Northwest Atlantic Fisheries Organization

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SCIENTIFIC COUNCIL MEETING - SEPTEMBER 1994

Report of Scientific Council, 19–23 September 1994 Meeting

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REPORT OF SCIENTIFIC COUNCIL

19-23 September 1994

I. PLENARY SESSIONS

Chairman: H. Lassen Rapporteur: T. Amaratunga

The Scientific Council met at the Holiday Inn, Dartmouth, Nova Scotia, Canada during 19-23 September 1994, to consider the various matters listed in its agenda (see Appendix IV).

Representatives attended from Canada, Denmark (in respect of Faroe Islands and Greenland), Estonia, European Union (Denmark, France, Germany, Portugal, Spain and United Kingdom), Iceland, Japan, Republic of Korea and Russian Federation, and an observer from FAO, of the United Nations. The Executive Secretary and Assistant Executive Secretary were in attendance.

The opening session of the Council was called to order at 1025 hr on 19 September 1994.

The Chairman welcomed everyone to this 16th Annual Meeting. The Assistant Executive Secretary was appointed rapporteur. The Council welcomed R. Grainger the CWP Secretary, extending its invitation to the FAO representative as an observer to this meeting.

In considering the provisional agenda, the Chairman noted that the Council had by unanimous consent agreed to include the Denmark/Greenland request for advice on Greenland halibut in Div. 0B and 1BCDEF. This was accordingly included in the agenda as Item II.2.d (see Appendix IV). There being no further changes considered, the Council **adopted** the agenda.

Noting that the STACFIS stock assessments were needed for presentation at the Fisheries Commission Meeting on 20 September, the session was adjourned at 1040 hr on 19 September 1994.

The Council reconvened at 1620 hr to address some requests from the Fisheries Commission that were still outstanding from the June 1994 Meeting. Discussions pertaining to the update on the 1995 Symposium, the status of the Russian experimental fishing for redfish with different mesh sizes and the Faroese experimental fishery on shrimp in the Flemish Cap and in a part of Div. 3L, are reported below under relevant agenda headings.

The session was adjourned at 1730 hr.

The Council reconvened briefly through 20-22 September 1994 particulary to address requests from the concurrent Fisheries Commission sessions and discuss various items in the agenda. These are reported in relevant sections below.

The concluding session was called to order at 0900 on 23 September 1994. The Council then considered and **adopted** the Report of the Standing Committee on Fishery Science (STACFIS), the Report of the Standing Committee on Research Coordination (STACREC), and the Report of the Standing Committee on Publications (STACPUB) and **adopted** the Scientific Council Report of this meeting.

The meeting was adjourned at 1115 hr.

Brief summaries of the Standing Committee Reports and other matters considered by the Scientific Council are given below in Sections II-XII. The Agenda, List of Research (SCR) and Summary (SCS) Documents and the List of Participants of this meeting are given in Appendix IV, V and VI, respectively.

II. FISHERY SCIENCE (see STACFIS report, App. I)

1. Review of 1994 Recommendations

There was no review of recommendations from the June 1994 Meeting done by STACFIS.

2. Stock Assessments

a) Shrimp in Division 3M

The Council noted that available information on shrimp in Div. 3M was reviewed by STACFIS and reported in detail in the STACFIS report. The following was prepared in response to the request for advice from the Fisheries Commission.

The present fishery for shrimp in Div. 3M raises questions related both to the management of the shrimp resource and regulation of redfish by-catch.

i) Status of Shrimp Resource

The Council considered information from the commercial fishery and research surveys to determine the status of the northern shrimp resource on Flemish Cap (Div. 3M). No significant commercial effort was reported from the area before spring 1993 but, since then, a multinational fishery has developed with removals of shrimp in the order of 30 000 tons in 1993 and 22 000 tons up to the end of August, 1994.

Fishery information from Canada and Denmark/Greenland indicated that the distribution of effort in 1994 differed from that observed in 1993 in that more fishing activity occurred in the western and southwestern areas of the Cap. The Denmark/Greenland data showed that fishing was unproductive in eastern areas and that catch rates were maintained by concentrating effort in areas where densities were highest. The Canadian fishery in March, 1994 produced low catch rates over the preferred grounds fished in 1993. Data from some nations showed that catch rates were substantially lower in 1994 and there was no distinct decline in CPUE over the year, as observed in 1993.

Commercial catch sampling data showed changes in the size/age composition of the catches between the two years. Males were much more prevalent in the catches of several nations in 1994, compared to a clear domination by female ages in 1993. The component of females present in 1994 is believed to be the remains of the strong 1988 year-class which cannot be expected to contribute substantially to the catches much longer. The EEC/EU groundfish surveys from 1988 to 1994 showed that biomass in 1994 was substantially lower than observed during the 1991 to 1993 period, approaching the levels estimated for 1988 to 1990. The data further showed that decreases were widespread, occurring throughout the survey area in all strata. The proportions of biomass estimated in western and southwestern strata in 1994 were higher than in the previous two years, consistent with the change in the distribution of fishing effort by the commercial fleet. Size/age composition data, over time, revealed the growth and maturation of the strong 1988 year-class.

The Council agreed that shrimp abundance decreased in 1994 and that changes observed in biomass, CPUE, distribution of effort and size composition of the catches were a reflection of the intensive fishery (>50 000 tons) over a 16-month period. The data suggested that the 1988 year-class has been substantially reduced through natural and fishing mortality and that catches in 1995 will be dependent upon younger, male year-classes. None of the strength of these year-classes appear to be as strong as the 1988 year-class.

It is still unclear whether or not a sustainable shrimp fishery is possible on Flemish Cap. If the high abundance of the early-1990s was due almost entirely to one strong year-class, and if occurrences of such year-classes are sporadic, then the concept of sustainability does not apply. Harvesting the 1988 year-class at lower removals over several years (1991-94), with the addition of some annual recruitment, might have been possible. However, this opportunity to test the concept of a sustainable fishery has been lost. Clearly, any fishery cannot be maintained at current effort levels and a reduced annual effort is required to afford some protection for younger animals at lower stock size.

ii) **By-catch of redfish**

In 1993, the Council considered the by-catch of small redfish taken in the shrimp fishery on Flemish Cap as a potential for significantly impacting the redfish resource in the area and recommended that sorting grates be mandatory in shrimp fishing operations as a means of minimizing the by-catch of redfish and other fish species. Data from the 1994 fishery show that redfish by-catch remained a problem, despite the use of sorting grates. Bar spacings of 28 mm were not effective in eliminating by-catch of redfish in the 14-20 cm size range (ages 2-5). Although it is not possible to quantify the actual removal of redfish as by-catch, it is certain that for 50 000 tons of shrimp taken since May, 1993, several thousand tons of redfish also have been taken. The redfish by-catch will adversely effect the catch possibilities for commercial redfish fisheries 5-6 years hence. A minimal, annual by-catch of 3 000 tons at current sizes corresponds to approximately 100 000 000 fish. If projected, these would correspond to lost future catch opportunities of more than 10 000 tons.

By-catch of redfish will continue to be a problem in 1995. Grates with 28 mm bar spacings eliminate virtually all by-catch of redfish >21 cm. The Council **recommended** that *the mandatory use of grates in shrimp fishing activities on Flemish Cap be continued but that a bar spacing of less than 28 mm be enforced.* The appropriate spacing is unknown at present but experiments conducted in 1994 showed that 19 mm spacings significantly reduced the redfish by-catch in Div. 3M. However, the effect of such a spacing on the shrimp catch rates and size composition has not been determined.

b) **Capelin in Divisions 3N and 3O**

Preliminary data from the Russian acoustic survey on capelin in Div. 3NO during 14-24 July 1994 were available. Few capelin were seen, however, the survey results were difficult to interpret because the timing of the survey did not coincide with the presence of mature capelin on the Southeast Shoal spawning area. Consequently, the Council had no basis to change its previous advice that no capelin fishing be allowed in Div. 3NO during 1995.

c) **Data Availability for Assessment of Northern Shrimp in November 1994**

The Council noted that data would be available for consideration by STACFIS at the 18-21 November 1994 meeting of the Scientific Council. The Council noted the change in dates of this meeting (originally announced as 17-20 November 1994).

d) **Greenland Halibut Fishery with Longline *vs* Trawl in Div. 0B and 1BCDEF**

The Council received from Denmark (Greenland) on 22 July 1994 (after the provisional agenda was circulated) a request for additional scientific advice on management of Greenland halibut (see Attachment 4 to Agenda) on options corresponding to different ratios between longlining and trawling. Further to STACFIS discussion on this matter the Council submitted the following response.

The Scientific Council noted that the precision in the current advice did not allow for an attribution of a catch level to specific gears, as stock composition at age was unknown, and as the relative fishing power of the gears needed to be quantified. It was also noted, that the current fishing mortality was thought to be high, and thus the difference in yield-per-recruit for longline and trawl was considered to be small. It was further noted that the yield-per-recruit analysis was very sensitive to slight changes in the parameters. Thus the gear comparison should be treated with caution.

3. **Fisheries Commission Requests**

The following responses, to requests for advice and information received by the Council from the Fisheries Commission, were submitted to the Fisheries Commission during the course of this meeting. It is noted that some responses may have been issued directly as FC documents.

a) **Minimum Landing Sizes for Greenland Halibut and Flatfishes**

A request regarding minimum landing sizes for Greenland halibut and flatfishes (see Attachment 1 to Agenda) was forwarded for the Council's consideration in June 1994.

No data pertinent to this question were made available to either the June 1994 or to the September 1994 sessions of the Scientific Council, even though it was previously indicated that such data would be available.

The Council recognized that the data required would be selectivity studies with mesh sizes in current use, supplemented with biological data on length of first maturity and growth.

It was established that no selectivity data were available in Canadian and EU laboratories. Some preliminary information was received from Norway during this meeting. It was not possible to clarify the status of data in Russian laboratories. It was agreed that the Secretariat should inquire from the laboratories of Contracting Parties on the availability of mesh selection data appropriate to evaluate minimum landing size for Greenland halibut and witch flounder. Results of this inquiry should be reported to the June 1995 Scientific Council Meeting.

b) **Flemish Cap Cod (Division 3M)**

Further to the scientific advice on cod in Div. 3M provided by the Council in June 1994, the Fisheries Commission request further clarifications. The Council in response submitted the following note.

Survivors of the good 1990 and 1991 year-classes could begin to contribute to the spawning stock in 1995 and continue to contribute for the subsequent 4 to 5 years. However, both of these year-classes recruited to the fishery at age 2, and data from EU surveys indicate that both experienced high levels of exploitation in 1993 and 1994. Since fish are recruited to the fishery at such a young age (2-3 years old), at the present high levels of fishing mortality, only a small proportion of these year-classes will survive to contribute to the spawning stock. Hence in order to allow the spawning stock to rebuild, a much reduced level of fishing mortality on young fish, is necessary.

Although there is no direct relationship between spawning stock and recruitment for the Flemish Cap cod, an increase in spawning stock biomass will not only increase the probability of good recruitment, but will also result in an increase in the proportion of larger fish in a larger exploitable biomass that should allow a more stable fishery.

c) **Research Requirements for Greenland Halibut**

In response to a request of the Fisheries Commission, the Council reviewed the research requirements considered necessary to significantly enhance knowledge on the biology and assessment of Greenland halibut in Subareas 2 and 3.

The major requirements are:

i) Survey coverage of the total stock area to depths of at least 1 500 m.

ii) Data from the commercial fisheries, including biological data.

At present, part of the distribution area is being surveyed but coverage of deep strata has not been carried out except on an occasional basis. It is recognized that some of the vessels currently used for surveys do not have the capacity to carry out surveys in deeper waters. Therefore, vessels with the necessary capability to fish deep water would be required as a complement.

In reviewing the current survey activity in comparison to the major requirements, the Council noted that:

i) There has been no recent stratified-random bottom trawl survey in Div. 2G and 2H.

ii) The annual Canadian groundfish surveys conducted in autumn in Div. 2J+3K and Div. 3LNO extends only to depths of 1 000 m and 730 m, respectively.

iii) A Canadian Greenland halibut directed deep water fixed station survey was conducted in August/September 1991 in Div. 3KLM. A second survey was conducted in February/March 1994 extending to Div. 3N, using a stratified-random design. If such a survey is repeated, it should use the same design, gear and the same or similar vessel as used in 1994. In addition, the survey should be expanded to cover additional area in Div. 3NO to where the commercial fishery has also expanded in recent years.

iv) The annual groundfish survey conducted by the EU in Div. 3M during summer (mainly July) does not extend below 750 m, nor does it include the area of the Flemish Pass.

v) The EU proposed Greenland halibut survey in the NAFO Regulatory Area using longlines to depths of 2 000-2 500 m should be carried out in autumn 1995 in conjunction with, and as a complement to, the Canadian groundfish surveys.

vi) There is a need to expand sampling of the commercial fishery for biological data such as length, sex, maturity and age, especially from deepwater fixed gear fisheries in Canada's far north where current sampling is very limited.

vii) For the purpose of examining migratory patterns especially in the deepwater of Div. 3LMNO, tagging studies should be conducted. As a first initiative, this should be conducted in part during the proposed EU longline survey, since longline gear offers an increased chance of survival from tagging.

viii) In response to continued requests from the Fisheries Commission regarding minimum landing size for Greenland halibut, gear selectivity studies using current regulated mesh size would be informative.

In addition to the above proposals, it would be advisable to continue the trawl surveys in Subarea 1, being the longest continuous survey time series on the stock in recent years, and further expand this survey or to supplement this with surveys in Div. 0B offshore so as to cover the offshore distribution area.

Besides a thorough collection of biological data including length, sex, maturity, fecundity, diet etc. from the above proposed surveys and expanded surveys, a complete set of appropriate environmental observations should be collected.

d) **Information on the Food Fishery for Cod in Newfoundland and Labrador**

In response to the Fisheries Commission request of 20 September 1994, for information on the Canadian food fishery for cod in Newfoundland and Labrador area, the Council submitted the following information.

In 1994, the Minister of Fisheries and Oceans allowed a subsistence food fishery to take place for cod in the waters around Newfoundland and Labrador. This fishery took place over a 4 week period but was open only 2 days a week. Thus the fishery occurred over a period of only 8 days. Participants were restricted to the use of hand lines/baited hook, jiggers or sport fishing gear (rod and reel) only. A limit of 10 fish per day per individual was imposed, with the requirement that all groundfish caught regardless of species or size must be retained and counted against the 10 fish limit.

Preliminary estimates suggest that during the 8 days of this fishery, the total cod catch was in the range of 700-750 tons. This catch was spread amongst 3 different cod stocks, one of them being Div. 2J and 3KL (northern) cod. At present there is no information concerning the proportion of the estimated catch taken from this one stock.

e) **Concerning Redfish By-catch in the Shrimp Fishery in Div. 3M**

In response to the request from the Fisheries Commission concerning further detailed information on the loss of yield of Div. 3M redfish as a result of by-catches of pre-recruit fish in the shrimp fishery, the following calculations were carried out.

Yield-per-recruit analysis is a tool used in fishery science to obtain estimates of the yield weight which might be expected from a recruiting fish under different reference levels of fishing mortality. The reference levels usually discussed at the Scientific Council are $F_{0.1}$ and F_{max}. In 1989, Scientific Council had available information (NAFO Sci. Coun. Rep., 1989, p 69) concerning yield-per-recruit for redfish in Div. 3LN, and it was agreed at that time that the values were reasonably appropriate for application to redfish in Div. 3M. These data give the following results:

Natural Mortality Rate: 0.1 per year
$F_{0.1}$ computed as 0.1216 per year at Y/R of 0.1543 kg
F_{MAX} computed as 0.2196 per year at Y/R of 0.1653 kg

The following tables summarize the yield losses under different scenarios concerning shrimp catches and by-catch levels based on the above yield-per-recruit analysis. All losses would be spread out over about 15 years, but these losses would in an equilibrium situation represent annual losses. The expected accumulated yield of a year-class over its entire lifespan in the fishery is approximately 20 000 tons. The accumulated losses should be compared with this yield. Losses in excess of 20 000 tons would only be realized for strong redfish year-classes.

By-catch of 1%

Shrimp catch (t)	By-catch ($\times 10^6$)	Yield loss (t) $F_{0.1}$	Yield loss (t) F_{max}
30 000	10	1 540	1 650
10 000	3.3	510	550
5 000	1.7	260	280
3 000	1	154	165

By-catch of 3%

Shrimp catch (t)	By-catch ($\times 10^6$)	Yield loss (t) $F_{0.1}$	Yield loss (t) F_{max}
30 000	30	4 620	5 000
10 000	10	1 540	1 650
5 000	5	780	840
3 000	3	460	500

By-catch of 5%

Shrimp catch (t)	By-catch ($\times 10^6$)	Yield loss (t) $F_{0.1}$	Yield loss (t) F_{max}
30 000	50	7 700	8 250
10 000	17	2 550	2 750
5 000	9	1 300	1 400
3 000	5	770	825
1 000	2	230	250

By-catch of 10%

Shrimp catch (t)	By-catch ($\times 10^6$)	Yield loss (t) $F_{0.1}$	Yield loss (t) F_{max}
30 000	100	15 400	16 500
10 000	33	5 100	5 500
5 000	17	2 600	2 800
3 000	10	1 540	1 650
1 000	3	460	500

By-catch of 20%

Shrimp catch (t)	By-catch ($\times 10^6$)	Yield loss (t) $F_{0.1}$	Yield loss (t) F_{max}
30 000	200	30 800	33 000
10 000	66	10 200	11 000
5 000	33	5 200	5 600
3 000	20	3 080	3 300
1 000	6	920	1 000

f) **Concerning the Nature of Papers Expected for the 1995 Symposium on Seals**

In response to the Fisheries Commission request on the nature and extent of analyses that are expected to be tabled at the 1995 Symposium with respect to the interrelation between seals and commercial fish stocks, the Council noted that although many researchers throughout the world had expressed interest in participating, it was premature to predict the papers.

The full text of the response is given below in Section X.1.

4. **Arrangements for Conducting Stock Assessments and Proposed Future Documentation**

a) **Working Procedures for the June 1995 Meeting**

The Council noted the useful discussions by STACFIS regarding the procedures, and agreed further discussions would assist the Committee in completing its work effectively.

b) **Updating List of Designated Experts**

The Council noted the proposed changes in the Designated Experts, and encouraged early contact with the experts, and to provide them with necessary data for their assessment work.

c) **Guidelines for Designated Experts**

The Council noted the guidelines being proposed by STACFIS for the Designated Experts. However, with the changes to the work of the Scientific Council and STACFIS, these may need to be reviewed during the June 1995 Meeting.

d) **Status of Scientific Documents**

The Council observed that STACFIS had agreed on some minor amendments to past practice. The Scientific Council would review this topic further during the June 1995 Meeting.

e) **Guidelines for Documentation of Assessments**

The Scientific Council noted the decisions made by STACFIS and agreed to discuss these further during the June 1995 Meeting.

5. **Future Special Sessions**

a) **Report of the 1994 Special Session**

The Council endorsed the appreciation extended to the conveners for their work and convening the Special Session. The Council endorsed the recommendation on a long-term monitoring of oceanographic properties within the NAFO area.

The Council noted the Special Sessions planned for 1995 and 1996 were discussed (see Section X. below). The Council also noted the discussion on the Special Session for 1997.

6. **Other Matters**

a) **Silver Hake Ageing Methodology Report**

The Council was pleased with the progress made with respect to preparing a manual on silver hake ageing methodology, and encouraged the completion of the report by June 1995.

III. RESEARCH COORDINATION (see STACREC report, App. II)

1. **Acquisition of STATLANT 21 Data and Publication of Statistical Information**

The Council agreed with STACREC that the *NAFO Statistical Bulletin* Vol. 41 containing the 1991 data should be published in the absence of data from EU-France. It was noted that Volumes 39 and 40 were also published without data from EU-France. The Council reiterated the importance of obtaining STATLANT data from all Contracting Parties for the publication of the Bulletins.

2. **Report of CWP *Ad Hoc* Consultation of 11-15 July 1994**

The Council accepted the STACREC review of the Report of the CWP Consultation held during 11-15 July 1994 in Madrid, Spain. The subsequent submission to the General Council regarding the Statutes and Rules of Procedure for the CWP was addressed by Scientific Council under agenda item on Structure of CWP (see Section VIII.2 below).

3. **Non-traditional Fishery Resources in the NAFO Area**

The Council agreed with the STACREC view that with the decline in the fishery for most of the traditional species, information concerning distribution and abundance of species such as skates and wolffish were becoming more important. The Council endorsed the **recommendation** that *efforts be made to analyze research survey databases held by Contracting parties, and present the results of these analyses during the June 1995 Meeting.*

4. **Data from the Pilot Observer Program**

The Council agreed that the accessibility to the data collected by the various Contracting Party Pilot Observer Programs should be investigated, and if the data are accessible, they should be made available by the representatives to the Designated Experts prior to June 1995.

5. **Updating Conversion Factors**

The Council noted the steps undertaken by FAO to update the conversion factors, and was thankful to R. Grainger, CWP Secretary, for his efforts on this matter.

6. **Research Coordination for Greenland Halibut**

The Council was pleased with STACREC initiatives in coordinating research among Contracting Parties on Greenland halibut. It is noted that in response to a Fisheries Commission request during this meeting, the Council submitted a proposal on research survey requirements for Greenland halibut which was reported in Section II.3.c. above.

7. **Review of Research Documents**

The Council noted ten Research Documents which were not relevant to stock assessments and not considered by STACFIS, were reviewed and reported by STACREC.

IV. PUBLICATIONS (see STACPUB report, App. III)

1. Review of Scientific Publications

The Council was pleased with the substantial progress made, since the June 1994 meeting, in the review of papers and the publication of both the Journal and Studies issues.

Noting the delay in the review process of papers presented at the 1993 Symposium, the Council endorsed the recommendation to request an update from the conveners (editors).

2. Promotion and Distribution of Scientific Publications

The Council was pleased an attempt would be made to compile an overview paper on the historic oceanographic work carried out on the Flemish Cap.

3. Review of Papers for Possible Publication

The Council appreciated the considerable difficulty experienced by STACPUB to find an appropriate vehicle to publish the papers from the 1994 Symposium. Since the quality of papers submitted at most Special Sessions are likely to vary substantially, the Council endorsed the **recommendation** that *a discussion be initiated during the June 1995 Meeting to consider a publication series for Symposium contributions.*

The Council was pleased to note that scientists working on shrimp on the Flemish Cap will be approached to solicit papers for a special publication on the subject.

V. EXPERIMENTAL FISHERIES

1. Faroese Experimental Shrimp Fishery in Divisions 3LN

In respect of the Faroese experimental shrimp fishery in a part of Div. 3L, the Scientific Council noted that it had not received a research plan for prior comments for this program. Since shrimp fishing in Div. 3L was banned in 1994, the Scientific Council found it particularly unfortunate that this had not happened, but recognized the short time available for planning these cruises. The Scientific Council encouraged that future research programs of this nature be discussed prior to their implementation.

The Council was informed the experimental fishery was in Div. 3L and did not include Div. 3N. The Council reviewed SCR Doc. 94/75, 76, 77, 78 and 79 on this subject.

In the period 1 January-30 June 1994, two Faroese shrimp vessels conducted exploratory fishing in Div. 3L on the Nose of the Bank. Two observers were onboard gathering biological data including by-catches especially in relation to sorting grates. The scientific design of the investigation is described in SCR Doc. 94/75.

In limited areas the experimental fishing found catch rates comparable to those experienced in Flemish Cap.

The spacial coverage of the survey was limited and no assessment of the occurrence over the Bank and its slopes can be made.

By-catches included cod and redfish. Cod by-catch, given their length distribution, were probably a result of the grate not functioning. Compared with Div. 3M it appeared that the by-catch of redfish is lower.

Age, growth and reproduction was analyzed and was compared with Div. 3M. It was noted there may be growth differences between shrimp on the Bank and on the Flemish Cap.

2. **Russian Experimental Fishing for Redfish with Different Mesh Sizes**

The Russian representative informed the Council that the program was underway, the cruise was ongoing and data would be available late-1994 or early-1995. The Russian representative agreed that these data and analyses in the form of an SCR Document would be forwarded to the Secretariat as soon as possible, for an early distribution prior to consideration at the June 1995 Meeting.

VI. RULES OF PROCEDURE

The Council noted that it had adopted changes in its Rules of Procedure, particularly Rule 5, in June 1994. The Council at that time allowed the time between the June and the September meeting for further considerations. However, there were no comments received and the amended rules will come into force on 1 January 1995.

VII. STRUCTURE OF SCIENTIFIC COUNCIL AND DOCUMENTATION

1. **Adoption of Work Procedures for June 1995 Scientific Council Meeting**

The Council noted that during the June 1995 Meeting there will be a new element with an overlap of 3 days at the beginning of the Scientific Council (7-21 June) with the Joint ICES/NAFO Working Group on Harp and Hooded Seals (5-9 June). It was recognized that time must be provided on 9 June to review the assessments of this Working Group. It was also considered that this timing should not be in conflict with the schedule of STACFEN.

The Scientific Council tentatively scheduled the meeting as follows, however, it was noted that the Chairmen would discuss this schedule in advance of June 1995:

a) 5-9 June – Working Group on Harp and Hooded Seals.

b) 7 June – Opening of Scientific Council followed by STACFIS (see STACFIS report, App. I, item IV.1.).

c) 8 June – STACFEN

d) 9 June – Scientific Council. Discussion of advice for Harp and Hooded Seals in the Northwest Atlantic, and STACFEN if needed.

e) 10-11 June – No committee meetings. Completion of preliminary assessments.

f) 12-13 June – STACFIS. Review of assessments.

g) 14 June – STACREC and STACFEN.

h) 15-16 June – STACFIS. Review of assessments and completion of agenda.

i) 17-21 June – Scientific Council. Formulation of advice.

The Council agreed that the Executive Committee will discuss this plan further, prior to formulating the provisional agenda in early-April, 1995. The Council further took note of the discussion on time constraints (see Other Business below) and it was pointed out that the Chairmen of the Scientific Council and its Committees could take a critical look at the agendas. There could be items which could be deleted from either the Annual or the June meeting, i.e. items to be discussed only once a year.

2. **Space Requirements for June Meeting**

The Council was pleased to learn that similar space to June 1994 will be provided for the June 1995 Meeting.

3. **Hardware and Software Requirements for June Meeting**

The Council recalled its comments from the June 1994 Meeting, and emphasized the need for improved computer printing facilities and, for software, the availability of a spreadsheet program on the computers e.g. LOTUS 1-2-3/QUATTRO/EXCEL. It was also recognized that there may be a need for special computer equipment for presentations. Members also mentioned various other software which may be useful. It was agreed that information should be forwarded to the Secretariat for circulation among Scientific Council members.

4. **Documentation and Publications of the Scientific Council**

The Council took note of the discussion in STACFIS and recognized the need to continue discussions on this point to make the best use of the time available for the meeting as well as the Secretariat.

VIII. COLLABORATION WITH OTHER ORGANIZATIONS

1. **Joint ICES/NAFO Working Group on Harp and Hooded Seals**

The Scientific Council on 17 June 1994 received a request for advice on harp and hooded seals. At the June 1994 Meeting, it was agreed a meeting of the Working Group prior to its June 1995 Meeting would provide an opportunity for the Council to review the Working Group report and develop advice to the Fisheries Commission. The Council at its meeting in June 1994 agreed to defer discussion on Terms of Reference for the Joint ICES/NAFO Working Group on Harp and Hoods Seals to address the request. After consultations with the incoming Chairman of the Working Group and ICES, the Council agreed the following Terms of Reference should be forwarded to ICES to call a meeting of the Working Group.

The proposed Terms of Reference for this Working Group are as follows:

The joint ICES/NAFO Working Group on Harp and Hooded Seals shall meet 5-9 June 1995 at NAFO Headquarters, Dartmouth, Nova Scotia, Canada, with G. Stenson, St. John's, Newfoundland, Canada, as Chairman to:

- Assess stock sizes, distributions and pup production of harp and hooded seals in the Northwest Atlantic and estimate replacement and sustainable yields both at present stock sizes and in the long term under varying options of age compositions in the catch.

- Assess the effects on harp and hooded seal populations of recent environmental changes or changes in food supply and possible interactions with other living marine resources in the North Atlantic.

- Provide proposals for future research programs.

Based on the report of the above-mentioned meeting, the Scientific Council will then at its June 1995 Meeting:

- Advise on catch options for harp and hooded seals in the NAFO area.

2. **Review of Structure of CWP**

The Scientific Council reviewed the amended statutes of the CWP as proposed by STACREC and forwarded them to the General Council for approval.

IX. REVIEW OF FUTURE MEETING ARRANGEMENTS

1. **Scientific Council Meeting on Northern Shrimp, November 1994**

The Council agreed to change scheduled dates from the original 17-20 November to 18-21 November 1994. The meeting will be held at NAFO Headquarters, Dartmouth, Nova Scotia, Canada.

2. **June 1995 Meeting of Scientific Council**

The dates previously agreed of 7-21 June 1995 were confirmed by the Council. The meeting will be held in Dartmouth, Nova Scotia, Canada. The meeting will be preceded and partly overlapped by the meeting of the ICES/NAFO Working Group on Harp and Hooded Seals during 5-9 June 1995, which will also held at the same place as the Council Meeting.

3. **Special Session and Annual Meeting, September 1995**

The Council noted the dates for the Annual Meeting 11-15 September 1995 which would be preceded by a Special Session symposium on "The Role of Marine Mammals in the Ecosystem" during 6-8 September 1995.

4. **June 1996 Meeting of the Scientific Council**

The provisional dates for the meeting were set for 5-19 June 1996.

X. FUTURE SPECIAL SESSIONS

1. **Update on Special Session of September 1995**

The Scientific Council of NAFO and the International Council of the Exploration of the Sea (ICES) have agreed to sponsor a Symposium on the "Role of Marine Mammals in the Ecosystem", co-convened by J. Sigurjonsson (Iceland) and G. B. Stenson (Canada). It is intended that papers presented at this Symposium will address a number of issues including ecological processes affecting marine mammals, foraging strategies, energetic considerations, marine mammal-fisheries interactions, multispecies models and future research requirements. Relevant papers dealing with any marine mammal population will be accepted although, studies related to issues in the North Atlantic will be given preference if time is limited.

The Council noted a first announcement has been distributed by both NAFO and ICES, alerting potential participants to the intentions. Speakers will be invited to present keynote addresses for each session, and a second announcement and call letter for contributed papers will be issued by 1 December 1994. Abstracts describing proposed papers will be due 1 March 1995.

As the first announcement has only recently been distributed and the final deadline for papers is not until next March, the convenors could not at this time determine the nature of the papers which will be presented on interrelationships between seals and commercial fish stocks. The convenors are aware of a number of studies addressing the topic and are encouraging the researchers to present their findings. A number of researchers from throughout the world have already expressed interest in participating in the Symposium (e.g. Australia, Canada, Denmark, Norway, Philippines, South Africa, United Kingdom and United States of America), but have not provided information on the papers they intend to present. The convenors will have a better understanding of the nature and extent of analyses that will be presented once abstracts are submitted next spring.

2. **Special Session of September 1996**

The Council noted that there had been no progress made since the June 1994 Meeting to develop on the proposed topic "What future for Capture fisheries", and hoped that this would be possible before the June 1995 Meeting.

XI. OTHER BUSINESS

1. **Annual (September) Meeting**

The Council discussed the time constraints it faces during the Annual meetings and recognized that there were significant problems in running an effective Scientific Council Meeting parallel to meetings of the Fisheries Commission.

It was further noted that assessment of the Flemish Cap Shrimp during this meeting was rushed and that there had been little time to adequately draw conclusions.

The Council discussed several ideas. These included

- The Scientific Council September Meeting would start on Friday or Saturday of the week before the Annual meeting. While the General Council and Fisheries Commission are in session, the Scientific Council would only deal with requests from those bodies.
- How the requests should be answered was discussed, and it was questioned whether it would be necessary or desirable that these be answered by the entire Scientific Council or be answered by the Chairman and /or the Executive Committee of the Council.

No conclusions were drawn at this point in time.

The Council recalled its discussions on how the June Meeting should be organized. Since they have implications on the workload at the Annual Meeting, the Council agreed that it would need yet another look at the total arrangements. In this connection the Council recalled its decision that the Chairmen should critically review their agendas and consider if most topics could not be completed during the June meeting when most participants are present.

XII. ADOPTION OF REPORTS

At its concluding session on 23 September, the Council **adopted** the reports of STACFIS, STACPUB and STACREC.

The Chairman then proposed that the Council Report as discussed be adopted, noting that some text change would be made by the Chairman and the Assistant Executive Secretary. The Council accordingly **adopted** the report of this meeting.

XIII. ADJOURNMENT

In closing the meeting the Scientific Council thanked the outgoing Chairman of STACFIS H.-P. Cornus (EU-Germany) for a job very well done. His term of office had been at a time of considerable scientific problems with the new fisheries on the Flemish Cap and in the Flemish Pass. Even so H.-P. Cornus had time to also critically review the working procedures of his Committee and had with success introduced several changes. The Chairman also welcomed the incoming Chairman of STACFIS W. B. Brodie (Canada) and looked forward to a period with a friendly, open and fruitful cooperation. The Chairman thanked all participants for their contributions and for helping him in running the meeting and wished them a safe journey home. Furthermore he thanked the Assistant Executive Secretary for all his help and asked him to convey the thanks of the Council for the very effective support provided by the staff of the Secretariat.

APPENDIX I. REPORT OF THE STANDING COMMITTEE ON FISHERY SCIENCE (STACFIS)

Chairman: H. P. Cornus Rapporteurs: Various

The Committee met at the Holiday Inn, Dartmouth, Nova Scotia, Canada, during 19-23 September 1994 to consider and report on various matters referred to it by the Scientific Council. Representatives from Canada, Denmark (in respect of the Faroe Islands and Greenland), Estonia, European Union, Iceland, Japan, Republic of Korea and the Russian Federation, and an observer from FAO were present.

I. REVIEW OF RECOMMENDATIONS

Recognizing the notes attached to the agenda reflected the recommendations from the Report of the June 1994 Meeting, STACFIS did not further consider recommendations at this meeting.

II. STOCK ASSESSMENTS

1. **Shrimp in Division 3M** (SCR Doc. 94/35, 75, 76, 77, 78, 79, 81, 82, 83, 85, 86)

a) **Introduction**

The shrimp fishery in Div. 3M began on 30 April 1993, when two Canadian offshore vessels were granted exploratory permits to fish for *Pandalus borealis* in the area. Activity increased thereafter to include about 50 vessels in early July but subsequently declined over the remainder of the year. Only 4 vessels were reported fishing shrimp at the end of December.

Fishing continued into 1994, albeit at low intensity. Activity increased over winter to 21 vessels but then decreased in early spring. In May, effort began to increase again and the number of vessels grew from 16 to 47 by the middle of June. Therefore, the number decreased to 30 as of the end of August.

Landings totalled approximately 28 000 tons in 1993 and 20 293 tons up to 31 August 1994. As many as 79 different vessels from 9 countries participated in 1993 compared to 72 vessels from 12 countries so far in 1994. Preliminary nominal catches by nation and year are given below.

Nation	1993 (tons)	1994 (to 31 August) (tons)
Canada	3 724	1 030
Denmark	800	375
Estonia		597
Faroe Is.	8 545	4 899
Greenland	3 770	1 768
Iceland	2 243	1 405
Latvia		261
Lithuania		1 150
Norway	8 700	8 100
Russia	300	25
Spain		250
St. Vincent		75
Total	28 098	20 293

b) **Input Data**

i) **Commercial fishery data**

Fishery information from Canada and Greenland indicated that the distribution of effort in 1994 differed from that observed in 1993 in that more fishing activity occurred in the

western and southwestern areas of the Cap. The Greenland data showed that fishing was unproductive in eastern areas and that catch rates were maintained by concentrating effort in areas where densities were highest. The Canadian fishery in March 1994 produced low catch rates over the preferred grounds fished in 1993. Available data showed that catch rates were substantially lower in 1994 and there was no distinct decline in CPUE over the year, as had been observed in 1993.

Commercial catch sampling data showed changes in the size/age composition of the catches between the two years. Males were much more prevalent in the catches of several nations in 1994, compared to a clear domination by the female ages in 1993. The component of females present in 1994 was believed to be the remains of the strong 1988 year-class which cannot be expected to contribute substantially to the catches much longer.

Ageing of shrimp from commercial samples had been attempted by Canada, Faroe Islands, Iceland and Norway and there seemed to be a degree of consistency among interpretations. The Faroe Islands study showed a difference in growth rate of shrimp between Flemish Cap and the adjacent Div. 3L.

Icelandic and Faroese sampling data from May 1993 to August 1994 showed that females spawned primarily in August and their eggs hatched from March through May. It was concluded that the egg-bearing period lasts for about nine months.

The only data on shrimp discarding were from the Canadian fishery which showed low relative levels in all months, except for an estimate of 6.3% of the total shrimp catch in July 1993.

By-catch in 1993 consisted primarily of small redfish (mode at 14 cm) and Canadian observer data indicated levels of 9 and 13% of the total catch weight in May and June, increasing to 44% in July. Redfish were still a problem in 1994 (up to 32% in April), despite the mandatory use of sorting grates, and occurred in large numbers at 17-18 cm. If the Canadian data represented overall shrimp fishing conditions on the Flemish Cap, then it was highly likely that several thousand tons of small redfish have been taken as by-catch in both 1993 and 1994. Although sorting grates with bar spacings of 28 mm appeared largely ineffective to eliminate small redfish by-catch, they were very efficient at eliminating the larger sizes (>21 cm). By-catch of other commercial species in the Div. 3M shrimp fishery does not appear to be a problem.

ii) **Research survey data**

The EEC/EU groundfish surveys from 1988 to 1994 (text table below) showed that biomass in 1994 was substantially lower than observed during the 1991 to 1993 period, approaching the levels estimated for 1988 to 1990.

Year	Biomass (t)	Average catch per mile (kg)	Standard error
1988	2 164	1.54	± 0.28
1989	1 923	1.37	± 0.24
1990	2 139	1.53	± 0.21
1991	8 211	5.83	± 0.71
1992	16 531	11.75	± 1.86
1993	9 256	6.57	± 1.04
1994	3 337	2.37	± 0.35

The data further showed that decreases in 1994 were widespread, occurring throughout the survey area in all strata. The proportions of biomass estimated in western and southwestern strata in 1994 were higher than in the previous two years, consistent with the change in the distribution of fishing effort by the commercial fleet. Size/age composition data, over time, revealed the growth and maturation of the strong 1988 year-class.

c) **Assessment Results and Prognosis**

STACFIS noted that the assessment results and prognosis, and further clarifications as requested by the Fisheries Commission were addressed and reported by the Council. These are given in the Scientific Council Report above.

d) **Research Recommendations**

In 1993, STACFIS made three recommendations with respect to shrimp in Div. 3M and was pleased to note that some progress had been made with each:

- Commercial sampling of shrimp catches and commercial by-catch species was performed by some participating countries. These data were critical for the current assessment and STACFIS reiterated that all countries provide levels of sampling as recommended by NAFO Conservation and Enforcement Measures.

- The EU groundfish survey in 1994 provided data on shrimp distribution and abundance, as requested, continuing the time-series.

- No further analyses of existing data on predation by cod were available for this meeting to provide further insights into shrimp growth, distribution and/or abundance. However, a study (SCR Doc. 94/35) concluded that the abundance of shrimp on the Cap in summer makes them an important prey for several fish species. Wolffish, Greenland halibut and thorny skate were important predators of shrimp, and redfish (*Sebastes* spp.) fed on shrimp which migrated vertically, presumably, at night.

2. **Capelin in Divisions 3N and 3O**

In the light of the preliminary nature of the data from the Russian survey this agenda item was dealt with directly in Scientific Council (see Scientific Council Report above).

3. **Data Availability for Assessment of Northern Shrimp in November 1994**

STACFIS reviewed the availability of data for the forthcoming Scientific Council Meeting for assessment of northern shrimp in Subareas 0 and 1, and Denmark Strait.

Shrimp in Subareas 0+1. Participants from Canada and Greenland informed that data from the commercial fishery in 1994 (up to August-September), *including catch* statistics and catch rates, and also results from inshore and offshore trawl surveys in 1994 by Greenland will be available before the meeting.

Shrimp in Denmark Strait. Commercial fishery data from Greenland and Iceland, as well as results from a trawl survey by Greenland, will be available before the meeting.

STACFIS noted the meeting will be held at the NAFO Headquarters in November 1994. STACFIS proposed to change the scheduled dates to 18-21 November 1994, from the originally proposed dates of 17-20 November 1994.

4. **Fishery for Greenland Halibut with Longline *vs* Trawl in Div. 0B and Div. 1BCDEF**

In response to a request by Denmark (on behalf of Greenland and Faroe Islands) STACFIS considered the question as to whether the advised catch level for Greenland halibut would change if catches were to be taken by longline instead of trawl.

Data presented by Greenland on a comparison between longline and trawl catches in the Davis Strait in 1991 showed a distinct difference in selection by the two gears, where longlines were catching the larger and older fish. Further a yield-per-recruit analysis showed a higher yield for longlines as compared to trawl, especially at low fishing mortalities.

STACFIS indicated that the precision in the current advice does not allow for an attribution of a catch level to specific gears, as stock composition at age is unknown, and as the relative fishing power of the gears

need to be quantified. It was also noted, that the current fishing mortality is thought to be high, and thus the difference in yield-per-recruit for longline and trawl is considered to be small. It was further noted that the yield-per-recruit analysis was very sensitive to slight changes in the parameters. Thus the gear comparison should be treated with caution.

A change in gear to longlines would further change the sex ratio in the catches, as the large fish are mostly females, but STACFIS was not able to quantify the effect of such a change.

III. FISHERIES COMMISSION REQUESTS

STACFIS noted that all requests forwarded by the Fisheries Commission were dealt with directly by the Scientific Council.

IV. ARRANGEMENTS FOR CONDUCTING STOCK ASSESSMENTS AND PROPOSED FUTURE DOCUMENTATION

1. Adoption of Work Procedures for the June 1995 STACFIS Meeting

The Committee considered that the procedure followed at the June 1994 Meeting was very useful, when the first day of the meeting was utilized to agree on the best estimates of catches for the stock to be assessed. In addition, STACFIS proposed and welcomed to have presentation of surveillance data on the first day to enhance information on catches.

STACFIS noted the other procedural change where the second, third and fourth days were used for finishing and updating preliminary assessment work, prior to STACFIS taking up the stock-by-stock assessment work during the following week.

2. Updating List of Designated Experts

The Committee was informed that W. B. Brodie (Canada) was due to begin his term as Chairman of STACFIS as of September 1994, and he would not be in a position to undertake the tasks of the Designated Expert for American plaice in Div. 3LNO and yellowtail flounder in Div. 3LNO, and that M. J. Morgan (Canada) and S. J. Walsh (Canada) will take over these tasks, respectively. In addition, M. B. Davis (Canada) will replace C. A. Bishop (Canada) as Designated Expert for cod in Div. 3NO.

Recognizing the heavy workloads of the Designated Experts during the June Meetings, STACFIS in September 1993 felt it would be desirable to nominate one scientist per stock. Although this was not practical at the time, STACFIS noted some progress was being made with the changes this year. Accordingly, the list of Designated Experts for 1994 was reviewed and the following were tentatively identified for the 1995 assessments:

– From the Science Branch, Northwest Atlantic Fisheries Centre, Department of Fisheries and Oceans, P. O. Box 5667, St. John's, Newfoundland, Canada, A1C 5X1 [Telefax: (709) 772-4188; E-mail: NAME@NFLORC.NWAFC.NF.CA]

for	Cod in Div. 3NO	M. B. Davis
	Redfish in Div. 3LN	D. Power
	American plaice in Div. 3LNO	M. J. Morgan
	Witch flounder in Div. 3NO	W. R. Bowering
	Yellowtail flounder in Div. 3LNO	S. J. Walsh
	Greenland halibut in SA 2 + Div. 3KL	W. R. Bowering
	Roundnose grenadier in SA 2+3	D. B. Atkinson
	Capelin in Div. 3L	J. E. Carscadden
	Capelin in Div. 3NO	J. E. Carscadden
	Squid in SA 3+4	G. H. Winters
	Shrimp in Div. 3M	D. G. Parsons

- From the Instituto de Investigaciones Marinas, Muelle de Bouzas, 36208 Vigo, Spain [Telefax: +34 86 292762]

  for Cod in Div. 3M — A. Vazquez

- From the Instituto Espanol de Oceanografia, Centro Oceanografico de Cantabria, Aptdo 240, 39080 Santander, Spain [Telefax: +42 275072],

  American plaice in Div. 3M — E. de Cárdenas

- From the Polar Research Institute of Marine Fisheries and Oceanography (PINRO), 6 Knipovich Street, Murmansk, 183763, Russia [Telefax: +47 789 10518; Telex: 126 111 PINRO; E-mail: PINRO@IMR.NO]

  for Redfish in Div. 3M — K. V. Gorchinsky

- From the Greenland Fisheries Research Institute, Tagensvej 135, 1, DK-2200, Copenhagen, Denmark [Telefax: +45 35821850],

  for
  Northern shrimp in SA 0+1 — D. Carlsson
  Roundnose grenadier in SA 0+1 — J. Boje
  Wolffish in SA 1 — J. Boje
  Greenland halibut in SA 0+1 — J. Boje

- From the Institut für Seefischerei, Fischkai 35, D-27572 Bremerhaven, Republic of Germany [Telefax: +49 431565876]

  for Redfish in SA 1 — H. J. Rätz

- From the Marine Fish Division, Department of Fisheries and Oceans, Bedford Institute of Oceanography, P. O. Box 1006, Dartmouth, Nova Scotia, Canada, B2Y 4A2 [Telefax: (902) 426-7827, E-mail: M_SHOWELL@BIONET.BIO.DFO.CA]

  for Silver hake in Div. 4VWX — M. A. Showell

- From the Marine Research Institute, Skulagata 4, P. O. Box 1390, 121 – Reykjavik, Iceland [Telefax: +354 1 623790]

  for Northern shrimp in Denmark Strait — U. Skúladóttir

The Secretariat was requested to confirm the availability of the Designated Experts from their respective laboratories.

3. Guidelines for Designated Experts

STACFIS highlighted that Scientific Council Research (SCR) Documents are scientific contributions to the Scientific Council from individual scientists, including preliminary stock assessments prepared by Designated Experts prior to the meetings.

The full contents of the preliminary assessment reports should be in the format of the assessment reports currently compiled in STACFIS reports. In addition, STACFIS noted the general guidelines for preparation of SCR Documents as agreed to by the Council in September 1993 should be followed. It was noted these guidelines are forwarded to scientists at the beginning of each year by the Secretariat in the Circular Letter series.

The format of the stock assessments to be presented in the Scientific Council Reports, however, would be a brief summary of the STACFIS accepted stock assessments and should only include:

- Reference to SCS Documents where the STACFIS accepted stock assessments can be found

- Reference to SCR Documents drawn upon for the assessment
- Description of the fishery
- Prognosis and management recommendation
- Summary sheet
- Basic graphs:

  i) Catch and TAC *vs* year
  ii) Abundance indices for analytical assessments
  iii) Recruitment and SSB *vs* year
  iv) Fishing mortality *vs* year
  v) Yield and SSB *vs* F for the year of projection
  vi) Any other graphs deemed essential for understanding the management advice

4. **Status of Scientific Documents**

Although only a few members of the Committee were present, there was a vigorous discussion on this topic. A proposal to change the documentation of assessment results in view of the agreed changes in the structure of the Scientific Council was not accepted by the Committee. The proposal would have placed the details of each assessments in separate SCS documents. The Committee agreed that the only change to past practice should be to transfer the section dealing with advice to the Report of the Scientific Council while retaining the summary of the assessment, including the discussion and the results, in the STACFIS report.

The Committee agreed that some improvements should be made to the assessment reports with citations and references to SCR and SCS Documents placed in the text against specific subjects discussed. It was also agreed that when information was obtained from working papers, those working papers should be improved and upgraded to SCR Document status, and then referenced in the assessment reports.

5. **Guidelines for Documentation of Assessments**

The Committee agreed on the following structure for documentation of survey results (where appropriate):

a) Description of designated area covered by the survey and season.

b) Description of differences to former years.

c) i) Description of survey methods (should be referenced).
   ii) If stratification is involved – description of stratification (should be referenced).
   iii) description of differences to former years.

d) i) Total survey results of biomass and abundance including standard errors, as time series.
   ii) Survey results (biomass, abundance) including standard error (where appropriate) by stratum, as time series.

e) i) Description of changes by time in population structure (age, length).
   ii) Description of changes by area in population structure.

f) Migration features, if appropriate.

g) Estimates of recruiting year-classes (year-class by year-class) and changes in estimation by year, if appropriate.

h) Mean length- or mean weight-at-age and length-weight relationship (if available).

V. FUTURE SPECIAL SESSIONS

1. **Report of 15-16 September 1994 Special Session on "Impact of Anomalous Oceanographic Conditions at the Beginning of the 1990s in the Northwest Atlantic on the Distribution and Behaviour of Marine Life"**

STACFIS reviewed the report of the Special Session on "Impact of Anomalous Oceanographic Conditions at the Beginning of the 1990s in the Northwest Atlantic on the Distribution and Behaviour of Marine Life" held from 15-16 September 1994 at the NAFO Headquarters, as prepared by the co-conveners M. Sinclair (Canada) and M. Stein (EU-Germany). This report is appended as Annex 1 to this report.

STACFIS expressed its appreciation to the co-conveners for their preparatory work and convening of this Special Session. The Committee endorsed the Special Session **recommendation** that *long-term monitoring of oceanography properties (including plankton) as well as of fish distributions and abundance, be given high priority within the NAFO area in order to allow interpretation of fish population variations.* It was proposed that further elaboration for a monitoring program could be developed by STACFEN which will meet in June 1995.

2. **Progress Report on September 1995 Special Session**

This item was dealt with during Scientific Council sessions.

3. **Progress Report on September 1996 Special Session**

STACFIS was not able to report any progress on this Special Session.

4. **Theme for September 1997 Special Session**

STACFIS discussions resulted in two tentative proposals given below. It was agreed that the representatives who proposed these topics would prepare outlines for further discussion at the June 1995 Meeting of the Scientific Council.

The proposed titles are: "Assessment of Fish Stocks When A Moratorium on Fishing Exists". This session would examine methods of stock assessment which could be used in the absence of current commercial fishery data, or when such fishery data are considered inadequate.

"Fisheries Management by Effort Regulation". The relationships between fishing activity, fishing effort, fishing mortality and fleet capacity could be considered along with their consequences for management.

VI. OTHER MATTERS

1. **Silver Hake Ageing Methodology Report**

In 1991 and 1992 the Scientific Council recommended that the results of various workshops on the ageing of silver hake be consolidated into a comprehensive document on methodological techniques for ageing this species. In response to this request, the Canadian scientists conducting studies on this species presented a proposed outline for such a manual for consideration by STACFIS, with the intention to present a completed document at the June 1995 meeting of the Scientific Council. STACFIS approved this proposal.

2. **Other Business**

There being no further business, the Chairman thanked the participants for their patience during the meeting and their valuable contributions to successfully complete the work of STACFIS.

Noting his term of office ends at the end of this meeting, the Chairman expressed his sincere thanks to STACFIS members for their support and cooperation during the often long and difficult discussions during his tenure. He also particularly thanked the Designated Experts for their hard work and the Assistant Executive Secretary and the Secretariat for the support afforded to him. He welcomed the incoming Chairman, W. B. Brodie, wishing him a successful and rewarding term.

ANNEX 1. REPORT OF THE SYMPOSIUM ON "Impact of Anomalous Oceanographic Conditions at the Beginning of the 1990s in the Northwest Atlantic on the Distribution and Behaviour of Marine Life"

The following report prepared by the co-conveners was accepted by STACFIS during its meeting of 19-23 September 1994.

Introduction

The Symposium on "Impact of Anomalous Oceanographic Conditions at the Beginning of the 1990s in the Northwest Atlantic on the Distribution and Behaviour of Marine Life", with M. Sinclair (Canada) and M. Stein (EU-Germany) as co-conveners, was held at the NAFO Headquarters, Dartmouth, Nova Scotia, Canada during 15-16 September 1994. Twelve papers were presented (SCR Doc. 94/63-74). The Symposium was opened by H.-P. Cornus (STACFIS Chairman – EU-Germany).

M. Sinclair introduced the theme of the meeting with an historical account of the shift in the conceptual framework of the fisheries fluctuations problem that occurred during the first decade of ICES research activities. The title of the talk was "Fisheries Fluctuations: the Paradigm Shift of Committee A (1902-14)". At the turn of the century the existing hypothesis accounting for interannual and decadal scale fluctuations was that migration changes at the species level, forced by changing oceanographic conditions (on ocean-basin scales), generated variable abundance at diverse fishing locations along the coast of Europe. The new hypothesis of Hjort (1914), based largely on the work of Committee A of ICES, emphasized the role of year-class variability of geographically restricted stocks as the major cause of fluctuations in catches. In recent years migration changes due to oceanographic variability are considered to be an important component of the "fisheries fluctuations" problem. Thus the speaker proposed that a balance between the "migration thinking" of the 19th century and the "population thinking" of the 20th century will probably be the conceptual framework of the 21st century.

A total of 31 participants registered for the Symposium, representing 12 countries (Canada, Denmark, Faroe Islands, France, Germany, Greenland, Japan, Portugal, Spain, Russian Federation, United Kingdom and the United States of America).

Summary of Contributions

Four papers (SCR Doc. 94/69-72) were presented on the changes in the environmental conditions of the North Atlantic on a range of time and space scales. On a time scale of a century, it was shown that the cold atmospheric conditions off West Greenland during the past two decades were comparable to those at the turn of the century, and as such were not anomalous. On a shorter time scale (i.e. the past several decades), however, the oceanographic conditions of the 1980s and the early-1990s were shown to be colder than average (relative to the 1961-1990 mean) for most of the Northwest Atlantic from West Greenland to about the eastern Scotian Shelf. In contrast the conditions in the eastern part of the North Atlantic (Iceland to Europe) had been warmer than average during the past decade. The environmental conditions over the western Scotian Shelf, the Gulf of Maine area and the Mid-Atlantic Bight had been average. The changes in environmental conditions, as well as their pattern, were described. The major change had been shifts in the winter wind conditions (the intensity and direction of the northwesterlies) over time, which in turn modified the advection of cold water from the Davis Strait *via* the Labrador Current. The shift in the winter winds (which are generated by the relative air pressure strengths of the Icelandic Low and the Bermuda-Azores High) bring warmer air temperatures over the eastern seaboard of the United States, when the cooler than normal conditions are being generated in the Northwest Atlantic. Thus the southern part of the NAFO area had been experiencing average environmental conditions during the past decade, while the northern part had been cooler than average. On shorter time scales (within season) it was shown that anomalous advection of Scotian Shelf water across the Northeast Channel can displace Georges Bank water. This occurred in the winter spring of 1992, and may have had an impact on gadoid recruitment processes. The four papers on the oceanographic conditions within the NAFO area provided an excellent framework within which to summarize the degree to which the past several years had been anomalous. In the summary discussion it was concluded that on a time scale of interest to fisheries management (i.e. years to decades) the early-1990s had been very cold for most of the NAFO area.

Four papers (SCR Doc. 94/64, 66, 67 and 73) evaluated trends in spawning stock biomass (SSB), recruitment, survival rate (i.e. recruitment over SSB), and growth of fish as a function of changing environmental conditions and fishing pressure. It was concluded that survival rate had been relatively low during the past decade. Also weight-at-age and growth rates had been low for several cod stocks, but not all. To a certain degree the recent patterns in

growth rate changes and weight-at-age follow the broad patterns in changes in environmental conditions. Weights-at-age for Div. 2J+3KL cod, Div. 4T cod, Div. 4VsW cod and annual growth rate for Div. 2J+3KL cod had been declining during the cool period. In contrast growth rates for Icelandic and Arcto-Norwegian cod, and weights-at-age for the Gulf of Maine area cod (Div. 4X and 5Z) had either been stable or high during the respective average and warm periods. It was also noted that fishing mortality had been increasing during the time period of stock declines in many areas. Thus fishing had contributed to the rate of decline of the stocks during a time period which had been poor for fish production over a large part of the NAFO area. There was some evidence that cod recruitment variability off West Greenland was associated with increased advection of warm oceanic waters and that temperature and current strength off Atlantic Canada influenced recruitment for a range of fish species (groundfish and pelagic).

Four papers (SCR Doc. 94/63, 65, 68 and 74) addressed changes in distribution of fish species in response to the cool period of the last several years. There was strong evidence that capelin and Greenland halibut had expanded their distribution to the Scotian Shelf in parallel with the declining temperatures on the eastern shelf. Spawning times of capelin have been 4-6 weeks later since 1991. Capelin have also appeared on Flemish Cap in recent years. American plaice were observed more frequently in deeper water within Div. 3LNO than had been the case prior to the 1990s. Silver hake were shown to be associated with the shelf/slope front off the Scotian Shelf. On short time scales (weeks), silver hake were observed to change their distribution in relation to shifts in the position of the front.

During a general discussion, it was **recommended** that *long-term monitoring of oceanographic properties (including plankton), as well as of fish distributions and abundance be given high priority within the NAFO area to allow interpretation of fish population fluctuations.* The consensus of the participants was to publish the papers and the discussion from the symposium in a special publication. The co-conveners thanked the Secretariat for their help in the preparation of the papers and their support at the meeting.

List of Participants

Canada

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APPENDIX II. REPORT OF STANDING COMMITTEE ON RESEARCH COORDINATION (STACREC)

Chairman: C. A. Bishop Rapporteur: D. B. Atkinson

The Committee met at Holiday Inn, Dartmouth, Nova Scotia, Canada on 19-23 September 1994, to discuss various matters pertaining to statistics and fisheries research in the Regulatory Area, as referred to it by the Scientific Council. Representatives from Canada, Denmark (in respect of Faroe Islands and Greenland), Estonia, European Union, Iceland, Japan, Republic of Korea and Russian Federation, and an observer from FAO of the United Nations, were present.

1. Acquisition of STATLANT 21 Data

The Secretariat reminded the Committee that it had been unable to provide a preliminary list of 1993 catches in June because many countries had not submitted their STATLANT 21A data. Information from Cuba, Estonia, Faroe Islands and Lithuania was still not available so it was still not possible to tabulate updated information on fishery trends. Recognizing the requirement to submit these data in advance of the June meeting, STACREC emphasized this was a serious lapse this year.

2. Publication of Statistical Information

The Secretariat reported that since June 1994, data for 1991 had been received from Denmark so that the only missing information was from EU-France. The French data were also missing from previous years, and the Committee agreed that the *NAFO Statistical Bulletin* Vol. 41 for 1991 should be published without these data as had been done for 1990.

Data for 1992 were still missing from EU-France and Lithuania. Data had been received from the Russian Federation and Canada but require some clarifications before they could be finalized. Although data were not yet available from the United States, the Secretariat had been informed they should be available soon. STACREC encouraged the Secretariat to make contact with the relevant statistical offices to obtain the required data and finalize the publication of the *Statistical Bulletin* Vol. 42 for 1992.

It was reported that EU-France data were now available separated between metropolitan catches and St. Pierre-Miquelon catches for 1983-85 and an update of the revisions for these years will be included in the next issue of the Statistical Bulletin.

3. Report of CWP *Ad hoc* Consultation of 11-15 July 1994

The Report of the CWP *Ad hoc* Consultation in Madrid, 11-15 July 1994, was made available and summarized to STACREC by R. Grainger of FAO, the CWP Secretary. It had been recognized by the Consultation that new demands for statistics from Regional Fishery Organizations will probably result from developments at the UN Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks and hence the need for improved coordination amongst organizations. It may also become desirable to expand the horizons to areas outside the Atlantic. During the consultation it was agreed that a two step process should be followed. First, revised Statutes and Rules of Procedure would be prepared, discussed and agreed upon. Later there would be careful consideration of the idea of expanding the area covered during CWP discussions. During that consultation, proposed new Statutes and Rules of Procedure were developed including more focused terms of reference which could be referred to the member organizations for their revisions.

STACREC reviewed the proposed Statutes and subject to making a few minor changes recommended that they be accepted. It was also agreed that the term "Atlantic" should be dropped from the title of the working party. STACREC was also in general agreement with the proposed Rules of Procedure.

The Consultation Report along with suggested minor changes to the proposed statutes are contained in NAFO SCS Doc. 94/20.

The Committee noted that the 16th Session of the CWP is now scheduled for late March 1995 rather than February. Attendance by C. A. Bishop (STACREC Chairman), the Assistant Executive Secretary and the representative from Spain, E. de Cardenas was reconfirmed.

4. **Non-traditional Fishery Resources in the NAFO Area**

The Chairman pointed out that this issue had been discussed briefly during the June 1994 Meeting, but that there was a need identified at that time for further discussion and consideration. The idea of maintaining a database of research survey data at NAFO was discussed. The Committee agreed that with the decline in the fishery for most of the traditional species, increasing pressure would occur on non-traditional species but there is little information on these in the literature. Information concerning distribution and abundance of such species as skates and wolffish can, however, be found in many of the research survey databases held by Contracting Parties and STACREC **recommended** that *efforts be made to analyse data on distribution and abundance of non-traditional species such as skates and wolffish contained in research survey databases held by Contracting Parties, and present the results of these analyses during the June, 1995 meeting.* The information will serve as useful background when considering these fisheries in the future.

5. **Data from the Pilot Observer Program**

In June 1994, STACREC noted the potential usefulness for assessment work of data obtained from the Pilot Observer Program and requested Scientific Council to investigate the availability of these data. Information from Fisheries Commission documentation suggests that there are data available, but accessibility was still unknown since the data belong to the collecting Contracting Party. It was also not clear as to what data were required to be collected, and it appeared that the amount of information ranged from very detailed to summary data on daily catches, as well as sampling data, depending on the Contracting Party involved. It was agreed that national representatives should investigate within their own countries the accessibility to data collected during this pilot project and report on their findings in June 1995. If the data are accessible, they should be made available to Designated Experts prior to June 1995, along with other required data.

6. **Updating of Conversion Factors**

In June it was noted that FAO was in the process of updating their previously published document on conversion factors, and STACREC should wait for this update before further considerations of this topic. It was reported to the Committee by R. Grainger (FAO, CWP Secretary) that FAO had sent out questionnaires on this topic and responses were required by the end of 1994. Thus additional information should be available at the 16th Session of the CWP in March 1995. Two separate consultants reports had been received by FAO: the first was a review of existing factors used at sea, and the second included a review of the first as well as examining both sea and land based conversion factors. Reports of these should also be available during the 16th Session of the CWP.

The Committee agreed to await the reports expected in March and then discuss the issue further during the June 1995 meeting.

7. **Research Coordination for Greenland Halibut**

The EU representative reported that a proposal for a long-line survey in Div. 3LMNO in depths of 800-2 000 m had been submitted to their authorities, and that it appeared that approval for this would be received. The Spanish representative expressed interest in coordinating this survey with the annual Canadian spring or autumn groundfish surveys so that calibrations can be attempted between the bottom trawl and long-lines fishing in the same area. Canadian scientists reported that it might be better to coordinate with the Canadian autumn survey since this usually covers a larger area (Div. 2J and 3K) than that in the spring. The EU noted that they were flexible and this idea could be easily accommodated. It was also noted that Canada and EU could discuss the possibility of associated scientific exchanges between themselves. Representatives from Greenland indicated that they were very interested in this research activity and would like to participate in any way they could be helpful. As a minimum, they would appreciate being informed of progress as results become available. STACREC emphasized that during these studies, efforts should be made to collect oceanographic data, and further, these should be presented to Scientific Council when analyzed.

The representative from Japan noted that at present they conduct deepwater surveys in Davis Strait in collaboration with Greenland. They have proposed to expand this work so as to conduct deepwater surveys in Subareas 2 and 3 in 1995 and were awaiting final approval from their government for funding support. The Committee was pleased to hear this, but cautioned that close coordination with Canada would be necessary, particularly if Japan was proposing to work inside the Canadian Zone.

STACREC noted that the Fisheries Commission during its 19-23 September 1994 meeting, when considering the Greenland halibut fisheries, had requested the Scientific Council to submit a proposed outline of research surveys that should be undertaken. The research proposal was discussed by the Council, and presented in the *Scientific Council section* of this report.

The Secretariat noted that they now receive brief trip reports of research work conducted by some Contracting Parties. While it was agreed that these preliminary reports are produced by all Contracting Parties at the end of research surveys, it was unclear whether forwarding these to the Secretariat for compilation and distribution during June meetings would be problematic or not. National representatives of Contracting Parties currently not submitting their reports to the Secretariat were requested to investigate the feasibility of adding NAFO to their mailing lists for these summaries, and report back to STACREC in June 1995.

8. **Review of Research Documents**

A total of ten Research Documents were tabled for review by STACREC. Seven of these were presented by the authors or their representatives and the reviews are presented below.

a) **Mean length at 50% Maturity of Atlantic Cod in Subdivision 3Ps: Year to year Variations and Comparison of Samples from Burgeo Bank, St. Pierre Bank and South Slope** (SCR Doc. 94/11)

Median length at 50% maturity of Atlantic cod in Subdiv. 3Ps were calculated using data from French research surveys annually conducted in the spring from 1978 to 1992. The area was divided into three subareas (Burgeo, South Slope and St. Pierre Bank) and L_{50} was calculated for each of these subareas. The values were compared annually in order to study the possibility of using shifts in the values as an indicator of mixing with neighbouring stocks (mixing with Div. 4R cod on Burgeo Bank and with Div. 3O cod in the South Slope). Year-to-year variations were also studied for the St. Pierre Bank area.

Year to year variations in the L_{50} of St. Pierre Bank cod showed some changes but related to the time of observation. The comparison between the South Slope values and the St. Pierre Bank values did not show differences except for one year (1991). Comparison between Burgeo Bank and St. Pierre Bank showed significant differences in L_{50} for the years 1984, and 1986 to 1991. The values calculated for Burgeo Bank are lower than those calculated for St. Pierre Bank and similar to values observed previously for cod in Div. 4R. An analysis of stratum by stratum in this area showed increasing values from west to east that could be interpreted as deceasing levels of mixing.

b) **Diet of Flemish Cap Cod with Particular Reference to Predation on Redfish: 1988-93** (SCR Doc. 94/24)

A review of all information on cod predation obtained from the EU surveys on the Flemish Cap between 1988 and 1993 was presented. Hyperidae for small fish and redfish for medium and large sized cod were the dominant prey. A decrease in importance of redfish as a prey was observed in 1992 and 1993, and it coincided with a decrease in the condition factor of the cod.

c) **Feeding of Most Abundant Fish Species on Flemish Cap in Summer 1993** (SCR Doc. 94/35)

The analysis of stomach contents of 14 species of fish on the Flemish Cap indicated three main patterns of feeding: the pelagic constituted by redfish which feed on planktonic and vertically migrating species; the benthic, constituted mainly by most flatfishes, wolffishes and eelpouts which feed on benthic and vertically migrating species; and the benthopelagic feeders constituted by Gadiforms and Greenland halibut, which have a mixed diet. The hyperiids, shrimp and redfish constituted the most important resources on the Flemish Cap.

d) **Length and Age of First Maturation of Flemish Cap Cod in 1993 with an Histological Study** (SCR Doc 94/26)

The histological analysis of cod ovaries sampled during the EU survey in July 1993, was the basis for a study of spawning frequencies. According to the presence of oocytes in cortical alveoli stage (as the indicator of next year spawners), 50% maturation corresponded to 50 cm length and 4 year

old fish. According to the presence in the ovary of postovulatory follicles (as an indicator of past spawners), 50% maturation corresponded to 64 cm length and 5 year old fish.

e) **Summary of Age Training for Silver Hake** (SCR Doc 94/34)

The responsibility for silver hake ageing was assumed by Marine Fish Division personnel at the Bedford Institute of Oceanography in 1992. Ageing was conducted by a new reader and training was therefore initiated to ensure consistency with historical ageing results and to minimize bias between new and old readers. The NAFO protocol for ageing silver hake were followed. The results of training indicated that the precision of ages by the new age reader are similar to those for historic samples.

f) **A Review with Some Proposals for Amendments of the Catch Statistics for the Cod Fisheries in Greenland Waters Since 1911** (SCR Doc 94/38)

In preparation of a special volume of the NAFO Journal, concerning a review of the cod fishery in Greenland waters during this century, it was found necessary to review, country by country, and partly revise the catch statistics for the cod fishery at West as well as East Greenland for the whole period.

It was decided that the review of the statistics should not be included in the intended volume of the Journal because it would make it too detailed and heavy to read. It was, therefore, proposed that the present review should not occur in the Journal, but be available upon request as a NAFO document. The first issue of this paper was distributed in April 1993 by the NAFO Secretariat as a working document to national representatives. Comments and advise received during 1993 and 1994 of the revision of the recorded ICNAF/NAFO catch and effort statistics is included in the present issue.

g) **Age Structure of Grenadier (*Macrourus berglax*) on Flemish Cap, 1994** (SCR Doc 94/80)

Roughhead grenadier catches on the EU survey in July 1994 was aged through otoliths reading. Results indicated a multi-aged population, a slow growth rate of the species, a faster growth rate after age 6 in females than in males, and a dominance of the 1986 year-class, aged 7 years, in the actual stock.

The remaining three papers were tabled, but in the absence of the authors or their designated presenters STACREC decided that a review would not be appropriate and that the present report would only include information from the abstracts provided. It was also considered that the subject matter of SCR Doc 94/84 was stock assessment related, and should be considered by a larger group of experts at the 1995 June Meeting. Only the title of this paper is provided below.

h) **On the problem of the Commercial Fish Populations Abundance Control in the Northwest Atlantic Since 200-miles Economic Zones Enforcement** (SCR Doc. 94/5)

An attempt was made to reveal major trends in abundance regulation of commercial fish populations in NAFO Subareas 2-4 in 1977-92, classified according to the geographical patterns taking in to account the 200-mile economic zone. Three population groups were determined as follows: Those distributed in the northern edge of the species area and the 200-mile zone, those in the middle area of the species area and 200-mile zone, and those partially or entirely distributed in the NAFO Regulatory Area.

For the first group of populations, abundance seemed to be controlled mainly by oceanographic factors and it was concluded that at persistent unfavourable conditions for the juvenile fish survival, even the total fishery prohibition will provide no positive effect. The stock state dynamics of the second group showed that maintenance of the optimum fishing mortality levels for some populations seemed to be the main method of abundance regulation. As for the third group, the danger of overfishing requires a strict control over the observation of fishery regulations, and the maintenance of optimum fishery mortality level is a necessary condition for successful control of the abundance of that group. Besides, possible environmental effects upon the juvenile fish survival and adult fish distribution should be considered in any case.

i) **Composition of Bottom Trawl Catches at Different Depths off the Flemish Pass in 1989-1993** (SCR Doc 94/29)

Analysis for Russian bottom trawl catches taken at 100-800 m depths in May-July 1989-93 and in September-October 1991-93 indicated a minor portion of the catch was Greenland halibut (11%) and that of *Sebastes marinus* constituted 51.8% from catches up to 800 m depth. Skate constituted 26.8% from catches taken at 211-300 m depths.

Greenland halibut below 50 cm in length from depths less than the 901-1 000 m stratum, and *Sebastes mentella* smaller than 30 cm at depths up to 800 m, were predominant in catches. Mean length of these fish species increased with an increase in fishing depth.

According to NAFO statistics in 1990-92 the roundnose grenadier by-catches, taken by vessels from EU-Spain and EU-Portugal during the Greenland halibut fisheries in the Flemish Pass area (Div. 3L, 3M, 3N), made up on the average 13-14% of total catch (the highest was 25% in Div. 3M).

j) **On Stability of Cod Stock Estimates in NAFO Area 2J+3KL** (SCR Doc 94/84)

STACREC proposed this paper be reviewed at the June 1995 Meeting.

9. **Acknowledgements**

The Chairman expressed his gratitude to the Secretariat, the rapporteur, and all participants for their assistance in compiling all of the information necessary for the meeting.

APPENDIX III. REPORT OF STANDING COMMITTEE ON PUBLICATIONS (STACPUB)

Chairman: W. R. Bowering Rapporteur: M. Stein

The Committee met at the Holiday Inn, Dartmouth, Nova Scotia, Canada on 22 September 1994. In attendance were W. R. Bowering (Canada, Chairman), K. H. Nygaard (Greenland), M. Stein (EU-Germany), A. Vazquez (EU-Spain) and the Assistant Executive Secretary (T. Amaratunga).

1. Review of Scientific Publications

a) Publications Since June 1994 Meeting

i) Journal of Northwest Atlantic Fishery Science

The Assistant Executive Secretary updated STACPUB on progress since the June 1994 Meeting. It was noted that:

Volume 16 containing 7 miscellaneous papers was published with a publication date of July 1994.

Volume 17, containing papers presented at the November 1990 Canada-USSR Meeting on Capelin, has 5 papers in the final stages of preparation. This issue is expected to be completed by mid-1994.

Volume 18, containing the papers presented at the NAFO 1993 Symposium on "Gear Selectivity/Technical Interactions in Mixed Species Fisheries" originally expected to be completed in late-1994, will be delayed in completion since there have been further delays in the editorial process of some manuscripts. Noting the importance of completing this publication as soon as possible, STACPUB **recommended** that *conveners of the 1993 symposium be requested to inform STACPUB on the anticipated time of completion.*

ii) NAFO Scientific Council Studies

Studies Number 21, containing 9 papers dealing with Northern Cod is in the final stage of preparation. The publication of this issue is expected to be completed by the end of 1994.

There are presently 4 miscellaneous papers in hand at the Secretariat which are in the process of being edited. The paper on Environmental Overview (K. Drinkwater) has been announced to arrive soon at the NAFO Secretariat.

b) Proposals for Future Publications

Of the 13 papers nominated at the June 1994 Meeting, 3 responses have been received from authors indicating their intent to submit.

In addition, 1 paper from outside of the STACPUB nomination process was submitted since June 1994.

2. Promotion and Distribution of Scientific Publications

a) Invitational Papers

Papers for the single issue publication on West Greenland cod is being compiled by the coordinator (H. Lassen). One paper has already been published in the Journal and STACPUB noted another paper is near completion for final publication in the Journal.

STACPUB was informed that there was no progress in getting more invitational papers, mostly due to time constraints and workload of potential authors.

The incoming STACFEN Chairman (M. Stein, EU-Germany) indicated that he will provide an overview paper on Flemish Cap oceanography during the Scientific Council Meeting in June 1995, provided that database permits such an overview.

b) **Promotion of the Journal**

STACPUB was informed that there was no activity to be reported.

3. **Editorial Matters**

There were no changes in the editorial board, and there was nothing new brought to the attention of STACPUB on this matter.

4. **Review of Papers for Possible Publication**

a) **Consideration of Publication of Papers from September 1994 Special Session**

There was considerable discussion on the possibility of publishing the Symposium contributions in one volume including a summary of discussions and the individual questions and answers to the papers presented. STACPUB did not find a solution for getting all contributions under the umbrella of one NAFO publication (i.e. Journal or Studies) since the quality of papers were of different levels. The conveners of the Symposium were requested to contact the authors of the Symposium papers and seek a common denominator for a combined publication. STACPUB **recommended** that *a discussion be initiated during the June 1995 meeting to consider a publication series similar to ICNAF Special Publication Series to provide a collated volume of Symposium contributions.*

b) **Papers Presented at This Meeting**

There being a considerable number of current publications on shrimp on Flemish Cap where a new fishery has developed, STACPUB **recommended** that *during the Scientific Council Meeting on northern shrimp in November 1994, the views of the authors should be solicited with respect to a possible special publication of these papers.*

c) **Consideration of Papers Being Presented at November 1994 Shrimp Meeting**

There being no STACPUB meeting during the November 1994 Shrimp Meeting, papers being presented then will be considered by STACPUB at its June 1995 Meeting.

5. **Other Matters**

The Chairman noting that there were no other matters, closed the meeting by thanking the participants for their contributions and cooperation. A special thanks was afforded the NAFO Secretariat for preparing the documentation and the rapporteur, M. Stein for his assistance while being an active participant.

APPENDIX IV. AGENDA SCIENTIFIC COUNCIL MEETING – 19-23 SEPTEMBER 1994

I. Opening (Chairman: H. Lassen)

1. Appointment of rapporteur
2. Adoption of agenda
3. Plan of work

II. Fishery Science (STACFIS Chairman: H. P. Cornus)

1. Review of 1994 recommendations

2. Stock assessments

   a) Shrimp in Division 3M (including availability of Div. 3M redfish data) (see note 1 in Attachment 5)
   b) Capelin in Div. 3N and 3O (subject to availability of Russian data)(see note 2)
   c) Data availability for assessment of northern shrimp in November 1994
   d) Greenland halibut fishery with longline *vs* trawl in Div. 0B and Div. 1BCDEF (see Attachment 4)

3. Fisheries Commission requests

   a) Minimum landing sizes for Greenland halibut and flatfishes (see Attachment 1)
   b) Others

4. Arrangements for conducting stock assessments and proposed future documentation

   a) Adoption of work procedures for the June 1995 STACFIS Meeting
   b) Updating list of Designated Experts
   c) Guidelines for Designated Experts
   d) Status of scientific documents
   e) Guidelines for documentation of assessments

5. Future Special Sessions

   a) Report of 15-16 September 1994 Special Session on "Impact of Anomalous Oceanographic Conditions at the Beginning of the 1990s in the Northwest Atlantic on the Distribution and Behaviour of Marine Life" co-conveners M. Sinclair (Canada) and M. Stein (EU-Germany)
   b) Progress report on September 1995 Special Session (see Attachment 1)
   c) Progress report on September 1996 Special Session
   d) Theme for September 1997 Special Session

6. Other matters

   a) Silver hake ageing methodology report (see note 3)
   b) Other business

III. Research Coordination (STACREC Chairman: C. A. Bishop)

1. Acquisition of STATLANT 21 Data (see note 4)
2. Publication of statistical information (missing data in Statistical Bulletins)
3. Report of CWP *Ad hoc* Consultation of 11-15 July 1994
4. Non-traditional fishery resources in the NAFO Area
5. Data from the Pilot Observer Program (see note 5)
6. Updating of conversion factors (see note 6)
7. Research coordination for Greenland halibut (see note 7)
8. Review of Research Documents (see note 8)
9. Other matters

IV. Publications (STACPUB Chairman: W. R. Bowering)

1. Review of scientific publications

   a) Publications since June 1994 Meeting
   b) Proposals for future publications

2. Promotion and distribution of scientific publications

   a) Invitational papers
   b) Promotion of the Journal

3. Editorial matters

4. Review of papers for possible publication

   a) Consideration of publication of papers from September 1994 Special Session
   b) Papers presented at this meeting
   c) Consideration of papers being presented at November 1994 Shrimp Meeting

5. Other matters

V. Experimental Fisheries

1. Faroese experimental shrimp fishery in Div. 3LN
2. Russian experimental fishing for redfish with different mesh sizes

VI. Rules of Procedure

VII. Structure of Scientific Council and Documentation

1. Adoption of work procedures for June 1995 Scientific Council Meeting (see note 9)
2. Space requirements for June Meeting
3. Hardware and software requirements for June Meeting
4. Documentation and publications of the Scientific Council (see Attachment 2)

VIII. Collaboration with Other Organizations

1. Joint ICES/NAFO Working Group on harp and hooded seals (proposed meeting of 5-7 June 1995) (see Attachment 3 and note 10)
2. Review of proposals at CWP *Ad hoc* Consultations of 11-15 July 1994 on Structure of CWP. (see Note 11)

IX. Review of Future Meeting Arrangements

1. Scientific Council Meeting on northern shrimp 17-20 November 1994
2. June 1995 Meeting of Scientific Council
3. Special Session and Annual Meeting, September 1995
4. June 1996 Meeting of Scientific Council

X. Future Special Sessions

1. Update on Special Session of September 1995 (see Attachment 1)
2. Special Session of September 1996

XI. Other Business

XII. Adoption of Reports

1. Committee Reports of present meeting (STACFIS, STACREC, STACPUB)
2. Report of Scientific Council, September 1994

XIII. Adjournment

ATTACHMENT 1

FISHERIES COMMISSION REQUEST

Regarding Minimum Fish Size for Witch, Redfish and G. Halibut, the following discussions developed at the 15th Annual Meeting (extracted from the STACTIC Report):

7. Minimum Sizes for Cod, Yellowtail Flounder and American Plaice – Possible Alternatives to Current Measures (item 9 of the Agenda)

7.1 The Representative of Canada presented a proposal for technical discussions on adding 3 new species to the list – Witch, Redfish and Greenland halibut and three additional columns with their length equivalents.

7.2 *The Chairman indicated the Scientific Council would have to be requested to provide information on* round length for the three new species proposed but as indicated by some Contracting Parties it would be difficult for the Scientific Council to provide information on product form. Therefore, it **was agreed** that a proposal to the Fisheries Commission would be prepared that the Scientific Council be requested to look at the feasibility and desirability of establishing minimum fish size for the three additional species and to advise on *the minimum round length for the three new species proposed* in the Canadian paper.

The following response is from Scientific Council Report, 8-22 June 1994, Item 6.d (pages 24-25)

d) **Minimum Landing Sizes for Greenland Halibut and Flatfishes**

The Fisheries Commission requested (FC Doc. 93/18) the Scientific Council to: *review appropriate minimum landing sizes for Greenland halibut and flatfishes.*

The Council noted it had advised on minimum landing sizes for American plaice (25-28 cm) and yellowtail flounder (25-28 cm) in 1992 (NAFO Sci. Coun. Rep., 1992, p. 71).

It was also noted that available data in laboratories have not yet been analyzed and presented to the Scientific Council. The Council agreed to defer its discussions on this subject to its September 1994 meeting.

Fisheries Commission's Request for Scientific Advice on Seals in the Ecosystem

In September 1993 the Fisheries Commission forwarded i.a. the following request to the Scientific Council:

5. Noting that the Scientific Council has scheduled a Symposium on Seals in the Ecosystem for September 1995, the Fisheries Commission requests a report in 1994 on the nature and extent of analyses that are expected to be tabled at the Symposium with respect to the interrelation between seals and commercial fish stocks.

ATTACHMENT 2

PROPOSED PUBLICATIONS RELATED TO THE DOCUMENTATION TO THE SCIENTIFIC COUNCIL STARTING AS OF 1 JANUARY 1995

With regards to the reorganization of the work of the Scientific Council, the following are the publications and the proposed disposition of the documentation related to the Scientific Council, starting as of 1 January 1995.

1. **Journal of Northwest Atlantic Fishery Science** (unchanged, peer reviewed)

   Scientific contributions from individual scientists. Aimed at the general scientific community.

2. **NAFO Scientific Council Studies** (unchanged, limited review)

   Scientific contributions from individual scientists. Aimed at the general scientific community, and more specifically at the fishery scientists working in the Northwest Atlantic.

3. **SCR Document** (no review)

   Scientific contributions from individual scientists including Preliminary Assessments by Designated Experts.

   Documentation relevant to the topics discussed at the Scientific Council meetings and preliminary data and analyses may be considered later in a more complete form for publication in Studies or in the Journal.

4. **SCS Document** (no review)

   a) Statistical updates
   b) National research reports
   c) External committee reports (e.g. CWP, harp and hooded seals)
   d) STACFIS accepted assessments
   e) Internal Reports of the Standing Committees (STACFIS, STACREC, STACFEN and STACPUB)
   f) Scientific Council Reports (each meeting)
   g) Other summary documents (survey plans, ...)

   The papers documenting the STACFIS accepted assessment will be issued as SCS Documents and be made available from the Secretariat upon request.

5. **Statistical Bulletin** (edited by the Assistant Executive Secretary) (unchanged)

   Fisheries statistics

6. **Scientific Council Reports** (issued annually) (will contain all Scientific Council Meeting Reports of each year. These will be issued with the usual red cover).

   a) Requests for advice
   b) Scientific Council Reports
      - Records of Scientific Council meetings including lists of SCR and SCS Documents presented, Agenda and list of participants
      - Annual overview of the fisheries in the Convention Area
      - Annual overview of the environmental conditions in the Convention Area
      - Assessment of fish stocks as requested by the Fisheries Commission and by Contracting Parties
      - Response to other requests from the Fisheries Commission and Contracting Parties
      - Other recommendations

This report is primarily aimed for the Fisheries Commission and Contracting Parties.

The format of the assessments as presented in the Scientific Reports should include:

- Reference to SCS Documents where the accepted assessment can be found
- Reference to SCR Documents drawn upon for the assessment
- Description of the fishery
- Prognosis and management recommendation
- Summary sheet
- Basic graphs:
  - i) Catch and TAC *vs* year
  - ii) Abundance indices for analytical assessments
  - iii) Recruitment and SSB *vs* year
  - iv) Fishing mortality *vs* year
  - v) Yield and SSB *vs* F for the year of projection
  - vi) Any other graphs deemed essential for understanding the management advice

The accepted STACFIS assessment documents (SCS Doc. mentioned in 4.f above) of a given meeting will be compiled in a single set, with a red cover identifying the set of documents as being the accepted assessments. This package will be issued to participants of the Annual Meeting, and to governments according to an appropriate mail list.

7. **Executive Summary**

Discontinued

8. **Working Papers**

Any information which should be disseminated to Scientific Council and its Committees during session, but which is not relevant for use after the meeting is concluded.

9. **Dumm Documents**

Brightens the life of Scientific Council and Committee members.

ATTACHMENT 3

SCIENTIFIC ADVICE ON SEALS

1. The following request for advice was received on 17 June 1994. This is presented to the Scientific Council with a view to developing terms of reference for a proposed meeting of the ICES/NAFO Working Group.

"Denmark (on behalf of Faroe Islands and Greenland) request advice from the NAFO Scientific Council (eventually via the Joint ICES/NAFO Working Group on Harp and Hooded Seals) on the following issues:

Harp and hood seals

- assessment of stock sizes, distribution and pup production of harp and hooded seals in the Northwest Atlantic;
- assessment of sustainable yields at present stock sizes and in the long term under varying options of age composition in the catch;
- advise on catch options in the NAFO area;
- assessment of effects of recent environmental changes or changes in the food supply and possible interaction with other living marine resources in the area."

Einar Lemche
Namminersornerullutik Oqartussat
Gronlands Hjemmestyre
Copenhagen, Denmark"

ATTACHMENT 4

DENMARK (GREENLAND) REQUEST FOR ADDITIONAL SCIENTIFIC ADVICE ON MANAGEMENT OF GREENLAND HALIBUT IN 1995

The Scientific Council recommends that a TAC for Greenland halibut in Divisions 0B and 1BCDEF be set below 11 000 tons.

Denmark (in respect to Greenland and the Faroe Islands) requests advice from the Scientific Council on a new TAC for this area based on the condition that the TAC will be taken by longlines.

If possible the advice should contain different options corresponding to different ratios between longlining and trawling.

This request is based on the fact that there is a substantial difference in size distribution in the two types of fishery.

Yours sincerely

Einar Lemche

ATTACHMENT 5

SCIENTIFIC COUNCIL

NOTES FROM REPORT OF JUNE 1994 MEETING

Note 1. **By-catch of Redfish in Shrimp Fisheries** (page 32)

The Council expressed its concern of the likely negative impact on future recruitment to the redfish fisheries from the discards of small redfish in trawl fisheries for shrimp in Subarea 1 and in Div. 3M. In Subarea 1 a dramatic decline of adult redfish (≥ = 16 cm) to an extremely low level has been observed. The Council therefore stressed that this mortality component be included in the assessment of the redfish stocks. This requires that estimates of the magnitude of these by-catches and biological sampling data be made available.

It is important that information on by-catches be provided on numbers and sizes of the redfish as well as weight of the by-catch, whether or not sorting mechanisms are employed, because of the size selectivity of these devices.

With respect to the shrimp fishery in Div. 3M, information on by-catches in the shrimp fishery only up to July 1993 was available. The Council stressed that all information for 1993 be made available when the shrimp resources in this Division will be assessed in September 1994. It was also stressed that the annual information should be made available in advance of the June meeting, when the status of Div. 3M redfish is assessed, because of the relevance of this information to the assessment.

Note 2. **Capelin in Divisions 3N and 3O** (page 95)

A Russian survey is planned for June 1994 and if the results of this survey area available during the September 1994 Meeting, STACFIS **advised** that no capelin fishing be allowed in Div. 3NO during 1995.

Note 3. **Report on Methods of Ageing Silver Hake Otoliths** (pages 98, 99)

In response to the 1991 and 1992 recommendation of the Scientific Council regarding publication of a comprehensive manual on silver hake ageing, STACFIS was informed that the work on the silver hake radio-nucleotide study was unsuccessful because of technical reasons. Consequently, the status of the initially proposed report on ageing techniques must now be reviewed in light of the lack of results from this study, as well as the change in responsibilities for the Canadian research group conducting ageing studies. The results of this review will be reported to STACFIS at its September 1994 Meeting.

Note 4. **Acquisition of STATLANT 21A and 21B reports for recent years** (page 107)

STACREC was seriously concerned that a major component of NAFO statistics are not available since 1988 from EU-France and **recommended** that *the Scientific Council take steps to obtain these data to complete the database and update statistical bulletins.*

Note 5. **Pilot Observer Program** (page 116)

STACREC noted that this information may be quite useful with regards to stock assessments and **recommended** that *the Scientific Council determine if the data from the Pilot Observer Program can be made available for assessment purposes.*

Note 6. **Update of Information on Conversion Factors** (page 116)

The Secretariat has since been informed that the information is not yet available. The 1993 report of CWP also indicated that the Working Party had made a similar request to FAO. STACREC **recommended** that *further work on conversion factors would not be required at the Scientific Council level until the status of the FAO report was determined.* It also suggested that the Secretariat obtain further information on the progress from FAO.

Attachment 5 (continued)

Note 7. **Coordination of Surveys** (page 115)

Information provided by EU-Spain indicated that they will propose to the EU to conduct a survey (1995) in Div. 3M, 3L, 3N and 3O in depths from 700 to 2 000 m. Greenland with Japan will conduct a survey for Greenland halibut in Subarea 1 during 1994 at depths from 400 to 1 500 m. STACREC **recommended** that *this initiative be discussed and coordinated with other interested countries.*

Note 8. **Other Papers** (page 116)

STACREC tabled for review, eight papers not related to stock assessments, which were traditionally considered in STACFIS (SCR Doc. 94/4, 11, 24, 26, 29, 34, 35, and 38). Sufficient time for adequate review was not available at this particular meeting and STACREC deferred the review to the September 1994 Annual Meeting. STACREC hoped that such reviews in future would be done in June to ensure adequate peer-review.

Note 9. **Review of Recommendations From 1993 Meetings** (page 38)

STACFIS noted the value of the early submission of papers, and this encouraged the Committee to extend the requirements stated in June 1993 (NAFO Sci. Coun. Rep., 1993, p. 43) and **recommended** that *Scientific Council Research Documents (SCR Doc.), excluding assessment papers, and Scientific Council Summary Documents (SCS Doc.) particularly the National Research Reports, in future be submitted to the Secretariat 15 days before the beginning of the Scientific Council Meeting.*

Note 10. **Joint ICES/NAFO Working Group on Harp and Hooded Seals** (page 30)

At the Council meeting on 17 June 1994, the Chairman announced that a request for scientific advice on harp and hooded seals had just been received from Denmark (on behalf of Faroe Islands and Greenland) (see Annex 2). Noting advice would have to be provided by the Council at the Annual Meeting of September 1995, the Scientific Council agreed a request would be forwarded to the ICES/NAFO Working Group on Harp and Hooded Seals to address this request. The Council proposed that this request should be addressed immediately prior to the 7-21 June 1995 Meeting of the Scientific Council. It is hoped the Working Group would schedule its meeting for 5-7 June 1995, in order that some scientists from the Council may attend the meeting.

Note 11. **Structure of the CWP** (page 30)

Further to this Scientific Council request, the Chairman of General Council requested the FAO Coordinator (R. Grainger) of the July 1994 *Ad hoc* Consultation to forward to NAFO, all proposals submitted to that meeting. The Scientific Council deliberations on this matter and any recommendations from the 19-23 September 1994 Meeting will be reviewed by the General Council (see Itemized Memorandum of the General Council Agenda, Item 17 – Other Business).

APPENDIX V. LIST OF RESEARCH AND SUMMARY DOCUMENTS – SEPTEMBER 1994

RESEARCH DOCUMENTS (SCR)

SCR #	Ser. #	
94/63[1]	N2437	SIGAEV, I. K. Ecological conditions of silver hake concentrations in the Scotian Shelf area.
94/64[1]	N2438	DE CARDENAS, ENRIQUE. Some considerations about annual growth rate variations in cod stocks.
94/65[1]	N2439	IGLESIAS, SERGIO, ENRIQUE DE CARDENAS, and JAVIER PAZ. Presence of American plaice (*Hippoglossoides platessoides*) at non-habitual depths in the Northwest Atlantic.
94/66[1]	N2440	SIGAEV, IGOR K., and VLADIMIR A. RIKHTER. On relation of some commercial fish species year-classes abundance and hydrological conditions in the Northwest Atlantic.
94/67[1]	N2445	STEIN, M., and J. LLORET. Stability of water masses – Impact on cod recruitment off West *Greenland*?
94/68[1]	N2446	FRANK, K. T., J. SIMON and J. E. CARSCADDEN. Recent excursions of capelin (*Mallotus villosus*) to Scotian Shelf and Flemish Cap during anomalous hydrographic conditions.
94/69[1]	N2447	MALMBERG, Sv. Aa., H. VALDIMARSSON and J. MORTENSEN. Long-time series in Icelandic waters in relation to physical variability in the northern North Atlantic.
94/70[1]	N2449	STEIN, M. Environmental Overview in the Northern Atlantic Area – With Emphasis on Greenland.
94/71[1]	N2450	DRINKWATER, K. F. Climate and oceanographic variability in the Northwest Atlantic during the 1980s and early-1990s.
94/72[1]	N2451	MANNING, J. Oceanographic conditions of Georges Bank spawning grounds, 1992-1994.
94/73[1]	N2452	SINCLAIR, A. Recent declines in cod stocks in the Northwest Atlantic.
94/74[1]	N2453	NAKASHIMA, B. S. The relationship between oceanographic conditions in 1990s and changes in spawning behaviour growth and early life history of capelin (*Mallotus villosus*).
94/75	N2454	NICOLAJSEN, Á. Scientific design of the investigation on board Faroese commercial shrimp vessels in NAFO Divisions 3L *and* 3M.
94/76	N2455	NICOLAJSEN, Á. Age structure of northern shrimp in Division 3M in September-November 1993 and in Division 3L in March 1994.
94/77	N2456	NICOLAJSEN, Á. Growth and reproduction in northern shrimp on Flemish Cap (Division 3M) and the Nose of the Bank (Division 3L) in September 1993-May 1994.
94/78	N2457	NICOLAJSEN, Á. Assessment of the Northern Shrimp Stock on Flemish Cap (Division 3M)
94/79	N2458	NICOLAJSEN, Á. By-catch in shrimp catches using sorting grade.
94/80	N2459	CASAS, J. M. Age Structure of Roughhead Grenadier (*Macrourus berglax*) on Flemish Cap, 1994.

[1] Papers presented to September 1994 Symposium on "Impact of Anomalous Oceanographic Conditions at the Beginning of the 1990s in the Northwest Atlantic on the Distribution and Behaviour of Marine Life".

94/81	N2460	SAINZA, C. Northern shrimp (*Pandalus borealis*) stock on Flemish Cap in July 1994.
94/82	N2461	PARSONS, D. G. Preliminary assessment of shrimp (*Pandalus borealis*) in Division 3M (Flemish Cap).
94/83	N2462	PARSONS, D. G., and P. J. VEITCH. The Canadian fishery for northern shrimp (*Pandalus borealis*) on Flemish Cap (NAFO Division 3M) in 1993 and 1994.
94/84	N2463	GASJUKOV, P. S. On stability of cod stock estimates in NAFO Area 2J3KL.
94/85	N2465	SKÚLADÓTTIR, U. The Icelandic shrimp (*Pandalus borealis*) fishery at the Flemish Cap in 1994.
94/86	N2466	SIEGSTAD, H. The Greenland fishery for northern shrimp (*Pandalus borealis*) on Flemish Cap, 1993 and 1994.

SUMMARY DOCUMENTS (SCS)

SCS #	**Ser. No.**	
94/20	N2467	NAFO SECRETARIAT. Report of CWP *Ad hoc* Consultation of 11-15 July 1994.
94/21	N2468	NAFO. Report of Scientific Council Meeting, 19-23 September 1994.
94/22	N2469	NAFO SECRETARIAT. Reports of the Coordinating Working Party on Atlantic Fishery Statistics (CWP).

APPENDIX VI. LIST OF PARTICIPANTS – SEPTEMBER 1994

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