe Islands and Greenland) with reference to their obligations on the submission of data to NAFO and further recommended* that the *Scientific Council should prepare a document for submission to the General Council and the Fisheries Commission on the adverse effect the absence of the STATLANT 21A and 21B data was having on the work of the Scientific Council.*

NOMINATION AND ELECTION OF OFFICERS

Chairman of STACFEN

The election of all other Scientific Council officers will take place in June 2001. It was proposed that the present Chairman of STACFEN, M. Stein (EU-Germany) be requested to continue for one more year. The Council agreed to this proposal, and M. Stein agreed to continue, with the understanding that an election will take place in June 2001 to replace him.



Participants at Scientific Council Meeting, 1-15 June 2000 (Bottom to top – left to right):

A. Nicolajsen, A. Avila de Melo, S. Cerviño, H-J. Rätz,
 T. Amaratunga, H. Siegstad, H. Murua
 W. B. Brodie, W. Melle, P. Durán D. B. Atkinson, R. K. Mayo
 E. A. Colbourne, V. K. Babayan, K. Patterson, V. A. Rikhter, K. F. Drinkwater, M. Stein, J. C. Mahé
 D. Cross, A. Okhanov, C. Darby, V. N. Shibanov, E. Valdes, T. Dougherty-Poupore, D. Power, M. Treble, D. Rivard
 T. Ichii, A. Vaskov, K. A. Sosobee, C. Simonsen, R. Aploim, O. Jørgensen, W. R. Bowering, D. Stansbury

Missing from picture: N. G. Cadigan, E. G. Dawe, D. W. Kulka, G. R. Lilly, D. Maddock Parsons, M. J. Morgan, G. Stenson, S. J. Walsh, E. Trippel, F. Woodman, T. Saat, E. de Cárdenas, M. Botvinro, F. M. Serchuk, C. M. Jones, T. Jakobsen, H. Lassen, E. J. Molenaar, D. C. A. Auby, G. M. Moulton, B. L. Marshall, C. L. Kerr



Chairman of Standing Committees of Scientific Council:

M. Stein (Chairman STACFEN), W. B. Brodie (Chairman Scientific Council), H.-J. Rätz (Chairman STACFIS), O. A. Jørgensen (Chairman STACPUB) and R. K. Mayo (Chairman STACREC).



STACFIS members in session during the 1-15 June 2000 Meeting.

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NAFO SECRETARIAT

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

Annex 2. Agenda

- I. Opening (Chairman: W. B. Brodie)
 1. Appointment of rapporteur
 2. Adoption of agenda
 3. Attendance of observers
 4. Plan of work
 5. Review of LAN use at meetings
 6. Report of proxy votes (by Executive Secretary)
- II. Review of Scientific Council Recommendations in 1999
- III. Implementation of Precautionary Approach (PA)
 1. Review of results of 1999/2000 Meetings
 2. Future development
- IV. Fisheries and Environment (STACFEN Chairman: M. Stein)
 1. Opening
 2. Chairman's introduction; report on intersessional activities
 3. Invited lecture (W. Melle, IMR, Norway: "Climate-fish-plankton interactions")
 4. Review of environmental conditions
 - a) Marine Environmental Data Service (MEDS) Report for 1999
 - b) Review of environmental studies in 1999
 - i) Results from physical oceanographic studies
 - ii) Results from interdisciplinary studies
 - c) Overview of environmental conditions in 1999
 5. Formulation of recommendations based on environmental conditions in 1999
 6. Environmental indices (implementation in the assessment process; progress report)
 7. Russian/German data evaluation (ICNAF/NAFO data; status report)
 8. ICES/NAFO Symposium on Hydrobiological Variability, August 2001, Edinburgh, UK (progress; formulation of recommendations)
 9. National representatives
 10. Other matters
- V. Research Coordination (STACREC Chairman: R. Mayo)
 1. Opening
 2. Review of recommendations in 1999

3. Fishery statistics
 - a) Progress report on Secretariat activities in 1999/2000
 - 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)
 - v) Elasmobranch species
 - b) CWP Sessions 2000/2001
 - i) Report on the CWP Intersessional Meeting, Copenhagen, 10-11 February 2000
 - ii) CWP 19th Session, July 2001
 - Review of Agenda
 - New proposals
4. Research Activities
 - a) Biological sampling
 - i) Report on activities in 1999/2000
 - ii) Report by National Representatives on commercial sampling conducted
 - iii) Report on data availability for stock assessments (by Designated Experts)
 - b) Biological surveys
 - i) Review of survey activities in 1999 (by National Representatives and Designated Experts)
 - ii) Surveys planned for 2000 and early-2001
5. Report of Working Group on Biological Information Database Exchange (Cod in Div. 3NO)
6. Report of the Working Group on NAFO Observer Protocol
 - a) Protocol for scientific data on Pilot Observer Program
 - b) Format on data from Pilot Observer Program for Scientific Council purposes
7. Review of SCR and SCS Documents
8. Other matters
 - a) Tagging activities
 - b) Conversion factors
 - c) Comparative fishing between Canada and EU-Spain
 - d) Other business

VI. Publications (STACPUB Chairman: O. A. Jørgensen)

1. Opening
2. Review of recommendations in 1999
3. Review of STACPUB membership and chairmanship
4. Review of scientific publications since June 1999

- 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) Consideration of publication of 2000 Special Session papers
 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) Progress review of publication of 1999 Symposium
 8. Papers for possible publication
 - a) Review of proposals resulting from the 1999 Meetings
 - b) Review of contributions to the June 2000 Meeting
 9. Other matters
- VII. Fisheries Science (STACFIS Chairman: H.-J. Rätz)
1. Opening
 2. General review
 - a) Review of recommendations in 1999
 - 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 (Attachment 1)(Shrimp in Div. 3M and Div. 3LNO will be undertaken during Scientific Council Meeting 8-15 November, 2000):
 - Cod (Div. 3NO (monitor); Div. 3M)
 - Redfish (Div. 3LN (monitor); Div. 3M)
 - American plaice (Div. 3LNO (monitor); Div. 3M)
 - Witch flounder (Div. 3NO)
 - Witch flounder (Div. 2J+3KL (monitor))
 - Yellowtail flounder (Div. 3LNO)
 - Squid (Subareas 3 and 4) (see also Attachment 1, Item 3.f)
 - Greenland halibut (Subareas 2 and 3)

- Capelin (Div. 3NO)
 - Elasmobranchs (see Attachment 1, Item 6)
 - [Note also Attachment 1, Item 8 concerning catches and/or discards of juvenile fish]
- b) Stocks within the 200-mile fishery zone in Subareas 0 to 4, as requested by Canada (Attachment 2)
- Cod (Div. 2J+3KL)
 - [Note also Attachment 2, Item 4 on by-catch of yellowtail flounder in Div. 3LNO]
- c) Stocks within the 200-mile fishery zone in Subarea 1 and at East Greenland as requested by Denmark on behalf of Greenland (Attachment 3)(Northern shrimp in Denmark Strait and off East Greenland will be undertaken during Scientific Council Meeting, 8-15 November 2000):
- Redfish (Subarea 1) (monitor)
 - Other finfish (Subarea 1) (monitor)
- d) Stocks overlapping the fishery zones in Subareas 0 and 1, as requested by Canada and by Denmark (Greenland) (Attachments 2 and 3) (Northern shrimp in Subareas 0 and 1 will be undertaken during Scientific Council Meeting, 8-15 November 2000):
- Greenland halibut (Subareas 0 and 1) (see also Attachment 2, Item 1 on SA 0 and 1 separately, SA 2+Div. 3K, and Div. 3LMNO)
 - Greenland halibut (Subarea 0, Div. 1 offshore)
 - Greenland halibut (Div. 1 inshore)
 - Roundnose grenadier (Subareas 0 and 1) (monitor)
- e) Assessment of other stocks:
- Roughhead grenadier (Subareas 2 and 3)
4. Other matters
- a) New Designated Experts
 - b) Other business

VIII. Management Advice and Responses to Special Requests

1. Fisheries Commission (Attachment 1)

- a) Request for advice on TACs and other management measures for year 2001

Redfish in Div. 3M
 Yellowtail Flounder in Div. 3LNO
 Squid in Subareas 3 and 4
 Capelin in Div. 3NO
 Greenland Halibut in Subareas 2 and 3
 Elasmobranchs (Attachment 1, Item 6)

- b) Request for advice on TACs, and other management measures for the years 2001 and 2002

Cod in Div. 3M
 American plaice in Div. 3M
 Witch flounder in Div. 3NO

- c) Special requests for management advice
- i) Precautionary measures (Attachment 1, Item 4)
 - ii) Squid in Subareas 3+4 (Attachment 1, Item 3 f)
 - iii) Catches and/or discards of juvenile fish (Attachment , Item 8)
- d) Monitoring of stocks for which multi-year advice was provided in 1999

Cod in Div. 3NO, Redfish in Div. 3LN, American plaice in Div. 3LNO, Witch flounder in Div. 2J+3KL

2. Coastal States (Attachments 2 and 3)

- a) Request by Canada for advice:

Cod in Div. 2J +3KL (Attachment 2, Item 3)
 By-catch of Yellowtail flounder in Div. 3LNO (Attachment 2, Item 4)

- b) Request by Denmark (Greenland) for advice:

Redfish in Subarea 1 (monitor)
 Other finfish (monitor)
 Roundnose grenadier in Subarea 0+1 (monitor)

- c) Request by Canada and Denmark (Greenland) for advice on TACs and other management measures:

Greenland halibut in Subareas 0+1

3. Scientific advice from Scientific Council on its own accord

Roughhead grenadiers in SA 2+3

IX. Future Scientific Council Meetings 2000 and 2001

1. Scientific Council Meeting and Special Session, September 2000
2. Scientific Council Meeting, November 2000 (assessment of shrimp stocks)
3. Scientific Council Meeting, June 2001
4. Scientific Council Meeting and Symposium, September 2001
5. Scientific Council Meeting, November 2001 (assessment of shrimp stocks)

X. Arrangements for Special Sessions

1. Progress report on Special Session in 2000: Workshop on Assessment Methods (Co-conveners: D. Rivard and C. Darby)
2. Progress report on ICES/NAFO Symposium on Hydrobiological Variability in August 2001
3. Progress report on Special Session in 2001: Symposium on "Deep Sea Fisheries"
4. Topic for Special Session in 2002

XI. Report of the Working Group on Reproductive Potential (Chairman: E. A. Trippel)

XII. Nomination and Election of Officers

1. Chairman STACFEN

XIII. Review of Scientific Council working procedures/protocols

- a) Adapting the form of advice to PA requirements
- b) NAFO Scientific Council observership at ICES ACFM meetings
- c) STACPUB membership: elections
- d) Review of proposed NAFO millennium publication "NAFO Century book"

XIV. Other Matters

- a) Report on FAO ACFR Working Party on Status and Trends of Fisheries, Nov/Dec 1999
- b) Report on NAFO intersessional meetings
- c) Participation at ICES ACFM meetings 1999-2000
- d) Joint NAFO-ICES Working Group on harp and hooded seals
- e) Other business

XV. Adoption of Committee Reports

- a) STACFEN
- b) STACREC
- c) STACPUB
- d) STACFIS

XVI. Scientific Council Recommendations to General Council and Fisheries Commission

XVII. Adoption of Scientific Council Report

XVIII. Adjournment

Attachment 1. Fisheries Commission's Request for Scientific Advice on Management in 2001 of Certain Stocks in Subareas 3 and 4, Including Supplementary Questions on Division 3M Shrimp for 2000

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 2000 Annual Meeting, provide advice on the scientific basis for the management of the following fish and invertebrate stocks or groups of stocks in 2001:

Redfish (Div. 3M)
 Yellowtail flounder (Div. 3LNO)
 Squid (Sub-areas 3 and 4)
 Shrimp (Div. 3M)
 Greenland halibut (Subareas 2 and Div. 3KLMNO)
 Capelin (Div. 3NO)

2. The Fisheries Commission with the concurrence of the Coastal State as regards the stocks below which occur within its jurisdiction, requests that the Scientific Council, 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, all stocks were assessed in 1999 but advice pertained to different time periods to allow the introduction of the new scheme over time. Consequently:

- In 1999, advice was provided for 2000 and 2001 for American plaice in 3LNO, witch flounder in 2J3KL, cod in 3NO and redfish in 3LN. The next assessment of these stocks will thus be conducted in 2001.
- In 2000, advice will be provided for 2001 and 2002 for cod in 3M, American plaice in 3M and witch flounder in 3NO. 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_{1999} and F_{max} in 2001 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 2001 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 Subareas 3 and 4 is a short-lived species such that a change in productivity regime could be sudden. The Scientific Council is requested to develop an in-season indicator of productivity level based on results from the annual July survey of the Scotian-Shelf and any other source of data. If it is not considered possible to develop an in-season indicator, the Scientific Council is requested to comment on the research that would be required to develop such an indicator. The Scientific Council is also requested to review the protocol outlined in FC Working Paper 99/18 and to advise on possible modifications to ensure its applicability on the long term, including a level of TAC which would be applicable during the high productivity regime.
4. 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 2000 report, the following information for the 2000 Annual Meeting of the Fisheries Commission for stocks under its responsibility requiring advice for 2001, or 2001 and 2002, as per Section 2 (i.e. cod in 3M, American plaice in 3M, yellowtail flounder in 3LNO, witch flounder in 3NO, redfish in 3M, Greenland halibut in SA 2+3KLMNO, 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 (when precautionary reference points cannot be determined directly, proxys should be provided);
 - 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;
 - d) any other aspect of Article 6 and Annex II of the Agreement which the Scientific Council considers useful for implementation of the Agreement's provisions regarding the precautionary approach to capture fisheries;
 - e) propose criteria and harvest strategies for re-opening of fisheries and for new and developing fisheries; and
 - f) to work toward the harmonization of the terminology and application of the precautionary approach within relevant advisory bodies.
5. 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 and seasonal distribution inside and outside the NAFO Regulatory Area; and
 - d) provide information on annual yield potential for this stock.
6. The Scientific Council is requested to summarize all available information from the Convention Area on catches of elasmobranchs, by species and by the smallest geographical scale possible. The Scientific Council is requested to review available information from research vessel surveys on the relative biomass and geographic distribution of elasmobranchs by species, and to quantify the extent of exploitation on these resources. Further, the Scientific Council is requested to initiate work leading to the development of precautionary reference points.
7. The Scientific Council is requested at its November 11-17, 1999 meeting to evaluate, on the basis of the best data available, whether the provision for a Div. 3M shrimp closure in FC Working Paper 99/16 would be a precautionary approach-based measure and if so, whether proposed area and timing of the closure are appropriate.
8. The Scientific Council is requested to compile and review all information on catches and/or discards of juvenile fish in the various NAFO fisheries. The Scientific Council is requested to

describe and evaluate the effectiveness of additional technical management measures aiming at reducing catches of juvenile fish and male shrimp in the various NAFO fisheries.

*With respect to elements 3 and 4, the Scientific Council is advised that additional or revised requests may arise from the next meeting of the joint FC-SC Working Group on the Precautionary Approach.**

* [Note: Meeting was held 29 February-2 March 2000.]

ATTACHMENT 2. CANADIAN REQUEST FOR SCIENTIFIC ADVICE ON MANAGEMENT IN 2001 OF CERTAIN STOCKS IN SUBAREAS 0 TO 4

1. Canada requests that the Scientific Council, at its meeting in advance of the 2000 Annual Meeting of NAFO, subject to the concurrence of Denmark (on behalf of Greenland) provide advice on the scientific basis for management in 2001 of the following stocks:

Shrimp (Subareas 0 and 1)
Greenland halibut (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 (on behalf of Greenland) as regards Subarea 1, to provide an overall assessment of status and trends in the total stock throughout its range and comment on its management in Subareas 0+1 for 2001. 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.

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-type assessments, the status of the stock should be reviewed and management options evaluated in terms of their implications for fishable stock size in both the short- and long-term. The implications of no fishing as well as fishing at $F_{0.1}$ and F_{1999} in 2001 and subsequent years should be evaluated in relation to precautionary reference points of both fishing mortality and spawning stock biomass. The present stock size and spawning stock size should be described in relation to those observed historically and those to be expected in the longer term under this range of fishing mortalities, and any other options Scientific Council feels worthy of consideration under a precautionary framework.

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

should be given. Uncertainties in the assessment should be evaluated and presented in the form of risk analyses related to B_{lim} (B_{buf}) and B_{target} , and F_{lim} (F_{buf}) and F_{target} .

- b) For those stocks subject to general production-type assessments, the time series of data should be updated, the status of the stock should be reviewed and management options evaluated in the way described above to the extent possible. Management options should be within the precautionary framework.
- c) For those resources for which only general biological and/or catch data are available, few standard criteria exist on which to base advice. The stock status should be evaluated in the context of management requirements for long-term sustainability and management options evaluated in the way described above to the extent possible. Management options should be within the precautionary framework.
- d) Presentation of the results should include the following:
 - I. For stocks for which analytical-type assessments are possible:
 - A graph of historical yield and fishing mortality for the longest time period possible;
 - A graph of spawning stock biomass and recruitment levels for the longest time period possible;
 - Graphs and tables of catch options for the year 2001 and subsequent years over a range of fishing mortality rates (F) at least from $F = 0$ to $F_{0.1}$ including risk analyses;
 - Graphs and tables showing spawning stock biomass corresponding to each catch option including risk analyses;
 - Graphs showing the yield-per-recruit and spawning stock per recruit values for a range of fishing mortalities.
 - II. For stocks for which advice is based on general production models, the relevant graph of production on fishing mortality rate or fishing effort.

In all cases, the three reference points, actual $F = 0$, actual F , and $F_{0.1}$ should be shown.
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. Noting the increase in by-catch of 3LNO yellowtail flounder in other fisheries, in particular the skate fishery, the Scientific Council is requested to comment on the potential impacts of these by-catches on the long-term sustainability of the yellowtail flounder resource.

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

**ATTACHMENT 3. DENMARK (GREENLAND) REQUEST FOR SCIENTIFIC
ADVICE ON MANAGEMENT IN 2001 OF CERTAIN STOCKS IN SUBAREAS 0 AND 1**

1. In the Scientific Council Report of 1999, scientific advice on management of redfish (*Sebastes* spp.) and other finfish in Subarea 1 was given for 2000 and 2001. Also, advice for Roundnose grenadier in Subareas 0+1 was given as a 3-year advice (for 2000, 2001 and 2002).

Denmark, on behalf of Greenland, requests the Scientific Council to continue to monitor the status of these stocks annually and, should significant change in stock status be observed (e.g. from surveys), the Scientific Council is requested to provide an 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 Greenland halibut overlapping Subareas 0 and 1.

For Greenland halibut in Subareas 0 and 1, the analyses on which management advice will be based, the following should be included:

In its 1993 report, the Scientific Council 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 in Subarea 1 was unknown. The Council is therefore asked to provide advice on the following topics:

- a) allocation of TACs to Subarea 0 and Subarea 1 offshore.
 - b) allocation of TAC for Subarea 1 inshore.
3. Denmark, on behalf of Greenland, further requests the Scientific Council of NAFO before December 2000 to provide advice on the scientific basis for management of Northern shrimp (*Pandalus borealis*) in Subareas 0 and 1 in year 2001, 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.

On behalf of The Ministry of Industry
Jørn Birk Olsen
Director

WORKSHOP ON ASSESSMENT METHODS

(Hosted by the Scientific Council of the Northwest Atlantic Fisheries Organization (NAFO))
13-15 September 2000

The Scientific Council Special Session, "*Workshop on Assessment Methods*", was held at the Boston Back Bay Hilton, Boston, Massachusetts, United States of America, with co-conveners D. Rivard (Canada) and C. Darby (EU-United Kingdom) during 13-15 September 2000. R. K. Mayo (USA) also played a key role in the preparation of this Workshop and the presentation of tutorials. There were 31 participants from Canada, Denmark (in respect for Greenland and Faroe Islands), European Union (Portugal, Spain and United Kingdom), Japan, Russia Federation and the United States of America. (Annex 1)

This Workshop was designed to provide an opportunity for the members of Scientific Council to explore assessment techniques and the various tools available for their application with emphasis on tools to perform age-structured analyses and stock abundance estimations, calculate reference points in the context of the Precautionary Approach and carry out risk analyses.

The following assessment techniques and methods were on the table:

1. Age-structured Analyses and Stock Abundance Estimation

- Lowestoft Tuning Suite: introduction-principles of VPA tuning (SCR Doc. 00/61); Separable VPA (SCR Doc. 00/62); Laurec-Shepherd tuning method (SCR Doc. 00/63); Extended survivor analysis (SCR Doc. 00/64).
- Integrated Catch Analysis (ICA)
- Adaptive Framework (ADAPT): Introduction to ADAPT VPA tuning; Woods Hole Fishery Assessment Compilation Toolbox (FACT) version (SCR Doc. 00/69); St. Andrews (S. Gavaris) version (SCR Doc. 00/56)

2. PA Reference Points

- FISHLAB: provides a series of functions for use in Excel for simulations and sketching assessment problems. FISHLAB is a set of fisheries tools developed at the Centre for Environment, Fisheries and Aquaculture Science (CEFAS) with partial funding by the European Union.
- PA software: The software was developed at CEFAS to enable ICES working groups to estimate limit and precautionary reference points for fishing mortality and spawning.

3. Risk Analyses

- Long-term Simulations Based on Excel Spreadsheets Using @Risk (SCR Doc. 00/59): This session was intended as a tutorial to explore risk analyses using spreadsheets. The tutorial used @Risk (Anon., 2000a), an Add-in to the Excel spreadsheet software (Anon., 2000b) to add risk analysis capabilities to models. The Add-in provides a framework to handle probability distributions for any variable or input parameter to a model. It also provides tools to analyze the distribution of the results, i.e. any calculated field (or cell) dependent upon your input.

- Woods Hole AgePro Stochastic Simulations (AGEPRO) (SCR Doc. 00/70): The AGEPRO program performs stochastic projections of the abundance of an exploited age-structured population over a time horizon of up to 25 years. The primary purpose of the AGEPRO model is to characterize the sampling distribution of key fishery system outputs such as landings, spawning stock biomass, and recruitment under uncertainty. The acronym "AGEPRO" indicates that the program performs age-structured projections in contrast to size- or biomass-based projection models. In this framework, the USER chooses the level of harvest that will be taken from the population by setting quotas or fishing mortality rates in each year of the time horizon.
- ADAPT-based Short-term Projections: This tutorial explored the functions available within the St. Andrews implementation of the ADAPTive framework to carry out stock forecasts and analyses of the risks associated with various scenarios. This implementation provides for two types of projections: deterministic and stochastic. Deterministic projections make forecasts of stock characteristics from the point estimates of stock abundance and from fishery scenarios that are specified by the user. Stochastic projections make forecasts using the point estimates as well as a measure of their precision. The measure of precision can either be obtained analytically, or through a bootstrap procedure.
- Lowestoft Projection Software: Projection software currently under development at Lowestoft was presented. This software integrates in a single environment the functionality of a number of programs used by ICES Working Groups to perform medium-term projections. The software was designed to be used in conjunction with the Lowestoft VPA tuning programs and offers features that are similar to the other projection programs explored during this Workshop.

Discussion

The Workshop aimed not only at showing how the various software programs work but also at establishing good working practices to analyze the results. Discussion sessions were held throughout the Workshop. They served to clarify technical questions on the use of the software programs and to discuss common practices in stock assessment.

It was noted that the age-structured models explored during this workshop are based on the same population dynamics equations. However, the estimation problem (i.e. the problem of estimating population abundance in the most recent year) is defined differently in each of these models. The differences mainly lie in the assumptions (or constraints) that are imposed to reduce the number of parameters. When these methods are applied using (or forcing) similar assumptions, they essentially give similar results. The fact is that in their default mode, different methods make widely different assumptions to facilitate the estimation of stock abundance within their estimation framework. Some of the assumptions can free up parameters.



Scientific Council Workshop on Assessments Methods, 13-15 September 2000, Boston, Massachusetts, USA (L to R)

Back Row: R. Aploim, D. Maddock Parsons, E. F. Murphy, D. E. Stansbury, O. A. Jørgensen, L. Motos, D. Power, H. Murua, A. Avila de Melo, M. J. Morgan, M. A. Showell, V. K. Babayan, V. N. Shibanov, H. Okamura, T. Amaratunga

Middle Row: B. Healy, L. C. Hendrickson, W. R. Bowering, Á. Nicolajsen, M. A. Treble, E. de Cárdenas, P. A. Shelton, D. B. Atkinson, D. C. A. Auby

Front Row: S. J. Walsh, S. Cerviño, R. K. Mayo, C. Darby, D. Rivard, W. B. Brodie, A. Vazquez, S. Junquera



Co-Conveners of Workshop: D. Rivard (Canada), C. Darby (EU-United Kingdom), R. K. Mayo (USA)



Participants in session during Workshop on Assessment Methods.

Annex 1. List of Participants

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Scientific Council Annual Meeting
18-22 September, Boston, Massachusetts, USA

Chairman: W. B. Brodie (Canada)

Rapporteur: T. Amaratunga, Assistant Executive Secretary

The Scientific Council met at the Boston Back Bay Hilton, 40 Dalton Street, Boston, Massachusetts, USA, during 18-22 September 2000. Representatives attended from Canada, Denmark (in respect of Faroe Islands and Greenland), European Union (France, Germany, Portugal and Spain), Estonia, Japan, Russian Federation and the United States of America (Annex 1).

The Agenda was adopted (Annex 2).

Brief summary of the Standing Committee Reports and other matters considered by the Scientific Council are given below.

FISHERY SCIENCE

Shrimp (*Pandalus borealis*) in Division 3M

Concern was expressed during the course of the Meeting about the appropriateness of the advice for 2001 on shrimp in Div. 3M, which was provided by the Scientific Council in November 1999. The concern was based on the fact that the catch in 1999 considerably exceeded the TAC advised for 1999 (GC Doc. 00/03) and the provisional catch figures indicate that the TAC advised for 2000 would also be exceeded (FC Working Paper 00/5). It was noted that the TAC advice provided by the Scientific Council since 1996 has always been exceeded and that the management of the stock is based on effort control. Consequently, any technical changes to improve the effectiveness of the fishing activities (bigger vessels, twin- and triple trawling) will lead to unforeseeable increases in catches. It was noted the Scientific Council will re-evaluate its advice for 2001 for shrimp in Div. 3M at the November 2000 Scientific Council shrimp assessment meeting.

Estimates of recruitment and exploitable biomass currently derived from surveys conducted by EU-Spain and EU-Portugal and Faroese vessels on the Flemish Cap are highly uncertain.

The Meeting stressed that the precision of the stock assessment and the derived prediction of biomass and catches will not be improved until a survey directed towards shrimp on Flemish Cap is established which will provide indices of shrimp recruitment and of the size of the exploitable stock.

**SPECIAL REQUESTS FROM THE ANNUAL
FISHERIES COMMISSION MEETING**

1. Greenland Halibut Depth Distribution and Protection of Juveniles

The Scientific Council was requested to evaluate:

"The biomass of Greenland halibut available to the commercial fishery over the whole distribution area of this species, in depth strata of 0-99 m, 100-199 m, 200-299 m, 300-399 m, 400-599 m, 600-799 m and 800-1,000 m. It was further specified that separate values should be provided for: a) Fish above and below the length of 50% maturity and b) Fish above and below the current minimum landing size."

Data from Canadian surveys (1995-1999)

	Depth Range (m)							
	0-50	51-100	101-150	151-200	201-250	251-300	301-350	351-400
Biomass (tons)	0	3 820	2 416	6 100	20 994	41 181	55 237	72 565
% of Biomass	0.00%	0.59%	0.37%	0.94%	3.24%	6.36%	8.52%	11.20%

	Depth Range (m)							
	401-450	451-500	501-600	601-700	701-800	801-900	900-1000	1001-2000
Biomass (tons)	133 708	41 731	29 892	15 068	17 508	19 247	15 269	173 257
% of Biomass	20.63%	6.44%	4.61%	2.33%	2.70%	2.97%	2.36%	26.74%

Data from EU-Spanish surveys (1999)

Year	Biomass	SSB	%	Percentages of SSB by depth strata (m)								
				0-99	100-199	200-299	300-399	400-599	600-799	800-999	1000-1199	1200-1600
1996	34 246	8 124	24	0	0	0	0	0	4	74	22	ns
1997	71 000	21 731	31	0	0	0	0	0	0	9	90	ns
1998	147 864	33 657	23	2	2	0	0	0	3	35	28	29
1999	121 043	31 664	26	0	0	0	0	0	5	16	42	36

ns – not surveyed

2. Long-term Effects on the Greenland Halibut Stock of Increasing Mesh Size

The Fisheries Commission requested the Scientific Council to: *provide information on the long-term effects on the Greenland halibut stock (biomass and yield) of increasing mesh size from 130 mm to 145 mm.*

Scientific Council was unable to answer this question at the present time and will consider this issue during the next meeting of the Scientific Council in June 2001.

3. New Pelagic Fishery for Oceanic Redfish in NAFO Regulatory Area (Div. 1F)

The Fisheries Commission requested the Scientific Council to: *provide information regarding the new pelagic fishery for oceanic redfish in the NAFO Regulatory Area (Div. 1F) as follows:*

In responding to the requests below, the Scientific Council noted that the assessment of the oceanic redfish stock in ICES areas is conducted annually in May by the ICES Northwestern Working Group. The ICES advice on management of this stock is provided to NEAFC.

- a) *"Description of the geographical distribution and stock structure of oceanic redfish."*

The Scientific Council responded that, since the initiation of systematic surveys of the oceanic redfish distribution in the early-1990s, the stock was found to be distributed in the NEAFC Convention Area in ICES Div. Va, XII and XIV. Any previous survey information available for the NAFO Convention Area has never been considered in the assessment of the stock. Until 1999, directed fishing activities have occurred almost exclusively in the NEAFC Convention Area. During the most recent international survey conducted in 1999, the stock was found distributed to a great extent inside the NAFO Regulatory Area (Div. 1F, see Fig. 1). In 2000, there has been reported significant fishing activities directed towards oceanic redfish in NAFO Div. 1F for the first time. Scientific Council considers the oceanic redfish distributed in the NAFO Div. 1F as a part of the oceanic redfish stock previously being distributed inside the NEAFC Convention area where it is currently managed as a single stock unit. However, the stock structure (one or more stock units) remains unclear and scientific work is ongoing addressing this question.

- b) *"Biomass of oceanic redfish in NAFO Div. 1F."*

The Scientific Council responded that, it is unable to provide absolute or relative estimates of the oceanic redfish biomass in NAFO Div. 1F during the course of this September 2000 Meeting. The Scientific Council would be able to assess such a figure in June 2001 for the year 1999 given the databases available.

- c) *"Advise on appropriate mesh size regulation for the pelagic fishery directed towards oceanic redfish in NAFO Div. 1F."*

In response the Scientific Council noted that, there is at present no mesh size regulation for the pelagic fishery directed towards oceanic redfish in the NEAFC Regulatory Area. This is due to the fact that the biomass consists almost exclusively of adult redfish as the juveniles are distributed outside the fishing grounds. Inside the NAFO Regulatory Area there is, however, the use of a minimum mesh size of 130 mm obligatory for trawl fisheries including those for redfish. Scientific Council considers that any proposed changes in mesh size regulations for a portion of the NAFO Regulatory Area, regardless of species, is a regulatory issue and should therefore be addressed by NAFO Fisheries Commission.

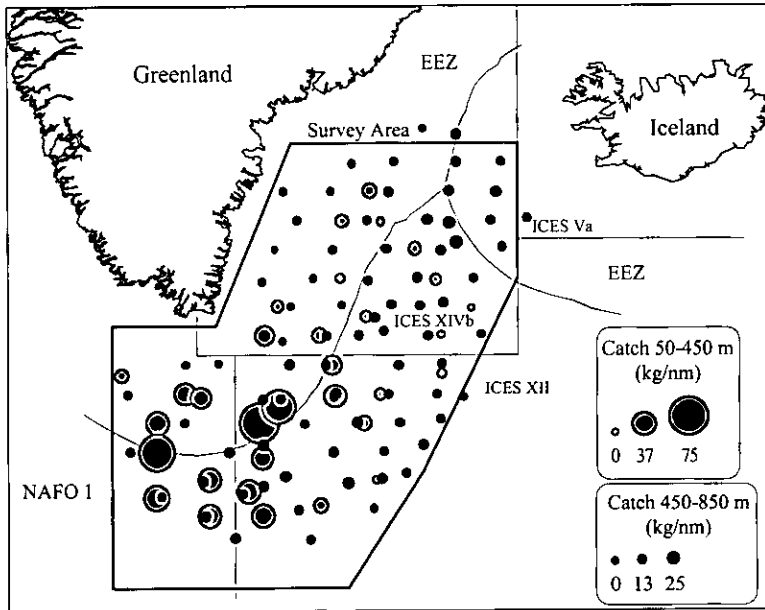


Fig. 1. Distribution area of oceanic (pelagic) redfish (*Sebastes mentella* Travin) in NEAFC and NAFO Convention Areas. Results of survey catches from the June-July 1999 international hydro-acoustic survey with participation of Iceland, Russia and EU-Germany.

4. Cod Stock in Divisions 2J+3KL

- a) *The use made of information from a) the index fishery; b) the sentinel fishery in the assessment of Div. 2J and 3KL cod; c) the food/recreational fishery*

In summary, data from the sentinel fisheries, index fisheries and food fisheries are being used as part of the assessment in developing catch-at-age matrices, maturity ogives, fish condition indices and CPUE indices for the inshore components. The catches in these fisheries also enable the conduct of the very critical mark-recapture work that has given estimates of exploitation on the inshore components as well as estimates of the biomass. Overall, the limited fisheries in the inshore area provide invaluable information that form a critical part of the resource assessment.

- b) *The state of the stock of Div. 2J and 3KL cod and the impact of a fishery at a level of 7 000 tons in 2000, with respect to precautionary criteria as proposed by Scientific Council, and reference points previously used for management of this stock.*

With respect to the Precautionary Framework of Scientific Council, it is noted that there have been no biological reference points determined for this stock. However, it is considered that the Div. 2J and 3KL cod resource overall is such that no fishing mortality would be recommended. This is the course of action, under the Scientific Council PA Framework, that would be recommended when the spawning stock biomass is below B_{buf} . The reference point used historically for Div. 2J and 3KL cod was $F_{0.1}$ (18% exploitation rate) that corresponds to a fishing mortality considered to be conservative in relation to reference points used in other parts of the world.

Canada has implemented a number of conservation measures that may be considered to be consistent with the Scientific Council interpretation of the Precautionary Approach as well as representative of supportive management measures under a Precautionary Approach as reported during the Joint Scientific Council/Fisheries Commission Working Group meetings as part of a carefully controlled fishery.

- c) *The effect of fisheries of the order of 7 000 tons to 9 000 tons on the prospective recovery of the Div. 2J and 3KL cod.*

It was not possible to carry out in depth analyses during this meeting. Preliminary analyses that were conducted clearly indicated that the rate of recovery of the Div. 2J and 3KL cod stock is highly sensitive to future natural mortality relative to fishing mortality.

- d) *The proportion of juvenile fish taken by the various gears in the inshore fishery.*

The Council responded that, the proportion of juvenile and mature cod in the total catch (numbers in '000s) of the inshore fishery for the period 1995-99 for all gears combined was as follows:

Year	Catch	Mature Abundance	Juvenile Abundance	Fishery
1995	197	78%	22%	Sentinel fishery
1996	1 076	61%	39%	Sentinel + Food/Recreational
1997	251	74%	26%	Sentinel
1998	2 125	82%	18%	Sentinel + Food/Recreational + Index
1999	3 596	81%	19%	Sentinel + Food/Recreational + Commercial

The proportion of juvenile and mature cod in the total catch of the inshore fishery in 1997, 1998 and 1999 by individual gear was as follows:

1997	All gears	Gillnet	Line trawl	Handline	Trap
Mature	74%	82%	58%	64%	63%
Juvenile	26%	18%	42%	34%	37%
Catch in No. ('000)	251	166	38	11	35
1998	All gears	Gillnet	Line trawl	Handline	Trap
Mature	82%	90%	77%	66%	79%
Juvenile	18%	10%	23%	34%	21%
Catch in No. ('000)	2 125	1 038	742	307	33
1999	All gears	Gillnet	Line trawl	Handline	Trap
Mature	81%	85%	62%	67%	59%
Juvenile	19%	15%	38%	33%	41%
Catch in No. ('000)	3 596	2 927	101	563	6

- e) *The implications of concentrated fishing on local aggregations for the preservation of the genetic biodiversity of the stock.*

For the 2000 fishery, and as indicated above, Canada developed the protocols for the prosecution of the limited inshore fishery based on consultation with assessment

scientists in order to ensure that the best possible information is collected for assessment purposes. The primary concern for scientists was the distribution of the index fishery harvest over space and time. This distribution is required to enable reliable estimation of exploitation rates (and thus stock size) through analysis of tagging data. This was also considered to ensure that there would not be overexploitation of any one stock component.

Resultant management measures included:

- Two separate fishing seasons – one in July and one in early autumn – to spread fishing effort over time.
- Restrictions on areas fished to spread fishing effort over space. Fishers were restricted to their NAFO Division of residence. Division 3L was further subdivided into fishing areas.
- Implementation of individual index quotas for each fisher to further ensure distribution of catch throughout the area.
- Closure of areas of high density of potentially spawning cod (Smith Sound).

All of these will act together to better preserve genetic biodiversity of the various stock components.

FUTURE SPECIAL SESSIONS

- a) The Council noted that the Hydrobiological Variability Symposium will be held during 6-10 August 2001 in Edinburgh, Scotland. It was noted that the Steering Committee included M. Stein (STACFEN Chairman), who will lead the subject-area "Physical Oceanography and Fisheries of West Greenland and NW Atlantic, and Interface with NAFO", and K. Drinkwater (Canada) was on the editorial board for the publication of the Symposium proceedings. NAFO agreed to contribute CDN \$8 000 to cover partial costs of conducting this ICES Symposium.
- b) The Symposium on "Deep-sea Fisheries" will be held during 12-14 September 2001 in conjunction with the 23rd Annual Meeting of NAFO in Cuba. It was recognized that the co-conveners J. Moore (NAFO/USA), J. Gordon (ICES/EU-United Kingdom) and T. Koslow (CSIRO/Australia) should announce plans and details on the subject matter of this Symposium shortly, to provide potential participants adequate lead time.
- c) The Symposium on "Elasmobranch Fisheries" will be held in conjunction with the 24th Annual Meeting of NAFO in September 2002 in Spain.

The Council was informed that three potential co-conveners, P. Walker (International Council for the Exploration of the Sea – ICES), J. Musick (Virginia Institute of Marine Science, USA), and T. Walker (Marine Fisheries Research Institute, Australia) were contacted in July 2000 conveying the interests of the Scientific Council to host the Symposium and its intention of publishing the proceedings in the NAFO Journal.

SCIENTIFIC COUNCIL WORKING PROCEDURES AND PROTOCOLS

1. Rules of Procedure

The Council noted that the General Council and the Fisheries Commission during the September 1999 Meeting had modified the Rules of Procedures regarding Observers to those Constituent Bodies, and the Scientific Council had deferred its review of Rule 1.3 to this meeting. The Council agreed that there was no change required to its Rule 1.3 of the Rules of Procedure.

2. Standardizing Assessment Reporting and Documentation

Presentation of stock assessment documentation at three levels in the assessment system: SCR documents, STACFIS reports, and in Scientific Council was reviewed. This highlighted that in several cases it was not clear why Scientific Council had chosen to present some information, yet other data had been omitted from presentations. After discussion, it was agreed that it would be helpful for Scientific Council to adopt a more consistent approach to presenting information in support of advice.

3. NAFO Website

It was recognized that inclusion of summaries of all Standing Committee Reports was desired, and that such summaries should be placed visibly on the Website for easy access. The Council requested O. A. Jørgensen (STACPUB Chairman) to form a small technical working group, and interessionally develop a template for consideration by the Council during its June 2001 Meeting.

4. Implementation of Symposium Fees

It was noted that funds are particularly important to make Symposia attractive to participants and to invite eminent scientists. The Council observed that historically the NAFO budget accommodated costs of running symposia and publishing the proceedings. It was agreed that budget requirements to conduct Scientific Council symposia in the future should be reviewed by the Council on a case by case basis.

5. Procedures or Protocols

During the course of the current meeting, concern was expressed by members of the Scientific Council regarding performing "on the spot" technical analyses in response to *ad hoc* requests from the Fisheries Commission. During the Annual Meetings a smaller complement of scientific expertise within the Scientific Council is in attendance, and this quite often presents considerable difficulty in the Council's ability to provide the best possible advice on many technical requests when the required experts are unavailable.

Discussions with the Fisheries Commission Chairman on this matter will continue.



Participants at Scientific Council Meeting, 18-22 September 2000 (left to right):

Back Rows: E. de Cárdenas, R. Aploim, F. M. Serchuk, A. Vazquez, D. B. Atkinson, S. Junquera, D. Cross, L. C. Hendrickson, T. Saat, D. C. A. Auby, D. Kulka, W. R. Bowering, V. A. Rikhter, K. Patterson, A. Nicolajsen, H. Murua, T. Amaratunga, A. Avila de Melo, V. N. Shibanov, D. Rivard, D. Briand

Front Row: O. A. Jørgensen, R. K. Mayo, W. B. Brodie, H-J. Rätz, M. Stein, S. Kawahara



Left to Right: Chairman STACPUB – O. A. Jørgensen (Greenland), Chairman STACFIS – R. K. Mayo (USA), Chairman Scientific Council – W. B. Brodie (Canada), Chairman STACFIS – H.-J. Rätz (EU – Germany), Chairman STACFEN – M. Stein (EU – Germany)

Annex 1. List of Participants

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Annex 2. Agenda

- I. Opening (Chairman: W. B. Brodie)
 1. Appointment of Rapporteur
 2. Adoption of Agenda
 3. Attendance of Observers
 4. Plan of Work

- II. Fisheries Science (STACFIS Chairman: H-J. Rätz)
 1. Opening
 2. Matters Related to Stock Considerations
 - a) Review of advice given in 1999 on Shrimp in Div. 3M
 - b) Nomination of Designated Experts
 3. Other Matters
 - a) Review of SCR and SCS Documents (if necessary)
 - b) Other Business

- III. Research Coordination (STACREC Chairman: R. K. Mayo)
 1. Opening
 2. Fisheries Statistics
 - a) Progress Report on Secretariat Activities
 - i) Acquisition of STATLANT 21 data
 - ii) Publication of statistical information
 - iii) Progress Report on Internet Site for Statistical Information
- Progress on Loading FISHSTAT Software
 - b) 19th CWP Session
 - i) Proposed Agenda Items
 3. NAFO Observer Protocol
 - a) Report of the *Ad hoc* Working Group on NAFO Observer Protocol
- Progress Report from June 2000 STACTIC Meeting
 4. Other Matters
 - a) Review of SCR and SCS Documents (if necessary)
 - b) Other Business

- IV. Publications (STACPUB Chairman: O. Jørgensen)
 1. Opening
 2. Review of Scientific Publications
 - a) Papers from June 2000 Meeting
 - b) Status of Papers from 1999 Symposium
 - c) Information from the 2000 Special Session

- d) Status of Invitational Papers
- e) Other Reviews
- 3. Considerations of NAFO Website
- 4. Scientific Citation Index (SCI)
- 5. Review of Editorial Board (new members)
- 6. Other Matters
- V. Special Requests from Concurrent Fisheries Commission Meeting (as necessary)
- VI. Development of Precautionary Approach
 - 1. Review of Papers Related to Precautionary Approach
 - 2. Future Development
- VII. Review of Future Meeting Arrangements
 - 1. Scientific Council Meeting, June 2001
 - 2. Special Session and Annual Meeting, September 2001
 - 3. Other Meetings in 2001 and 2002
- VIII. Future Special Sessions
 - 1. Progress Report on Symposium in 2001
 - 2. Progress Report on Special Session in 2002
- IX. Scientific Council Working Procedures and Protocols
 - 1. Review of Rules of Procedure
 - a) Observers at Scientific Council Meetings
 - 2. Standardizing assessment reporting and documentation
 - 3. Matters related to NAFO Website
 - 4. Possible implementation of Symposium fees
 - 5. Other Procedures or Protocols
- X. Other Matters
 - 1. Report of STACTIC intersessional meeting, June 2000
- XI. Adoption of Reports
 - 1. Consideration of Report from the Workshop of 13-15 September 2000
 - 2. Committee Reports of Present Meeting (STACFIS, STACREC, STACPUB)
 - 3. Report of Scientific Council Present Meeting, 13-22 September 1999
- XII. Adjournment

**Scientific Council Meeting
8-15 November 2000, Copenhagen, Denmark**

Chairman: W. B. Brodie (Canada)

Rapporteur: T. Amaratunga, Assistant Executive Secretary

The Scientific Council met at the International Council for the Exploration of the Sea (ICES) Headquarters, Copenhagen, Denmark, during 8-15 November 2000. Representatives attended from Canada, Denmark (in respect of Faroe Islands and Greenland), European Union (Germany), Iceland, Norway and Russia.

The Provisional Agenda was adopted (Annex 2).

FISHERY SCIENCE

The Council adopted the STACFIS Report as summarized below.

Northern Shrimp (Pandalus borealis) in Division 3M

The shrimp fishery in Div. 3M began in 1993. Total catches were approximately 27 000 tons in 1993, increased to 48 000 tons in 1996 and declined thereafter.

The provisional catches are as follows:

Year	Catch ¹ (‘000 tons)	TAC	
		Recommended	Agreed
1997	25	lpl	er
1998	30	lpl	er
1999	42	30	er
2000	40 ²	30	er
2001		30	

¹ STACFIS estimates.

² Tabulated catch to 1 October. STACFIS estimate to end of 2000 is about 50 000 tons.

er Effort regulations.

lpl Lowest possible level.

No analytical assessment is available and fishing mortality is unknown. Evaluation of stock status is based upon interpretation of commercial fishery and research survey data.

Scientific Council is unable to estimate absolute stock size. Biomass and SSB are indicated to be higher in 1998-2000 than in 1994-1997.

Considering that the stock appears to have sustained an average catch of more than 40 000 tons in 1999-2000 and that there are concerns regarding recruitment, Scientific Council advises a reduction in catch in 2001 to the previously advised TAC of 30 000 tons. Based on the reduced recruitment expected from the 1997 and 1998 year-classes, Scientific Council anticipates that a further reduction in catches in 2002 will be warranted, particularly if catches in 2001 exceed 30 000 tons. Scientific Council was not able to advise on a specific catch level for 2002 and recommends that the advice for 2002 be re-evaluated by Scientific Council in November 2001.

Northern Shrimp (Pandalus borealis) in Sub-areas 0 and 1

A small-scale inshore fishery began in SA 1 during the 1930s. Since 1969 an offshore fishery has developed and the shrimp fishery is the largest fishery in Davis Strait.

The fishery is conducted by Greenland and Canada. Recent catches from the stock are as follows:

Year	Catch ('000 tons) ¹			TAC ('000 tons) Recommended
	Inshore	Offshore	Total	
1997	13.5	51.0	64.5	60.0
1998	9.5	56.6	66.1	55.0
1999	17.0	59.5	76.5	65.0
2000			76.5 ²	65.0

¹ Provisional.

² Projected to the end of 2000

No analytical assessment is available and fishing mortality is unknown. Evaluation of the status of the stock is based on interpretation of commercial fishery data (catch, effort and standardized catch rates), research survey indices and biological data.

Scientific Council is not able to provide estimates of absolute stock size. The indices of stock sizes show that both the recruitment and SSB estimates in 2000 are the highest observed. In addition, the stock appears to be well represented by a broad range of size groups.

Scientific Council notes that all available indices of size and age composition were favorable and with exploitation rates near 30% from 1988 to 1997 the survey biomass remained stable. Combining an exploitation rate of this order with the most recent survey results, allowance made for possible estimation errors, Scientific Council considers that the stock can sustain a catch of 85 000 tons in 2001.

Therefore, Scientific Council recommends a TAC of 85 000 tons for 2001 for shrimp in Subareas 0+1.

Northern Shrimp (Pandalus borealis) in Denmark Strait

The fishery began in 1978 in areas north of 65°N in Denmark Strait, where it occurs on both sides of the midline between Greenland and Iceland. Areas south of 65°N in Greenlandic waters have been exploited since 1993.

The fishery soon became multi-national, with recent catches and TACs as follows:

Year	Catch ¹ (‘000 tons)	TAC ('000 tons)	
		Recommended	Agreed
1997	11.6	5.0	9.6
1998	9.3	5.0	9.6
1999	9.5	9.6	10.6
2000	7.9 ³	9.6	10.6

¹ Provisional.

² Only for Greenland EEZ

³ To November 1.

No analytical assessment is available and fishing mortality is unknown. Evaluation of the status of the stock is based on interpretation of commercial fishery data and biological data.

Mean catches in recent years around the advised TAC of 9 600 tons for 1999 and 2000 has resulted in improvement of the stock. Under the present level of exploitation the fishable biomass is not expected to decrease in the short term. Scientific Council therefore advises a TAC of 9 600 tons for shrimp in Denmark Strait in 2001.

Special Requests by the Fisheries Commission

1. Shrimp in Divisions 3LNO (fishing mortality-by-catches, abundance, distribution, potential yield):
 - A catch of 5 000 tons would correspond to between 5 and 10% of the biomass estimates from Canadian surveys in Div. 3L during autumn 1999 and spring 2000. By-catch proportions by weight were relatively low for all species although they were comprised mainly of small fish. Scientific Council reiterated its recommendation that the use of a sorting grate with a maximum bar spacing of 22 mm be mandatory for any shrimp fishery in this area. Scientific Council again cautioned that selection experiments with a 22 mm bar spacing indicate that selection is not effective for Greenland halibut less than about 20 cm and redfish less than about 15 cm.
 - A review of the current distribution of shrimp from research survey data compared to current and historical distribution of juveniles of various groundfish species currently under moratorium indicated some overlap of shrimp with cod in Div. 3L and also with American plaice. There is more overlap with areas where juvenile redfish have been traditionally found, particularly in the Sackville Spur and 'nose' areas of Div. 3L. These are the same areas where the highest concentrations of shrimp occur. In addition, there is considerable overlap in the distribution of shrimp and juvenile Greenland halibut.
 - The data indicate some overlap with juvenile Atlantic cod and American plaice in areas of highest shrimp biomass. Juveniles of these species are, however, present in shallower water. Scientific Council recommended that fishing be restricted to depths greater than 200 m to reduce overlap in distribution of fishing effort and these juveniles. For redfish and Greenland halibut there is considerable overlap in distribution such that exclusion zones would not be feasible. Other measures, in addition to sorting grids, should be considered for these species such as use of longer toggle chains. This will allow greater separation between the foot-gear of the trawl and the trawl itself allowing small fish such as Greenland halibut to pass over the foot gear but escape under the net itself.
 - From Canadian research surveys from autumn in 1995-99, and spring in 1999 and 2000. At least 90% of the shrimp biomass was within Div. 3L in each survey, mostly at depths from 185 to 550 m. The percentage of biomass in Div. 3LNO in the NRA ranged from 12 to 31, averaging 23% over the seven surveys. For Div. 3L alone, the range was similar (11 to 30) and the average was 21%. The proportion of biomass in the NRA was higher in the 2 spring surveys (29 and 31%) than in most of the autumn surveys (12 to 29%).

Divisions 3NO accounted for less than 10% of the overall biomass estimates, and less than 3% of the estimates in 1999 and 2000.

Based on these data, Scientific Council recommended that the shrimp fishery in Div. 3LNO 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 of groundfish in Div. 3NO.

On annual yield potential for this resource, Scientific Council was unable to provide information at this time. As indicated previously, a cautious approach to development of the fishery in this area was recommended and fishing should be restricted to Div. 3L. Scientific Council noted the basis for its previous advice (NAFO Scientific Coun. Rep., September 1999), and considered the survey results for 1999 and 2000 available since that advice was given. Scientific Council reiterated its recommendation that for the shrimp fishery in Div. 3L, catches be restricted to no more than 6 000 tons until the response of the resource to this catch level can be evaluated. Scientific Council also again recommended that fishing effort be distributed proportional to the distribution of biomass.

2. Closed Area for Shrimp in Division 3M:

The Scientific Council was not able to assess the effect of the area closure with respect to the Precautionary Approach but on the issue of the appropriateness of the area and timing Scientific Council noted the following. The timing of the closure, June-September, is not effective as it does not coincide with the season of highest fishing effort in this area, i.e. March-April (SCR Doc. 00/74). The closed area is limited by about the 140 fathom depth contour where as age-group 2 generally is distributed down to 200 fathom as suggested in the EU survey in 2000 (SCR Doc. 00/71). Estimates based on the Faroese survey in 2000 suggest that about half of age-group 2 are within the closed area. The closed area covers about 40% of the total area of Flemish Cap down to 600 m. If the closure is to continue, Scientific Council recommends that it extend to the whole year for the closure to be effective. To protect the juveniles in the whole fishing area, Scientific Council suggests that Fisheries Commission also consider other technical measures known to be effective in improving the size selectivity of shrimp trawls.

3. Shrimp in Division 3M (impact of removal 25,000; 30,000; 35,000; 40,000 mt in 2001 and 2002):

Considering that the stock appears to have sustained an average catch of more than 40 000 tons in 1999-2000 and that there are concerns regarding recruitment, Scientific Council advises a reduction in catch in 2001 to the previously advised TAC of 30 000 tons. Based on the reduced recruitment expected from the 1997 and 1998 year-classes, Scientific Council anticipates that a further reduction in catches in 2002 will be warranted, particularly if catches in 2001 exceed 30 000 tons. Scientific Council was not able to advise on a specific catch level for 2002 and recommended that *for shrimp in Div. 3M the advice for 2002 be re-evaluated by Scientific Council in November 2001.*

Scientific Council notes that the precision of its assessment of this stock is such that it cannot evaluate the impact of removals in 2001 and 2002 in 5 000 ton increments as requested. Catches above 30 000 tons in 2001 will likely result in declines to stock biomass

Formulation of Advice Under a Precautionary Approach Framework

At its meeting during 11-17 November 1999, Scientific Council agreed to proceed with the "Traffic Light" Approach for the application of the Precautionary Approach to the northern shrimp stocks (Subareas 0+1, Div. 3M, Denmark Strait). It was noted that progress with this method would require some quantification of the evaluations and links to proposed management measures when the "traffic lights" change color. Scientific Council also

recommended that the Designated Experts for these 3 stocks work by correspondence to develop the traffic light methodology for the current meeting.

Scientific Council was informed that some progress had been made in Canada on some cod stocks using this method in conjunction with more analytical PA frameworks, but that this methodology could not be attempted with the shrimp stocks at this meeting. Scientific Council again debated the merits and shortcomings of the "Traffic Light" Approach, noting that this method did not provide reference points as required under the PA framework. It was concluded that the "Traffic Light" Approach would not be used by Scientific Council at this meeting, but that further exploration of this methodology should be carried out. Scientific Council noted some progress in the use of age structured models for the shrimp stocks and encouraged further work in this area. Eventual development of such models would allow calculation of PA reference points based on biomass and fishing mortality.



Participants, Scientific Council Meeting, 8-15 November 2000 at ICES Headquarters, Copenhagen, Denmark.

Back (left to right) H.-J. Rätz, A. Nicolajsen , M. C. S. Kingsley, K. Wieland, D. C. Orr, H. Siegstad, W. R. Bowering, D. C. A. Auby, C. Hvingel, U. Skuláðóttir, P. Kannevorff

Front: S. Bakanev, D. M. Carlsson, W. B. Brodie, T. Amaratunga



Back (left to right): D. M. Carlson (Designated Expert: Shrimp in Denmark Strait)
H. Siegstad (Designated Expert: Shrimp in Subareas 0+1)
D. C. Orr (Designated Expert: Shrimp in Div. 3LNO)
U. Skuláðóttir (Designated Expert: Shrimp in Div. 3M)

Front: H.-J. Rätz (Chairman STACFIS), W. B. Brodie (Chairman Scientific Council)

Annex 1. List of Participants

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NAFO SECRETARIAT

T. Amaratunga, Assistant Executive Secretary
D. C. A. Auby, Secretary

Annex 2. Agenda

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

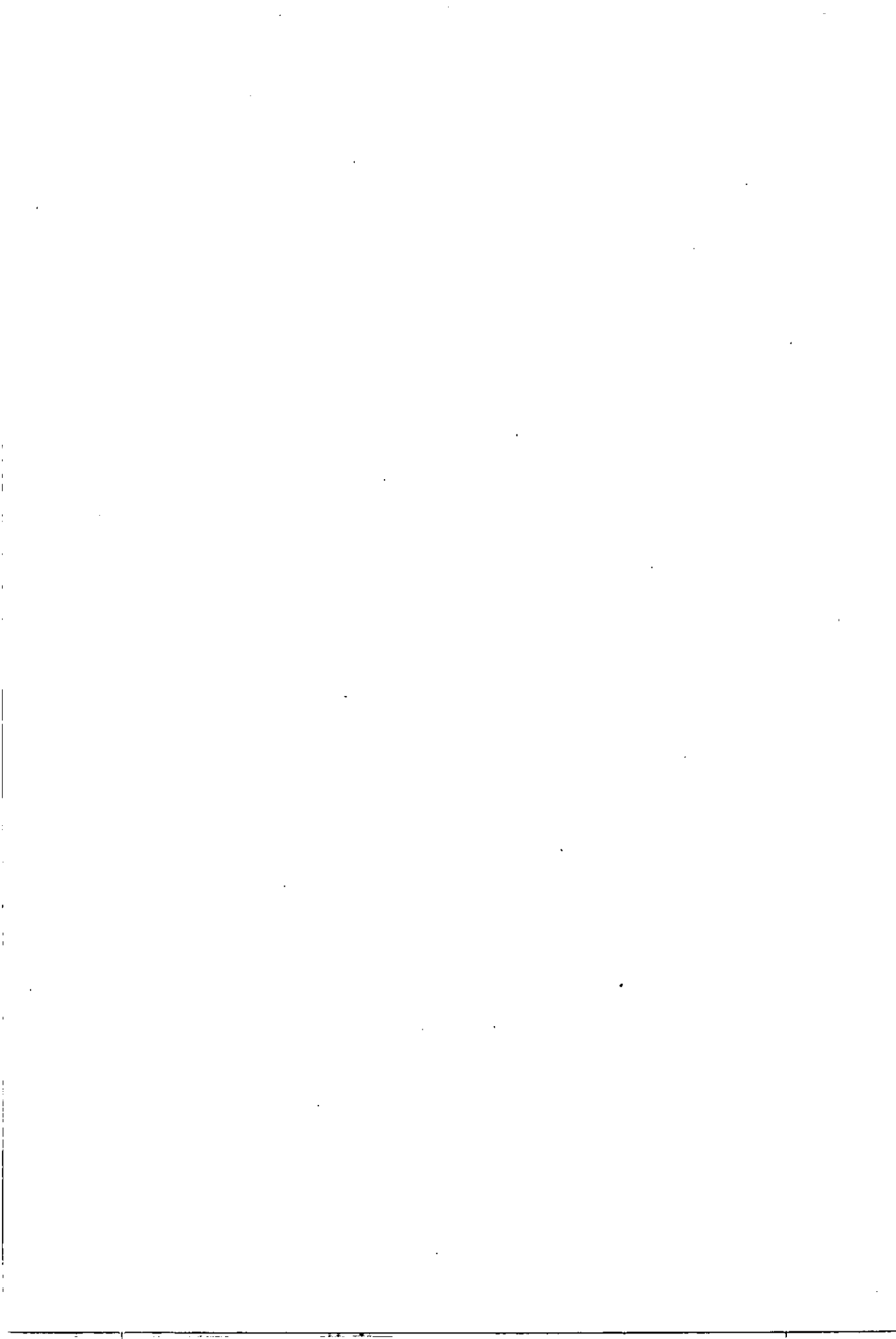
- II. Fisheries Science (STACFIS Chairman: H. J. Rätz)
 1. Review of Recommendations in 1999 and 2000
 2. General environmental review
 3. Stock assessments
 - Shrimp (Div. 3M)
 - Northern shrimp (Subareas 0 and 1)
 - Northern shrimp (in Denmark Strait and off East Greenland)
 - Shrimp in Div. 3LNO
 4. Other business
 - Assessment methodology

- III. Formulation of Advice
 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
 - Shrimp in Div. 3LNO
 - Closed area for shrimp in Div. 3M
 3. Formulation of advice under a Precautionary Approach framework

- IV. Other Matters
 1. Meeting of November 2001
 2. Meeting of November 2002

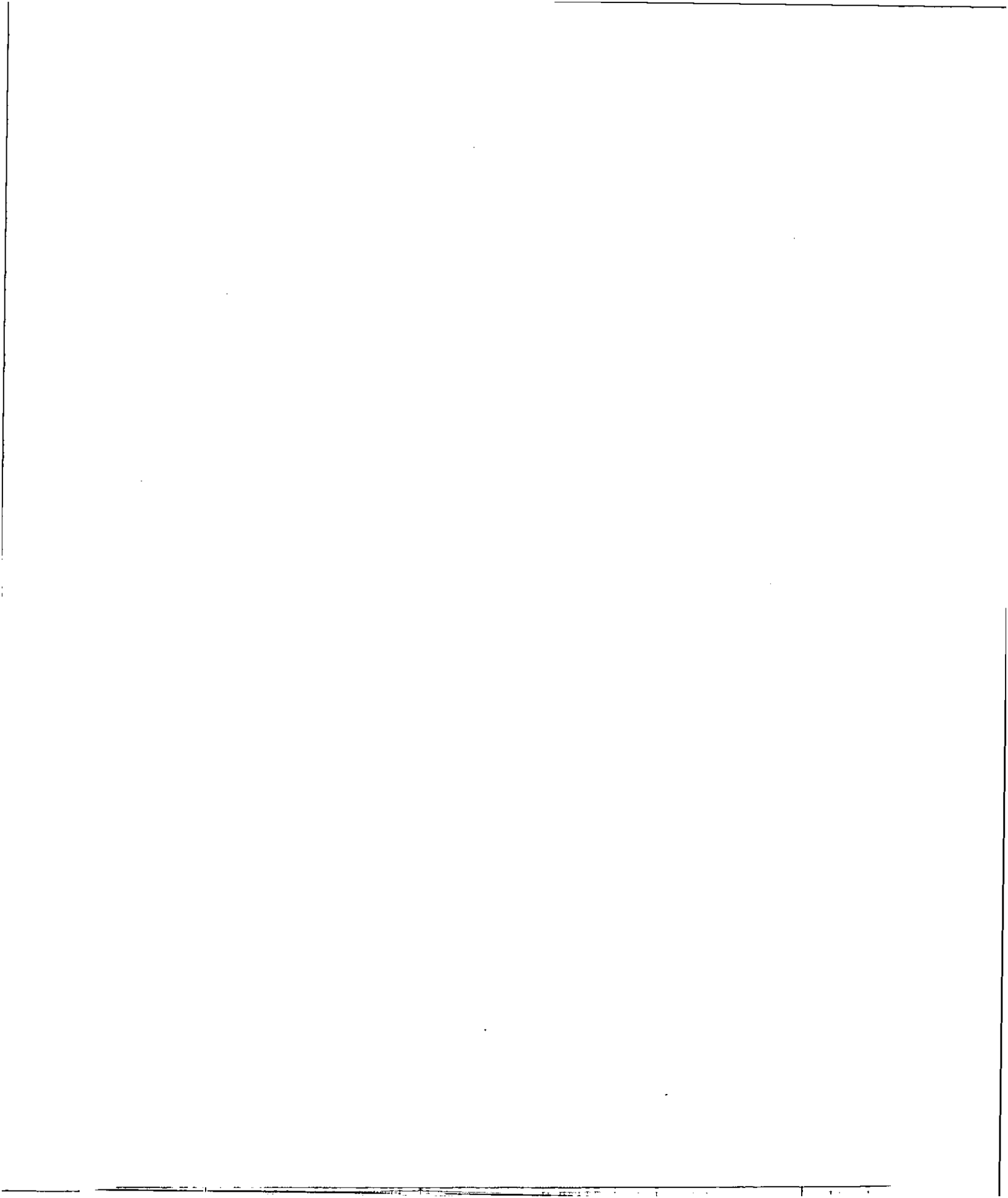
- V. Adoption of Reports

- VI. Adjournment



PART IV
(pages 201 to 213)

**Administrative and Financial Report
for the year ended 31 December 2000**



Administrative Report for the Year Ended 31 December 2000

Meetings and NAFO Secretariat Activities

1. The Joint Scientific Council and Fisheries Commission Working Group on Precautionary Approach, Brussels, Belgium, 29 February – 2 March 2000.
2. The Meeting on Shrimp Stocks in the Regulatory Area, Washington, D.C, USA, 27-30 March, 2000.
3. The Working Group on Allocation of Fishing Rights to Contracting Parties of NAFO, Washington, D.C., USA, 28-30 March 2000.
4. The International Fisheries Commission Pension Society Annual Meeting, Seattle, Washington, USA, 26-28 April 2000. The NAFO Secretariat was represented by Mr. F. D. Keating and Mr. S. M. Goodick.
5. The Working Group on Dispute Settlement Procedures (DSP), Copenhagen, Denmark, 29-31 May 2000.
6. The Scientific Council and its Standing Committees, Dartmouth, N.S., Canada, 1-15 June 2000.
7. The Meeting of the Standing Committee on International Control (STACTIC), Dartmouth, N.S., Canada, 27-29 June 2000.
8. STACTIC Working Group on Technical on Communications, Dartmouth, N.S., Canada, 30 June 2000.
9. Workshop on Assessments Methods, Boston, Massachusetts, USA, 13-15 September 2000.
10. The Annual Meeting of the Organization including all constituent bodies - the General Council, the Fisheries Commission, the Scientific Council, Boston, Massachusetts, USA, 18-22 September 2000.
11. The Scientific Council, Copenhagen, Denmark, 8-15 November 2000.

The NAFO Secretariat made all necessary arrangements for the above-mentioned meetings and prepared all documents in accordance with the provisions of the NAFO Convention and Rules of Procedure.

Publications

The publications listed below are prepared and printed at the NAFO Secretariat. It has been estimated that 1.5 million pages have been circulated from the NAFO Secretariat as printing matter in the form of documents, circular letters and publications during 2000. The basic publications were the following:

- a) *NAFO Annual Report* for the year 1999 (190 pages) was distributed in May 2000.
- b) *NAFO Meeting Proceedings* for the year 1999 (260 pages) was distributed in January 2000.

- c) *NAFO Scientific Council Reports* for 1999 (327 pages) was distributed in February 2000.
- d) *NAFO Scientific Council Studies* Number 33 (135 pages) was distributed in June 2000.
- e) *NAFO Convention* (104 pages) was distributed in May 2000.
- f) *NAFO Newsletter "NAFO News"* No. 12 for January-June 2000 was issued in July 2000, and No.13 for July-December 2000 was issued in January 2001.

Fishery Statistics

The NAFO statistical database is at the NAFO Secretariat and available in computer diskette form or hard copies to the Contracting Parties, and from 1999, the statistical data of catches have been posted on the NAFO website www.nafo.ca.

The data reports for the preceding year of fishing, STATLANT 21A reports (preliminary annual catches in the NAFO Convention Area by species and divisions), due 15 May have not been received from: for 1994 – USA (partial); for 1995 – USA (partial); for 1996 – USA (partial); for 1997 – USA (partial); for 1998 - Denmark (Faroes) and USA (partial); for 1999 – Denmark (Faroes), Korea, Lithuania and USA (partial).

The data reports for the preceding year of fishing, STATLANT 21B reports (final annual catches in the NAFO Convention Area by species, month, effort), due 30 June have not been received from: for 1989 EU-France (M); for 1994 - USA; for 1995 - Denmark (Faroes) and USA; for 1996 - Denmark (Faroes) and USA; for 1997 – Denmark (Faroes) and USA; for 1998 - Denmark (Faroes), Norway (provisional) and USA. For 1999, STATLANT 21B reports have been received from Canada (M), Canada (C&A), Cuba, Estonia, EU-Denmark, EU-France (M), EU-Great Britain, EU-Germany, EU-Spain, France (SP), Iceland, Japan, Latvia, Norway (provisional), Poland and Russia.

Financial Report for the Year Ended 31 December 2000

An audit of the NAFO accounts for the fiscal year 2000 was completed by the firm of Deloitte and Touche, Chartered Accountants.

The auditor's report is as follows:

To the Chairman and Members of the General Council of Northwest Atlantic Fisheries Organization

We have audited the statement of financial position of the Northwest Atlantic Fisheries Organization as at December 31, 2000 and the statements of revenue and expenditures, statement of changes in net assets and changes in cash flow for the year then ended. These financial statements are the responsibility of the Organization's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with Canadian generally accepted auditing standards. These standards require that we plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation.

As outlined in Note 4 to the financial statements, the Organization has not recorded a liability for enhanced employee termination benefits, as approved as part of the Staff Rules by General Council at its annual meeting in September, 1991. At December 31, 2000, these enhanced benefits amounted to approximately \$50,300. Failure to record this amount as a liability in 2000 is not in accordance with the Organization's stated accounting principles. Had the liability been recorded \$50,300 would have been reflected as a prior period adjustment and the net assets at the end of the year would have been reduced by \$50,300.

In our opinion, except for the effects of the Organization's failure to record the liability referred to in the preceding paragraph, and the policy not to capitalize capital assets as referred to in Note 10, these financial statements present fairly, in all material respects, the financial position of the Organization as at December 31, 2000 and the results of its operations and the changes in its cash flow for the year then ended in accordance with the accounting principles disclosed in the notes to the financial statements.

We further report as required by Rule 7.1 of the Financial Regulations of the Organization, that in our opinion, the financial statements are in accordance with the books and records of the Organization; the financial transactions reflected in the statements have, in all significant respects, been in accordance with the Financial Regulations and the budgetary provisions of the Northwest Atlantic Fisheries Organization; and the monies on deposit and on hand have been verified by certificate received directly from the Organization's depositories or by actual count.

February 16, 2001

Deloitte & Touche
Chartered Accountants

Statement of Revenue and Expenditures
(Year Ended 31 December 2000)
(Expressed in Canadian Dollars)

	Budget 2000	Actual 2000	Actual 1999
Revenue			
Contributions assessed Contracting			
Parties (Note 5)	\$ 1,028,643	\$ 1,028,643	\$ 921,846
Allocation from surplus for operations.....	128,357	128,357	170,154
Personal income taxes			
Federal	-	112,852	123,188
Provincial	-	55,266	42,653
Interest	-	32,570	29,016
Sales of publications.....	-	4,120	5,600
Shrimp symposium contributions	-	-	36,452
	<u>1,157,000</u>	<u>1,361,808</u>	<u>1,328,909</u>
Expenditures			
Salaries.....	677,500	683,613	666,288
Vacation pay	1,000	2,669	3,269
Superannuation (Note 6).....	73,500	73,244	74,519
Additional help	1,000	-	-
Group medical and insurance plan.....	52,000	58,416	50,785
Termination benefits (Note 4).....	33,000	31,668	53,178
Travel.....	20,000	19,353	9,233
Transportation.....	1,000	662	783
Communications.....	60,000	50,267	49,008
Publications	28,000	27,559	27,655
Contractual services	43,000	42,003	42,466
Materials	30,000	29,332	31,687
Equipment	5,000	4,636	4,887
Annual and Scientific Council Meetings.....	62,000	73,014	81,978
Inter-sessional meetings.....	20,000	26,099	16,311
Computer services.....	50,000	15,568	20,120
Shrimp symposium	-	-	36,452
	<u>1,157,000</u>	<u>1,138,103</u>	<u>1,168,619</u>
Excess of revenue over expenditures before provision for uncollectible accounts.....	-	223,705	160,290
Provision for uncollectible accounts and write-off of contributions	<u>34,288</u>	<u>34,288</u>	<u>31,933</u>
(Deficiency) excess of revenue over expenditures..	<u>\$ (34,288)</u>	<u>\$ 189,417</u>	<u>\$ 128,357</u>

Statement of Changes in Net Assets
(Year Ended 31 December 2000)

(Expressed in Canadian Dollars)

	2000	1999
Balance, beginning of year	\$ 203,357	\$ 245,154
Allocations		
To operations	<u>128,357</u>	<u>170,154</u>
	75,000	75,000
Excess of revenue over expenditures	<u>189,417</u>	<u>128,357</u>
Balance, end of year	<u>\$ 264,417</u>	<u>\$ 203,357</u>

Statement of Financial Position as at 31 December 2000

(Expressed in Canadian Dollars)

	2000	1999
ASSETS		
Current		
Cash and short-term deposits.....	\$ 207,983	\$ 193,625
Contributions receivable (Note 3).....	35,475	22,193
Accounts receivable	5,878	12,616
Accrued interest receivable.....	15,613	10,280
Grant receivable-Province of Nova Scotia.....	56,603	45,000
Prepaid expenses.....	<u>13,490</u>	<u>10,847</u>
	335,042	294,561
Investments segregated for employee termination benefits	<u>337,409</u>	<u>284,232</u>
	<u>\$ 672,451</u>	<u>\$ 578,793</u>
LIABILITIES		
Current		
Accounts payable and accrued liabilities.....	\$ 18,330	\$ 15,851
Accrued vacation pay payable.....	14,227	11,558
Advance contributions	<u>6,400</u>	<u>10,618</u>
	38,957	38,027
Provision for employee termination benefits (Note 4).....	<u>369,077</u>	<u>337,409</u>
	<u>408,034</u>	<u>375,436</u>
MEMBERS' NET ASSETS		
Accumulated Surplus	<u>264,417</u>	<u>203,357</u>
	<u>\$ 672,451</u>	<u>\$ 578,793</u>
Commitments (Note 7)		

Statement of Changes in Cash Flow
(Year Ended 31 December 2000)

(Expressed in Canadian Dollars)

	2000	1999
Net inflow (outflow) of cash related to the following activities:		
Operating		
Excess of revenue over expenditures	\$ 189,417	\$ 128,357
Item not affecting cash		
Allocation from surplus	<u>(128,357)</u>	<u>(170,154)</u>
	61,060	(41,797)
Changes in non-cash operating working capital items (Note 9)	<u>(25,193)</u>	<u>(9,871)</u>
	<u>35,867</u>	<u>(51,668)</u>
Investing		
Increase in investments segregated for employee termination benefits	<u>(53,177)</u>	<u>(27,632)</u>
Financing		
Increase in provision for employee termination benefits	<u>31,668</u>	<u>53,177</u>
Net cash inflow (outflow)	14,358	(26,123)
Cash position, beginning of year	<u>193,625</u>	<u>219,748</u>
Cash position, end of year	<u>\$ 207,983</u>	<u>\$ 193,625</u>

Notes to the Financial Statements
(Year Ended 31 December 2000)

(Expressed in Canadian Dollars)

1. Authority and Objective

The Northwest Atlantic Fisheries Organization was established by the Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries which came into force on January 1, 1979.

The objective of the Organization is to contribute through cooperation and consultation to the conservation, rational management and optimum utilization of the fishery resources in the Convention. For that purpose, it compiles statistics, maintains research programs, establishes management goals, and promotes and co-ordinates international surveillance.

2. Accounting Policies

These financial statements have been prepared in accordance with Canadian generally accepted accounting principles and reflect the following significant accounting policies:

a) Contributions Assessed Contracting Parties

Contributions are assessed annually and are recorded as revenue in the year for which billings apply.

b) Allowance for Uncollectible Accounts

As approved by the General Council, an allowance for uncollectible accounts is recorded for contributions that are one payment in arrears.

c) Accumulated Surplus

The Chairman of the General Council, after consultations with representatives of all members of the General Council, may authorize expenditures from accumulated surplus for unforeseen and extraordinary expenses necessary to the good conduct of the business of the Organization. Such funds may not be in excess of 20% of the annual budget for the current financial year.

d) Publications

Costs of publications are charged to expense as incurred.

e) Office Furniture and Equipment

Costs of office furniture and equipment are charged to expense when purchased. Leases for equipment, which transfer substantially all of the benefits and risks of ownership to the Organization, are not treated as asset purchases (capital leases). Lease payments are charged in the year paid to the contractual services expenditure categories.

f) Personal Income Taxes

Federal

According to an Order in Council (P.C. 1980-132) issued by the Government of Canada, the Organization comes under the jurisdiction of the Convention on the Privileges and Immunities of the United Nations. Article V, Section 18(b) of this Convention exempts officials of the United Nations organizations from taxation on the salaries and emoluments paid to them. However, the Order in Council (Section 3.(3)) does not exempt a Canadian citizen, residing or ordinarily resident in Canada, from liability for any taxes or duties imposed by any law in Canada.

Accordingly, as is customary for international organizations, the Organization credits revenue with an amount equal to the Canadian federal income taxes that would be otherwise assessed on its employees.

Provincial

The Organization deducts provincial income taxes from the salaries of Canadian employees and remits amounts deducted on a regular basis to the Province of Nova Scotia. At the end of each year, the Organization applies to the provincial government for an ex gratia grant equal to the amount of provincial personal income taxes paid. Such grants are accrued when ultimate receipt is assured.

g) Pension Plan

The Organization has a defined benefit pension plan and current contributions plus the payments for the unfunded portion of the plan are expensed annually.

h) Cash

Cash is made up of funds held in the Organization's bank account.

3. Contributions Receivable

This account reflects current assessments due from Contracting Parties as follows:

	<u>2000</u>	<u>1999</u>
Bulgaria.....	\$ 17,144	\$ 15,967
Cuba.....	17,460	17,072
Romania.....	17,144	15,967
Russian Federation.....	18,015	-
Ukraine.....	-	5,121
	<hr/>	<hr/>
	69,763	54,127
Less: Allowance for uncollectible assessments.....	34,288	31,934
	<u>\$ 35,475</u>	<u>\$ 22,193</u>

4. Provision for Employee Termination Benefits

The Organization provides its staff members with certain entitlements on termination of service based on the employee's position and years of service with the Organization.

At its annual meeting in September, 1991, the General Council approved in the Staff Rules an enhanced employee termination benefit package to be effective January 1, 1992. At December 31, 2000, the additional liability resulting from this enhancement amounted to approximately \$50,300, which amount has not been recorded in the accounts of the Organization.

The Organization is funding this liability at the rate of \$10,000 per annum as approved by the General Council (21st Annual Meeting, September, 1999).

5. Contributions Assessed Contracting Parties

	<u>2000</u>	<u>1999</u>
Bulgaria.....	\$ 17,144	\$ 15,967
Canada.....	426,259	364,145
Cuba.....	17,761	17,072
Denmark (in respect of the Faroe Islands and Greenland).....	105,305	102,275
Estonia.....	19,736	17,405
European Union.....	34,487	30,790
France (in respect of St. Pierre et Miquelon).....	19,472	16,027
Iceland.....	22,884	31,011
Japan.....	19,119	18,677
Republic of Korea.....	17,144	15,967
Latvia.....	17,946	16,851
Lithuania.....	18,564	17,128
Norway.....	20,107	21,553
Poland.....	17,144	15,967
Romania.....	17,144	15,967
Russian Federation.....	18,317	20,170
Ukraine.....	17,144	5,121
United States of America.....	<u>202,966</u>	<u>179,753</u>
	<u>\$ 1,028,643</u>	<u>\$ 921,846</u>

6. Superannuation

The Organization has a defined benefit pension plan which covers all employees. The last actuarial valuation was performed as at January 1, 1999. At that time, the value of the plan assets resulted in an unfunded pension liability of \$24,100. The unfunded pension liability is being funded at a rate of \$18,000 per year.

	<u>Actuarial Valuation</u> <u>January 1, 1999</u>	<u>Actuarial Estimate</u> <u>December 31, 2000</u>
Pension Plan obligations	\$ 2,013,000	\$2,337,400
Fair value of plan assets	<u>1,950,000</u>	<u>2,313,300</u>
Funded status – unfunded liability	<u>\$ 63,000</u>	<u>\$ 24,100</u>

The significant actuarial assumption adopted in measuring the Organization's pension fund obligation as at January 1, 1999 is as follows:

Expected rate of return on plan assets 7.0%

All plan assets are held by Sun Life. The Organization's pension plan expense for the year was \$73,244 (1999 - \$74,517).

7. Operating Lease Obligations

The Organization is committed to lease payments for certain equipment, as follows:

<u>2001</u>	<u>2002</u>	<u>2003</u>
\$25,561	\$15,866	\$7,402

8. Services Provided Without Charge

Accommodation for the Organization's secretariat in Dartmouth, Nova Scotia is provided without charge by the Canadian Department of Fisheries and Oceans. Accordingly, the related costs, which include, rent, grants-in-lieu of property taxes, heat, electricity and cleaning services, are not reflected in these financial statements.

9. Changes in Non-Cash Operating Working Capital Items

	<u>2000</u>	<u>1999</u>
Contributions receivable.....	\$ (13,282)	\$ 8,543
Accounts receivable	6,738	(1,331)
Accrued interest receivable.....	(5,333)	415
Accrued <i>ex gratia</i> grant receivable.....	(11,603)	4,424
Prepaid expenses.....	(2,643)	8,832
Accounts payable and accrued liabilities.....	2,479	(21,789)
Accrued vacation pay.....	2,669	3,269
Advance contributions	<u>(4,218)</u>	<u>(12,234)</u>
	<u>\$ (25,193)</u>	<u>\$ (9,871)</u>

10. Capital Assets

Capital assets are expensed on acquisition which, as noted in the Auditors' Report is contrary to the accounting requirements of the Canadian Institute of Chartered Accountants. Capital assets held at December 31, 2000 include computer hardware and software, and office furniture and equipment. An analysis of the approximate acquisition costs of all capital assets up to December 31, 2000, and the amortization of them over the same period, is reflected in the following:

	<u>Cost</u>	<u>Accumulated Amortization</u>	<u>Rates</u>	<u>Net Book Value</u>	
				<u>2000</u>	<u>1999</u>
Computer equipment	\$ 52,629	\$ 34,275	25%	\$ 18,354	\$ 16,206
Office furniture and equipment	<u>181,836</u>	<u>144,848</u>	10%	<u>36,988</u>	<u>45,396</u>
	<u>\$ 234,465</u>	<u>\$179,123</u>		<u>\$ 55,342</u>	<u>\$ 61,602</u>



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