

## **PART B**

### **Scientific Council Annual Meeting, 17-21 September 2001**

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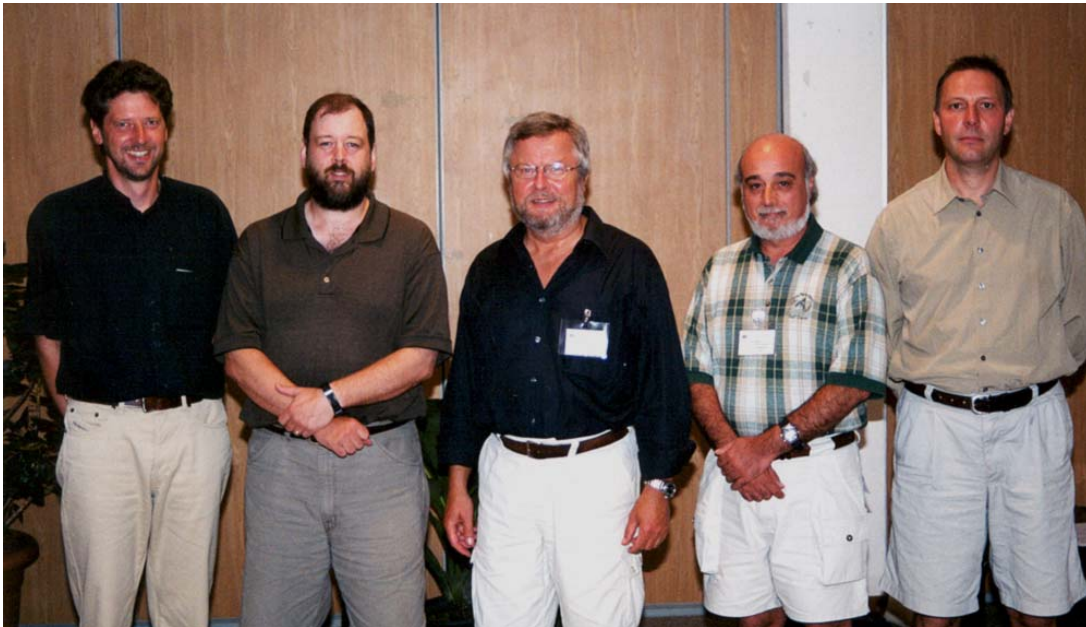


**Participants, Scientific Council Meeting, 17-21 September 2001 at the Centro de Convenciones de Plaza de América, Varadero, Matanzas, Cuba:**

Seated (left to right): T. Amaratunga, A. Nicolajsen, F. González, S. Junquera, O. A. Jørgensen, D. Kulka, W. B. Brodie, W. R. Bowering

Standing (left to right): I. I. Serobaba, V. K. Babayan, V. N. Shibanov, D. J. Doulman, R. Alpoim, E. Valdes, A. I. Boltnev, A. Avila de Melo, V. A. Rikhter, H. Murua, E. De Cardenas, T. Saat, A. Vazquez, H.-J. Rätz, D. Cross, F. M. Serchuk, R. K. Mayo, M. Stein, L. C. Hendrickson, C. Stransky, S. J. Correia, D. B. Atkinson, S. Kashindi

Missing: D. C. A. Auby, F. D. Keating, S. Goodick, J. Price, T. Sigurdsson



**Chairs of Standing Committees and Scientific Council:**

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



Scientific Council members in session during the 17-20 September 2001 Meeting.

## SCIENTIFIC COUNCIL ANNUAL MEETING, 17-21 SEPTEMBER 2001

### REPORT OF SCIENTIFIC COUNCIL MEETING

Chairman: W. B. Brodie

Rapporteur: T. Amaratunga

#### I. PLENARY SESSIONS

The Scientific Council met at the Centro de Convenciones de Plaza de América, Varadero, Matanzas, Cuba, during 17-20 September 2001 (**note**: the Council concluded its work a day ahead of the schedule of 17-21 September 2001). Representatives attended from Canada, Cuba, Denmark (in respect of Faroe Islands and Greenland), Estonia, European Union (Germany, Portugal and Spain), Iceland, Russian Federation, Ukraine and United States of America. Observers were present from FAO, ICES and SEAFO. The Assistant Executive Secretary was in attendance.

The Executive Committee met prior to the opening session of the Council, and the Provisional Agenda, plan of work and other related matters were discussed. The Council noted the Scientific Council Special Session Symposium on "Deep-sea Fisheries" was successfully conducted during 12-14 September 2001.

The opening session of the Council was called to order at 1000 hours on 17 September 2001.

The Chairman welcomed everyone to Cuba and to this venue for the Meeting. The Assistant Executive Secretary was appointed rapporteur. The Council noted that as a result of the tragic events in the USA, meetings of other Constituent Bodies of NAFO (General Council and Fisheries Commission) scheduled for this 23<sup>rd</sup> Annual Meeting were not held. The Council noted that most representatives of the Scientific Council had arrived in Cuba to attend the Special Session, before the unfortunate USA events. The Council therefore agreed to complete its scheduled work as announced in the Provisional Agenda.

The Council noted with concern that important issues on Conservation and Enforcement Measures and Allocations in the work of the Fisheries Commission and Administration in the work of the General Council, usually addressed during the Annual Meeting, will remain outstanding. The Council therefore noted some additional agenda items may be needed to address the Council's concerns on some of these issues.

In particular, the Council noted the status and participation of the present and incoming Executive Officers of the Scientific Council need to be considered.

In its consideration of the agenda, the Council noted a new item was needed under Item VII.4 on the review of future meetings. The Council noted the status of the Executive Officers would also be addressed under this item.

The revised Agenda was accordingly **adopted**.

The Council noted the Provisional Agenda for the Scientific Council Meeting on shrimp during 7-14 November 2001 will be circulated during the course of this meeting, after consideration of matters related to that meeting.

The Council noted that three international organizations had requested participation as observers. The Council accordingly welcomed D. J. Douman (FAO), H.-J. Rätz (ICES), who is also a regular NAFO participant, and M. S. Kashindi (SEAFO).

The Session was adjourned at 1210 hours.

The Council reconvened at 0900 hours on 18 September 2001 and sessions were conducted through to 20 September 2001 in accordance with the proposed timetable.

The Council considered and **adopted** the reports of the Standing Committees (STACFIS, STACREC, STACPUB) as they became available.

The concluding session was called to order at 1830 hours on 20 September 2001 when the Council addressed other outstanding agenda items and **adopted** its report of this Scientific Council Meeting.

The meeting was adjourned at 2100 hours on 20 September 2001.

The Reports of the Standing Committees as **adopted** by the Council are appended as follows: Appendix I – Report of Standing Committee on Fisheries Science (STACFIS), Appendix II – Report of Standing Committee on Research Coordination (STACREC), and Appendix III – Report of Standing Committee on Publications (STACPUB).

The Report of the Scientific Council Symposium on "Deep-sea Fisheries" is presented at Annex 1 of this Scientific Council Report.

The Agenda, List of Research (SCR) and Summary (SCS) Documents, and the List of Representatives, Advisers/Experts and Observers of this meeting are given in Part D, this volume.

The Council's considerations of the Standing Committee Reports, and other matters addressed by the Council follow in Sections II-XII.

## II. REVIEW OF SCIENTIFIC COUNCIL RECOMMENDATIONS IN 2000 AND 2001

The Council noted that recommendations made by the Scientific Council through 2000 and 2001 will be addressed as needed under relevant agenda items at this meeting.

## III. FISHERIES SCIENCE

The Council **adopted** the Report of the Standing Committee on Fisheries Science (STACFIS) as presented by the Chairman, H.-J. Rätz. The full report of STACFIS is at Appendix I.

## IV. RESEARCH COORDINATION

The Council reviewed the Report of the Standing Committee on Research Coordination (STACREC) as presented by the Chairman, R. K. Mayo. Noting some agenda items were specifically or additionally addressed at the Council Plenary, and reported accordingly in the Council report, the Report of the Standing Committee on Research Coordination (STACREC) was **adopted**.

The Council noted that a number of Contracting Parties with activity in the NAFO Regulatory Area have not submitted National Reports in recent years. The Council agreed this matter should be conveyed to the National authorities concerned.

## V. PUBLICATIONS

The Council reviewed the Report of the Standing Committee on Publications (STACPUB) as presented by the Chairman, O. Jørgensen. Noting some agenda items were specifically or additionally addressed at the Council Plenary, and reported accordingly in the Council report, the Report of the Standing Committee on Publications (STACPUB) was **adopted**.

## VI. RESPONSES TO SPECIAL REQUESTS FROM FISHERIES COMMISSION

### 1. Information on Unregulated Species, Including Elasmobranchs, in the Regulatory Area

Fisheries Commission requested (see Agenda Annex 1, Item 8) that:

*The Scientific Council review all available information from both research vessel surveys and commercial catches on the relative biomass and geographic distribution of the following unregulated species/stocks occurring within the NAFO Regulatory Area: monkfish (*Lophius americanus*), wolffishes (*Anarhichas lupus*, *A. minor*, *A. denticulatus*), thorny skate (*Amblyraja radiata*), black dogfish (*Centroscyllium fabricii*), eelpouts (*Lycodes spp.*), longfin hake (*Urophycis chesteri*), and orange roughy (*Hoplostethus atlanticus*).*

In response the Scientific Council noted:

Information on monkfish was presented to Scientific Council in June 2001 (SCR Doc. 01/47). Information on orange roughy was presented to NAFO Annual Symposium on Deep Sea Fisheries (SCR Doc. 01/84) and information on other species listed in the Fisheries Commission request was presented in SCR Doc. 01/162. With the exception of orange roughy (derived from commercial fishery records) the information on distribution and abundance is based on Canadian spring and autumn surveys. The autumn surveys covered Div. 3LNO while the spring surveys covered Div. 3LNO and Subdiv. 3Ps. The description of distribution and trends in biomass and abundance encompass the entire area surveyed, not just the NAFO Regulatory Area (NRA). No information was available for Div. 3M. Information from the commercial fisheries, with the exception of thorny skate in the NRA was not available.

- a) **Monkfish** are at the northern extent of their distribution on the Grand Banks, restricted primarily to the southwest slope (about 1/3 in Subdiv. 3Ps, 2/3 in Div. 3O). Research survey data indicate only occasional records in Div. 3N and 3L (and north in Div. 3K on the Labrador Shelf) in deeper, warmer trenches and on the slope edge. A shift to deeper waters after the mid-1980s followed by a return to shallower depths in recent years may be related to a cooling trend during the mid-1980s. The highest densities of monkfish on the Grand Banks were associated with the warmest areas (southwest slope) where bottom temperatures exceed 4°C.

Biomass and abundance indices fluctuated, low in 1979, peaking in 1988 again reaching a low in 1992-93. Since then, the index has fluctuated widely, particularly from the Campelen survey gear. 2000 represents a year of peak abundance; almost double that of the previous year. Such abrupt changes from year to year likely do not reflect dramatic fluctuations in the population. Rather, these changes suggest that there may be a catchability issue. Mean monkfish weight peaked in the late-1980s, in conjunction with the peak in biomass. It average size has declined since 1996.

- b) **Orange roughy** was previously unreported from Canadian waters. From 1982 (first record) and 1991 to 2000, fishery observers recorded 506 specimens of orange roughy from 218 of a total of 202 741 sets for various fleets fishing on the slope waters off Canada. With the exception of the fishery for shrimp in Div. 3M, there was no fishery information available in the NRA although survey data confirm their presence there in Div. 3L, 3N and 3O. The range of orange roughy extends from the slope waters off southwest Greenland to the southwest Scotian Shelf but is mostly concentrated north of the NRA centered at Latitude 60°, primarily at depths exceeding 800 m and associated with the warmest available bottom temperatures.

Distribution patterns suggest that orange roughy are rare in the Northwest Atlantic and are a fringe component of the northeast Atlantic population.

- c) **Arctic and Vahl's eelpout** comprised about 85% of the catch of eelpouts among 10 eelpout species identified from the surveys. An increase in unidentified species since 1995 is due to the increase in capture of small (difficult to identify) eelpouts captured with the introduction of the Campelen trawl. Eelpouts, as a group, are found over the entire extent of the bank in Div. 3L and mainly in slope waters in the other Divisions. In both the spring and autumn surveys, catches of eelpouts in Div. 3NO appear to be

concentrated in deeper water along the edge of the bank. Thus, they commonly occur in the NRA. This is particularly apparent prior to the change to Campelen gear in 1995.

Based on both the spring and autumn surveys, a decline in abundance and biomass is apparent from the late-1980s to 1994. From 1995-2000, following the change to the Campelen trawl, abundance and biomass have been relatively stable.

- d) **Longfin hake** are concentrated mainly along the Laurentian Channel slope and the southwest slope of the Grand Banks, in Subdiv. 3Ps and Div. 3O, intermittently and to a lesser extent in Div. 3LN, spring and autumn. When they do occur in Div. 3LN in the autumn surveys, they are found along the edge of the bank. Similar to monkfish, longfin hake are found largely where bottom temperature exceeds 3°C.

Prior to the switch to the Campelen trawl, relative abundance and biomass estimates were very low across all Divisions. After the change, the autumn research vessel surveys show a steady increase in biomass and abundance from 1996 to present in particularly Div. 3O. In Div. 3LN, the abundance of longfin hake in the autumn appears to be variable. While the abundance and biomass estimates from the spring research vessel surveys in Div. 3O and Subdiv. 3Ps are greater than those observed in the autumn surveys, the general increase in abundance in Div. 3O is not apparent.

- e) **Thorny skate** are widely distributed throughout the survey area. Since the late-1980s, fewer catches of thorny skate occurred in Div. 3L particularly to the western extent. In recent surveys catches of thorny skate appear to be concentrated mainly in Div. 3NO and Subdiv. 3Ps along the southwest slope and edge of the Grand Bank overlapping the 200-mile boundary. Thorny skate undergoes a limited on/off (autumn/winter, spring/summer, respectively) bank migration.

Thorny skate relative abundance and biomass underwent a decline during the late-1980s and early-1990s particularly in Div. 3L. Since the change to the Campelen trawl, thorny skate relative abundance and biomass have been variable and concentrated in Div. 3NO and Subdiv. 3Ps.

The majority of the catch, about 80% continues to be non-Canadian from the NRA.

- f) **Spotted wolffish** are concentrated in Div. 3L, mainly on the north and east edges of the Grand Bank. Smaller catches are taken along the shelf edge in Div. 3N and 3O.

In both spring and autumn surveys, abundance and biomass underwent a decline from the late-1980s through the early-1990s and remained low in the mid-1990s. In spring surveys, there has been an apparent increase in abundance and biomass from 1997 to present. The increase is less apparent from in the autumn surveys.

- g) **Striped wolffish** is concentrated along the edge of the Grand Bank and on the southwest slope of the Grand Bank in Div. 3LNO. Historically, striped wolffish were more widespread in Div. 3L and areas north. In Subdiv. 3Ps, it appears to be concentrated on the northern slope of the Laurentian channel and along the slopes of Hermitage channel.

Striped wolffish abundance declined from the late-1980s to 1994 in both the autumn and spring surveys. Since 1996, relative biomass and abundance estimates have fluctuated at a low level.

- h) **Broadhead wolffish** are concentrated along the shelf edge of the Grand Bank in Div. 3LNO and Subdiv. 3Ps distributed deeper than the other two species.

As for the other wolffish, broadhead wolffish relative biomass and abundance declined from the late-1980s to early-1990s. Prior to 1994, broadhead wolffish were most abundant in Div. 3L, and present at low levels in Div. 3NO. In recent years, the abundance and biomass of broadhead wolffish has been variable in Div. 3LNO, with a slight increasing trend. However, the abundance and biomass estimates from the autumn survey in 2000 show a lower value in Div. 3L.



- i) **Black dogfish** occur in deeper waters along the edge of the Grand Bank in Div. 3LNO and in the deep waters of the Laurentian channel, to a lesser degree in the Hermitage channel. In Div. 3O, black dogfish are also found along the southwest slope of the Grand Bank at the greatest depths sampled. Commercial catches at depths exceeding 1 000 m commonly take this species along the entire slope.

Black dogfish were detected at very low levels in the autumn surveys prior to the change to Campelen trawl and when deep sets were fewer. Relative biomass and abundance from the spring surveys show a fairly stable pattern during the late-1980s and early-1990s in Subdiv. 3Ps. Since 1995, black dogfish relative abundance and biomass have been quite variable. In recent surveys, levels were lower than that observed immediately after the gear change in 1996.

The species described above can be placed into two general categories: those that have a more widespread distribution on the banks within the area surveyed and those restricted to warmer slope waters. The more widespread species namely the eelpouts, thorny skate and the wolffishes underwent a decline in abundance during the late-1980s (or earlier) and early-1990s. The other group, longfin hake, monkfish and black dogfish were distributed along the slope, particularly in the Laurentian Channel and the southwest slope of the Grand Bank where bottom temperatures were warmest. A decline in abundance was not apparent for these species.

Abrupt inter-annual changes have been observed for many of the species, particularly those less abundant. These changes do not likely reflect dramatic fluctuations in the population. Rather, these changes suggest that there may be a catchability issue associated with the sparse distribution.

2. **Distribution of Fishable Biomass of Main Commercial Species** (SCR 01/9, 13, 31, 39, 40, 59, 67, 72, 75, 76, 122, 164)

Fisheries Commission requested (see Agenda Annex 1, Item 9) the Scientific Council: *to evaluate the distribution of the fishable biomass of the main commercial species of fish in relation to depth (100-m intervals). Separate values should be provided a) for fish above and below the length of 50% maturity and b) for fish above and below the current minimum landing size.*

The Council responded:

Scientific Council is not, at this point in time, in a position to respond to the question exactly as posed. The limited data that are available do not cover depths in 100-m intervals, all species of interest nor all areas where fisheries occur. Nonetheless, Scientific Council is able to provide some information to Fisheries Commission regarding the distribution of biomass by depth for various species.

**Fishable Biomass**

Although data were available from the Canadian surveys, they were aggregated over a wide area including the Canadian zone (Div. 2G through Div. 3O) and it was not possible to separate these out by area so as to provide information on stocks in the NRA.

EU-Spain has conducted research surveys during May in the NRA of Div. 3NO beginning in 1995. The survey coverage included depths to 1 463 m in 1998 and 1999. Biomass information was available for cod, American plaice, yellowtail flounder, witch flounder and Greenland halibut.

The information was for all sizes caught during the research survey in only a small portion of the overall area (Div. 3NO) representing distribution in May, and did not cover an important portion of the NRA. Also, it was not possible to separate the information into the fishable portion of the stocks.

The data clearly show that Greenland halibut biomass increases steadily with depth as a proportion of the biomass of the five species combined. It is also clear that yellowtail flounder were not found deeper than about 100 m. American plaice biomass was greatest in depths shallower than about 200 m, then declined in deeper waters but showed some increase in depths between 732-914 m. Cod were found to about 550 m in 1999 but extended to 732 m in 1998. Witch flounder were widely distributed with no clear trend in biomass in relation to

depth. Other important species, redfish and roughhead grenadier, are missing from the data so it is not possible to examine its distribution in the area.

Information was also available from some of the fisheries in the NRA. These indicated that catch rates for Greenland halibut are very low for depths shallower than 600 m compared to greater depths. This is also reflected in that relatively little effort is directed for Greenland halibut in depths shallower than 700 m. Catch rates were highest for skate in depths shallower than 400 m, and yellowtail flounder and American plaice in depths shallower than 200 m. For cod, catch rates were highest from depths shallower than 500 m. The fishery data on redfish indicate that most catches are taken in depths of 200-800 m. Roughhead grenadiers were also captured in depths generally deeper than 600 m. This is a similar pattern of distribution demonstrated in research surveys and suggests the fishable biomass is found in depths greater than 600 m.

### **Maturity at Depth**

Only limited information was available with regard to maturities and depth and these data were from the commercial fisheries. There is a gradual increase in the proportion of mature Greenland halibut with depth but for the most, catches are immature sizes due to the selectivity in the trawler fishery. There was variability in the proportion of mature fish between years and depths for cod. For American plaice, the proportion of mature fish was slightly >80% in depths shallower than 600 m and somewhat <80% in depths greater than 600 m. Yellowtail catches are primarily of mature fish. For skates, <20% are mature in depths of 800-1 000 m, and <60% are mature in depths shallower than 200 m. The highest percentage of mature fish was in depths of 200-400 m.

### **Fish above and below minimum landing size**

The survey data were not available in a form to allow determination of the proportions above and below minimum landing sizes.

No other information was available to allow the provision of further commentary in response to the Fisheries Commission request. Data are available to provide additional information but more work would be required to place these in the appropriate format.

### **3. Medium Term Development of Several Stocks Under Various Assumptions** (SCR Doc. 01/39, 40, 59, 67, 72, 76, 122, 164)

The Fisheries Commission requested (see Agenda Annex 1, Item 10): *with the concurrence of the Coastal State, that the Scientific Council evaluate the likely future medium-term development for Greenland halibut in 2+3KLMNO, Yellowtail flounder in 3LNO, American plaice in 3LNO (if possible) and cod in 3NO, under the following assumed constraints:*

- a) *Closure of targeted Greenland halibut fishery in depths less than 200, 500 and 800 meters or any other depths considered appropriate. These cases, which will have to make a reasonable assumption on the redirection of effort so removed onto the remaining depth strata, should be compared with evaluation of current fishing practices.*

The Council responded that:

Adherence to the NAFO by-catch regulations would, in itself, contribute significantly to reducing by-catches of species under moratoria.

### **Divisions 3LM**

Data available through the 1990s and most particularly from the recent years, indicate that only limited directed fishing for Greenland halibut takes place in depths shallower than 800 m in Div. 3L or 3M. Fisheries carried out by Japan, Russia and Spain would not be significantly displaced compared to current practices. For Portugal,

there would be a displacement of 2.5% of the 1999/2000 effort in Div. 3L, and 7.2% of the Div. 3M effort. Greenland halibut is the main species in their fishery deeper than 500 m in Div. 3L and 3M.

Data from the fisheries indicates that currently by-catches of cod, American plaice and redfish are low in Div. 3L in depths where Greenland halibut is fished. American plaice overlaps Greenland halibut distribution in all depths shallower than 1 000 m. Historically, American plaice catch rates were low deeper than about 600 m.

In Div. 3M, the Portuguese data indicate that the redfish fishery is at depths shallower than 500 m.

Russian data from their 2000 fishery do not indicate any fishing in depths shallower than 600 m. For both Div. 3L and 3M, catches rates for American plaice were highest at this shallowest depth but decreased in deeper water.

### **Divisions 3NO**

The situation in Div. 3N is somewhat different. In depths deeper than 800 m there will be significant by-catches of American plaice at certain times of the year, particularly in the spring.

A higher proportion of effort was reported to be directed toward Greenland halibut in depths shallower than 800 m. There is, however, concern about the legitimacy of the claim that they are directed for Greenland halibut. Based on available information, the proportion of Greenland halibut in the overall catches is relatively low and these fisheries would be better described as 'mixed'.

The fishing in these depths may be related to the consideration of by-catch 'limits' being treated as 'targets'. This is considered inappropriate generally, but especially given that the species being caught as 'by-catch' are mainly those under moratoria – American plaice, witch flounder, redfish and cod.

Restricting the Greenland halibut directed fishery to depths deeper than 500 m would limit the American plaice catch from depths deeper than 200 m to unavoidable by-catch taken from this fishery. Scientific Council did note however, that commercial catch rates of Greenland halibut are significantly lower in depths shallower than 600 m. The American plaice catches from the ongoing skate fishery in Div. 3N in shallow waters which, according to Spanish data for 1999 form the bulk of the of Div. 3LNO American plaice catches, would remain unaffected. Moreover, re-direction of effort in the intermediate depths from the target species being Greenland halibut to being an unregulated species could result in an increase in the existing problem. Introduction of mesh regulations for the directed skate fishery would help to alleviate the problem of by-catch in this fishery.

Relatively little effort is directed for Greenland halibut in Div. 3O. Most of the fishing is in depths shallower than 800 m but much of this is directed for redfish, and unregulated species in this area, as well as skate (also unregulated). There is concern about the catch of American plaice, witch flounder, yellowtail flounder and cod in these unregulated fisheries and Fisheries Commission should consider the introduction of controls on these fisheries.

Yellowtail flounder do not appear in catches deeper than 200 m. Cod in Div. 3NO have not been reported in Spanish and Portuguese fisheries in depths deeper than 500 m. The redfish by-catch in the Portuguese fishery is at depths of 200-800 m in Div. 3N. The redfish catch by Spain in Div. 3O is at 400-600 m while that for Portugal is in depths of 200-800 m. American plaice overlaps Greenland halibut distribution in all depths shallower than 1 000 m in Div. 3N. Catch rates of American plaice in depths greater than 500 m are low compared to in shallower depths in Div. 3N.

The Russian data for 2000 indicate a gradual increase in catch rates of American plaice from 300 m to higher levels in 800-1 000 m. In Div. 3O, high catch rates were reported for 0-400 m, followed by a decline at 500 m, then a gradual increase again to 700-800 m. There was no fishing deeper than 800 m.

## Summary

Choosing 500 m or 600 m as a limit for the Greenland halibut fisheries would have minimal impact on the directed fisheries for this species and would eliminate by-catch of yellowtail flounder and cod. By-catch of American plaice would be reduced, as would that of redfish. Choosing 700 m or 800 m would have only moderate impact. This restriction would substantially reduce the by-catch of redfish. Fisheries Commission also stated:

- b) *Subject to the above, likely future medium-term consequences (5 to 10 years) for the yield, spawning biomass, exploitable biomass and recruitment, stating the relevant biological assumptions.*
- c) *The scenarios should be explored for a range of fishing effort assumptions corresponding to:*
  - i) *Maintaining overall fishing effort at the same levels as estimated in the last year for which good information is available.*
  - ii) *Increases or decreases of +/- 30% in fishing effort from this value.*
  - iii) *Additional scenarios as considered appropriate by the Scientific Council.*

*In these scenarios, the Scientific Council should evaluate whether these fishing strategies provide adequate long-term protection to juvenile fish to allow maintenance of the spawning biomass at an appropriate level.*

The Council noted that:

Scientific Council, during the June 2001 Meeting, expressed concern about the increasing exploitation rates on Div. 3LNO American plaice and Div. 3NO cod, both of which are now approaching  $F_{0.1}$ . For both of these stocks, medium term projections were done under various assumptions about future fishing mortality rates. For American plaice, continuation of the current level of exploitation will likely result in further declines. Decreasing fishing mortality by 50% will only result in moderate increases in stock size.

Restricting fishing to depths deeper than 800 m will not eliminate by-catches of American plaice and may not significantly reduce them in any directed Greenland halibut fishery. By-catch of American plaice and cod in the Spanish fishery is low in depths deeper than 500 m in Div. 3N. Fishing in depths deeper than 200 m will avoid yellowtail flounder.

It is considered that the elimination of the 'mixed' fisheries in shallower than 800 m depths in Div. 3NO, coupled with mesh size restrictions in the skate fishery should reduce the by-catch of American plaice, yellowtail flounder and cod. The risk of further declines to the Div. 3LNO American plaice and Div. 3NO cod resources would be reduced. However, concern would still remain related to by-catches in the Div. 3O redfish fishery.

Scientific Council did not express concerns in similar detail regarding Div. 3LN redfish, but catches have been increasing with the 2000 catch at about 4 600 tons, double that of 1999. Elimination of fishing in intermediate depths coupled with mesh regulation for skate would significantly reduce this 'by-catch' ensuring that the spawning biomass does not decline.

Scientific Council also noted that in many years, roughhead grenadiers were reported as being the main by-catch in deep waters as well as intermediate depths. It should be noted that if restrictions are contemplated for fishing for Greenland halibut in intermediate depths, they should also be applied to roughhead grenadiers.

## Juveniles

It is not possible, with current data, to evaluate whether or not restricting fishing for Greenland halibut to depths deeper than 800 m will afford 'adequate' protection to juveniles of Greenland halibut and other species. The nature of the Greenland halibut fishery is such that mainly juveniles are taken. Thus 'adequate' protection must be achieved through careful limits to overall exploitation.

Available data do not suggest changes in the proportions of mature and immature American plaice with depth.

As indicated above, lowering exploitation rates on American plaice from the current level is essential if there is to be any hope of increasing the stock size. At current spawning stock biomass, it is critical that as many mature fish be allowed to survive as possible in order to enhance the possibility of good recruitment, an event necessary for rebuilding. As stated above, the exploitation should be reduced through elimination of 'mixed' fisheries in shallower than 800 m depths and mesh size regulation for the skate fishery. The same may be said for redfish, witch flounder and cod; ongoing survival of the mature fish is important to improve the chances of good recruitment.

Scientific Council has also repeatedly expressed concern regarding the high proportion of juveniles caught in the Greenland halibut fishery. When coupled with the current low spawning stock size relative to historical levels, this presents a situation of considerable risk. It is the nature of any bottom-trawling fishery for Greenland halibut that larger fish are poorly represented in the catches. While the research data suggest an increase in size of fish with increasing depth, and suggest that the mature portion of the population is in depths deeper than 800 m, the fishery data do not clearly indicate increases in mean size with increasing depth of capture. The data do show that the larger fish (>70 cm) are primarily taken in depths deeper than 800 m although the proportions are generally shallower than 2%. Restricting fishing to depths deeper than 800 m would result in only a moderate increase in the catch of these larger fish with a related decline in the catch of smaller individuals, but any benefit would probably only accumulate after many years.

#### 4. Update on Pelagic *S. mentella* (Redfish) in Division 1F and Adjacent ICES Area

Regarding redfish in Division 1F, the Fisheries Commission requested (see Agenda Annex 1, Item 12) the Scientific Council to: *review all available information on the distribution of this resource over time, as well as on the affinity of this stock to the pelagic redfish resource found in the ICES Sub-area XII, parts of SA Va and XIV or to the redfish found in NAFO Sub-areas 1-3.*

The Council responded:

The Council noted STACFIS at this meeting reviewed new information on the stock size and distribution of pelagic *Sebastes mentella* in NAFO Convention Area (Div. 1F, 2GHJ, 3K) and ICES Divisions XIV, XII and Va. (NAFO SCR Doc. 01/161). EU-Germany, Iceland, Russia and Norway carried out an ICES co-ordinated trawl-acoustic survey in June/July 2001. Five vessels participated and over 420 000 sq. naut. miles were covered. The stock size measured with the acoustic instruments was assessed to be about 715 000 tons at depths down to the deep-scattering layer (to about 350 m), with redfish having a mean length of 34.6 cm. Highest concentrations of redfish were in the southwest part of the area covered. The redfish was also mixed with the deep scattering layer. In addition to the acoustic measurements, an attempt was made to estimate the redfish in and below the deep scattering layer. This was done by correlating catches and acoustic values at depths between 100 and 450 m. The obtained correlation was used to transfer the trawl data at greater depths to acoustic values and from there to abundance. A total of approximately 1 075 000 tons were estimated to be at depths between 0 and 500 m and about 1 056 000 tons below 500 m depth. Below 500 m, the densest concentrations were found in the northeastern part of the area. The average length of the fishes caught below 500 m was 38.3 cm. The estimated abundance derived from the trawl data should be treated with great caution and they cannot be combined with the acoustic results. The preliminary data evaluation did not indicate significant changes in the stock size or distribution as compared with 1999 survey results.

A decreasing trend in the proportion of females at shallower water than 500 m during the last decade, but whether it is related to overexploitation of the females is not known. During the survey in 2001, recruits (25-30 cm) were observed, particularly in the western most area of the investigation; the western part of NAFO Div. 1F but also in the eastern parts of Div. 2H and 2J.

Fisheries of various fleets were discussed and various nations reported that little effort was directed towards pelagic *Sebastes mentella* in the NAFO Regulatory Area in 2001 up to date.

Council noted that a review on information about the stock structure of pelagic *Sebastes mentella* was presented during the NAFO Symposium on Deep-sea Fisheries (12-14 September 2001, Varadero, Cuba) and that there was no consensus with regard to various hypotheses.

## VII. REVIEW OF FUTURE MEETING ARRANGEMENTS

### 1. Special Session and Annual Meeting, September 2002

The Council confirmed the Annual Meeting will be held during 11-20 September 2002 in Spain, but the meeting site had not been announced yet. The Council noted further details could not be reconfirmed because the Annual General Council Meeting did not take place at this time.

The Council reconfirmed the Special Session, the Symposium, which is now titled "Elasmobranch Fisheries: managing for sustainable use and biodiversity conservation" will be held in conjunction with the Annual Meeting during 11-13 September 2002 in Spain.

### 2. Scientific Council Meeting on Shrimp, November 2002

The Council noted its meeting on northern shrimp will be held in Nuuk, Greenland. The meeting dates and site will be finalized during the Scientific Council Meeting on shrimp in November 2001.

### 3. Scientific Council Meeting, June 2003

The Council agreed the Scientific Council Meeting will be held from 29 May to 12 June 2003, at Alderney Landing, 2 Ochterloney Street, Dartmouth, Nova Scotia, Canada.

### 4. Additional Meetings

- a) **Status of Scientific Council Executives:** the Scientific Council decided that the current Executive Officers should finish their term as scheduled at the end of this 17-21 September 2001 Scientific Council Meeting. The new Executive Officers would then take office, and the first scheduled Scientific Council Meeting is on shrimp stocks, during 7-14 November 2001 in Dartmouth, Nova Scotia, Canada.
- b) **23<sup>rd</sup> Annual Meeting:** the Scientific Council considered the possibility that a meeting of the General Council and Fisheries Commission may be called in 2001 or early-2002 to address the work of the 23<sup>rd</sup> Annual Meeting, because the 23<sup>rd</sup> Annual Meeting of September 2001 did not occur as scheduled in Cuba. Given that Scientific Council expected to finish its work at the current meeting, it was agreed that it would not be necessary for Scientific Council to meet should the General Council and Fisheries Commission Meetings be held.
- c) **A proposal for a second Scientific Council Workshop on the Precautionary Approach to Fisheries Management:** the Scientific Council held its first Workshop on the Precautionary Approach in March, 1998 to describe procedures for determining limit and target reference points and to determine the limit and target precautionary reference points for all stocks under the responsibility of the Fisheries Commission. For many stocks, it was not possible to determine precautionary reference points due to time constraints and/or data limitations. Therefore, the workshop focused detailed attention on Div. 3LNO American plaice, and applied various methods to Greenland halibut in SA 2 + 3, shrimp in Div. 3M, redfish in Div. 3M and squid in SA 3 + 4.

The Scientific Council discussed the desirability of convening a second Workshop to further develop limit reference points within the Precautionary Approach framework for as many stocks as possible. The workshop will focus on methods that utilize biomass and exploitation values based primarily on research vessel survey indices as proxies for absolute values. Scientific Council agreed on the value of such a Workshop but could not determine an appropriate time to schedule the Workshop. It was noted that

spring 2003 is the most likely period. In the interim, Scientific Council will review the data available for each stock at the June 2002 Meeting.

## VIII. FUTURE SPECIAL SESSIONS

### 1. Progress Report on Symposium in 2002

The convenors D. W. Kulka (Department of Fisheries and Oceans, Canada – NAFO), J. Musick (Virginia Institute of Marine Sciences, USA), M. Pawson (Centre for Environment, Aquaculture and Fisheries Science – UK/ICES), T. Walker (Modelling and Data Management, Marine and Freshwater Resources Institute – Australia) made progress in the planning of the Elasmobranch Symposium. A draft of the first announcement for the Symposium containing all of the elements plus information on Symposium structure, venue, participation and other administrative details was presented and accepted by the Scientific Council. The following describes the main elements:

a) The **Proposed Title**:

*Elasmobranch Fisheries: managing for sustainable use and biodiversity conservation.*

b) The **Introduction** is meant to provide background information and justification for the chosen themes is as follows:

*Elasmobranch resources are increasingly exploited in various places around the world. A worldwide trend exists towards increasing exploitation of the fishery resources. This has raised a number of issues concerning both the biology and management of these resources. Countries and various regional management bodies (notably tuna commissions) around the world are preparing Shark Assessment Reports and Plans of Action in response to FAO's International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks), where the term 'shark' is defined to include all chondrichthyans. It is the generally low productivity of shark populations compared with the productivity of teleosts and invertebrates that led to development of the IPOA-Sharks. The IPOA-Sharks has two main thrusts:*

1. *Sustainable and rational use of targeted and by-product species through responsible management, and*
2. *Conservation of biodiversity through management of by-catch.*

*The Symposium will provide the first opportunity for international discussion following adoption of the IPOA-Sharks. The purpose of this Symposium will be to discuss the available biological information and the issues in the management of elasmobranch fisheries. The Symposium will address elasmobranch resources around the world.*

c) Proposed **themes** include the following:

The Scientific Council commented it is important to allow for a broad coverage of biological and ecological issues. The Scientific Council also agreed *the term "elasmobranchs" (sharks, skates, rays) used in the announcement of this Symposium should be defined to include all chondrichthyans (sharks, skates, rays and chimeras).* The following modified themes were prepared for the co-convenors' consideration:

- **Population Dynamics and Biology.** *Population dynamics and biology of this group is generally poorly understood. As well, elasmobranchs as a group tend to have different population dynamics than teleosts and invertebrates particularly in their early life history and have a lower productivity.*
- **Stock identity and structuring.** *Many species of shark and possibly skates, rays, and chimaeras exhibit complex movement patterns and often separate spatially by sex and size, but stock identity*

*and structuring in populations of these animals are not well understood. In many fisheries, even species identity is uncertain.*

- ***Stock assessment methods and application in relation to elasmobranch biology.*** *The population biology of sharks and other elasmobranchs has more in common with marine mammals than the much more extensively investigated invertebrate and teleost species. Consequently, standard assessment methods and the types of biological and monitoring data collected in most fisheries are not always suitable for elasmobranch species.*
- ***Conservation of elasmobranch biodiversity: harvest strategies to manage stocks sustainably and rationally.*** *To manage shark fisheries there is need to determine the most appropriate harvest strategies to avoid depletion of stocks to levels where they can provide only low sustainable yields or collapse. By-catch of these animals requires special management and innovative approaches for rapid assessment of sustainability.*

The Council noted the good progress made and the potential for a good Symposium. The Council extended its appreciation to D. Kulka and the co-conveners for the work so far. For further urgent progress, the Scientific Council requested that the announcement of the Symposium be provided to the Secretariat before 10 October 2001 for circulation shortly thereafter.

## 2. **Proposal for Special Session 2003**

The Council noted that there was a proposal in 1998-99 for a Symposium titled "Managing Marine Ecosystem Variability in the NAFO Area". The objectives of that Symposium were to take a retrospective look at major changes in the ecosystems in the NAFO area over the past 40 years with influential effects on stock assessment and management. The Council was informed in 1999 that Canada had initiated a project that encompassed subject areas suggested for this symposium theme. Although Canadian participants in this project have expressed interest in a future Symposium in this area, Scientific Council was unable to commit to this proposal for a Scientific Council Special Session in 2003, at this time. Canadian members of the Scientific Council involved in this project were encouraged to keep Scientific Council informed of developments in this project.

The Council noted that a likely topic for a Special Session in 2003 was on geostatistics methodology and its use in studying fish stocks. It was agreed the Council will receive more information on this in June 2002, before deciding on its suitability for a Scientific Council Special Session.

The Scientific Council agreed to review these two topics or consider other proposals, such as workshops, during its meeting in June 2002.

## **IX. JOINT NAFO/ICES WORKING GROUPS OR MEETINGS**

### 1. **Update on Activities of Joint NAFO/ICES WG on Harp and Hooded Seals**

The Chairman informed the Working Group (WGHARP) had worked by correspondence during 2001 and had agreed to meet in late August-early September 2002 in Arkhangelsk, Russia.

One important issue at the 2002 meeting will be to review the results from the Pinniped Population Modelling Workshop. A subgroup (R. Merrick, N. Øien, G. Stenson) was designated to work by correspondence to develop the workshop. The result from their efforts is that the WGHARP will hold a three-day Workshop on "Harvest modeling of pinniped populations" to be hosted by the U.S. National Marine Fisheries Service, in Woods Hole, Massachusetts, USA in the period 28-30 January 2002 (tentative dates). Attendance will be limited to approximately 25 scientists, and will include members of WGHARP as well as invited presenters knowledgeable in large mammal population dynamics and management. Goal of the Workshop will be to further refine the abilities of the WGHARP on harvest modeling of the harp and hooded seal populations, which WGHARP is tasked with providing management advice on. Topics will include:

- a) Development of a range of model designs so that WGHARP can apply models applicable to existing data availability.



- b) Sensitivities and performance of various models.
- c) How to deal with the biological reference points and precautionary approach issues in WGHARP.

The Scientific Council agreed that modelling methods and the application of the precautionary approach, particularly related to the interaction of seals and fish, would be of interest. The Council expressed its interest in communicating to the WGHARP, the precautionary approach terminology being used by NAFO and ICES. The Council considered the value of having representation at the Workshop. The Council noted G. Stenson (Canada) usually represented the Council and provided the Council with a report from the WGHARP. The Council agreed that G. Stenson (Canada) be requested to do so again. The Council also welcomed the offer by R. Mayo (USA) (the incoming Scientific Council Chairman) to attend and provide relevant feedback to the Council.

## 2. Report from Joint NAFO/ICES Symposium on Hydrobiological Variability in August 2001

The Symposium "Hydrobiological Variability in the ICES Area, 1990-1999" was held at the Royal College of Physicians, Edinburgh, Scotland during 8-10 August 2001. M. Stein (EU-Germany) was representative of NAFO and member of the Scientific Steering Committee to cover the interface with NAFO, especially the physical oceanography and fisheries off West Greenland and the Northwest Atlantic. K. Drinkwater (Canada) was appointed member of the Editorial panel. The Symposium was held in conjunction with the "Symposium on the Occasion of the 70<sup>th</sup> Anniversary of the Continuous Plankton Recorder Survey of the North Atlantic" on 7 August 2001 at the same venue.

The Symposium was well attended. 204 participants had registered. A total of 42 oral presentations, and 59 posters were given. During the first day of the Symposium 13 physical oceanographic lectures covered climatic issues from the Labrador Sea in the west to the Barents Sea in the east. During the morning session of the second day the lectures were focused on Norwegian Sea and North Sea oceanography as well as on trends in plankton abundance during the 1990s. With his lecture "Biological response to a changing environment in Newfoundland waters during the latter decades of the 1900s" E. Colbourne (Canada) opened the series of fishery-related talks during the rest of the day. The morning lectures during the third day of the Symposium continued the topic on interactions between fish and environment in the North Sea, Norwegian Sea and the Barents Sea, and were followed by four lectures dealing with fish/environment interactions in the Baltic Sea. The afternoon of the third day was occupied with contributions from the Bay of Biscay area, which covered hydrography, plankton and demersal fish communities.

During the first and second day of the Symposium there were poster sessions of one-hour duration each. However, since the posters were mounted in the coffee/tea-break area there was much discussion going on at the posters each day.

Conclusions from the Symposium: The 1990s was a decade of extremes: extreme warm, extreme cold, North Atlantic Oscillation (NAO) strongly positive, in one occasion strongly negative (winter 1995/96). In the central Labrador Sea there was a four-year period of unusually intense convection followed by five years of restratification. The period of intense convection was caused by unusually severe winter weather associated with a persistently deep Icelandic Low in the atmosphere. The influence of NAO was visible on the North Atlantic space scale, both in the west, and in the east. In the Barents Sea warmest conditions were encountered since the 1930s. A causal link was made for the Barents Sea: NAO+ strong westerlies – high Barents Sea air temperatures – high Barents Sea water temperatures – growth of the Copepod *Calanus finmarchicus* – inflow of *Calanus finmarchicus* – increased cod growth. At the Norwegian coast, the winters during the 1990s indicated highest decadal mean temperatures at the sea surface and in the deep layers. For the North Sea, the 1990s revealed outstanding change in wind forcing compared to previous decades.

For the region of the Faroe Islands, it could be shown that during the 1990s there was a shift from an oceanic environment to a neritic environment, from *Calanus finmarchicus* dominated to neritic copepods dominated environment. There was a collapse of the cod and haddock stocks during the early-1990s, and recovery afterwards. The primary production index correlated with the growth of cod and haddock and the recruitment to these stocks.

In the Norwegian Sea, there was a significant positive correlation between herring condition index and NAO. Even on the short-time scale interaction between climate and fish could be shown: strong variations of NAO index (winter 1995/96, from highly positive to highly negative) led to a lower herring condition index.

For the Newfoundland waters it could be shown that the increase observed in the productivity of the pelagic ecosystem during the latter half of the 1990s was consistent with the expected biological response to changes in the physical ocean environment.

M. Stein expressed his pleasure to have attended the Symposium "Hydrobiological Variability in the ICES Area, 1990-1999". It was a unique occasion to learn about the present state of knowledge in the field of fishery-related research in the North Atlantic. It is his impression that the involvement of NAFO in this Symposium led to a "western" extension of the topics covered in the lectures and posters. For the benefit of marine science it was worth to pool the efforts of two international fishery-related organisations, ICES and NAFO. He acknowledged the financial contribution given by NAFO to sponsor this outstanding Symposium.

The Council was pleased to note that M. Stein and K. Drinkwater will ensure NAFO and the Scientific Council will be fully recognized as a co-sponsor of this Symposium, in the ensuing publication undertaken by ICES.

In review of the achievements of the Symposium, K. Drinkwater, E. Colbourne and M. Stein felt that although there was some information available for the Northwest Atlantic region, there were no papers contributed to the Symposium, which cover climatic variations off the US American Atlantic coast. It was therefore felt that it would be suitable to have a climatic overview on NAFO Subareas to be given during NAFO Scientific Council Meeting in June 2002 at the STACFEN Meeting. The following contributors indicated their willingness to provide climatic overviews: Subarea 1 - E. Buch (Denmark) and M. Stein (EU-Germany), Subareas 2 and 3 - E. Colbourne (Canada), Subarea 4 - K. Drinkwater (Canada), Subarea 5 - D. Mountain (USA). The Scientific Council was informed these papers would be submitted to the NAFO *Journal of Northwest Atlantic Fisheries Science*.

### 3. **Proposal for Joint Meeting on Shrimp, November 2002**

The Chairman informed the Council that no written proposal had been forwarded from ICES, since interests of a joint meeting were first received verbally in June 2000.

While noting that the NAFO November Meeting on shrimp is a full Scientific Council Meeting, and that ICES ACFM Meeting time schedules had recently changed, the Council requested the Chairman to communicate with ICES to inquire on their current interests.

## **X. SCIENTIFIC COUNCIL WORKING PROCEDURES AND PROTOCOL**

### 1. **Timetable and Frequency of Assessments**

Scientific Council considered material on the timetable and frequency of assessments for stocks: redfish in Div. 3M, short-finned squid in Subareas 3 and 4, yellowtail flounder in Div. 3LNO, and American plaice in Div. 3LNO.

For redfish in Div. 3M, squid in Subareas 3 and 4 and yellowtail flounder in Div. 3LNO, the Council considered changing the frequency of assessment from every year to every second year, with an interim monitoring report in non-assessment years, similar to the schedule currently adopted by Scientific Council for six Fisheries Commission stocks. Given the stability currently shown and projected to continue in the short-term for these stocks, Scientific Council agreed that a two-year cycle would be reasonable. Interim monitoring should provide updates of major indices, and assessment models where possible (e.g. ASPIC for yellowtail flounder).

There was some discussion about what time of the year the Council should undertake assessment of squid in Subareas 3 and 4, however, Scientific Council agreed that the assessments should continue to be done at the June meeting.

Scientific Council agreed to the following overall schedule (+ is assessment year, *i* is interim monitor) subject to the Fisheries Commission requests for advice and concurrence:

Stock	1999	2000	2001	2002	2003	2004	2005
<i>Current schedule</i>							
American plaice in Div. 3LNO	+	<i>i</i>	+	<i>i</i>	+	<i>i</i>	+
Cod in Div. 3N	+	<i>i</i>	+	<i>i</i>	+	<i>i</i>	+
Redfish in Div. 3LN	+	<i>i</i>	+	<i>i</i>	+	<i>i</i>	+
Cod in Div. 3M	+	+	<i>i</i>	+	<i>i</i>	+	<i>i</i>
American plaice in Div. 3M	+	+	<i>i</i>	+	<i>i</i>	+	<i>i</i>
Witch flounder in Div. 3NO	+	+	<i>i</i>	+	<i>i</i>	+	<i>i</i>
<i>Council's additional schedule</i>							
Yellowtail flounder in Div. 3LNO			+	+	<i>i</i>	+	<i>i</i>
Squid in Subareas 3 and 4			+	+	<i>i</i>	+	<i>i</i>
Redfish in Div. 3M			+	+	+	<i>i</i>	+

For American plaice in Div. 3LNO, the Council decided to leave this stock on its current 2-year timetable, after some debate. Several reasons were considered for changing the frequency of assessments to an annual basis, including an increasing trend in fishing mortality, and perceived increases in some survey indices. However, considering its advice from the 2001 Meeting that the stock remains at a low level, Scientific Council concluded that the current schedule of assessment was acceptable. During the interim monitoring, there is a need to continue to monitor the level of fishing mortality.

## 2. STACPUB Working Procedures and Membership

### a) New Initiatives for Publications

- i) Future publishing policy for the Journal, and
- ii) Publishing of GLOBEC proceedings

Scientific Council considered these 2 items together, and concluded that the current scope of the Journal, i.e. focusing on the Northwest Atlantic area, should not be changed. Reasons were varied, and included workload issues.

- iii) Methods of promotion of the Journal

Scientific Council agreed that the availability of accepted electronic manuscripts prior to the actual publication of the Journal issue was an excellent feature worthy of promotion. Notification of these manuscripts should be sent to web-based discussion lists, etc. as soon as they are ready, indicating that pdf versions of these papers can be downloaded from the NAFO Website.

### b) STACPUB Membership

The Council noted its decisions in June 2001 to conduct STACPUB business in plenary, in the same way STACFIS, STACREC and STACFEN conduct business and the agreement to address the issue of STACPUB membership at this meeting.

Further to its decisions regarding Scientific Council Rules of Procedure during 13-17 September 1999, the Council noted the present Rule 5.1.(c).(ii) states that STACPUB "consist of six other members appointed by the Scientific Council. Members would serve 3-year terms".

The Council after some discussion agreed that appointed STACPUB membership was no longer required and accordingly **recommended** that *the Scientific Council Rules of Procedure be modified by deleting Rule 5.1.(c).(ii)*.

The Council further reiterated that the June 2002 Meeting format be changed to accommodate about half-day for STACPUB business, and that the Agendas of all Standing Committees be critically reviewed to eliminate overlap and duplications.

c) **E-mail Addresses**

Another issue raised in STACPUB was the issue of individual e-mail addresses for Secretariat members. It was noted that such capabilities may already exist at the Secretariat, and Scientific Council confirmed its view that this was important to ensure secure and confidential communication between Scientific Council members and Secretariat members when necessary. Scientific Council requested the chair to discuss this matter with the Executive Secretary to see if these e-mail addresses could be implemented as soon as possible.

## XI. OTHER MATTERS

### 1. Report of STACTIC Intersessional Meeting, June 2001

a) **STACTIC Intersessional Meeting, June 2001**

The Council received a summary of the proceedings of the Standing Committee on International Control (STACTIC, 26-28 June 2001, Halifax) on matters relevant to Scientific Council. The following refers to sections of STACTIC Report in document NAFO/FC Doc. 01/10.

1. Under item 5, **Consideration of possible measures for protection of juvenile fish**, Canada presented four proposals.
  - a) The first proposal regarding **depth restrictions relating to the Greenland halibut fishery**, information on the relationship between water depth and the size of Greenland halibut demonstrated that such a restriction would be effective in minimizing the capture of juvenile fish while not placing undue hardship on the viability of the Greenland halibut fishery. The Chair indicated that this issue is scheduled to be discussed by the Scientific Council at the annual meeting so that their advice will be available to STACTIC during its meeting. It was agreed that the depth restriction proposal would be revisited by STACTIC at the next Annual Meeting.
  - b) The second Canadian proposal dealt with an **enhancement of the closed area for the Div. 3M shrimp fishery**. Canada's initial proposal to expand the current Div. 3M shrimp closure from the 300 m depth contour to the 450 m depth contour and to extend the closure from the current 1 June to 30 September to a year round closure was amended its proposal to retain the coordinates of the current closed area while extending the time period of the closure to the entire year. The Chair indicated that further debate is required regarding both fishing gear selectivity in the shrimp fishery and the length of the closure period for the closed area. He asked that Contracting Parties review these issues and be prepared to further discuss this issue at the next STACTIC meeting.
  - c) The third Canadian proposal, **creation of a closed area on the Southeast Shoal** area of the Grand Bank in Div. 3N was discussed. This area has been identified by the Scientific Council as a nursery area for Div. 3NO cod, Div. 3LNO American plaice, Div. 3LNO yellowtail flounder and Div. 3NO witch flounder. The Chair suggested that the Fisheries Commission could be asked to consider the nature of the debate at the next meeting of

STACTIC and, at their discretion, take a decision or provide further direction to STACTIC on this issue.

- d) The fourth Canadian proposal, **to increase minimum mesh size for groundfish trawls in the NAFO Regulatory Area** from 130 mm to 145 mm when fishing at depths less than 700 m. This would allow for increased escapement of juvenile Greenland halibut and cod. Canada later agreed to withdraw this proposal.
2. Under item 6, **Restriction and regulation of by-catch of moratoria species**, Canada proposed new measures to protect flounder species and species under moratoria in the skate fishery, where these species are taken and reported as incidental catch. The proposal calls for the establishment of a minimum mesh size for skate of 305 mm for the cod-end and 254 mm for all other parts of the trawl. Following discussion, the Chair suggested that since there was no consensus reached, and as the Canadian information will be provided after this meeting, this issue could be revisited at the next annual meeting of STACTIC.
3. Under item 8, **Program for Observers and Satellite Tracking for shrimp in Division 3M**, Iceland introduced STACTIC Working Paper 01/8 (Ideas for an alternative observer program regarding shrimp fisheries in Div. 3M). The proposal is to reduce observer coverage for the shrimp fishery and possibly other fisheries where by-catch is not an issue. Iceland indicated that Iceland will be submitting a formal proposal regarding an alternative observer program at the September annual meeting.
4. Under item 10, **other matters, the use of observer information for scientific purposes** (SCS Doc. 00/23 Harmonized NAFO Observer Program Data System Proposal) adopted by the Fisheries Commission in 2000, the European Union indicated that certain elements of this document need to be revisited, e.g. confidentiality and identification of data elements required for scientific purposes. The European Union will review this issue and submit proposed amendments to SCS Doc. 00/23 at the annual meeting. The European Union may also submit a proposal for an observer manual.

On this matter, it was agreed that the Chair of Scientific Council contact the Chair of Fisheries Commission to discuss the concern about re-opening of this issue at STACTIC after it had been adopted by the Fisheries Commission in 2000.

#### b) **Observer Program Database**

The Scientific Council discussed the availability of data collected under the Program for Observers and Satellite Tracking and noted the STACREC recommendation from June 2001 with regard to the ACCESS database developed by Canada to capture these data. This database is designed to accept data in a variety of formats as submitted by Contracting Parties. The Scientific Council considers this database to be an effective tool for managing the Observer Program database and, therefore, **recommended** that *the existing database be installed at the NAFO Secretariat in the immediate future to capture current data, and that work should commence to evaluate requirements for entry of the remaining historical data.*

#### 2. **Workshop on Sequential Population Analysis for Greenland halibut in SA 2 + Div. 3KLMNO**

Scientific Council noted there was no progress on this since its June 2001 Meeting and subsequently deferred it for discussion in June 2002. Scientific Council Chair will contact the Executive Secretary of NAFO to inform him that a request for \$3000 in funding will not be required for the year 2002.

#### 3. **Geostatistics Methodology for Studying Fish Stocks**

Scientific Council considered a proposal for a 3-day Workshop to be held, in conjunction with the September 2003 NAFO Meeting, to educate Scientific Council members about the use of geostatistical methods in fisheries

stock assessments. The Workshop agenda will be presented by the conveners, D. W. Kulka (Canada) and L. Hendrickson (USA), at the June 2002 Scientific Council Meeting for further discussion before the Council decided on the suitability of this proposal for the Scientific Council in 2003.

#### 4. **Other Business**

Scientific Council agreed to use the common name "northern shortfin squid" for *Illex illecebrosus* in all its reports, documents and databases. This is in keeping with current taxonomic nomenclature.

## **XII. ADOPTION OF REPORTS**

### 1. **Consideration of Report of the Symposium on Deep-sea Fisheries, 12-14 September 2001**

The Council was presented with a brief overview report of the Symposium by the co-convenor J. D. M. Gordon.

The Council was informed that the Symposium was attended by 104 participants from 22 countries although many potential participants could not come due to travel difficulties resulting from the tragic events in USA. The original program was therefore modified as needed. Seventy-five percent of the participants were from European countries and 77% of first authors of oral presentations were also from Europe.

The program consisted of 3 invited papers, 35 oral presentations, 5 posters/oral short presentations and 57 posters.

The revised proceedings were divided into six sessions: Deepwater Fisheries; Impact Management; Greenland halibut; Biology and Life History; Redfish; and Fisheries Ecology. The report of the Symposium is given at Annex 1.

The Council was in addition introduced to some general issues:

1. The long established fishery for Greenland halibut could be useful as a model for the management of developing deepwater fisheries. At the request of NEAFC, ICES is working towards such an approach by ranking species in terms of life-history patterns.
2. ICES Sub-areas and Divisions are inappropriate for deepwater fisheries.
3. The high levels of discards and mortality of escapees makes it important, wherever possible, to record catch and not simply landings.
4. Public awareness of the impact of fishing is growing and there is a need to involve a wider audience in management, as exemplified by New Zealand and Norway in their protection of corals.
5. There is a need to develop non-invasive sampling techniques.

About the Symposium, a general question asked was, could we have done better?

The co-convenor's view was that more effort should have been made to present the posters such as was done for Greenland halibut. A general review of management of Greenland halibut would have been useful to European participants who are not familiar with NAFO procedures.

Council reviewed and **adopted** the Report of the Symposium on "Deep-sea Fisheries" as presented at Annex 1.

The Council was pleased with the success of the Symposium. The Council extended special thanks to J. D. M. Gordon (ICES) for the extra attention he offered to this Symposium and to the co-conveners J. A. Moore (NAFO), and A. Koslow (CSIRO). The Council recognized this Symposium was very informative and a valuable contribution to the scientific work of the Scientific Council. While adopting the report of the

Symposium, the Council agreed with the STACPUB proposal that the papers presented at the Symposium be published in the *NAFO Journal of Northwest Atlantic Fishery*.

**2. Committee Reports of Present Meeting (STACFIS, STACREC, STACPUB)**

The Council at its ongoing sessions considered and **adopted** the reports of its Standings Committees, STACFIS, STACREC and STACPUB as they became available. These reports are given in Appendix I, II and III, respectively.

**3. Report of Scientific Council Present Meeting 17-21 September 2001**

The Council at its concluding session on 20 September 2001 considered and **adopted** its own Report. This meeting was scheduled and announced for 17-21 September 2001.

### **XIII. ADJOURNMENT**

The Chairman expressed his gratitude to the Council members for their work and co-operation during the meeting. He was especially pleased to note the excellent co-operative efforts on a number of items, resulting in completion of the full Scientific Council agenda. He thanked the Cuban hosts for facilities and support, excellent hospitality (and the nice weather). In noting that this concluded his two-year term as Scientific Council Chairman, special thanks were extended to the Designated Experts for their commitment and for carrying out an extra workload during most meetings. Also appreciation was expressed for the excellent work of all the Standing Committee Chairmen for their support and guidance; in particular to Manfred Stein for his extended service as Chair of STACFEN, and to H.-J Rätz for his fine work as STACFIS Chairman, given the heavy workload of STACFIS at most meetings.

The Chairman thanked the Assistant Executive Secretary for his work as rapporteur. The Secretariat was congratulated for its fine efforts and support during the meeting, and for providing support to the Chairman over the past 2 years, and to Scientific Council on an ongoing basis.

In closing, the Chairman extended a warm welcome to the new Chairman and the new Chairs of the Standing Committees, noting that the work that lay ahead was in good hands.

The incoming Chairman of Scientific Council, and the incoming Chairman of STACPUB expressed best wishes to the outgoing Chairman, and thanked him for his contributions during the past 2 years.

There being no further business, the Chairman wished everyone a safe trip home and closed the meeting.



Convenors and Session Chairman

Secretariat and Cuban Hosts

Plaza Americas

Reception

Opening Session



**ANNEX 1. SCIENTIFIC COUNCIL SPECIAL SESSION**  
**REPORT OF THE SYMPOSIUM ON DEEP-SEA FISHERIES**

Hosted by the Scientific Council of the Northwest Atlantic Fisheries Organization (NAFO)  
12-14 September 2001

The Symposium, *Deep-Sea Fisheries*, was held at the Centro de Convenciones de Plaza de América, Varadero, Matanzas, Cuba, with co-conveners J. A. Moore (NAFO), J. D. M. Gordon (ICES), and A. Koslow (CSIRO) during 12-14 September 2001. There were 104 participants from Australia, Austria, Brazil, Canada, Cuba, Denmark, Estonia, Faroe Islands, France, Greece, Iceland, Ireland, Italy, Mexico, New Zealand, Norway, Poland, Portugal, Russia, Spain, United Kingdom, and United States of America.

W. B. Brodie, Chairman of Scientific Council, opened the symposium by welcoming the participants and presenting a brief overview of NAFO and its activities. The participants were welcomed by Mr. E. Oltuski, Ministerio de la Industria Pesquera, Cuba, as the Cuban host, and the President of NAFO and Chairman of General Council.

J. D. M. Gordon welcomed the participants on behalf of the co-conveners. He noted that a theme session on deep-water fish and fisheries at the 1998 ICES Annual Science Conference had resulted in a record number of oral presentations and posters. This meeting had exceeded that number indicating both the rapid development of deep-water fisheries and concerns about their sustainability. He explained that there would be changes to the schedule resulting from the cancellation and/or late arrival of speakers due to the closure of all airports in the USA following the events of 11 September. Regrettably the NAFO co-convener, J. A. Moore, was unable to attend the symposium.

The co-conveners invited D. Power and W. R. Bowering to Chair the sessions on "Redfish" and "Greenland halibut", respectively. M. Clark was invited to Chair the opening session on "Deepwater Fisheries".

The Symposium considered current research, advances and impacts of deep-water fisheries in many different locations around the world. In addition, two sessions were devoted to important deep-water fisheries (Greenland halibut and redfish) of the North Atlantic area.

Three invited speakers addressed specific issues within the six sessions. Thirty-five other oral presentations were delivered and 62 posters were displayed. Posters were highlighted in the Greenland halibut session during which five poster authors presented 5-minute summaries of their work.

**SESSION 1. DEEPWATER FISHERIES**

The first part of this session, chaired by J. A. Koslow, mostly consisted of descriptions of developing deep-water fisheries. The leadoff invited paper by Koslow and co-authors reviewed recent evidence for high diversity and endemism and highly localized distributions of seamount benthic communities, based on data from the Southwest Pacific. Trawl fishing was shown to be capable of severely impacting these communities, leading to the need to conserve this fauna based on localized networks of representative protected areas.

One paper covered preliminary faunal information from exploratory work at Bear Seamount, just off Georges Bank that had revealed a rich fauna, including 115 species of fish. Another paper described recent trends in the deep-water fishery off southern Brazil and emphasized the need for orderly development of that region's deepwater fishery, based on initial explorations now being carried out with chartered foreign fishing vessels. Their systematic exploration, based on use of a range of gears over that country's deepwater zone, provided a valuable model for deepwater fishery development. In contrast, a paper on the Spanish multi-species deep-sea fishery in the international waters of the Hatton Bank (ICES Sub-area XII) described the rapid development of the Spanish trawl fishery for *Alepocephalus bairdii* (Baird's smoothhead) and *Coryphaenoides rupestris* (roundnose grenadier). Only five years old, the fishery is already Spain's largest deepwater trawl fishery. Data on both the Spanish and Brazilian fisheries is obtained by observers working from commercial vessels. The Spanish fishery already shows signs of declining catch and catch per unit of effort, indicating that a cautious approach to future management of the fishery is warranted. A space in the program was filled by an unscheduled paper by Hareide, Langedal, Garner and Dyb entitled "Hatton Bank resources and catch results – results from Norwegian exploratory fisheries" that presented interesting results from Hatton Bank, showing a clear relationship between the fish assemblages and water mass

characteristics. The fish fauna within the arctic-influenced water to the west of the bank had more coldwater affinities, while the fauna to the east had more typically Atlantic affinities. The authors pointed out that the present division of the region into several ICES sub-areas was probably no longer appropriate scientifically for management of the region.

Another paper on the distribution and density of carnivorous fish species around Lanzarote and Fuerteventura, Canary Islands, used multivariate statistics to extract information from commercial long-line data on community structure in relation to depth and potentially hydrological factors. Their approach illustrated the potential to obtain important ecological information from available commercial catch data. This first session ended with a review of recent catch records, which extend the range for *Hoplostethus atlanticus* (orange roughy) into Canadian waters. The catches were generally quite low, on the order of one individual per set, so the fishery potential appears negligible at present.

J. D. M. Gordon chaired the second part of this much depleted session and presented his invited paper, which aimed to provide an overview of the Rockall Trough (northeast Atlantic) and its deep-water fisheries. Deep-water fishes were first dredged from the area in 1868 and since the 1970s there have been many surveys. The deep-water fishery that began in the 1980s has been well documented and can provide insights into the fishery effects on the ecosystem. The other presentation in this session described a comparison of a long-line and a gill net fishery for *Merluccius merluccius* (hake) in deep-water off southern Portugal.

## SESSION 2. GREENLAND HALIBUT

This session, which was chaired by W. R. Bowering, comprised 10 presentations grouped into three themes. Two papers were concerned with the effects of fishing on growth and fishing patterns. Two papers considered stock structure issues and six papers described studies on maturation (e.g. length- and age-at-maturity, ovarian maturation and fecundity). The concluding discussion focused almost entirely on the maturation issues. The key results were 1) that length and age at maturity indicated high interannual variation among stocks throughout the North Atlantic; 2) the interpretation of the maturity cycle can be difficult since it has been shown that the fish may not spawn annually and 3) the length and age at maturity was rather similar throughout the North Atlantic except for NAFO Div. 2J+3K where fish matured at a larger size and age. It was also noted that some imprecision in the length- and age-at-maturity can be caused by errors in the visual interpretation of the immature and resting stages and it was suggested that precision could be improved by using histological techniques for interpreting maturity stages. It was also suggested that some of the annual variation observed in length- and age-at-first-maturity might be removed if sampling could be spread throughout the year. For practical purposes averaging maturity rates over some years may be useful for approximating SSB trends.

At the conclusion of the session it was suggested that it might be useful to consider whether the experience of managing long established Greenland halibut fisheries might have something to offer to the management of some of the new deep-water fisheries. It was noted that all Greenland halibut stocks declined rapidly when F increased even at relatively low average values. SSB remains at low levels in most stocks in the North Atlantic but when F is reduced the population can rebuild fairly rapidly as demonstrated by the NAFO Subarea 2 and Div. 3KLMNO stock. However, it remains to be seen whether the SSB will improve to former levels for this stock. From the experience of Greenland halibut it was clear that other species that live much longer, grow slower and have a lower reproductive potential will be much more sensitive to F, even at much lower values. Any stock rebuilding will take much longer, if it occurs at all.

## SESSION 3. DEEP-WATER FISHERIES; IMPACTS ASSESSMENT AND MANAGEMENT

The session, chaired by M. Clark opened with his invited paper describing the deepwater trawl fishery for orange roughy on seamounts off New Zealand. It was shown that seamount habitat could be severely affected by bottom trawling, with extensive removal of coral cover. Another paper showed that the large reefs of *Lophelia* off the Norwegian coast are also vulnerable to bottom trawling. Management action has been taken to close 19 seamounts around New Zealand, and to prohibit trawling in several areas of reef habitat off the Norwegian coast.

A paper described the distribution of deepwater fish and fisheries throughout the ICES area, which was then followed by a paper presenting and discussing options for their assessment and management. This included data requirements, possible stock assessment models and approaches, and management measures. Strong decreases in

catch levels and CPUE in several fisheries highlight the need for immediate management action to limit catches. ICES area boundaries also need to be revised for deep-water species, as they are not consistent with bathymetry or water masses in some areas. Several are also very large, which does not recognize the small spatial scales often necessary to monitor some of these deepwater fisheries to prevent serial depletion of populations/stocks.

Biological data were presented for several deepwater species off Ireland that further advocated a cautious approach to fishery development. Estimates of population replacement rates for deepwater species were much lower than for some shelf species.

In a paper reviewing the track record of stock assessment and fishery performance of several deepwater species, the possibility of episodic recruitment in fish like orange roughy was raised. Long periods of low recruitment between strong pulses adds a challenge to develop appropriate population models, and increases the complexity of estimating sustainable annual yields.

An account was presented of the biology and fishery for the deepwater prawn *Aristeus antennatus* in the western Mediterranean Sea. Established fishing grounds could be extended into deeper waters, but care is required to establish migration and life-history links between the areas.

#### SESSION 4. BIOLOGY AND LIFE HISTORY

The first paper in this session, chaired by J. D. M. Gordon, presented the results of a study of the predator prey relationships of a small, isolated deep-water fish assemblage in the Skagerrak. The food web showed quite clearly the links between the demersal fish and their pelagic prey that appears to be a common feature of the exploited deep-water fishes. A paper on the trophic ecology of the blue whiting in the northeastern Atlantic described the diet and the degree of overlap both within different length classes of the species and also between other pelagics. The role of this species in providing a food source for deep-sea fishes and in transporting the products of the rich plankton blooms of Nordic Seas to the northeastern Atlantic was indicated. How the products of surface production might reach the deeper waters was one of the aspects discussed in a paper on the deep-scattering layers of the Baja California, Mexico.

A study of the behaviour of deep-water fishes in nine habitats observed in the Bay of Biscay using a manned submersible showed that some species were more flexible than others in their choice of habitat. A multivariate analysis of the numerous observed parameters grouped the species in to a number of assemblages associated with one or more habitat types.

Four papers dealt with aspects of the biology of the deep-water witch flounder (*Glyptocephalus cynoglossus*), the deep-water sharks, the blue hake (*Antimora rostrata*) and the roughhead grenadier (*Macrourus berglax*). These four papers, covering a wide range of taxa exemplified some of the many of the characteristics of deep-water species such as slow growth, high age at first maturity, non-seasonal reproduction and missing stages in the life cycle.

#### SESSION 5. REDFISH

This session was chaired by D. Power and comprised three oral presentations and three posters dealing with various aspects of the biology, ecology and population structure of various species of redfish from the North Atlantic based on both commercial fisheries and fishery-independent surveys.

The three oral presentations covered a variety of topics. The first was a paper on the stock structure and ecology of *S. mentella* and suggested that only a single stock exists in the Irminger Sea. The second paper presented an age validation for *S. mentella* in NAFO Div. 3M and suggested density-dependent growth may be occurring for the 1990 year-class. The final paper provided Norwegian information from a long-line and gillnet fishery for the 'giant' *S. marinus* conducted along the Reykjanes Ridge. The data suggested CPUE declined by 27-85% between 1996 and 1997 before the fishery ceased due to a decline in its economic viability.

The session discussion focused on the population structure and migrations of *S. mentella* in the Irminger Sea. There was no general consensus amongst the participants on whether there were one stock or three.

## SESSION 6. FISHERIES ECOLOGY

This session, chaired by J.D.M. Gordon opened with a paper on uncertainties in the age estimation of *Coryphaenoides rupestris* (roundnose grenadier) caused by the removal of the accumulated biomass of older fish at the start of the fishery. Another paper, also utilizing otoliths, described a preliminary attempt to use otolith microchemistry to test the hypothesis that there is only one stock of *Aphanopus carbo* (black scabbardfish) in the North East Atlantic.

A paper describing studies on the distribution growth and exploitation of *Argentina silus* (greater silver smelt) in Norwegian Sea during the early 1980s was followed by a presentation on some of the results of acoustic surveys in the early 1990s. At the start of the fishery this species was managed by TAC but this has now changed to a control of effort by licensing. A paper on the size structure and production of ten demersal species off the Canadian shelf demonstrated the importance of predation as a link between the species in the community and the importance of life history parameters in determining dominance. The deep-bathyal, oligotrophic ecosystem of the western Mediterranean is co-dominated by fish and decapod crustacea. A paper described an analysis of the intensity of faunal change in relation to size and depth using material from two surveys to the southwest of the Balearic Islands.

In the summing up it was noted that otolith collections could be an important record of past history both for age composition and stock identification and should be archived. The Mediterranean, although sharing many of the same deep-water fish species of the Atlantic, is a very different ecosystem (e.g. high temperature, oligotrophic) and the maximum size of many species tends to be smaller. Comparative studies between the Mediterranean and the Atlantic could yield useful insights into processes in the deep-sea.

## POSTER SESSION

A total of 64 posters, including the five that were associated with short presentations, were on display throughout the symposium and there was a lunchtime viewing session where the authors were present to answer questions.

## SUMMING UP AND DISCUSSION

W. B. Brodie invited each of the chairs of the six sessions to present an overview of their session and to highlight what they considered to be the key results and concerns. The session specific outputs from these summaries have been incorporated in the report of each session described above.

In the general discussion it was considered that the emerging deep-water fisheries could learn from the experience in managing some of the longer established fisheries such as Greenland halibut and redfish. The 2001 report of the ICES Working Group on the Biology and Assessment of Deep-sea Fishery Resources had, at the request of NEAFC, made a first attempt at ranking life history characteristics of deep-water fish in relation to these two species. A recurring theme in many papers had been the fact that the current ICES Sub-areas and Divisions are, in many instances, unsuitable in terms of bathymetry and water masses for reporting information on deep-water species. Given the high discard rates and likely high mortality of escapees in trawl fisheries it was considered to be important to report catch and not simply landings. There is increasing public awareness about the impact of fishing activities on the deep-water ecosystem and the conservation of deep-water coral reefs and seamounts were good examples of how there should be wider involvement in the decision making process. The importance of the use of non-invasive technology for studies in the deep-sea, such as the plans for further exploration of the Bear Seamount, is an area that should be given greater priority.

## CONCLUSION

The Chairman of the NAFO Scientific Council thanked the host country and ICES and CSIRO, for their support in making the Symposium possible. He also thanked the co-conveners for organizing such an interesting and varied collection of papers and posters and the session chairs for helping the meeting to run smoothly. The day-to-day organization had been difficult because some speakers, including one of the co-conveners, had been unable to attend the meeting. The efforts of the Secretariat in coping with these changes were gratefully acknowledged. It is intended to publish a selection of the papers in the *Journal of Northwest Atlantic Fishery Science* within a target time frame of one year.

### SYMPOSIUM SCHEDULE\*

#### WEDNESDAY, 12 SEPTEMBER 2001

0800-0830 Registration

0830-0900 Introduction

#### SESSION 1. DEEPWATER FISHERIES (PART 1)

Chair: J. A. Koslow

Time	Paper No.	Author(s) and Title
0900-0930	1.1	<b>Invited paper:</b> KOSLOW, J. A., B. RICHER DE FORGES, and K. GOWLETT-HOLMES. Biodiversity and conservation in the deep sea: the impact of deepwater fisheries.
0930-0950	1.2	MOORE, J. A., M. VECCHIONE, K. E. HATEL, B. B. COLLETTE, J. K. GABRAITH, R. GIBBONS, M. TURNIPSEED, M. SOUTHWORTH, and E. WATKINS. Biodiversity of Bear seamount, New England seamount chain: results of exploratory trawling.
0950-1010	1.3	PEREZ, J. A. A., R. WAHRLICH, P. R. PEZZUTO, P. R. SCHWINGEL, F. R. A. LOPES, and M. RODRIGUES-RIBEIRO. Deep-sea fishery off southern Brazil: recent trends of the Brazilian fishing industry.
1010-1030	1.4	POWELL, S. M., R. L. HAEDRICH, and J. D. MCEACHRAN. The deep-sea fish fauna of the northern Gulf of Mexico. (read by title)
1030 -1100		<b>Break</b>
1100-1120	1.5	LORANCE, P., F. UIBLEIN, and R. C. EGUIA. Distribution and density of carnivorous fish species around Lanzarote and Fuerteventura, Canary Islands.
1120-1140	1.6	DURAN MUÑOZ, P., E. ROMÁN MARCOTE. The Spanish multi-species deep-sea fishery at Hatton Bank (North East Atlantic): 1996-2000.
1140-1200	1.7	KULKA, D., D. T. THEMELIS, and R. G. HALLIDAY. Distribution and biology of orange roughy ( <i>Hoplostethus atlanticus</i> Collette 1889) in Canadian waters.
1200-1330		<b>Lunch</b>

#### SESSION 2. GREENLAND HALIBUT

Chair: W. R. Bowering

1330-1350	1.8	HØINES, Å. S., and K. KORSBREKKE. Variation in population structure of Northeast Arctic Greenland halibut ( <i>Reinhardtius hippoglossoides</i> ) based on data from Norwegian surveys in the period 1992-2000.
1410-1430	1.9	SIMONSEN, C. S., and M. A. TREBLE. Tagging mortality of Greenland halibut.
1430-1450	1.10	HUSE, I., and T. JOHANSEN. Trends in growth parameters analyzed in the light of selection responses to the exploitation of Greenland halibut.
1450-1530		<b>Break</b>
1530-1550	1.11	JUNQUERA, S., E. ROMÁN, J. MORGAN, M. SAINZA, and G. RAMILO. Time scale of ovarian maturation in Greenland halibut.

\* The list of documents and the sequence of presentations may have changed during the symposium

<b>Time</b>	<b>Paper No.</b>	<b>Author(s) and Title</b>
1550-1610	1.12	MORGAN, M. J., W. R. BOWERING, A. C. GUNDERSEN, Å HØINES, B. MORIN, O. SMIRNOV, and E. HJØRLEIFSSON. Comparative analyses of Greenland halibut ( <i>Reinhardtius hippoglossoides</i> ) maturation for populations throughout the North Atlantic.
1610-1635		<b>Poster pursuit:</b> POSTER AUTHORS. 5 min. presentations (max. 3 graphics) of Greenland halibut posters P.1 to P.5 (originally offered as oral presentations)
1610-1615	1-P.1	ALBERT, O. T. Northeast Arctic Greenland halibut ( <i>Reinhardtius hippoglossoides</i> ) population structure from nursery to spawning area.
1615-1620	1-P.2	GUNDERSEN, A. C., O. S. KJESBU, K. H. NEDREAAS, and O. T. ALBERT. Maturity of northeast Arctic Greenland halibut ( <i>Reinhardtius hippoglossoides</i> ).
1620-1625	1-P.3	TUENE, S., A. C. GUNDERSEN, W. EMBLEM, I. FOSSEN, J. BOJE, P. STEINGRUND and L. H. OFSTAD. Maturation and occurrence of Atresia on oocytes of Greenland halibut ( <i>Reinhardtius hippoglossoides</i> , Walbaum).
1625-1630	1-P.4	GUNDERSEN, A. C., J. BOJE, O. A. JØRGENSEN, E. HJØRLEIFSSON, C. S. SIMONSEN, I. FOSSEN, L. H. OFSTAD, and H.-J. RÄTZ. Variability in fecundity and total egg production for West Nordic Greenland halibut.
1630-1635	1-P.5	HØINES, Å. S., and K. KORSBREKKE. Some aspects of a times series of longline catch-per-unit of effort data for Greenland halibut ( <i>Reinhardtius hippoglossoides</i> ).
1635-1700		<b>Discussion on Greenland halibut</b>

#### **THURSDAY, 13 SEPTEMBER 2001**

##### **SESSION 3. DEEPWATER FISHERIES: IMPACTS, ASSESSMENT AND MANAGEMENT**

**Chair:** M. Clark

0830-0900	2.1	<b>Invited paper:</b> CLARK, M. Deepwater Fisheries and their impact on seamount habitat in New Zealand.
0900-0920	2.2	KOSLOW, J. A., and G. N. TUCK. The boom and bust of deep-sea fisheries: why haven't we done better?
0920-0940	2.3	FOSSÅ, J. H. , P. B. MORTENSEN, T. MOLDSKRED, and D. M. FUREVIK. Protection and management of deep-water coral reefs in Norway.
0940-1000	2.4	SARDA, F., J. B. COMPANY, and F. MAYNOU. Deep-sea shrimp <i>Aristeus antennatus</i> Risso 1816 in the Catalan Sea: a review and perspectives.
1000-1020	2.5	GORDON, J. D. M., O. A. BERGSTAD, I. FIGUEIREDO, and G. MENEZES. The deep-water fisheries of the ICES Area.
1020-1040		<b>Break</b>
1040-1100	2.6	LARGE, P., C. HAMMER, O. A. BERGSTAD, J. D. M. GORDON, and P. LORANCE. Options for the assessment and management of deep-water species in the ICES area.
1100-1120	2.7	CLARKE, M. W., P. L. CONNOLLY, and C. J. KELLY. A life-history approach to stock assessment of deepwater fish in the northeast Atlantic.
1120-1330		<b>Poster viewing and lunch</b>

#### SESSION 4. BIOLOGY AND LIFE HISTORY

**Chair:** J. D. M. Gordon

<b>Time</b>	<b>Paper No.</b>	<b>Author(s) and Title</b>
1330-1400	2.8	BERGSTAD, O. A., Å. D. WIK, and Ø. HILDRE. Predator-prey relations and food sources of the Skagerrak deep-water fish assemblage.
1400-1420	2.9	BJELLAND, O., T. MONSTAD, and O. A. BERGSTAD. Trophic ecology of blue whiting ( <i>Micromesistius poutassou</i> (Risso), Gadidae).
1420-1440	2.10	UIBLEIN, F., P. LORANCE, and D. LATROUITE. Interspecific comparison of deep-sea fish locomotion behaviour and habitat selection.
1440-1500	2.11	WIGLEY, S E., and J. M. BURNETT. Preliminary estimates of biological and yield characteristics for deep-water witch flounder ( <i>Glyptocephalus cynoglossus</i> ) in the Georges Bank-Southern New England Region.
1500-1520	2.12	CLARKE, M. W., P. L. CONNOLLY, and J. J. BRACKEN. Biology of exploited deep-water sharks west of Ireland and Scotland.
1520-1550		<b>Break</b>
1550-1610	2.13	KULKA, D. W. Distribution and biology of blue hake in Canadian Atlantic waters.
1610-1630	2.14	MURUA, H. Roughhead grenadier ( <i>Macrourus berglax</i> ) biology and population structure in NAFO Divisions 3KLMN.
1630-1650	2.15	ROBINSON, C. J., and J. GOMEZ-GUTIÉRREZ. On the behavior and composition of dense deep scattering layers related to the shelf-break area along the northwest coast of Baja California, Mexico.
1650-1730		<b>Discussion</b>

#### FRIDAY, 14 SEPTEMBER 2001

##### SESSION 1. DEEPWATER FISHERIES (PART 2)

**Chair:** J. D. M. Gordon

0900-0930	3.1	<b>Invited paper:</b> GORDON, J. D. M. The Rockall Trough, North East Atlantic: an account of the change from one of the best-studied deep-water ecosystems to one that is being subjected to unsustainable fishing activity.
0930-0950	3.2	SANTOS, M. N., K. ERZINI, M. B. GASPAR, C. C. MONTEIRO, R. SÁ, L. BENTES, J. M. S. GONÇALVES, P. G. LINO, and J. RIBEIRO. Comparison of long-line and monofilament gill net selectivity for hake ( <i>Merluccius merluccius</i> ) in the Algarve (Southern Portugal).
0950-1010		<b>Discussion</b>
1010-1040		<b>Break</b>

**SESSION 5. REDFISH****Chair:** D. Power

<b>Time</b>	<b>Paper No.</b>	<b>Author(s) and Title</b>
1040-1100	3.3	SABORIDO-REY, F., D. GARABANA-BARRO, and C. STRANSKY. A review of the population structure and ecology of redfish species in the Irminger Sea and adjacent waters.
1100-1120	3.4	SABORIDO-REY, F. Age and growth of redfish ( <i>Sebastes marinus</i> , <i>S. mentella</i> and <i>S. fasciatus</i> ) in Flemish Cap (Northwest Atlantic).
1120-1140	3.5	HAREIDE, N.-R., G. GARNES, and G. LANGEDAL. The boom and bust of the Norwegian longline fishery for redfish ( <i>Sebastes marinus</i> 'giant') on the Reykjanes Ridge.
1140-1200		<b>Discussion</b>
1200-1330		<b>Lunch</b>

**SESSION 6. FISHERIES ECOLOGY****Chair:** J. D. M. Gordon

1330-1400	3.7	LORANCE, P., F. GARREN, and J. VIGNEAU. Age estimation of the roundnose grenadier ( <i>Coryphaenoides rupestris</i> ), effects of uncertainties on ages.
1400-1420	3.8	SWAN, S. C., J. D. M. GORDON, and T. SHIMMIELD. Preliminary investigations on the uses of otolith microchemistry for stock discrimination of the deep-water black scabbardfish ( <i>Aphanopus carbo</i> ) in the North East Atlantic.
1420-1440	3.9	JOHANNESSEN, A., and T. MONSTAD. Distribution, growth and exploitation of greater silver smelt ( <i>Argentina silus</i> ) (Ascanius) in Norwegian waters 1980-1983.
1440-1500	3.10	MONSTAD, T., and A. JOHANNESSEN. Acoustic recordings of greater silver smelt ( <i>Argentina silus</i> ) in Norwegian waters and West of the British Isles, 1989-1994.
1500-1520	3.11	MURILLO, M. N. M. Size structure and production in a demersal fish community.
1520-1550		<b>Break</b>
1550-1610	3.12	MORALES-NIN, B., F. MAYNOU, F.SARDÁ, J. CARTES, J. MORANTA, E. MASSUTÍ, J. COMPANY, G. ROTLANT, A. BOZZANO, C. STEFANESCU, AND C. LIRÓ. Size influence in zonation patterns in fishes and crustaceans from the deep-water communities of the western Mediterranean.
1610-1630		<b>Discussion</b>
1650-1730		<b>Summing up</b>

**POSTER PRESENTATIONS**

<b>Poster No.</b>	<b>Author(s) and Title</b>
P.1.	GIL, J., and I. SOBRINO. Studies on reproductive biology of the red (blackspot) seabream ( <i>Pagellus bogaraveo</i> (Brünnich, 1678)) from the Strait of Gibraltar (ICES IXa/Atlantic South-west of Spain).



**Poster  
No.**

**Author(s) and Title**

- P.2. GUNDERSEN, A. C., A. K. WOLL, and I. FOSSEN. Spawning of Greenland halibut (*Reinhardtius hippoglossoides*) in East Greenland waters.
- P.3. BAKAY, YU. I. Results from the analysis of geographical variability in parasite fauna of redfish, *Sebastes mentella*, from the North Atlantic.
- P.4. SOBRINO, I., and J. GIL. Studies on age determination and growth pattern of the red (blackspot) seabream (*Pagellus bogaraveo* (Brünnich, 1678)) from the Strait of Gibraltar: application to the species migratory pattern.
- P.5. VASCONCELOS, P., and N. R. BRAZ. Proximate composition of the deep-sea crab, *Chaceon affinis*, from an exploratory fishery off Madeira Island (Portugal - Eastern Central Atlantic).
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- P.9. PAIS, C., M. E. COSTA, S. OLIM, and T. C. BORGES. Biodiversity as a result of the by-catch from the commercial trawl fisheries off the southern Portuguese Coast.
- P.10. COSTA, M. E., S. OLIM, C. PAIS, and T. C. BORGES. The importance of by-catch from commercial trawl fisheries off the South Coast of Portugal.
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- P.15. POLITOU, C. Y., S. KAVADAS, CH. MYTILINEOU, A. TURSI, P. LEMBO, and R. CARLUCCI. Fisheries resources in the deep waters of the Eastern Mediterranean (Greek Ionian Sea).
- P.16. LEFKADITOU, E., and G. D'ONGHIA. *Loligo forbesi* and ommastrephid squid by-catches on the North-eastern Ionian slope: preliminary analysis of stock structure based on exploratory trawling.
- P.17. MYTILINEOU, CH., P. MAIORANO, S. KAVADAS, G. D'ONGHIA, K. KAPIRIS, and F. CAPEZZUTO. Size structure comparison in some demersal species between two areas of different fishing impact in the deepwaters of eastern-central Mediterranean (Ionian Sea).
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**Poster  
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- P.21. MAIERS, L., M. TREBLE, M. McPHERSON, and J. REIST. The potential of microsatellite analysis to discriminate stocks of Greenland halibut (*Reinhardtius hippoglossoides*) in the Canadian Arctic.
- P.22. RINELLI, P., T. ROMEO, T. BOTTARI, and S. GRECO. Maturity and growth of *Aristaeomorpha foliacea* in Tyrrhenian Sea (central Mediterranean).
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- P.25. HUSE, I., A. C. GUNDERSEN, Å. HØINES, and A. V. SOLDAL. Unaccounted mortality of Greenland halibut in trawl fishery.
- P.26. ERZINI, K., E. PUENTE, J. M. S. GONÇALVES, L. ARREGUI, L. BENTES, P. G. LINO, and J. RIBEIRO. The influence of hook model and size on catch rates, hooking position and by-catch in the hake deep-water semi-pelagic longline fisheries of the Algarve (southern Portugal) and the Cantabrian Sea (Bay of Biscay).
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- P.33. TRATHAN, P., A. BRIERLEY, M. BRANDON, and D. BONE. Oceanographic variability and changes in Antarctic krill abundance at South Georgia.
- P.34. REIS, S., D. SENA-CARVALHO, J. H. DELGADO, and M. AFONSO-DIAS. Historical overview of the black scabbardfish (*Aphanopus carbo* Lowe, 1839) fishery in Madeira Island.
- P.35. MORALES-NIN, B. Age determination in deep-water fish. How to validate and verify ages?
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- P.37. RIHAN, D., C. P. NOLAN, R. OFFICER, F. GUILFOYLE, M. CLARKE, and J. MURRIN. Ireland's development of deepwater fisheries in the NE Atlantic.
- P.38. ANDRADE, C. A. P., and J. R. J. GOMES. Distribution patterns and niche shift in wreckfish *Polyprion americanus* (Teleostei: Poliprionidae).
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| P.42.                 | ÁVILA-DA-SILVA, A. O., and M. HAIMOVICI. Demersal fish assemblage structure and diversity of southeastern and southern Brazilian continental outer shelf and upper slope.  |
| P.43.                 | HAIMOVICI, M., A. O. ÁVILA -DA-SILVA, S. L. DOS SANTOS TUTUI, and G. C. C. BASTOS. Distribution and relative abundance of demersal fishes vulnerable to bottom longlines from the outer shelf and upper slope of southern and southeastern Brazil. |
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| P.47.                 | PETRAKIS, G., and C. PAPACONSTANTINO. Catch composition in an unexploited deep-water area in the western Greek coasts.   |
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| P.49.                 | PIÑEIRO, C. G., M. CASAS, and H. ARAUJO Results of exploratory deep-sea fishing survey in the Galician Bank: biological aspects on some of seamount-associated fish (ICES Division IXb).   |
| P.50.                 | LEFKADITOU, E., P. MAIORANO, and CH. MYTILINEOU. Cephalopod species captured by deep-water exploratory trawling in the eastern Ionian Sea.   |
| P.51.                 | JUNQUERA, S., P. DURÁN, E. ROMÁN, G. RAMILO, and I. LOUREIRO. Reproductive biology and ovary structure of <i>Alepocephalus bairdii</i> in Hatton Bank (ICES XII).  |
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| P.57.                 | PEDCHENKO, A. P. The effect of oceanographic conditions on the spatical distribution of redfish in the Irminger Sea.   |

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## APPENDIX I. REPORT OF STANDING COMMITTEE ON FISHERIES SCIENCE (STACFIS)

Chairman: H.-J. Rätz

Rapporteurs: Various

### I. OPENING

The Committee met at the Centro de Convenciones de Plaza de América, Varadero, Matanzas, Cuba, during 17-20 September 2001, to consider and report on matters referred to it by the Scientific Council, particularly those pertaining to the provision of scientific advice on certain finfish and invertebrate marine stocks. Representatives attended from Canada, Cuba, Denmark (in respect of Faroe Islands and Greenland), Estonia, European Union (Germany, Portugal, and Spain), Iceland, Russian Federation, Ukraine and United States of America. Observers were present from FAO, ICES and SEAFO. Various scientists assisted in the preparation of the reports considered by the Committee.

The Chairman, H.-J. Rätz (EU-Germany), opened the meeting by welcoming participants. The agenda was reviewed and a plan of work developed for the meeting. The provisional agenda with no modifications was accordingly **adopted**.

### II. RESULTS OF THE INTERNATIONAL HYDROACOUSTIC SURVEY ON PELAGIC REDFISH

#### 1. Decadal Changes in the Thermal Properties of the Irminger Sea and Labrador Sea (SCR Doc. 01/150)

SCR Doc. 01/150 dealt with "Decadal Changes in the Thermal Properties of the Irminger Sea and Labrador Sea". Based on the climatic data sets available from the World Data Centre A, Washington, D.C., USA, it was shown that after unusually intense winter convection during winters of 1990-93 a fresh pool of Labrador Sea water (LSW) was formed. Temperatures in the central Irminger Sea were coldest during the period 1989-93. Mild winters during the rest of the decade led to increasing temperatures, both in the Labrador Sea and in the Irminger Sea where maximum temperatures were observed during 1996 at 400 m depth. Near the end of the decade, during 1999, temperature at 400m depths had decreased slightly.

The climatic background data clearly indicated that the decade of the 1990s was the coldest during the second half of the 20th century with a widely spread water mass being less than 4°C. It covered the area of the Labrador Sea and most of the Irminger Sea, between 400 m and 1 000 m depth. It should be mentioned here, that most of the available data for the 1990s are from 1991-95. The decadal variation of temperature at the depth layers 400 m and 1 000 m was rather small. Maximum temperatures in the transition area from Irminger Sea to Labrador Sea were observed for the 1970s decade with 4.95°C at 400 m, and 3.63°C at 1 000 m depth, and the difference between the warmest decade and the coldest decade (1990s) amounted to only 0.96°C.

#### 2. Draft Report on the Joint German/Icelandic/Norwegian/Russian Trawl-Acoustic Survey on Pelagic Redfish in the Irminger Sea and Adjacent Waters in June/July 2001 (SCR Doc. 01/161)

STACFIS reviewed new information on the stock size and distribution of pelagic *Sebastes mentella* in NAFO Convention Area (Div. 1F, 2GHJ, 3K) and ICES Divisions XIV, XII and Va. (NAFO SCR Doc. 01/161). EU-Germany, Iceland, Russia and Norway carried out an ICES co-ordinated trawl-acoustic survey in June/July 2001. Five vessels participated and over 420 000 sq. naut. miles were covered. The stock size measured with the acoustic instruments was assessed to be about 715 000 tons at depths down to the deep-scattering layer (to about 350 m), with redfish having a mean length of 34.6 cm. Highest concentrations of redfish were in the southwest part of the area covered. The redfish was also mixed with the deep scattering layer. In addition to the acoustic measurements, an attempt was made to estimate the redfish in and below the deep scattering layer. This was done by correlating catches and acoustic values at depths between 100 and 450 m. The obtained correlation was used to transfer the trawl data at greater depths to acoustic values and from there to abundance. A total of approximately 1 075 000 tons were estimated to be at depths between 0 and 500 m and about 1 056 000 tons below 500 m depth. Below 500 m, the densest concentrations were found in the north eastern part of the area. The average length of the fishes caught below 500 m was 38.3 cm. The estimated abundance derived from the trawl data should be treated with great caution and they cannot be combined with the acoustic

results. The preliminary data evaluation did not indicate significant changes in the stock size or distribution as compared with 1999 survey results.

A decreasing trend in the proportion of females at shallower water than 500 m during the last decade, but whether it is related to overexploitation of the females is not known. During the survey in 2001, recruits (25-30 cm) were observed, particularly in the western most area of the investigation; the western part of NAFO Div. 1F but also in the eastern parts of Div. 2H and 2J.

Fisheries of various fleets were discussed and various nations reported that little effort was directed towards pelagic *Sebastes mentella* in the NAFO Regulatory Area in 2001 up to date.

STACFIS noted that a review on information about the stock structure of pelagic *Sebastes mentella* was presented during the NAFO Symposium on deep-sea fisheries (12-14 September 2001, Varadero, Cuba) and that there was no consensus with regard to various hypotheses.

### III. NOMINATION OF DESIGNATED EXPERTS

STACFIS reviewed the list of Designated Experts for the stocks, which have to be assessed and for which management advice is requested. STACFIS noted that some vacancies could not be filled mainly due to the election of new Scientific Council Executive Officers. However, it was emphasized that final nomination of the Designated Experts will be conducted through the normal confirmation process between the various national institutes and the Secretariat. The nominations to date by STACFIS for the 2002 assessments are:

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[Fax: +45 33 69 3406 – Fax: +45 33 69 3457 – E-mail: [danmc@inet.un2.dk](mailto:danmc@inet.un2.dk)]
 

for Northern shrimp in Denmark Strait	D. M. Carlsson
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- From the Danish Institute for Fisheries Research, Charlottenlund Slot, DK-2920, Charlottenlund, Denmark  
[Phone: +45 33 96 33 00 – Fax: +45 33 96 33 33 – E-mail: [olj@dfu.min.dk](mailto:olj@dfu.min.dk)]
 

for Roundnose grenadier in SA 0+1	O. Jørgensen
Greenland halibut in SA 0+1	O. Jørgensen
  
- From the Marine Research Institute, Skulagata 4, P. O. Box 1390, 121 - Reykjavik, Iceland  
[Phone: +354 552 0240 – Fax: +354 562 3790 – E-mail: [unnur@hafro.is](mailto:unnur@hafro.is)]
 

for Shrimp in Div. 3M	U. Skúladóttir
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- From Knipovich Polar Research Institute of Marine Fisheries and Oceanography (PINRO), 6 Knipovich Street, Murmansk, 183763, Russia  
[Phone: +7 8152 47 34 61 – Fax: +47 789 10518 – E-mail: [inter@pinro.murmansk.ru](mailto:inter@pinro.murmansk.ru)]
 

for Capelin in Div. 3NO	V. Shibanov
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- From the Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543  
[Phone: +508-495-2285 – Fax: +508-495-2393 – E-mail: [lisa.hendrickson@noaa.gov](mailto:lisa.hendrickson@noaa.gov)]
 

for Squid in SA 3+4	L. Hendrickson
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#### IV. OTHER MATTERS

##### 1. Review of SCR and SCS Documents

There were no other SCR and SCS Documents pertaining to the STACFIS agenda items to review.

##### 2. Other Business

Noting that the term of his chairmanship expires at the end of this meeting, the Chairman expressed his pride for the work accomplished during the past 2 years and thanked the members, especially the Designated Experts, for their valuable contributions.

There being no other business, the Chairman extended particular gratitude to the Secretariat for their assistance and support, and the meeting was adjourned.



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

Chairman: R. K. Mayo

Rapporteur: S. J. Correia

The Committee met at the Centro de Convenciones de Plaza de América, Varadero, Matanzas, Cuba, during the 17-20 September 2001 to consider matters pertaining to statistics and fisheries research as referred to it by the Scientific Council. Representatives attended from Canada, Cuba, Denmark (in respect of Faroe Islands and Greenland), Estonia, European Union (Germany, Portugal, Spain,) Iceland, Russian Federation, Ukraine, and United States of America. Observers were present from FAO, ICES and SEAFO. The Assistant Executive Secretary was in attendance during portions of the meeting.

**1. Opening**

The Chairman opened the meeting by welcoming the participants. S. J. Correia was appointed Rapporteur.

**2. Fisheries Statistics****a) Progress Reports on Secretariat Activities****i) Acquisition of STATLANT 21 data**

The Assistant Executive Secretary reported that no additional STATLANT 21 data have been received since the June 2001 meeting. The Faroe Islands had submitted the outstanding data during the June 2001 meeting. The USA has not submitted any STATLANT 21 data since the June 2001 discussions on this matter.

**ii) Publication of statistical information**

The Assistant Executive Secretary reported that programs for publication of the Statistical Bulletins, Vols 45 through 49 are progressing, and publication should occur within months. As recommended by the Scientific Council at the June 2000 Meeting, the publication will include data from the Faroe Islands but will be done in the absence of USA data. Statistical Bulletins will be published sequentially beginning with 1995 data and ending with 1999.

**iii) Internet site for statistical information; loading FISHSTAT software**

Work began on loading the FISHSTAT software after the June 2001 Scientific Council Meeting. Several computer software problems delayed implementation but these have now been corrected and the program is nearly operational. Great progress has been made and the FISHSTAT software should be operational on the NAFO Website in the near future.

**b) Report of the 19<sup>th</sup> CWP Session**

The 19<sup>th</sup> CWP session was held in Noumea, New Caledonia during 10-13 July 2001. A summary of several issues related to NAFO activities was presented.

It was noted that differences between vessel tonnage class designations based on GRT and GT remain problematic, particularly with respect to effort standardization. The EU (EUROSTAT) noted that, following the study of the Norwegian fishing fleet which showed that GT is 85% higher than GRT (reported at the June 2001 Scientific Council Meeting), the study had been extended to the EU fleet for which it was found that the difference was smaller (35% higher) though still highly significant. STACREC stressed that the potential risks of interpreting catch/effort data should be brought to the attention of users of the current database.

STACREC was informed that CWP accepted the revised genus names of several species of elasmobranchs as proposed by the Scientific Council. The EU (EUROSTAT) reported that the EU legislation corresponding to the STATLANT 21A and 21B questionnaires has been changed to include the same elasmobranch species as required by NAFO.

A separate meeting devoted to a discussion of progress on the development of the FAO Program on FIGIS/FIRMS was held on 12 July 2001 prior to the CWP session. A summary of this discussion was presented to STACREC. Although questions still remain with regard to the formulation of partnership agreements between Regional Fishery Bodies and National Centers and FAO, it is clear that ownership of the information will remain with the providers, and only providers can make changes to these sources of information. STACREC considers it imperative that the content of the FIGIS/FIRMS components be under full control of only the contributing parties.

### 3. NAFO Observer Protocol

#### a) **Report of the *Ad Hoc* Working Group on NAFO Observer Protocol – Progress Report from June 2001 STACTIC Meeting**

Summary of this meeting is found in Section 10a of NAFO/FC Doc. 01/10. SCS Doc. 00/23 (Harmonized NAFO Observer Program Data System Proposal), was adopted by the Fisheries Commission in September 2000. However, STACTIC considered that certain elements of the protocol should be revisited, e.g., confidentiality and identification of data elements required for scientific purposes. STACREC, however, considers that the harmonized data collection protocol as described in SCS Doc. 00/23 and adopted by the Fisheries Commission represents a complete program for collection of scientific data.

#### b) **Observer Program Data**

The Assistant Executive Secretary reported that NAFO Pilot Observer Program data have not yet been converted to electronic form. STACREC reiterated the importance of these data and the need to construct the electronic database.

### 4. Other Matters

#### a) **Review of SCR and SCS documents**

- i) A report on the Sea-surface Temperature and Water Boundaries in the Northwest Atlantic in 2000 was presented. (SCR Doc. 01/83) In 2000 monitoring of hydrological conditions in the Northwest Atlantic was continued on the basis of sea surface temperature (SST) data analysis in the area between 40°-55° N and 45°-65°W, and data on the location of hydrological fronts near the surface in the area between 37°-47° N and 55°-70° W. The conclusion was made that SST in the Labrador Sea, the main Labrador Current, shelves of Grand Bank and Nova Scotia as well as in the Gulf Stream exceeded the mean long-term values during most of the year. The cold shelf and slope water boundaries in New England and Nova Scotia fluctuated synchronously with positive anomalies in winter and spring, and negative anomalies in summer and autumn. The Gulf Stream front boundary shifted during 2000, following a half-year wave pattern. On the basis of SST and water boundaries analysis the year 2000 is classified as a relatively warm year.
- ii) A paper on the bathymetric distribution of crustaceans and cephalopods reported on the results obtained from the Spanish trawl survey carried out in summer 2000 on the Flemish Cap Bank at bottom depths ranging from 126 to 720 meters (SCR Doc. 01/41). A total of 17 crustaceans and 8 cephalopods species were found. Crustaceans comprise about 5% and cephalopods 0.01% of the catch. *Pandalus borealis* was the most abundant species in the area in terms of biomass and number, representing 98% by weight of the crustaceans and cephalopods catch. Analysis of the vertical distribution of the most representative species showed that at least crustaceans are zoned with depth.



- iii) The Seventh Report of the Joint Russian/German Project "Assessment of Short-time Climatic Variations in the Labrador Sea" (SCR Doc. 01/151) was presented. A workshop was held at the Knipovich Polar Research Institute of Marine Fisheries and Oceanography (PINRO), Murmansk, during 28-31 August 2001 and 3 September 2001, and during the weekend of 1-2 September at the Biological station of PINRO at Palkina Inlet/White Sea. The work done during this meeting was a continuation of and enhancement to the work done during the previous project meeting in Hamburg.

The study notes it could be shown that the linear trend, incorporated in the West Greenland cod recruitment time-series, explains 55% of variation. About 50% of the inter-annual variability in the de-trended recruitment time-series can be explained by inter-annual variation in surface air temperatures, zonal wind components, and meridional wind components. The downward trend in the recruitment time-series is explained by concurrent trends in the time-series of spawning stock biomass of West Greenland cod and Icelandic cod, annual sea surface temperature in the Denmark Strait region, and mean air temperatures for May-July from the West Greenland area. The resulting model (trend plus multi-regression factors) explains 79% of variability of recruitment of West Greenland cod (time-series in logarithmic form). STACREC was informed that as a next step the project results will be presented at the ICES Cod and Climate Workshop to be held in Copenhagen, Denmark, during April 2002.

b) **Other Business**

i) **National reports**

A number of Contracting Parties with activity in the NAFO Regulatory Area have not submitted National Reports in recent years. This issue will be raised in the Scientific Council.

ii) **Progress report on development the Northwest Atlantic survey database**

No progress has been made on the Northwest Atlantic Survey Database. The USA reported that they are interested in participating in the development of the Northwest Atlantic Survey Database. Representatives have been requested to report on their activities at the June 2002 Scientific Council meeting.

There being no other business, the Chairman expressed sincere thanks to S. Correia (rapporteur), the Assistant Executive Secretary and the NAFO Secretariat for their support to the Committee. The meeting adjourned on 20 September 2001.



### APENDIX III. REPORT OF STANDING COMMITTEE ON PUBLICATIONS (STACPUB)

Chairman: O. A. Jørgensen

Rapporteur: O. A. Jørgensen

The Committee met at the Centro de Convenciones de Plaza de América, Varadero, Matanzas, Cuba, on 18 and 19 September 2001. In attendance were V. A. Rikhter (Russian Federation), F. M. Serchuk (U.S.A.), M. Stein (EU-Germany), O. A. Jørgensen (Chairman) (Denmark in respect of Faroe Islands and Greenland), R. K. Mayo (USA), A. Nicolajsen (Denmark in respect of Faroe Islands and Greenland), and the Assistant Executive Secretary (T. Amaratunga).

#### 1. Opening

The Chairman welcomed the Committee. The agenda as presented in the Provisional Agenda was modified to include the item: Review of Recommendations from the June 2001 Meeting. STACPUB in consultation with Scientific Council Chair agreed that the item on "New Initiatives for Publications" should be addressed by Scientific Council. The agenda was modified with these changes and **adopted** (see Part D, this volume). O. A. Jørgensen (Denmark in respect of Faroe Islands and Greenland) was appointed as rapporteur.

#### 2. Review of Recommendations from the June 2001 Meeting

- a) *Each member of the Secretariat be given an individual e-mail address.*

STACPUB was informed that the Secretariat activities were functioning well without the recommended changes. STACPUB noted that this has not taken place, and it was agreed the Scientific Council should further discuss this matter.

- b) *the Secretariat should routinely submit a report in June on the website usage to STACPUB.*

This recommendation pertains to the work of the June 2002 Meeting, but STACPUB noted the Secretariat has already started to produce website usage statistic on a monthly basis.

- c) *an additional agenda item for future meetings should be introduced to include website use summaries and statistics.*

The following pertains to the forthcoming meeting of June 2002:

- d) *A Working Group with representatives from General Council, Fisheries Commission and Scientific Council should be established in order to ensure that all relevant material becomes available on the NAFO website.*

Some consultations had already taken place between the Chairs of Scientific Council and Fisheries Commission. Due to the fact that the concurrent General Council and Fisheries Commission Meetings did not take place, it was not possible to establish if there was further progress.

- e) *the collection of papers being prepared by the Working Group on Reproduction Potential be edited by the Working Group Chairman, E. A. Trippel (Canada) and compiled into a single issue of the Journal Northwest Atlantic Fisheries Science during 2002.*

The Working Group will meet mid-October 2001 and the papers targeted for the publication will be reviewed at that time.

- f) *the list of tables designed for the inventory of data on reproductive potential for marine fish stocks be compiled into a single issue of the NAFO Scientific Council Studies in 2002 once it has been reviewed by Scientific Council.*

The Chairman of the Working Group on Reproduction Potential undertook the task, and is due to further address this matter during the mid-October 2001 Working Group meeting.

- g) *the co-conveners of Symposia be responsible for nominating qualified editors, maintaining the scientific standard of the Journal, and that once the edited papers were received from the editors further editorial problems, if any, with such submissions will be addressed by STACPUB, while the NAFO Secretariat will only edit for technical aspects.*

STACPUB noted that the co-conveners of the Symposium on "Deep-sea Fisheries" have been informed about their obligations regarding maintaining the scientific standard of the submitted papers, and the NAFO Secretariat will edit for technical aspects.

### 3. Review of Scientific Publications

#### a) **Papers from June 2001 Meeting**

Seven papers, suggested to be considered for publication in either Studies or Journal, were deferred at the June 2001 Scientific Council Meeting. Four of the papers were subsequently withdrawn by the authors. Discussions were held of each of the remaining three papers, and the various comments and recommendations made. STACPUB Chair agreed to convey these to the authors.

#### b) **Status of the 2000 Workshop Workbook**

STACPUB noted there was still material outstanding, and the workbook is still under preparation. STACPUB considered the likely drawback if the publication was delayed further, but agreed to review the status at the next June 2002 Meeting. STACPUB agreed that electronic means of publication is essential for this material.

#### c) **Information from the 2001 Special Session**

STACPUB noted that the report of the Symposium on Deep-Sea Fisheries was submitted to the Scientific Council. STACPUB proposed a NAFO Journal publication of the proceedings be targeted within a 1-year time frame.

#### d) **Status of Invitational Papers**

The invited paper, by V. A. Rikhter on silver hake on the Scotian Shelf, was completed for Journal Vol. 29.

#### e) **Other Reviews**

There were no other reviews.

### 4. Considerations of NAFO Website

#### a) **Status of Scanning of Papers**

The scanning of Journal and Studies back issues is on going and all volumes back to No. 26 of Studies and Vol. 13 of the Journal have currently been scanned.

5. **Scientific Citation Index (SCI)**

The Assistant Executive Secretary has been in communication with the SCI authorities, but SCI has not made any decision yet. Communications with SCI will continue.

6. **Other Matters**

There being no other business, the Chairman thanked the participants for their contributions and co-operation and the Secretariat for their assistance during this meeting and for the previous 2 years of the Chair's term, the meeting was adjourned.

