

## **PART C**

### **Scientific Council Annual Meeting, 7, 13-17 September 1999**

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**Participants of Scientific Council Meeting, September 1999**

Back Row: D. M. Carlsson, P. Kanneworff, V. N. Shibanov, H. J. Ritz, S. Kawahara, V. K. Babayan, H. P. Cornus, A. Avila de Melo, A. Vazquez, M. A. Showell, D. Kulka, U. Skladtirtir, D. G. Parsons, J. Moores.

2<sup>nd</sup> Step: R. Alpoim, E. de Cordenas, W. B. Brodie, D. Orr.

1<sup>st</sup> Step: . Nicolajsen, D. B. Atkinson, W. R. Bowering, R. K. Mayo, T. Amaratunga, P. S. Veitch.

Not in picture: D. C. A. Auby, B. Berenboim, D. Briand, D. Cross, O. Hagström, S. Junquera, C. L. Kerr, P. A. Koeller, B. L. Marshall, L. Motos, G. Moulton, S. Munch-Petersen, O. Okhanov, V. A. Rikhter, D. Rivard, T. Saat, L. Savard, F. M. Serchuk., H. Siegstad, M. Stein.



## REPORT OF SCIENTIFIC COUNCIL

Annual Meeting, 7, 13-17 September 1999

Chairman: H. P. Cornus

Rapporteur: T. Amaratunga

### I. PLENARY SESSIONS

The Scientific Council met at NAFO Headquarters, 2 Morris Drive, Dartmouth, Nova Scotia, Canada, during 7 September 1999 and at the Holiday Inn, Dartmouth, Nova Scotia, Canada, during 13-17 September 1999. Representatives attended from Canada, Denmark (in respect of Faroe Islands and Greenland), Estonia, European Union (France, Germany, Portugal and Spain), Iceland, Japan, Russian Federation and the United States of America. The Assistant Executive Secretary was in attendance.

The Executive Committee met briefly before the opening to discuss the plan of work.

The opening session of the Council was called to order at 1015 hr on 7 September 1999. The Assistant Executive Secretary was appointed rapporteur.

The Chairman noted that the meeting of 7 September would be devoted to specifically address the Fisheries Commission request for scientific information on shrimp in Div. 3LNO. The Chairman proposed that the information review be undertaken by the Council. Accordingly, the STACFIS agenda was modified. The agenda pertaining to this work as **adopted** is given at Agenda III, Part E, this volume. The Council noted the computer LAN System will be in operation during this meeting at Headquarters as well as the 13-17 September 1999 Meeting at the Holiday Inn.

The Council conducted the review of shrimp in Div. 3LNO through the course of 7 September 1999, and prepared its response to the Fisheries Commission (FC Working Paper No. 99/6 revised).

The meeting of 7 September was closed at 1515 hr.

The opening session of the 13-17 September Meeting 1999 of the Scientific Council was called to order at 1020 hr on 13 September 1999 at the Holiday Inn, Dartmouth, Nova Scotia, Canada. The Assistant Executive Secretary was appointed rapporteur.

In the review of the Provisional Agenda, the Chairman noted some modifications were needed and the agenda as **adopted** is given at Agenda III, Part E, this volume. The Chairman noted that Agenda Items IX.1.b, III.2.c.i would be addressed first (see report under appropriate sections below) in order that the Council's views may be conveyed to the General Council and STACTIC, respectively. Having considered these agenda items, the session was adjourned at 1230 hr.

The Council met briefly on 14 September 1999 to consider its proposed harmonized scientific protocol for the NAFO Observer Program, and the issue of the proposed NAFO Observer to ICES, ACFM Meetings (Agenda Item X.2).

The Council noted that the Fisheries Commission during this annual meeting had submitted a request regarding cod in Div. 2J+3KL and a question on shrimp distribution in Div. 3L. The Council during its sessions on 15 September 1999 prepared its responses (see report under Agenda Item V.3).

Outstanding agenda items were addressed during the course of 15 and 16 September 1999.

The concluding session was called to order at 0900 hr on 17 September 1999 when the Council considered and **adopted** its report.

The meeting was adjourned at 1000 hr on 17 September 1999.

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 Joint NAFO/ICES/PICES 1999 Symposium on "Pandalid Shrimp Fisheries □ Science and Management at the Millennium" is presented at Annex 1 of the Scientific Council Report.

The Agenda, List of Research (SCR) and Summary (SCS) Documents, and the List of Participants of this meeting are given at Part E, this volume.

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

## II. FISHERIES SCIENCE

The Council **adopted** the Report of Standing Committee on Fisheries Science (STACFIS) as presented by the Chairman, R. K. Mayo. The full report is given at Appendix I.

## III. RESEARCH COORDINATION

The Council **adopted** the Report of the Standing Committee on Research Coordination (STACREC) as presented by the Chairman, V. N. Shibanov. The full report is given at Appendix II.

The **recommendations** made by STACREC for the work of the Scientific Council as **endorsed** by the Council, are as follows (recommendations relevant to General Council will be forwarded as GC Working Paper):

1. *the Working Group on NAFO Observer Protocol communicates by e-mail with STACREC members during development of the coding and sampling procedures in order to ensure concurrence with the recommendations tabled by STACTIC for consideration during the proposed STACTIC intersessional meeting in 2000.*
2. *noting that STACTIC will call an intersessional meeting on Observer Protocol in 2000, M. Showell (Canada) and D. Kulka (Canada) should represent Scientific Council at that meeting.*
3. *the Assistant Executive Secretary and STACREC Chairman attend the 19th Session of CWP in Noumea, New Caledonia in July 2001.*
4. *the Assistant Executive Secretary and the STACREC Chairman attend the CWP intersessional meeting in Copenhagen, Denmark, in February 2000 and report on the proceedings to the Scientific Council in June 2000.*
5. *the Designated Expert for cod in Div. 3NO complete the spreadsheet as proposed by the Working Group on Biological Database Format Exchange using the data for this stock and present it to the Scientific Council Meeting in June 2000.*

## IV. PUBLICATIONS

The Council **adopted** the Report of the Standing Committee on Publications (STACPUB) as presented by the Chairman, W. B. Brodie. The full report is given at Appendix III.

The **recommendations** made by STACPUB for the work of the Scientific Council as **endorsed** by the Council are as follows (recommendations relevant to General Council will be forwarded as GC Working Paper):

1. *the final issue of Scientific Council Studies using the present criteria for selection of papers should include papers of the June 1999 Meeting selected by STACPUB, and the paper selection using the new criteria come into effect thereafter.*
2. *the Assistant Executive Secretary takes the lead in drafting editorial guidelines for Journal papers and that STACPUB members and editors should provide input.*
3. *additional resources be made available to the Secretariat, or technical support obtained in the form of service contracts, to develop the website for access to NAFO Journal publications*
4. *the blue covered SCS documents (i.e. final) containing meeting reports be distributed to Designated Experts and national representatives of the Scientific Council, in addition to the current mailing list and website circulation.*
5. *Scientific Council consider a change in its Rules of Procedure to accommodate the format of rotating membership of STACPUB.*

*The following change to the Rules of Procedure be incorporated:*

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

The Council agreed that one new STACPUB member be appointed at the earliest possible date, with the 3-year term becoming effective as of 17 September 1999.

6. *any material related to ICNAF and NAFO scientific information being incorporated in the "NAFO Century book □ Northwest Atlantic Fisheries in the 20<sup>th</sup> Century", should be reviewed by the Scientific Council prior to publication, and that this book when completed should be placed on the NAFO website.*

## **V. MANAGEMENT ADVICE AND RESPONSES TO SPECIAL REQUESTS**

1. **Shrimp in Divisions 3LNO** (see Annex 1, Item 7)

The Fisheries Commission requested the Scientific Council to provide information on shrimp in Div. 3LNO (see complete request in Part E, Agenda III, Annex 1, Item 7).

The Council at its 3-16 June 1999 Meeting noted no information was available for review during the June 1999 Meeting. It was anticipated that information necessary to address this request would be available for review in the week before the Annual Meeting September 1999. Accordingly, the Council met on 7 September 1999 to prepare its responses to the Fisheries Commission.

The Fisheries Commission, with the concurrence of the Coastal State, requested that the Scientific Council:

- a) *provide information on the fishing mortality on shrimp in Divisions 3LNO in recent years, as well as information on by-catches of groundfish in 3LNO shrimp fisheries;*
- b) *provide information on abundance indices and the distribution of the stock in relation to groundfish resources, particularly for the stocks which are under moratorium;*
- c) *provide information on the distribution of shrimp in Divisions 3L, 3N and 3O, as well as describe the relative distribution inside and outside the NAFO Regulatory Area;*
- d) *advise on reference points and conservation measures that would allow for exploitation of this resource in a precautionary manner;*
- e) *identify and delineate fishing areas and exclusion zones where fishing would not be permitted, with the aim of reducing the impact on the groundfish stocks which are under moratorium, particularly juveniles;*
- f) *provide information on annual yield potential for this stock;*

- g) *determine the appropriate level of research that would be required to monitor the status of this resource on an ongoing basis with the aim of providing catch options that could be used in the context of management by Total Allowable Catches (TAC); and*
- h) *provide advice on whether shrimp found in the area of the Flemish Cap defined by the following geographical coordinates*

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

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

The following text was prepared and agreed to by the Council during its meeting on 7 (and 10) September 1999, and submitted to the Fisheries Commission (see NAFO FC Working Paper 99/6 (revised)).

**The Council especially noted that:** The responses to items (a) through (g) pertain to Divisions 3NO and only that portion of Division 3L which lies west of Flemish Pass and do not include the 'box' described in (h) above.

**Regarding item a) the Council responded:** Scientific Council was unable to provide any estimates of absolute fishing mortality on shrimp in Div. 3LNO in recent years. It was noted however that the ratio of catch to biomass from Canadian research surveys has been low, not exceeding about 1 during this period (1995-98). Catches during this period have been almost exclusively taken by the Faroes Islands during exploratory fisheries in the NAFO Regulatory Area (NRA). The ratio of their catch to Canadian survey biomass estimates within the NRA has ranged between 5 -10 .

Information on by-catches in a shrimp fishery is only available in the NRA of Div. 3L. The following Table 1 shows, for two periods, the average number of Greenland halibut, redfish, cod and American plaice caught for each ton of shrimp with or without a sorting grate with 22 mm bar spacing.

TABLE 1. Number of fish per ton of shrimp caught.

<b>WITH A GRATE OF 22 MM BAR SPACING</b>				
<b>Period</b>	<b>Greenland halibut</b>	<b>Redfish</b>	<b>Cod</b>	<b>American plaice</b>
Oct-Nov 1998	111	43	0	12
Jun-Jul 1999	13	8	0	2
<b>WITHOUT A GRATE</b>				
Oct-Nov 1998	857	188	6	238
Jun-Jul 1999	302	56	9	41

Catch rates of shrimp are higher in the summer which tend to reduce by-catch rates. Based on the observed differences when fishing with and without a grate, the Scientific Council **recommended** that *the use of sorting grate with a maximum bar spacing of 22 mm be mandatory for any shrimp trawl fishery in this area.*

However, it should be cautioned that selection experiments with a sorting grate with a maximum bar spacing of 22 mm, show that selection is not effective for Greenland halibut less than about 20 cm and redfish less than about 15 cm.

**Regarding item b) the Council responded:** Canadian autumn research survey index of shrimp biomass Div. 3LNO were about 6 000 tons, 21 000 tons, 47 000 tons and 62 000 tons for the years 1995 to 1998, respectively. These include the biomass both inside Canada's 200-mile zone and in the NRA. At least 85% of the shrimp biomass was within Division 3L and at depths of about 185-550 m.

A review of the current distribution of shrimp from research survey data compared to current and historical distribution of juveniles of various groundfish species currently under moratorium indicated only limited overlap with cod (Fig. 1) and American plaice (Fig. 2). There is overlap with areas where juvenile redfish (Fig. 3) have been traditionally found, particularly in the Sackville Spur and 'nose' areas of Div. 3L. These are the same areas where the highest concentrations of shrimp occur.

In addition, there is considerable overlap in the distribution of shrimp and juvenile Greenland halibut (Fig. 4).

There were insufficient fish caught to evaluate overlap with witch flounder in Div. 3L.

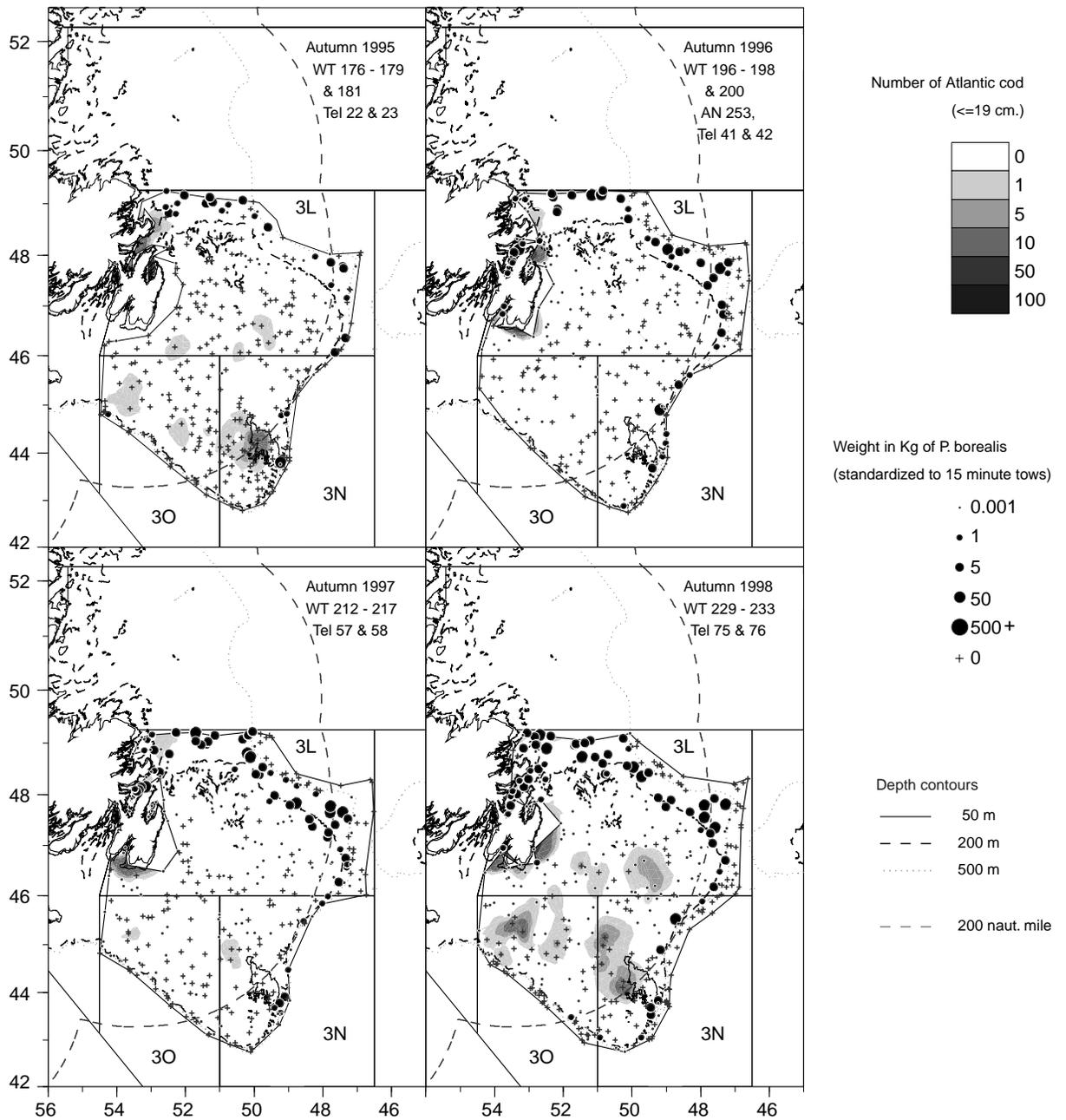


Fig. 1. Distribution of juvenile Atlantic cod (total length  $\leq 19$  cm) in relation to catches of *Pandalus borealis* (catches were collected during the annual Canadian multi-species autumn research surveys with a Campelen 1800 shrimp trawl).

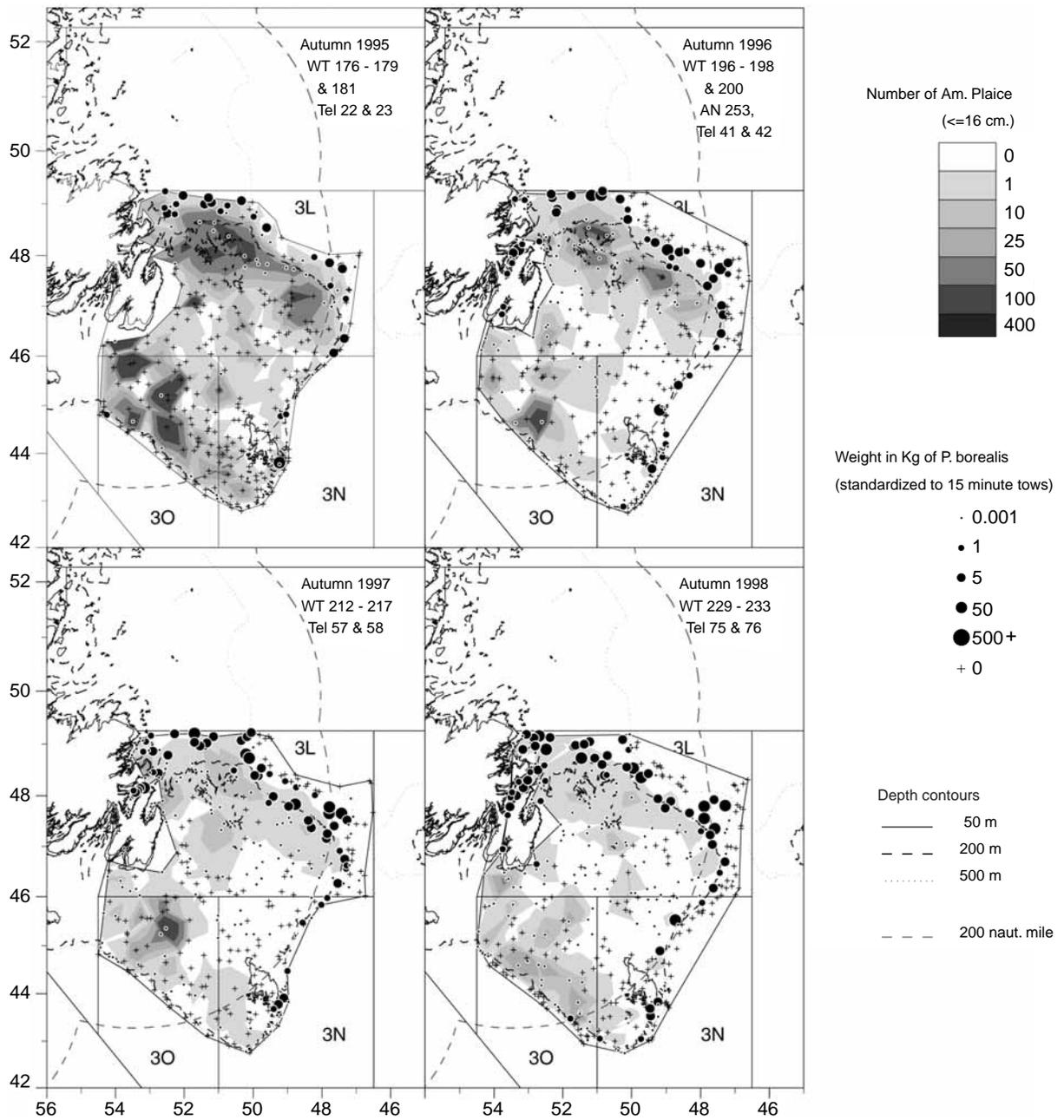


Fig. 2. Distribution of juvenile American plaice (total length  $\leq 16$  cm) in relation to catches of *Pandalus borealis* (catches were collected during the annual Canadian multi-species autumn research surveys with a Campelen 1800 shrimp trawl).

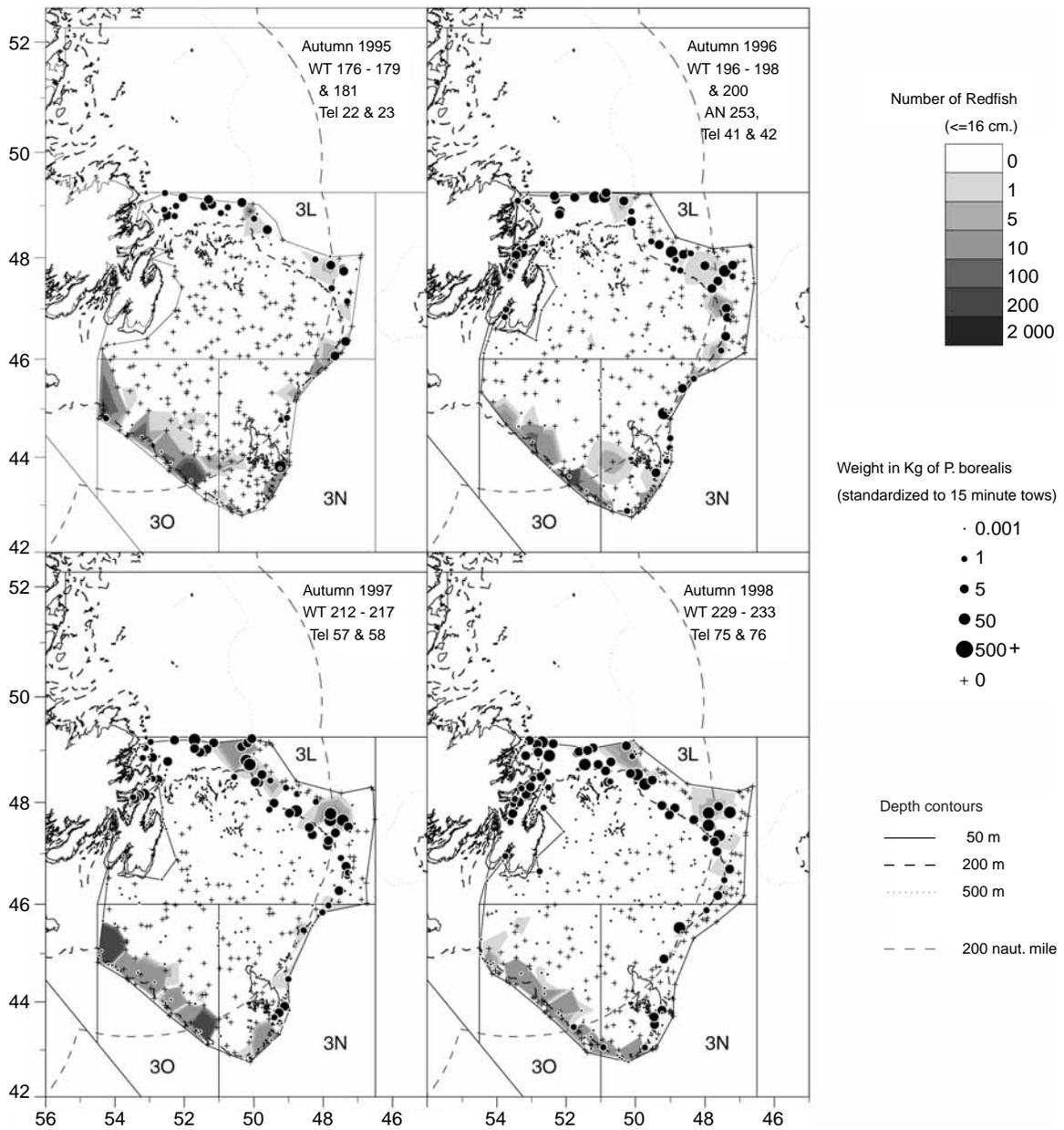


Fig. 3 Distribution of juvenile redfish (total length  $\leq 16$  cm) in relation to catches of *Pandalus borealis* (catches were collected during the annual Canadian multi-species autumn research surveys with a Campelen 1800 shrimp trawl).

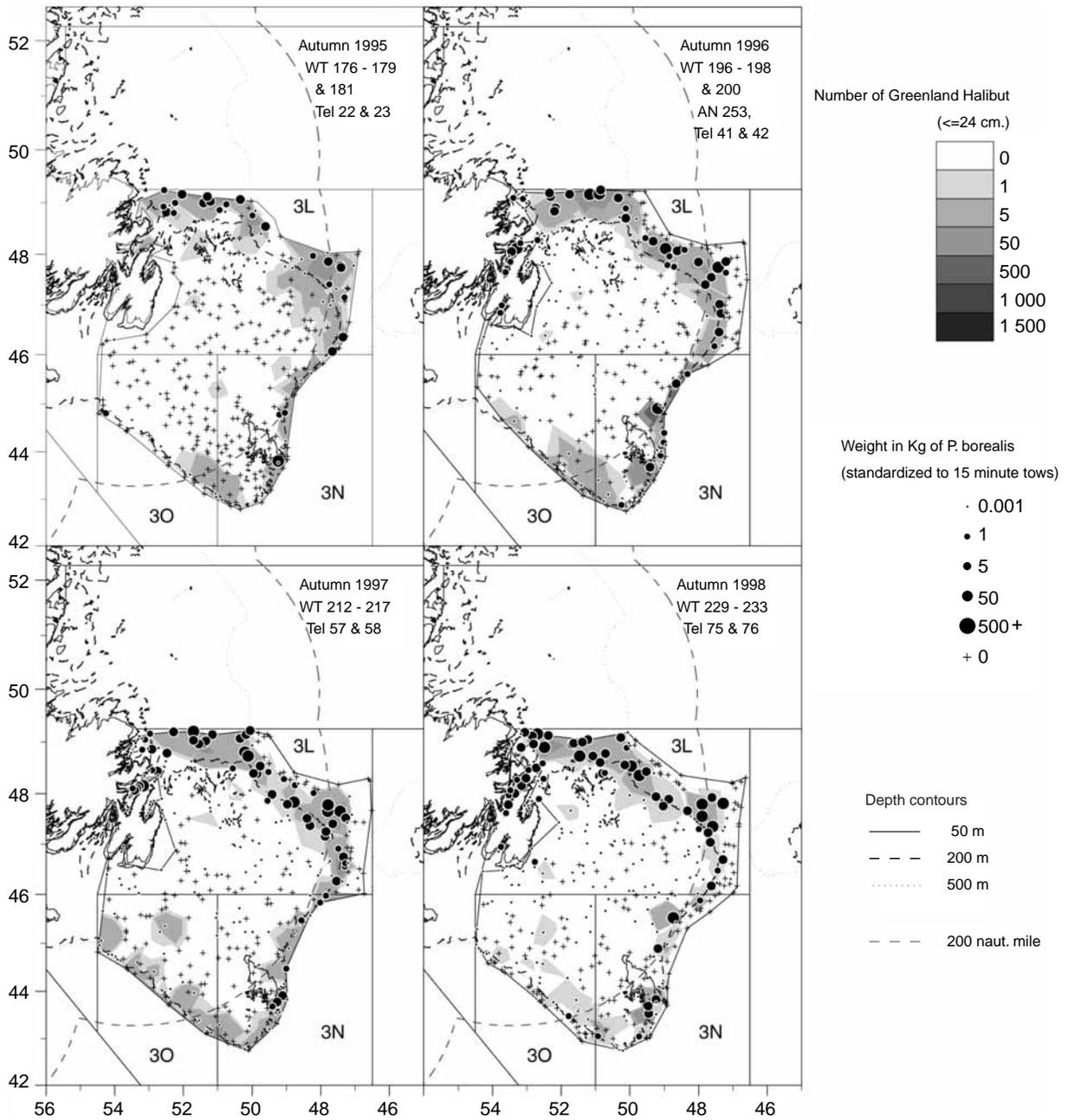


Fig. 4. Distribution of juvenile Greenland halibut (total length  $\leq 24$  cm) in relation to catches of *Pandalus borealis* (catches were collected during the annual Canadian multi-species autumn research surveys with a Campelen 1800 shrimp trawl).

**Regarding item c) the Council responded:** As indicated in the response to (b), the autumn Canadian research shrimp biomass index was 6 000 tons, 21 000 tons, 47 000 tons and 62 000 tons in Div. 3LNO for 1995 to 1998, respectively. The proportion in the NRA ranged from 12%-29% during this period.

Greater than 86% of the Div. 3LNO biomass was found within Div. 3L throughout this period, and between 11 and 23% of the Div. 3L shrimp biomass was within the NRA. Whereas the Canadian data indicate a continuing increase in biomass throughout Div. 3L and also in the NRA separately, data from the Faroes survey suggests some decline after June 1998 within the area they survey in the NRA.

In all years, more than 90% of the Div. 3L biomass occurred within the 185-550 m depth range.

Division 3N accounted for less than 14% of the overall biomass estimates, and Div. 3O accounted for less than 1% of the estimates. There were very wide confidence intervals around these estimates compared to those for Div. 3L.

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

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

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

Other measures in addition to the mandatory use of separator grates that will contribute to minimizing the by-catch of juveniles should be put in place. This should include restricting fishing to depths greater than 200 m (see (e)).

**Regarding item e) the Council responded:** The information presented in response to (b) indicates little overlap with juvenile Atlantic cod or American plaice in areas of highest shrimp biomass. Juveniles of these species are, however, present in shallower water. Restriction of fishing to depths greater than 200 m would prevent overlap in distribution of effort and these juveniles. For redfish and Greenland halibut there is considerable overlap in distribution such that exclusion zones would not be feasible. Other measures should be considered for these species such as use of longer toggle chains. This will allow greater separation between the foot gear of the trawl and the trawl itself allowing small fish such as Greenland halibut to pass over the foot gear but escape under the net itself.

**Regarding item f) the Council responded:** Scientific Council was unable to provide information at this time on annual yield potential for this resource. As indicated in the response to (d), a cautious approach to development of any fishery in this area was recommended and any fishing should be restricted to in Div. 3L only and depths greater than 200 m.

It was noted that in the adjacent area immediately north of Div. 3L (southern Div. 2J + Div. 3K), the ratio of TAC to the lower 95% confidence interval of the survey biomass is about 15%. The surveys in the Div. 2J and 3K area are at the same time of year and with the same fishing gear as the surveys in Div. 3L.

Applying a similar relative exploitation rate to the lower 95% confidence interval of the 1998 survey biomass estimate of the shrimp resource in Div. 3L would translate into a catch of about 6 000 tons.

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

#### **Regarding item g) the Council responded**

Canada currently conducts an annual autumn multi-species survey in the Div. 3LNO area during which information on both fish and invertebrates including shrimp is collected. Results from these surveys will allow for monitoring, on an ongoing basis, the status of the shrimp resource as well as its distribution in relation to groundfish.

It is important that there be fully adequate monitoring of any commercial fishery in this area. Detailed information on shrimp catch (including discards) effort, by-catch (kept and discarded) and fishing gear used should be collected on an ongoing basis. This work could be carried out through the Observer Program. All data should be made available to Scientific Council in a timely manner for analysis and review.

#### **Regarding item h) the Council responded**

The area of Div. 3L encompassed by the coordinates represent an area with contours continuous with those of the Div. 3M portion of Flemish Cap. These are well separated from similar depths further west in Div. 3L by the Flemish Pass which has depths to 1 500 m. As such, Scientific Council considers that shrimp in this area represent part of the overall Flemish Cap shrimp stock rather than a portion of any stock to the west of Flemish Pass.

Based on information from research surveys, Scientific Council did not consider that any by-catch and loss of yield of groundfish resources as a result of fishing in the area bounded by the given coordinates would not be different compared to that occurring as a result of the shrimp fishery in the Div. 3M portion of Flemish Cap.

## **2. Intersessional Information on Shrimp in Division 3M**

- a) The Council noted that the Chairman had informed the Fisheries Commission that for shrimp in Div. 3M there was no change in advice for the year 2000, and that the advice presented for 1999 would stand.

The Council noted the new assessment for this stock will be conducted during the 11-17 November 1999 Meeting of the Scientific Council in Reykjavik, Iceland.

- b) **Addition to the Response Provided in June 1999 to the Canadian Special Request** (see Part B, Item 2.e).v)(regarding Agenda I, Annex 2, Item 6)

The Scientific Council was requested regarding Agenda I to *evaluate the impact of by-catches in the NAFO Regulatory Area on the recovery of stocks currently under moratorium. Specifically, do the by-catches of these stocks in all other fisheries in the NAFO Regulatory Area impede their recovery?*

The Council responded:

In addition to information presented in September 1998 contained in SCR Doc. 98/80, an update was provided on the amount of by-catch of all species (including those under moratorium) from the shrimp fisheries from Davis Strait to Div. 3M (SCR Doc. 99/96).

In Div. 3M, redfish continues to be the most common by-catch, estimated at 216 tons in 1998 (compared to the peak 1993 catch of 11 970 tons). Greenland halibut by-catch was estimated at 57 tons, American plaice by-catch at 1.4 tons and cod by-catch was negligible. The latter two species

are under moratorium. Biomass of these species was near or at their lowest recorded level.

3. **Special Requests from Concurrent Fisheries Commission Meeting**

a) **Request Regarding Cod in Divisions 2J and 3KL**

The Fisheries Commission, on 14 September 1999, forwarded the following text to the Scientific Council:

*The Scientific Council is requested to evaluate the impact of catch in the range 5 000-10 000 yearly on the recovery of cod 2J+3KL stock unit.*

*The Scientific Council is also requested to evaluate the impact of by-catches of cod in other fisheries inside the Canadian zone and the NRA.*

The Scientific Council responded (see FC Working Paper No. 99/11):

As indicated in the June 1999 Report of Scientific Council (Part B, Appendix I, 18.1 above), "An analytical assessment of the Div. 2J and 3KL cod stock was not attempted. The inability to reconcile reported catches and the research vessel index in the late-1980s and early-1990s has not been resolved. Perhaps more importantly, the surveys do not cover the shallow coastal waters where good catch rates have been experienced in both the sentinel surveys and the 1998 index fishery, and the sizes and ages of cod taken in the offshore surveys do not represent the larger and older cod caught in the inshore."

Because of this, Scientific Council is not in a position to provide risks associated with fishing at different levels comparable to those made available for cod in Div. 3NO.

However, it is clear that the size of the stock as a whole remains at a very low level. It is also clear that any removals (including directed catch and by-catch in other fisheries) will hamper recovery of the resource although the extent of this delay cannot be determined with available data.

b) **Request Regarding Shrimp in Division 3L**

Scientific Council was requested by Fisheries Commission to respond to the question "*Is there any evidence for seasonal changes in shrimp distribution in Div. 3L?*"

The Scientific Council responded:

Scientific Council has information available from annual autumn surveys in Div. 3L for the period 1995 through 1998. These indicated that the proportions of the survey index biomass in the NRA were 20%, 23%, 11% and 15% respectively, and they were primarily distributed in depths of 185-550 m.

Information was available from only 1 spring survey – that of 1999. Data from this survey indicated about 24% of the index biomass was in the NRA and the shrimp were primarily in 185-500 m depth. The shrimp were, however, found somewhat deeper within this range.

It was also noted that the 95% confidence interval was much wider from the 1999 spring survey compared to the 1998 autumn survey although the mean estimates were similar at about 60 000 tons.

Based on a comparison of the data from the two periods, it appears that shrimp are distributed somewhat deeper in spring compared to autumn. Scientific Council, however, considers that there is too much variability in the 1999 spring survey data to determine if there are seasonal differences in distribution.

## VI. DEVELOPMENT OF PRECAUTIONARY APPROACH

### 1. Review of Papers Related to Precautionary Approach

The Council reviewed a paper "*On the Criteria (Reference Points) of Biomass, and Approaches to Some Fishery Management in the North Western Atlantic Ocean*" (NAFO SCR Doc. 99/13).

The paper considered the pattern of point scatter in the stock-recruitment relationship plots in relation to silver hake in Div. 4VWX, cod in Div. 2J+3KL, Div. 3NO and Subdiv. 3Ps, yellowtail flounder in Div. 3LNO, redfish in Div. 3M and mackerel in Subareas 3-6. The results of analysis had allowed to approximately estimate the optimal range of SSB in five stock units (cod in Div. 3NO, Subdiv. 3Ps, redfish in Div. 3M, yellowtail flounder in Div. 3LNO and mackerel in Subareas 3-6) and revealed uncertainty of scientifically substantiated estimates of the only possible  $B_{lim}$  level. The opinion was expressed on a strong and sometimes key impact of environmental factors upon year-class abundance of all above-mentioned populations. A flexible approach to fishery management was proposed on the basis of information on the state of those stocks and dynamics trends.

In the discussion that followed, the Scientific Council indicated that this paper served to illustrate the difficulties associated with the definition of limit reference points for many of the stocks. It was pointed out that more emphasis should be put on the definition of an optimal range (as opposed to limits) for the stock spawning biomass and total biomass. In that context, a possible PA strategy could be to ensure that the exploitation rates are regulated so as to maintain the biomass in its optimal range. In terms of the NAFO PA framework, this points at the importance of defining the target for biomass ( $B_{tr}$ ) as well as the limits ( $B_{lim}$ ) and that a strategy or harvest control rule should recognize both types of reference points.

### 2. Review of Meetings at San Sebastian, 27 April-5 May 1999 (see SCS Doc. 99/4; FC Doc. 99/2)

The Council noted the Chairman presented a summary of the 21 April to 1 May 1999 Meeting of the Scientific Council on the Precautionary Approach (SCS Doc. 99/4) and the Joint Scientific Council/Fisheries Commission Working Group Meeting of 3-6 May 1999 (FC Doc. 99/2), to the Fisheries Commission during its 14 September 1999 session.

The Council agreed the Scientific Council/Fisheries Commission Working Group Meeting was very valuable for the mutual understanding between scientists and managers. The Council hoped future meetings of this nature will improve this process.

### 3. Future Development of the Precautionary Approach

The Council noted that the Fisheries Commission proposed that a meeting of the Joint Scientific Council/Fisheries Commission Working Group be held in the intersessional period. The Council noted that the incoming Scientific Council Chairman and/or Vice-Chairman should attend that meeting and call upon any scientific experts to attend as needed. The Assistant Executive Secretary will attend the meeting subject to the scientific content and structure of the meeting.

The Council noted from the review of the Joint Scientific Council/Fisheries Commission Meeting that international harmonization of PA terminology, particularly between NAFO and ICES was important. The Chairman noted that there was communication with ICES ACFM intersessionally from H. P. Cornus. It was agreed a formal proposal to FAO from the NAFO Scientific Council and ICES ACFM should be initiated. A joint letter was drafted by the Council Chairman and reviewed by the Council.

## VII. REVIEW OF FUTURE MEETING ARRANGEMENTS

### 1. Scientific Council Meeting, June 2000

The Council agreed that the June 1999 Meeting experienced some time constraints in accomplishing its work. The Council therefore revised the proposed dates for the June 2000 Meeting.

The present scheduled dates for the Scientific Council Meeting are 1-15 June 2000 (**note:** this is a change from the tentative dates of 2-15 June 2000 announced before).

2. **Special Session and Annual Meeting, September 2000**

The Council noted the scheduled dates for the year 2000 Annual Meeting were from 18 to 22 September 2000, in Boston, USA.

It was agreed the Special Session dates would be 13-15 September 2000, and will be held at the same location as the Annual Meeting.

3. **Other Meetings in 2000 and 2001**

Noting that the Council hoped to invite ICES experts on shrimp to attend its shrimp assessment meeting in November 2000, the Council scheduled its meeting on shrimp in Div. 3M, Subareas 0+1 and Denmark Strait during a one week period in November 2000 (ideally starting 9 or 10 November), and the meeting will be held in Copenhagen, Denmark.

The Council did not consider its meetings of the year 2001 at this time. However, it was noted that the June 2001 Meeting will be held in Dartmouth, Nova Scotia, and the Annual Meeting will be held in Havana, Cuba, with the Special Session during 12-14 September 2001, and the Scientific Council during 17-21 September 2001.

## VIII. FUTURE SPECIAL SESSIONS

1. **Progress Report on Special Session in 2000**

Further to the proposal made during the June 1999 Meeting, the Council received a comprehensive proposal to conduct a workshop on assessment methods as a Scientific Council Special Session during 13-15 September 2000, in conjunction with the September 2000 Annual Meeting.

The Council reviewed the proposal for a Workshop on Assessment Methods, to be limited to Scientific Council participants. The proposal outlined a hands-on approach whereby the participants can be exposed to techniques and tools that they can try on data relevant to NAFO stocks. The proposal described four possible items or sessions:

1. Tools for Data Management;
2. Age-structured analyses and stock abundance estimation;
3. PA reference points; and
4. Simulations and risk analyses.

The Council believed that the priority should go to items 2 and 4, while giving only an introduction/overview on the PA software for the determination of reference points (item 3). It was also agreed that item 1 is important, but should be developed during the June meetings through examples or implementations on actual data. It was agreed that the Integrated Catch Analysis should be included in the exploration of age-structured analyses.

The Council suggested that the tutorials could be based on simulated data to facilitate the interpretation of outputs and comparison to expected results. This would be particularly useful for comparing results when programs offer options for invoking various formulations. It was suggested that the focus should be on techniques and tools routinely (or increasingly) used by the Scientific Council in the context of stock assessments, risk analyses and the development of the precautionary approach, as opposed to an exploration of new approaches and tools.

The convenors were invited to proceed with the development of a detailed agenda taking into consideration the priorities outlined above.

The Council welcomed the proposal from the co-convenors, D. Rivard (Canada) and C. Darby (EU-United Kingdom), and agreed the Special Session should focus on the most important subject areas to fit into the 3-day meeting schedule. The co-convenors were requested to formulate the session, taking into account the possibility of also conducting short hands-on sessions during the subsequent June Meeting of the Scientific Council.

## 2. **Progress Report on Special Session in 2001**

The Council agreed that a Symposium on "Deep Sea Fisheries" would be an attractive subject area and quite timely. The Council endorsed the proposal that Dr. Jon Moore (USA) be invited to be the convener. The Council requested the convener to plan and develop a Symposium on this topic to be held in conjunction with the NAFO Annual Meeting of September 2001 in Cuba. A progress report was requested for the June 2000 Meeting of the Scientific Council. Noting that the time frame available is short, the convener was requested to work on preparing for the Symposium as soon as possible.

## **IX. SCIENTIFIC COUNCIL WORKING PROCEDURES AND PROTOCOLS**

### 1. **Review of Rules of Procedure**

#### a) **STACPUB Membership**

The Council noted that STACPUB had addressed the issue of STACPUB membership, and the recommendation to change Rule 5.1 (c) (ii) of the Rules of Procedure for the Scientific Council and modify the scheme of nominating members, was accepted (see Item IV Publications above).

The Council noted the appointment of a new, sixth, member of STACPUB should take place as soon as possible with the 3-year term beginning effective as of 17 September 1999.

#### b) **Observers at Scientific Council Meetings**

The Council noted that a Working Group proposal to modify the Rules of Procedures of General Council and Fisheries Commission was under review by those constituent bodies. The Council agreed to defer its consideration of Rule 1.3 of its Rules of Procedure.

### 2. **Other Procedures or Protocols**

#### a) **Standard Software**

The Council reviewed the value of developing standard software for STACFIS stock assessments. It was agreed that the present day rapid changes and upgrades of software would make this very difficult to achieve, while also placing constraints on individual scientist's initiatives.

#### b) **Standard Database**

The Council reviewed the value of developing standard databases for STACFIS stock assessment. The Council noted that a proposed spreadsheet regarding data exchange format (see recommendation under Section III, Research Coordination above) is under development, and this will be reviewed at the June 2000 Scientific Council Meeting.

#### c) **Intermediate Stock Status Report for Stocks with Multiannual Advice**

The Council agreed there was a need to establish a standard method of monitoring stock status. It was, however, observed that Designated Experts are the responsible authorities to conduct this

work, and that it was also very likely that requests for scientific advice would be forthcoming if stock status were observed to be changing.

The Council agreed, however, that Designated Experts should be requested to monitor the stock status and provide reports to the Scientific Council each year.

## X. OTHER MATTERS

### 1. ***Ad hoc* Working Group on Future Computer Requirements and Improvement of NAFO Website**

As agreed by the Council during its June 1999 Meeting that a Working Group be established to look into the future computer requirements and improvements of the NAFO website, the Council established the *ad hoc* Working Group consisting of M. Stein (EU-Germany), F. M. Serchuk (USA) and L. Motos (EU-Spain) to be working intersessionally. It was proposed M. Stein should take the lead role in the Working Group, and the Working Group work with the Assistant Executive Secretary on this matter. The Council agreed that in developing the requirements at the Secretariat, advice and assistance should also be sought from B. Morrison (CanNet Computers, Dartmouth, Nova Scotia, Canada).

### 2. **NAFO Scientific Council Observer at ICES ACFM**

Noting that the present NAFO Observer to ICES, H. P. Cornus, would not be available to attend to this role after this 1999 Annual Meeting, the Chairman requested nominations for a replacement.

The Council was pleased to learn O. Jørgensen (Denmark-Greenland) (STACPUB Chairman) agreed to attend the forthcoming ICES, ACFM Meeting as NAFO Observer. The Council requested the Executive Secretary to inform ICES of the decision.

### 3. **Report from Scientific Council Representative at STACFAD**

The Council received a report of the progress on financial matters at STACFAD from M. Stein (EU-Germany) who was appointed by the Council to attend to that matter. He reported that it was timely that Scientific Council was represented in this Committee. It was particularly noted that the recommendations made by the Council (GC WP 99/5) were agreed to. It was reported that the Executive Secretary or the Assistant Executive Secretary should attend the ACFM Meeting in Rome in November/December 1999, to represent NAFO. The proposed funds allocation for the NAFO/ICES Hydrographic Symposium in the year 2001 was not finalized at this meeting.

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

The Council received the proposed Terms of Reference for the next Working Group Meeting of 9-13 October 2000, at ICES Headquarters, Copenhagen, with a request for NAFO Scientific Council input if needed. The Council did not propose any modifications and accordingly requested the Assistant Executive Secretary to inform ICES of the decision.

### 5. **Working Group on Reproductive Potential**

The Council was informed that further to the recommendation of the 1998 Symposium on "Variations in Maturation, Growth, Condition and Spawning Stock Biomass Production in Groundfish", and discussions during the June 1999 Meeting of the Scientific Council, a Working Group has been formed with E. Trippel (Canada) as Chairman and provisionally 11 members. The members list will be finalized shortly by the Chairman.

The Council looked forward to the work plan for the Working Group to be submitted to the June 2000 Meeting of the Scientific Council.

## XI. ADOPTION OF REPORTS

### 1. **Consideration of Report from the Symposium of 8-10 September 1999**

The Council reviewed and **adopted** the Report of the Symposium as presented by the co-conveners (Annex 1).

The Council was pleased with the success of the Symposium. The Council extended special thanks to the co-conveners, particularly to P. Koeller (Canada) who took the lead role in organizing the Symposium, which was a valuable contribution to the scientific work of the Scientific Council.

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

The Council at its session on 16 September 1999 considered and **adopted** the reports of its Standing Committees, STACFIS, STACREC and STACPUB. These reports are given in Appendix I, II and III, respectively. The recommendations by the Standing Committees as endorsed by the Council are given in Sections III and IV above.

### 3. **Report of Scientific Council Present Meeting, 7, 13-17 September 1999**

The Council at its concluding session on 17 September 1999 considered and **adopted** its own Report of this 7, 13-17 September 1999 Meeting.

## XII. ADJOURNMENT

The Chairman expressed his gratitude to the members of Scientific Council for their fruitful cooperation during his term in the chair. He stated that he enjoyed working with the Council members as the Scientific Council during this term reached out with more presence in other NAFO constituent bodies as well as other international fora. He expressed his pleasure in noting the progress made in the recent two years, especially in relation to the implementation of the Precautionary Approach and also in the success of getting acknowledgment in its financial needs particularly for computer innovations and website development at the Secretariat.

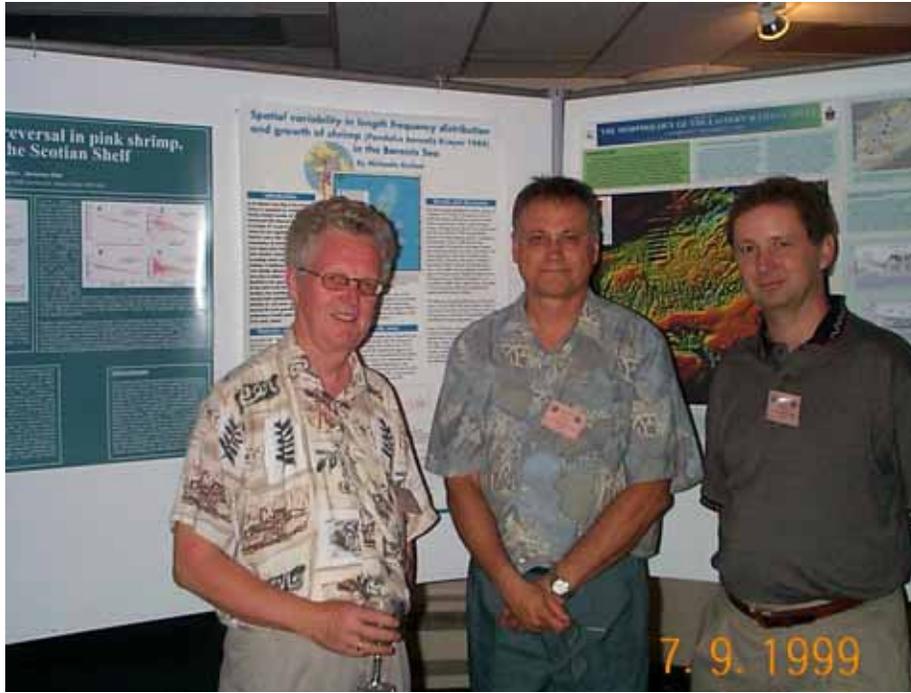
The Chairman especially thanked the Designated Experts for their important work, which forms the backbone for the work of the Standing Committees and the Scientific Council. He extended his special thanks to the Chairman of the Standing Committees for their excellent work and support for his task as Chairman of the Council.

In closing, the Chairman extended a warm welcome to the incoming Chairman, W. B. Brodie (Canada), noting the challenging work ahead was in good hands.

The incoming Chairman took the opportunity to, on behalf of Council members, to express sincere gratitude to the hard work and the success achieved by the outgoing Chairman, H. P. Cornus (EU-Germany).

In addition the NAFO Secretariat was thanked for its extraordinary support during and between the meetings of Scientific Council.

There being no further business, the Chairman having wished all participants a safe trip home, adjourned the meeting.



**Co-conveners:** S. Tveite, P. A. Koeller, J. Boutillier



**Keynote Speaker:** B. Bergström



## ANNEX 1. REPORT OF JOINT NAFO/PICES/ICES SYMPOSIUM

### PANDALID SHRIMP FISHERIES □ SCIENCE AND MANAGEMENT AT THE MILLENNIUM

Hosted by the Scientific Council of the Northwest Atlantic Fisheries Organization (NAFO)  
8-10 September 1999

#### THE SYMPOSIUM

The Symposium "*Pandalid Shrimp Fisheries - Science and Management at the Millennium*", was held at the Holiday Inn Harbourview, Dartmouth, Nova Scotia, Canada with co-conveners P. A. Koeller (NAFO), J. Boutillier (PICES), and S. Tveite (ICES) during 8-10 September 1999. There were 96 participants from Canada, Denmark, Faroe Islands, Germany, Greenland, Iceland, Japan, Luxembourg, Norway, Portugal, Russia, Spain, Sweden, Ukraine, and the United States of America.

The Symposium was opened by H. P. Cornus (EU-Germany), Chairman of Scientific Council, who on behalf of the Scientific Council welcomed participants to Dartmouth, and presented a brief overview of NAFO and its activities.

Co-convenor P. A. Koeller (Canada), welcomed the participants, and gave a general outline of the objectives of the Symposium.

The Symposium considered advances in all aspects of Pandalid shrimp biology, stock assessments and fisheries management since the last international Symposium was held in Alaska, during 1979. In addition, a session on harvesting and processing highlighted recent changes in this sector.

The Symposium was prefaced by a keynote presentation on the biology of *Pandalus*. Eight invited speakers addressed specific issues within the 4 sessions. Twenty-three oral presentations were delivered and fifteen posters were displayed. Posters were highlighted during three "Poster Pursuit" sessions during which poster authors presented short oral summaries of their work.

**Keynote Paper:** Bo Bergström (Sweden) provided a comprehensive review of the biology of the genus *Pandalus*, comparing distributions, reproductive strategies, behaviour, growth, and population dynamics of the sixteen known species. Key gaps in our knowledge of *Pandalus* biology were identified including the long period of relative inactivity in laboratory studies since the 1970s despite the need for basic physiological information. A communications gap exists not only between stock assessment biologists and those working on fundamental biological and ecological problems, but also between shrimp assessment biologists themselves, who tend to be isolated within their own management regimes.

Dr. Bergström emphasized the need to use the large amount of good quality data originally collected for stock assessment purposes to address the many fundamental biological questions which remain unanswered, and to publish results in the primary literature. This is the best way to attract the young and eager minds needed to revitalize research in this field.

#### Session 1: Environmental and Trophic Considerations

The invited speaker for the session Gunnar Stefansson (Iceland) described how environmental variables can be applied in multispecies models and stock assessments for *P. borealis*, a species where traditional methods tend to fail. In particular, the use of cod abundance in a production model used to assess Icelandic shrimp stocks were described. Another presentation described how a boreal ecosystem in the Northeast Pacific rapidly reorganized from a shrimp to a groundfish dominated system due to decadal environment changes, and how Pandalid shrimp can be used as indicators of a regime shift. Commercial and survey data were used in a paper to identify spatial scales and patterns of Pacific shrimp aggregations and how they are influenced by environmental conditions and interannual variations in abundance. One paper used time series analysis to construct predictive models of shrimp abundance on the

Newfoundland-Labrador shelf and supported the hypothesis that colder conditions favour larval survival. The relative importance of temperature, habitat and predation on the Scotian Shelf shrimp stock in contrast to more northern and southern stocks were described in another presentation. One researcher extended previously identified correlations between recruitment spawning stock biomass and spring surface temperatures in the Gulf of Maine to include freshwater runoff, wind velocity and direction, and predation. Research vessel survey biomass indices of cod and shrimp were used to show that release of predation pressure by cod may have contributed significantly to the unprecedented increase of shrimp stocks off Newfoundland and Labrador in recent years. The importance of temperature to the biology and population dynamics of shrimp was evident throughout this session but was highlighted by a paper describing growth in the Svalbad Area in relation to environmental parameters. Two papers described the importance of large scale hydrographic features on the distribution of shrimp in the Northwest Atlantic, including a first description of the strong relationship between the distribution of shrimp distribution and Particulate Organic Carbon as determined from sediment trap data and a sedimentation model; and the role of warm water influxes in the recent displacement of shrimp from the traditional fishing grounds off east Greenland. The session clearly demonstrated that environmental and trophic considerations along with multispecies modelling must play an increasingly important role in the assessment and management of Pandalid populations in the future.

### **Session 2: Stock Assessments**

The two invited speakers, Boris Ivanov (Russia) and Robert Mohn (Canada) gave a historical perspective of shrimp research in Russia, and described the application of data poor assessment methods to shrimp stocks, respectively. The importance of surveys in shrimp assessments were highlighted in several papers describing innovative survey designs, including the use of subjective prediction to optimise sample stratification in the Barents Sea, and a method for estimating biomass from trawl surveys on the Newfoundland-Labrador Shelf using information on depth and distance to adjacent stations. The trawl survey for *P. borealis* off West Greenland was described in detail, including changes in design and methodology over time to improve biomass estimates and information on biological parameters. A paper described a pre- and post-season pot survey for *P. platyceros* to estimate harvest rates in southeast Alaska. Two papers were presented on stock assessment methods and their performance in the Gulf of Maine: one described the sensitivity of results from production models to survey catchability estimates and the usefulness of these models in describing abundance trends despite the difficulties in obtaining absolute stock size when catchability is unknown or poorly estimated; the second provided a historical review of the fishery and concluded that fishing mortality has been the overriding factor in affecting survival and abundance of the shrimp stock since the 1970s, although environmental influences have also played a role at times; stock assessments in the Gulf of Maine have consistently shown that poor recruitment is more likely at low levels of spawning stock biomass. A paper describing the variations in growth of *P. borealis* in the Gulf of St. Lawrence demonstrated persistent spatial size gradients and synchronism in the events leading to them which impact on the interpretation of assessment data. The genetic variability of *P. borealis* in the Northwest Atlantic described in another paper suggested a high level of gene flow in this species and that differences observed between some areas may not be stable through time. A final paper described recruitment and abundance indices from surveys in the Norwegian Deep and Skagerrak in relation to environmental parameters including fluxes of Atlantic water into the area and the abundance of finfish species.

### **Session 3: Management**

The invited paper by Louise Savard, Don Parsons, Peter Koeller (Canada) and Caihong Fu (USA) described the "traffic light" approach to shrimp assessment adopted by Canadian east coast assessment scientists and by NAFO for data poor stocks. Simulation results suggest that "traffic light" scores could be linked to simple harvest control rules in a way that is consistent with shrimp stock dynamics and precautionary management requirements, creating an integrated management framework. Session papers highlighted the wide variety of approaches adopted for Pandalus stocks, ranging from the relatively simple TAC and limited entry controls in the large stock areas of the northwest Atlantic, to the complex suite of management programs in the Pacific northwest, including time and area closures, catch ceilings, limited entry, fixed escapement, and quotas assigned to many small management units. One paper evaluated different harvest strategies for Pandalid shrimp population including fishing during different times in the growth/life cycle, the use of several mesh size scenarios, and the use of area closures, with the effectiveness of the different policies being contingent on seasonal and annual variations in growth and natural mortality.

#### Session 4. Harvesting and Processing

Invited presentations were made by leading industry participants from four countries. In his presentation on modern trawling and by-catch reducing devices Roger Larsen (Norway) expressed concern about the continuing trend toward the development of super-efficient gear and the use of twin and even triple trawl configurations. In addition the problem of small fish by-catch continues to challenge technologists. Two submitted papers on gear trials with different grate bar spacings, secondary grates, cod end strengtheners, square mesh codends, and footrope configurations showed the potential for improvement in reduction of by-catch and small shrimp catches. The continued development of conservation oriented, selective fishing gear was seen to be essential to the future of the shrimp fishing industry. The history and development of shrimp fishing in Canada, Iceland and the United States was explored in presentations by John Angel (Canada), Petur Bjarneson (Iceland) and Roland Hurtubise (USA), respectively. The Canadian experience of quota management coupled with rights-based fishing was offered as a sensible and conservative management system, which has produced positive results. The importance of focused marketing in Iceland was demonstrated through an outline of a marketing initiative targeting German consumers - part of a "Mutual Nordic Marketing" program developed to promote prawn products from Nordic countries. Trends in the processing and marketing of Gulf of Maine shrimp was explored including the development of a niche for frozen, breaded shrimp.

#### Posters

Of the 15 posters submitted to the meeting, 9 were relevant to the theme of Session 1. Two dealt with trophic interactions including one highlighting the importance of cod on the population dynamics of *P. borealis* (*eous*) in the Barents Sea and another describing the role of the same species in the food webs of Sea of Japan. Several papers described distribution and migration patterns for various *Pandalus* species and showed that: spatial and temporal distributions in the Gulf of Maine are strongly dependent on temperature, depth and substrate and are size/year class specific; length frequencies of *P. borealis* in the Barents Sea varies both spatially and temporally, with much of the variation explained by temperature; *P. hypsinotus* in the Sea of Japan forms local populations with relatively little migrations between them. One poster presented preliminary results from ongoing recruitment studies of *P. borealis* in Greenland waters, including information on distribution and lipid composition in relation to hydrography and potential food resources. Another poster described an association between an anemone and various shrimp species, including *Pandalus* spp., which has not been observed before in northern waters. A final poster concluded that the positive relationship between size at transition and average size of breeders previously presented as evidence for environmentally controlled sex reversal could simply be explained as density dependent growth. The four posters relevant to Session 2 dealt with different aspects of assessment methodology including: description of a new survey gear (beam trawl) used for a pre-recruit survey and recruitment studies in the Gulf of St. Lawrence; the incorporation of economic considerations into yield-per-recruit analysis for *P. jordani* off California and its usefulness in defining management strategies; jack-knifing a production model for the *P. borealis* off west Greenland using independently modeled catch-per-unit effort and survey series; and age determination of *P. borealis* in Icelandic waters using the deviation method. Three posters were associated with Sessions 3 and 4, including one which described temporal changes in cod and shrimp distributions as inferred from commercial data which corroborated the link between the decrease in cod and the increase in shrimp on the Newfoundland-Labrador shelf; one poster described the relatively insignificant impact of by-catch and excluder devices on the quality of *P. jordani* catches; a final poster described a monitoring program for the shrimp trawl fishery in British Columbia.

#### DISCUSSION

A comment after the keynote address reiterated the major gaps in knowledge of Pandalid biology outlined by Dr. Bergström, including the gap between the flurry of laboratory studies in the 1970s and the present, and the gap between stock assessment biologists and those working on fundamental biological and ecological problems. While the lack of research funding has contributed to the first gap, this may improve in areas such as the Northwest Atlantic as shrimp overshadow groundfish in economic importance. The second gap may be addressed with available tools, including international meetings of this nature, and e-mail facilities such as the SHRIMP-NORTH discussion list.

Much discussion reiterated the sensitivity, apparent in many of the presentations, of *Pandalus* spp. stock distributions and abundances to hydrographic changes. Process studies on the planktonic stages were considered essential to establish the links between environmental changes and recruitment which have been inferred from historical time series analysis. The use of modern tools such as the satellite imagery of Sea Surface Temperatures showing the

instability of the water masses off east Greenland and their possible effect on shrimp distribution is essential if hydrographic data is to figure in shrimp stock predictions. Although workers in ocean climate may never be in a position to "forecast" beyond the short term, they are working towards predicting likely longer term trends in some areas. Discussions of a warming trend in the Northwest Atlantic associated with the North Atlantic Oscillation, and an anticipated cooling trend in the North Pacific perhaps delayed by recent unusual El Niño-Southern Oscillation (ENSO) events and their probable effect on shrimp stocks suggest a growing confidence in our ability to, if not understand all the linkages between ocean climate and shrimp populations, at least formulate testable hypotheses involving such large scale events.

The discussion clearly identified the need for further work on the influence of predation on shrimp stock dynamics and eventually, to develop the ability to recognize and separate effects due to predation from those due to environmental factors and fishing. A fundamental question in this area is the extent to which predation changes the size composition of a stock, which influences our interpretation of important parameters such as growth and distribution, and ultimately biases our interpretation of stock health.

Presented papers clearly showed that two main components of any stock assessment model, fishing mortality (F) and natural mortality (M), vary substantially. It was noted that it is essential that the varying predation component of M be incorporated into the advisory process in a quantitative way. In the absence of clearly defined M, assuming constant high natural mortality and the inevitable large, environmentally induced population fluctuations, the tendency of industry is to argue that fishing doesn't matter i.e. in the short term, fishing should be as high as possible because "they all die anyway", and in the longer term it should be as high as possible because "the stock will collapse anyway". In fact, total mortality, Z, representing the combined effects of environment, predation and fishing, results in survival of a certain spawning stock which must be related to stock survival through knowledge of the stock-recruitment relationship, the other essential component of M.

It was pointed out that more comparative biological and ecological studies of different stocks are needed to identify differences in population dynamics and vulnerabilities to overfishing. It is unlikely that the sustainable exploitation rate of a small stock isolated within a pocket of favourable environmental conditions at the southern end of the species range would be the same as a large northern stock well within the species range. It was felt the biological basis for more precaution in some stocks *versus* others should be established and documented.

Discussion on management focused on the application of the Precautionary Approach to shrimp stocks, specifically the Traffic Light adopted by shrimp assessments biologists and managers on the east coast of Canada, and adopted as an interim method for low data stocks within NAFO. This discussion quickly polarized into 2 camps, namely those who felt that the approach was not quantitative and should be interim, and those who felt it was quantitative and could be a long-term alternative to traditional methods. On the defensive, proponents pointed out that traditional quantitative models often give the perception of providing more information or certainty than is actually there in reality, especially to those unfamiliar with the underlying assumptions. In addition, important ancillary observations are often ignored or devalued because there is no place for them in the model. Traffic Light scores incorporate a suite of observations and their respective interpretations ranging from quantitative assessment results from surveys, commercial sampling, and VPAs if available, to semi-quantitative biological observations on demographic stability, natural mortality, environmental conditions, distribution, etc., to qualitative anecdotal information provided by industry, into a single score that represents current stock status more comprehensively and precautiously than traditional models. Simulations show that this score, when translated directly into a management response through harvest control rules, performs better than a constant exploitation approach in terms of yield-per-unit risk. Results are consistent with shrimp stock dynamics and precautionary management requirements and indicate that the method has considerable potential in the creation of an integrated management framework. It was pointed out that the management response as presently implemented in the model is limited to exploitation rates *via* TACs and should also incorporate additional response controls on fishing mortality *via* e.g. effort controls.

There was considerable discussion on the wide variety of sampling strategies, survey methods and data analysis techniques adopted by the various organizations, many of which have undergone considerable change recently. While much of these differences in methods are dictated by different stock characteristics it is clear that large differences also occur among organizations with relatively similar stock characteristics, e.g. the large stocks on both sides of the North Atlantic. There may be some advantage to continued dialogue between these organizations in terms of standardization and/or improvement of methodologies. The need for recruitment indices was emphasized and it was

pointed out that these could be obtained through relatively simple and inexpensive means, for example the "juvenile bag" used in Iceland, and the "underbelly" bags used in the Barents Sea.

During the discussions after the session on harvesting and processing, it was pointed out that the phenomenal success of the Nordmore grate and similar By-catch Reduction Devices (BRDs) is not without problems. These devices have been accepted and used for a relatively short time (10 yr) and their long-term effects are still to be determined. In particular, their impact on commercially important juvenile fish may be considerable in some areas and times. In Norway, fishermen feel that the release of "trash" fish by the grate may impact shrimp stocks negatively by increasing predation pressure. These problems can only be addressed by continuing to improve the selectivity of the gears. The trend in cooperative government-industry research and management in Canada was lauded by the industry representative as exemplary, but it was pointed out that successful industry participation is contingent on a guarantee of access to the resource and its early participation in the development of any management framework.

### Conclusion

The Chairman of the Scientific Council thanked the convenors and indicated that the Symposium must be considered one of the most successful of the NAFO series to date. This could not have been achieved without excellent organization, beginning in June of 1997 with a presentation to the NAFO Scientific Council, followed at appropriate times by similar representations to ICES and PICES. Funding from national organizations and industry obtained through the efforts of the convenors and steering committee members was also instrumental in the success of the meeting in that it provided for much wider participation and interaction than would otherwise have been possible. Finally, the overwhelming support of the scientific community in providing many excellent and significant contributions toward shrimp fisheries science is gratefully acknowledged and will clearly be apparent in the Proceedings, which is intended to be published through the *NAFO Journal of Northwest Atlantic Fishery Science*, within a target time-frame of one year.

### TIMETABLE OF THE SYMPOSIUM

#### WEDNESDAY, 8 SEPTEMBER 1999

0800-0830	Registration
0830-0900	Introduction
0900-0940	<b>Keynote:</b> BERGSTRÖM, B. The biology of <i>Pandalus</i> .

#### SESSION 1. ENVIRONMENTAL AND TROPHIC CONSIDERATIONS

##### Chair: Paul Anderson

0940-1010	1.1	<b>Invited Paper:</b> STEFANSSON, G. Assessment methods and utilization of shrimp stocks - from simple-minded approaches through resignation to multispecies and simulation methods.
1010-1030		<b>Break</b>
1030-1100	1.2	ANDERSON, P. J. Pandalid shrimp as indicators of marine ecological regime shift.
1100-1130	1.3	PERRY, R. I., and J. A. BOUTILLIER. Spatial scales of shrimp ( <i>Pandalus jordani</i> ) aggregations, environmental influences, and consequences for management.
1130-1200	1.4	PARSONS, D. G. Forecasting fishery performance for northern shrimp ( <i>Pandalus borealis</i> ) in NAFO Divisions 2HJ.
1200-1300		<b>Lunch</b>

- 1300-1330                   **Poster Pursuit:** POSTER AUTHORS. 5 min. presentations (max. 3 slides) of posters P.1 to P.5.
- 1330-1400           1.5    KOELLER, P. A. Relative importance of environmental and ecological factors to the management of the northern shrimp (*Pandalus borealis*) fishery on the Scotian Shelf.
- 1400-1430           1.6    RICHARDS, A. Physical and biological factors influencing recruitment of northern shrimp *Pandalus borealis* in the Gulf of Maine.
- 1430-1500           1.7    RAMSEIER, R. O., and C. GARRITY. How does the particulate organic carbon sedimentation within the seasonal sea-ice regime influence the distribution of northern shrimp (*Pandalus borealis*)?
- 1500-1515                   **Break**
- 1515-1545           1.8    LILLY, G. R., and D. G. PARSONS. Was the increase in shrimp biomass on the Northeast Newfoundland Shelf a consequence of a release in predation pressure?
- 1545-1615           1.9    HANSEN, H. □., and M. ASCHAN. Growth performance, size and age at maturity of shrimp *Pandalus borealis* in the Svalbard area related to environmental parameters.
- 1615-1645           1.10   STEIN, M. Hydrographic conditions off East Greenland - their potential effect on the distribution of shrimp (*Pandalus borealis*).
- 1645-1715                   **Discussion**

**SESSION 1: POSTERS**

- P.1.                   ASCHAN, M. Spatial variability in length frequency distribution and growth of shrimp (*Pandalus borealis* Kr yer 1984) in the Barents Sea.
- P.2.                   BERENBOIM B. I., A. V. DOLGOV, V. A. KORZHEV, and N.A.YARAGINA. Cod impact on the stock dynamics of shrimp *Pandalus borealis* in the Barents Sea and its application in multispecies models.
- P.3.                   BUYANOVSKY, A. Biology and Distribution of *Pandalus hypsinotus* (Brandt) in the northern part of the Sea of Japan.
- P.4.                   CLARK, S. H., S. VAUGHN, E. HOLMES, and J. B. O'GORMAN. Observations on the biology and distribution of northern shrimp, *Pandalus borealis*, in the Gulf of Maine, from research vessel surveys.
- P.5.                   KOELLER, P., R. MOHN, and M. ETTER. Density dependent sex-reversal in pink shrimp, *Pandalus borealis*, on the Scotian Shelf.
- P.6.                   STEVENS, B. G., and P. J. ANDERSON. An association between the anemone, *Cribrinopsis fernaldi*, and the shrimps of the families Pandalidae and Hippolytidae.
- P.7.                   MINAMI, T. Predator-prey relationship and trophic levels of the pink shrimp, *Pandalus eous*, in the Yamato Bank, the Sea of Japan.
- P.8.                   PEDERSEN, S. A. Hydrographical and biological processes of importance in determining recruitment variability of northern shrimp in West Greenland waters.

**THURSDAY, 9 SEPTEMBER 1999**

**SESSION 2. STOCK ASSESSMENTS**

**Chair: Michaela Aschan**

- |           |      |   |
|-----------|------|---|
| 0830-0900 | 2.1  | <b>Invited Paper.</b> IVANOV, B. G. Pandalid shrimps of the Boreal area: history of fisheries and research with special reference to Russia.                                |
| 0900-0930 | 2.2  | <b>Invited Paper.</b> MOHN, R. Data-poor stock assessment methods and their application to shrimp stocks.   |
| 0930-1000 | 2.3  | CADRIN, S. Assessment of <i>Pandalus borealis</i> stocks in the Northwest Atlantic: challenges with catch and catchability.   |
| 1000-1030 |      | <b>Break</b>  |
| 1030-1100 | 2.4  | EVANS, G. T., D. C. ORR, D. G. PARSONS, and P. J. VEITCH. A non-parametric method for estimating biomass from trawl surveys, with Monte Carlo confidence intervals.         |
| 1100-1130 |      | <b>Poster Pursuit:</b> POSTER AUTHORS. 5 minute presentations (max. 3 slides) of posters P.6 to P.11.   |
| 1130-1200 | 2.5  | HARBITZ, A. A Bayesian-adaptive approach to sampling design with application to shrimp abundance surveys in the Barents Sea.  |
| 1200-1300 |      | <b>Lunch</b>  |
| 1300-1330 | 2.6  | CARLSSON, D., O. FOLMER, P. KANNEWORFF, M. KINGSLEY, and M. PENNINGTON. A trawl survey for <i>Pandalus borealis</i> in West Greenland.                                      |
| 1330-1400 | 2.7  | CLARK, S. H., S. CADRIN, D. SCHICK, P. DIODATI, M. ARMSTRONG, and D. MCCARRON. The Gulf of Maine northern shrimp fishery □a review of the record.                           |
| 1400-1430 | 2.8  | CLARK, J., G. BISHOP, and T. KOENEMAN. Estimation of harvest rates in the spot shrimp pot fishery in Southeast Alaska using pre- and post-fishery stock assessment surveys. |
| 1430-1500 | 2.9  | HANNAH, R. W. By-catch reduction in an ocean shrimp ( <i>Pandalus jordani</i> ) trawl from a simple modification to the trawl footrope.                                     |
| 1500-1530 |      | <b>Break</b>  |
| 1530-1550 | 2.10 | SAVARD, L. Variations in the growth pattern of northern shrimp ( <i>Pandalus borealis</i> ) in the Gulf of St. Lawrence.  |
| 1550-1610 | 2.11 | S VIGNY, J.-M., L. SAVARD, and D. G. PARSONS. Genetic characterization of the northern shrimp <i>Pandalus borealis</i> , in the Northwest Atlantic.                         |
| 1610-1630 | 2.12 | TVEITE, S. Fixed stations survey for shrimp abundance indices, 15 years of investigations in the Norwegian Deepes and Skagerrak.  |
| 1630-1700 |      | <b>Discussion</b>   |

**SESSION 2: POSTERS**

- P.9. BOUCHARD, H., J. LAMBERT, and L. SAVARD. Catching juvenile northern shrimp (*Pandalus borealis*) in the St. Lawrence estuary with a rigid frame trawl.
- P.10. GALLAGHER, C. M., R. HANNAH, and G. SYLVIA. Biological and economic yield-per-recruit: alternative strategies for managing Pacific Ocean shrimp (*Pandalus jordani*).
- P.11. KINGSLEY, M.C.S., and C. HVINGEL. Jack-knifing an assessment model for the West Greenland stock of *Pandalus borealis*.
- P.12. SKLADTIR, U. Age assessment of *Pandalus borealis* by deviation method.

**FRIDAY, 10 SEPTEMBER 1999****SESSION 3. MANAGEMENT****Chair: Don G. Parsons**

- 0830-0900 3.1 **Invited Paper:** PARSONS, D., L. SAVARD, C. FU, and P. KOELLER. The Traffic Light: a colourful but ugly approach to precautionary shrimp stock management.
- 0900-0930 3.2 HARBO, R., L. CONVEY, J. BOUTILLIER, and D. HAY. Pacific coast shrimp trawl fisheries: new management and assessment co-management programs.
- 0930-1000 3.3 FU, C., T. J. QUINN, and G. H. KRUSE. Analyses of harvest strategies for Pandalid shrimp populations.
- 1000-1030 **Break**
- 1030-1100 3.4 BISHOP, G. H., T. M. KOENEMAN, and C. A. BOTELHO. Development of a management and stock assessment program for the pot shrimp fishery for *Pandalus platyceros* in southeastern Alaska.
- 1100-1130 3.5 BOND, J. A., and J. A. BOUTILLIER. A progress report on the control of growth and recruitment overfishing in the shrimp trap fishery in British Columbia.
- 1130-1200 Discussion
- 1200-1300 **Lunch**

**SESSION 4. HARVESTING AND PROCESSING****Chair: John Angel**

- 1300-1330 **Poster Pursuit:** POSTER AUTHORS. 5 min presentations (maximum 3 slides) of posters. P.12 to P.17.
- 1330-1400 4.1 **Invited Paper.** LARSEN, R. Modern trawling and by-catch reducing devices in the North Atlantic shrimp fisheries
- 1400-1430 4.2 **Invited Paper.** ANGEL, J. Management of the Canadian shrimp fishery.
- 1430-1500 4.3 SCHICK, D. F., and M. BROWN. Gear testing in the northern shrimp fishery in the Gulf of Maine to improve size selectivity, reduce by-catch and decrease production loss.
- 1500-1530 **Break**

1530-1600 4.4 **Invited Paper.** HURTUBISE, R. Trends in processing and marketing in the Gulf of Maine shrimp fishery.

1600-1630 4.5 **Invited Paper:** BJARNESON, P. The Icelandic shrimp industry.

1630-1730 **Discussion and Final Wrap-up**

#### SESSIONS 3 AND 4: POSTERS

P.13. KUTZIKOWSKI, V. H., R. HANNAH, G. SYLVIA, and M. T. MORRISSEY. Finfish by-catch effects on the quality of ocean shrimp, *Pandalus jordani*.

P.14 CLARKE, J., and W. E. L. CLAYTON. Monitoring the shrimp trawl fishery in British Columbia.

P.15 KULKA, D., D. G. PARSONS, and G. LILLY. Livin' on the edge.



**Lobster Race Participants:** S. Clark, L. Savard, B. Bergström, D. G. Parsons plus four numbered lobsters

## LIST OF PARTICIPANTS

## Co-conveners:

Koeller, P. A. (NAFO)  
 Dept. of Fisheries and Oceans  
 Bedford Institute of Oceanography  
 P. O. Box 1006  
 Dartmouth, Nova Scotia  
 Canada B2Y 4A2  
 Phone: +1-902-426-5379  
 Fax: +1-902-426-1862  
 E-mail: [koellerp@mar.dfo-mpo.gc.ca](mailto:koellerp@mar.dfo-mpo.gc.ca)

Boutillier, J. (PICES)  
 Pacific Biological Station  
 Nanaimo, British Columbia  
 Canada V9R 5R6  
 Phone: +1-250-756-7048  
 Fax: +1-250-756-7053  
 E-mail: [boutillierj@dfo-mpo.gc.ca](mailto:boutillierj@dfo-mpo.gc.ca)

Tveite, S. (ICES)  
 Institute of Marine Research,  
 Flodevigen Research Station  
 N-4817 His Norway  
 Phone: +47 37059054  
 Fax: +47 37059001  
 E-mail: [stein.tveite@imr.no](mailto:stein.tveite@imr.no)

## Canada

- Angel, J. Canadian Association of Prawn Producers, P. O. Box 1C1, Head of St. Margarets Bay, NS B0J 1R0  
 Phone: +1-902-826-7765 – Fax: +1-902-826-7065 – E-mail: [jangel@navnet.net](mailto:jangel@navnet.net)
- Atkinson, D.B. Science Branch, Dept. of Fisheries and Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1  
 Phone: +1-709-772-2052 – Fax: +1-709-772-4188 – E-mail: [atkinsonb@dfo-mpo.gc.ca](mailto:atkinsonb@dfo-mpo.gc.ca)
- Best, P.S. Dept. of Sustainable Development Gov't of Nunavut, Box 2410 Iqaluit, Nunavut X0A 0 H0  
 Phone: +1-867-975-5001 – Fax: +1-867-975-5096 – E-mail: [pbest@gov.nu.ca](mailto:pbest@gov.nu.ca)
- Boisvert, D. Fisheries and Oceans (Management), 104 Dalhousie, Quebec City, Quebec G1K 7Y7  
 Phone: +1-418-648-3236 – Fax: +1-418-649-8002
- Bouchard, H. Maurice-La Montagne Institute, Fisheries and Oceans, 850 Rte de la Mer, Mont-Joli, P.Q. G5H 3Z4  
 Phone: +1-418-775-0515 – Fax: +1-418-775-0740 – E-mail: [bouchardh@dfo-mpo.gc.ca](mailto:bouchardh@dfo-mpo.gc.ca)
- Brodie, W.B. Science Branch, Dept. of Fisheries and Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1  
 Phone: +1-709-772-3288 – Fax: +1-709-772-4188 – E-mail: [brodieb@dfo-mpo.gc.ca](mailto:brodieb@dfo-mpo.gc.ca)
- Bowering, W.R. Science Branch, Dept. of Fisheries and Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1  
 Phone: +1-709-772-2054 – Fax: +1-709-772-4188 – E-mail: [boweringb@dfo-mpo.gc.ca](mailto:boweringb@dfo-mpo.gc.ca)
- Clarke, J. Archipelago Marine Research Ltd., 200-525 Head St., Victoria BC V9A 5S1  
 Phone: +1-250-383-4535 – Fax: +1-250-383-0103 – E-mail: [jasonc@archipelago.bc.ca](mailto:jasonc@archipelago.bc.ca)
- Clayton, W. E. L. IEC Collaborative Mar. Res. and Development Ltd., 4829 Maplegrove Street, Victoria BC V8Y 3B9  
 Phone: +1-250-658-0179 – Fax: +1-250-658-4709 – E-mail: [clayton@ieccorporate.com/  
claytonssig@pacificcoast.net](mailto:clayton@ieccorporate.com/claytonssig@pacificcoast.net)
- Convey, L. Dept. of Fisheries and Oceans, 3225 Stephenson Pt. Rd., Nanaimo, BC  
 Phone: +1-250-756-7163 – Fax: +1-250-756-7162 – E-mail: [conveyl@pac.dfo-mpo.gc.ca](mailto:conveyl@pac.dfo-mpo.gc.ca)
- Covey, M. Dept. of Fisheries and Oceans, P. O. Box 1006, Dartmouth, NS B2Y 4A2  
 Phone: +1-902-426-7744 – Fax: +1-902-426-1862 – E-mail: [coveym@mar.dfo-mpo.gc.ca](mailto:coveym@mar.dfo-mpo.gc.ca)
- Dooley, T.F. Dept. of Fisheries and Aquaculture, Gov't of Nfld. & Lab., P. O. Box 8700, St. John's, Nfld. A1B 4J6  
 Phone: +1-709-729-0335 – Fax: +1-709-729-6082 – E-mail: [tdooley@mail.gov.nf.ca](mailto:tdooley@mail.gov.nf.ca)
- Eagles, M. Dept. of Fisheries and Oceans, 176 Portland St., Dartmouth, NS  
 Phone: +1-902-426-1782 – Fax: +1-902-426-9683 – E-mail: [eaglesm@mar.dfo-mpo.gc.ca](mailto:eaglesm@mar.dfo-mpo.gc.ca)
- Gadhi, Z. 22, Saint-Laurent, Ouest # 309, Rimouski, Quebec  
 Phone: +1-418-722-8342 – E-mail: [zine-al-abidine.gadhi@cgocable.ca](mailto:zine-al-abidine.gadhi@cgocable.ca)
- Garrity, C. Micowave Group – Ottawa-River Inc., 3954 Armitage Ave., RR#1 Dunrobin, Ontario  
 Phone: +1-613 832 0411 – E-mail: [icedoctors@igs.net](mailto:icedoctors@igs.net)
- Gaudet, M. 22 St. Pierre Blvd. East, Caraquet, NB E1W 1B6  
 Phone: +1-506-726-2400 – Fax: +1-506-726-2419 – E-mail: [mariog@gov.nb.ca](mailto:mariog@gov.nb.ca)
- Halliday, R.G. Marine Fish Div., Dept. of Fisheries & Oceans, BIO, P. O. Box 1006, Dartmouth, NS B2Y 4A2  
 Phone: +1-902-426-3240 – E-mail: [hallidayr@mar.dfo-mpo.gc.ca](mailto:hallidayr@mar.dfo-mpo.gc.ca)
- Johnson, B. Dept. of Fisheries & Aquaculture, Gov't of Nfld & Lab., P. O. Box 8700, St. John's, Nfld. A1B 4J6  
 Phone: +1-709-429-3766 – Fax: +1-709-729-1881 – E-mail: [bjohnson@mail.gov.nf.ca](mailto:bjohnson@mail.gov.nf.ca)

- Khadijo, O. 22, Rue Saint Laurent Quest, App. # 309 – Rimouski, Quebec G5L 8B4  
Phone: +1-418-722-8342 – E-mail: [kouahbi@hotmail.com](mailto:kouahbi@hotmail.com)
- Koke, B. Dept. of Fisheries and Oceans, 148 Port Augusta St., Comox BC  
Phone: +1-250-339-2809 – Fax: +1-250-339-4612 – E-mail: [kokeb@pac.dfo-mpo.gc.ca](mailto:kokeb@pac.dfo-mpo.gc.ca)
- Kulka, D.W. Science Branch, Dept. of Fisheries & Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1  
Phone: +1-709-772-2064 – Fax: +1-709-772-5469 – E-mail: [kulkad@dfo-mpo.gc.ca](mailto:kulkad@dfo-mpo.gc.ca)
- Lilly, G.R. Science Branch, Dept. of Fisheries & Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1  
Phone: +1-709-772-0568 – Fax: +1-709-772-4188 – E-mail: [lillyg@dfo-mpo.gc.ca](mailto:lillyg@dfo-mpo.gc.ca)
- Logan, D. BC Beam Trawlers' Assn., #100+1-5764 Turner Road., Nanaimo, BC V9T 6M7  
Phone: +1-250-751-0075 – Fax: +1-250-751-0875 – E-mail: [bcbtal@bc.sympatico.ca](mailto:bcbtal@bc.sympatico.ca)
- Logan, S. BC Beam Trawlers' Assn., #100+1-5764 Turner Road., Nanaimo, BC V9T 6M7  
Phone: +1-250-751-0075 – Fax: +1-250-751-0875 – E-mail: [bcbtal@bc.sympatico.ca](mailto:bcbtal@bc.sympatico.ca)
- MacKinnon, C.F. Fisheries & Aquaculture Policy, Planning 7 Coastal Resources, Bank of Montreal Building,  
7<sup>th</sup> Floor, 5151 George St., P. O. Box 2223, Halifax, NS B3J 3C4  
Phone: +1-902-424-0349 – Fax: +1-902-424-4671 – E-mail: [mackinnoc@gov.ns.ca](mailto:mackinnoc@gov.ns.ca)
- Mohn, R. Marine Fish Div., Dept. of Fisheries and Oceans, BIO, P. O. Box 1006, Dartmouth, NS B2Y 4A2  
Phone: +1-902-426-4592 – Fax: +1-902-426-1506 – E-mail: [mohnr@mar.dfo-mpo.gc.ca](mailto:mohnr@mar.dfo-mpo.gc.ca)
- Moores, J. Dept. of Fisheries & Oceans, 200 Kent St., Ottawa, Ontario K1A 0E6  
Phone: +1-613-990-0285 – Fax: +1-613-954-0807 – E-mail: [mooresj@dfo-mpo.gc.ca](mailto:mooresj@dfo-mpo.gc.ca)
- Morrison, J. Dept. of Fisheries and Oceans, 3225 Stephenson Pt. Rd., Nanaimo BC  
Phone: +1-250-756-7233 – Fax: +1-250-756-0332 – E-mail: [morrisonj@dfo-mpo.gc.ca](mailto:morrisonj@dfo-mpo.gc.ca)
- Osborne, B. 5151 George St., NS Dept. of Fisheries and Aquaculture, Halifax, NS B3J 3C4  
Phone: +1-902-424-0352 – Fax: +1-902-424-4671 – E-mail: [fish.osborne@gov.ns.ca](mailto:fish.osborne@gov.ns.ca)
- Orr, D.C. Dept. of Fisheries and Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1  
Phone: +1-709-772-7343 – Fax: +1-709-772-4105 – E-mail: [orrd@dfo-mpo.gc.ca](mailto:orrd@dfo-mpo.gc.ca)
- Parsons, D. G. Dept. of Fisheries and Oceans, Science Branch, P. O. Box 5667, St. John's, Nfld. A1C 5X1  
Phone: +1-709-772-2093 – Fax: +1-709-772-4188 – E-mail: [parsons@athena.nwafc.nf.ca](mailto:parsons@athena.nwafc.nf.ca)
- Perry, I. Pacific Biological Station, Nanaimo, BC V9R 5K6  
Phone: +1-250-756-7137 – E-mail: [perryi@pac.dfo-mpo.gc.ca](mailto:perryi@pac.dfo-mpo.gc.ca)
- Ramseier, R. O. Microwave Group – Ottawa-River Inc., 3954 Armitage Ave., RR#1 Dunrobin, Ontario  
Phone: +1-613-832-0411 – E-mail: [icedoctors@igs.net](mailto:icedoctors@igs.net)
- Saint-Cyr, J. FRAPP Inc., 278 Avenue des Pêcheurs, Shippagan, NB  
Phone: +1-506-336-1414 – Fax: +1-506-336-1415 – E-mail: [frapp@nbnet.nb.ca](mailto:frapp@nbnet.nb.ca)
- Savard, L. Dept. of Fisheries and Oceans, Maurice Lamontagne Inst., Box 1000, Mont-Joli, Quebec G5H 3Z4  
Phone: +1-418-775-0621 – Fax: +1-418-775-0740 – E-mail: [savardl@dfo-mpo.gc.ca](mailto:savardl@dfo-mpo.gc.ca)
- Sévigny, J.-M. Maurice Lamontagne Institute, DFO, 850 Route de la Mer Mont-Joli Quebec  
Phone: +1-418-775-0636 – Fax: +1-418-775-0740 – E-mail: [sevignyjm@dfo-mpo.gc.ca](mailto:sevignyjm@dfo-mpo.gc.ca)
- Smith, S.J. Dept. of Fisheries and Oceans, BIO, P. O. Box 1006, Dartmouth, NS B2Y 4A2  
Phone: +1-902-426-3317 – Fax: +1-902-426-1862 – E-mail: [smithsj@mar.dfo-mpo.gc.ca](mailto:smithsj@mar.dfo-mpo.gc.ca)
- Veitch, P.J. Dept. of Fisheries and Oceans, P. O. Box 5667, St. John's, Nfld. A1C 5X1  
Phone: +1-709-772-4562 – E-mail: [veitchp@dfo-mpo.gc.ca](mailto:veitchp@dfo-mpo.gc.ca)
- West, K. Dept. of Fisheries and Oceans, 100 Annacis Parkway, Unit 3, Delta, BC  
Phone: +1-604-666-6390 – Fax: +1-604-666-7112 – E-mail: [westk@pac.dfo-mpo.gc.ca](mailto:westk@pac.dfo-mpo.gc.ca)
- Zhang, Y. Pacific Biological Station, Nanaimo, BC V9R 5K6  
Phone: +1-250-756-7102 – E-mail: [zhangz@dfo-mpo.gc.ca](mailto:zhangz@dfo-mpo.gc.ca)

#### Denmark

- Carlsson, D. M. Greenland Institute of Natural Resources, Pilestraede 52, P.O Box 2151, Copenhagen K.  
Phone: +45 33 69 34 57 – Fax: +45 33 69 34 06 – E-mail: [danmc@inet.uni2.dk](mailto:danmc@inet.uni2.dk)
- Kanneworff, P. Greenland Institute of Natural Resources, Pilestraede 52, P.O Box 2151, Copenhagen K.  
Phone: +45 33 69 34 56 – Fax: +45 33 69 34 06 – E-mail: [grfipka@inet.uni2.dk](mailto:grfipka@inet.uni2.dk)
- Pedersen, S. A. Greenland Institute of Natural Resources, c/o Danish Fisheries Research Institute,  
Kavalergaarden 6, 2920 Charlottenlund  
Phone: +45 33 96 3423 – Fax: +45 33 96 3434 – E-mail: [sap@dfu.min.dk](mailto:sap@dfu.min.dk)
- Munch-Petersen, S. Charlottenlund Castle, Charlottenlund, Copenhagen  
Phone: +45 33 96 33 90 – Fax: +45 33 96 33 33 – E-mail: [smp@dfu.min.dk](mailto:smp@dfu.min.dk)

#### Faroe Islands

- Nicolajsen, A. Fiskorannsóknarstovan, Noatun, P.O.Box 3051, Torshavn FR-110  
Phone: +298 31 50 92 – Fax: +298 31 82 64 – E-mail: [arninic@frs.fo](mailto:arninic@frs.fo)

**Germany**

- Cornus, H.P. Institut für Seefischerei, Palmaille 9, D-22767, Hamburg  
Phone: +49 40 38905194 – Fax: +49 40 38905263 – E-mail: [cornus.ish@bfa-fisch.de](mailto:cornus.ish@bfa-fisch.de)
- Rätz, H-J. Institute of Sea Fisheries, Palmaille 9, D-22767 Hamburg  
Phone: +49 40 389 05169 – Fax: +49 40 389 05263 – E-mail: [hajoraetz@msn.com](mailto:hajoraetz@msn.com)
- Stein, M. Institut für Seefischerei, Palmaille 9, D-22767 Hamburg  
Phone: +49 40 38905 174 – Fax: +49 40 38905 263 – E-mail: [stein.ish@bfa-fisch.de](mailto:stein.ish@bfa-fisch.de)

**Greenland**

- Hvingel, C. Greenland Institute of Natural Resources, P. O. Box 570, DK-3900 Nuuk  
Phone: +299 321095 – Fax: +299 325957 – E-mail: [hvingel@natur.gl](mailto:hvingel@natur.gl)
- Kingsley, M.C.S. Greenland Institute of Natural Resources, P. O. Box 570, DK-3900, Nuuk  
Phone: +299 32 1095 – Fax: +299 32 5957 – E-mail: [mcsk@natur.gl](mailto:mcsk@natur.gl)
- Siegstad, H. Greenland Institute of Natural Resources, P. O. Box 570, Nuuk  
Phone: +299 321095 – Fax: +299 325957 – E-mail: [helle@natur.gl](mailto:helle@natur.gl)

**Iceland**

- Bjarnason, P. Fisheries Association of Iceland, Vanabyggd 6e Akureyri, Reyjavik  
Phone: +461 2966/551 0500 – Fax: +461 2068/552 7969 – E-mail: [petur@unak.is](mailto:petur@unak.is) or [petur@fiskifelag.is](mailto:petur@fiskifelag.is)
- Skúladóttir, U. Marine Research Institute, Skúlagata 4, P. O. Box 1390, 121 – Reykjavik  
Phone: +354 552 0240 – Fax: +354 562 3790 – E-mail: [unnur@hafro.is](mailto:unnur@hafro.is)
- Stefansson, G. Marine Research Institute, Skúlagata 4, Pósthólf Box 1390, 121 Reykjavik  
Phone: +354 552 0240 – Fax: +354 562 3790 – E-mail: [gunnar@hafro.is](mailto:gunnar@hafro.is)

**Japan**

- Kawahara, S. National Research Institute of Far Seas Fisheries, 5-7-1 Orido, Shimizu 424  
Phone: +81 543 36 6051 – Fax: +81 543 35 9642 – E-mail: [kawahara@enyo.affrc.go.jp](mailto:kawahara@enyo.affrc.go.jp)
- Minami, T. Japan Sea National Fisheries Institute, Suidocho +1-5939-22, Niigata 95+1-8121  
Phone: +81-25-228-0546 – Fax: +81-25-224-0950 – E-mail: [mtakashi@jsnf.affrc.go.jp](mailto:mtakashi@jsnf.affrc.go.jp)

**Luxembourg (G.D.)**

- Cross, D.G. EUROSTAT, European Commission, Jean Monnet Bldg, B.P. 1907  
Phone: +352 4301 37249 – Fax: +352 4301 37318 – E-mail: [david.cross@eurostat.cec.be](mailto:david.cross@eurostat.cec.be)

**Norway**

- Aschan, M. Fiskeriforskning, N-9291 Tromsø  
Phone: +47 77 629000/ 29092 – Fax: +47 77 629100 – E-mail: [michaela.aschan@fiskforsk.norut.no](mailto:michaela.aschan@fiskforsk.norut.no)
- Hansen, H. Ø. Fiskeriforskning, N-9291 Tromsø  
Phone: +47 77 629000/29234 – Fax: +47 77 629100 – E-mail: [Hege.Hansen@fiskforsk.norut.no](mailto:Hege.Hansen@fiskforsk.norut.no)
- Harbitz, A. Fiskeriforskning, N-9291 Tromsø  
Phone: +47 77 629000/29057 – Fax: +47 77 629100 – E-mail: [alf.harbitz@fiskforsk.norut.no](mailto:alf.harbitz@fiskforsk.norut.no)
- Larsen, R.B. The Norwegian College of Fishery College, University of Tromsø (NFH-Uity) N-9037 Tromsø  
Phone: +47 77 646000 – Fax: +47 77 646020 – E-mail: [rogerl@nfh.uit.no](mailto:rogerl@nfh.uit.no)

**Portugal**

- Alpoim, R. Inst. de Investigacao das Pescas e do Mar (IPIMAR), Av. de Brasilia, 1400 Lisbon, Portugal  
Phone: +3511 302 7000 – Fax: +3511-301-5948 – E-mail: [ralpoim@ipimar.pt](mailto:ralpoim@ipimar.pt)
- Avila de Melo, A. Inst. de Investigacao das Pescas e do Mar (IPIMAR), Av. de Brasilia, 1400 Lisbon, Portugal  
Phone: +3511 302 7000 – Fax: +3511-301-5948 – E-mail: [amelo@ipimar.pt](mailto:amelo@ipimar.pt)

**Russia**

- Babayan, V.K. Russian Federal Research Inst. of Fish. & Oceanog. (VNIRO), 17, V. Krasnoselskaya, Moscow, 107140  
Phone: +70 95 264 9532 – Fax: +70 95 264 9187 – E-mail: [babayan@vniro.msk.su](mailto:babayan@vniro.msk.su)
- Berenboim, B. Knipovich Polar Research Institute of Marine Fisheries and Oceanography (PINRO),  
6 Knipovich Street, Murmansk 183763  
Phone: +47 789 10 518 – E-mail: [borisber@pinro.murmansk.ru](mailto:borisber@pinro.murmansk.ru)
- Buyanovsky, A.I. VNIRO, V.-Krasnoselskaja 17, Moscow B-140, 107140  
Phone: +7-095-264 9054 – Fax: +7-095-264 9187 – E-mail: [perelad@dataforce.net](mailto:perelad@dataforce.net)
- Ivanov, B.G. VNIRO, V.-Krasnoselskaja 17, Moscow B-140, 107140  
Phone: +70 95 264 7010 – Fax: +70 95 264 9187 – E-mail: [inverteb@mx.iki.rssi.ru](mailto:inverteb@mx.iki.rssi.ru)
- Okhanov, A. Rep. Russ. Fed. On Fish., Welsford Place, Ste. 2202, 2074 Robie St., Halifax, NS, Canada B3K 5L3  
Phone: +1-902-425-6270 – Fax: +1-902-423-0943
- Samoilova, E.N. PINRO, 6 Knipovich St, Murmansk 183763  
Phone: +47 815 2 473461 – Fax: +47 789-10518
- Shibanov, V.N. Knipovich Polar Research Institute of Marine Fisheries and Oceanography (PINRO),  
6 Knipovich Street, Murmansk 183763  
Phone: +7 815 2 47 34 61 – Fax: +47 789 10518 – E-mail: [inter@pinro.murmansk.ru](mailto:inter@pinro.murmansk.ru)
- Troyanovsky, F. PINRO, 6 Knipovich Street, Murmansk, 183763  
Phone: +47 815 2 472532 – Fax: +47 789 10518 – E-mail: [inter@pinro.murmansk.ru](mailto:inter@pinro.murmansk.ru)

**Spain**

- De Cárdenas, E. Institute Español de Oceanografía, Avenida de Brasil 31, 28020 Madrid, Spain  
Phone: +34 91 5974443 – Fax: +34 91 5974770 – E-mail: [e.decardenas@md.ieo.es](mailto:e.decardenas@md.ieo.es)
- Junquera, S. Instituto Español de Oceanografía, Cabo Estay – Canido, Aptdo 1552, E-36280 Vigo  
(Pontevedra), Spain  
Phone: +34 9 86 49 2111 – Fax: +34 9 86 49 2351 – E-mail: [susana.junquera@vi.ieo.es](mailto:susana.junquera@vi.ieo.es)
- Vazquez, A. Instituto Investigaciones Marinas, Eduardo Cabello 6, 36208 Vigo, Spain  
Phone: +34 9 86 23 1930 – Fax: +34 9 86 29 2762 – E-mail: [avazquez@iim.csic.es](mailto:avazquez@iim.csic.es)

**Sweden**

- Bergström, B.I. Kristineberg Marine Research Station, S-450 34 Fiskebäckskil  
Phone: +(0)523 18548 – Fax: +(0)523-18502 – E-mail: [b.bergstrom@kmf.gu.se](mailto:b.bergstrom@kmf.gu.se)

**Ukraine**

- Abramovich, V.V. Fleet Manager, 6, 1. Kozlova str., 334500, Kerch, Republic of Crimea  
Phone: +(06561) 2-14-67 – Fax: +(06561) 2-35-49 or +(06561) 2-13-35
- Chernik, V. Ukrainian State Committee of Fisheries, 82A Turgenivska St., Kyiv 252053  
Phone: +38-044-226-2405
- Kachurenko, V. Ministry of Foreign Affairs of Ukraine, 1, Mykhaylyvska Str., Kyiv 252018  
Phone: +38-044-212-8531 – Fax: +38-044-212-8227
- Litvinov, V. Ukrainian State Committee of Fisheries, 82A Turgenivska St., Kyiv 252053  
Phone: +38-044-216-6883 – Fax: +38-044-226-2405

**United States of America**

- Anderson, P.J. National Marine Fisheries Service, Alaska Fisheries Science Center, Kodiak Lab.,  
1532E Kouskov St., Kodiak, AK 99615-1638  
Phone: +1-907-481-1723 – Fax: +1-907-481-1701 – E-mail: [paul.j.anderson@noaa.gov](mailto:paul.j.anderson@noaa.gov)
- Bishop, G.H. Alaska Dept. Fish & Game, Commercial Fish. Div., P. O. Box 240020, Douglas, AK 99824-0020  
Phone: +1-907-465-4269 – Fax: +1-907-465-4944 – E-mail: [gretchen\\_bishop@fishgame.state.ak.us](mailto:gretchen_bishop@fishgame.state.ak.us)
- Cadrin, S. National Marine Fisheries Service, NEFSC, 166 Water St., Woods Hole, MA 02543-1026  
Phone: +1-508 495 2335 – Fax: +1-508 495 2393 – E-mail: [steven.cadrin@noaa.gov](mailto:steven.cadrin@noaa.gov)
- Clark, S. National Marine Fisheries Service, NEFSC, 166 Water St., Woods Hole, MA 02543-1026  
Phone: +1-508-495-2312 – Fax: +1-508-495-2258 – E-mail: [stephen.h.clark@noaa.gov](mailto:stephen.h.clark@noaa.gov)
- Fu, C. JCSFOS, 11120 Glacier Highway, Juneau, AK 001  
Phone: +1-907-465-6372 001 – Fax: +1-907-465-6320 – E-mail: [ftcf@uaf.edu](mailto:ftcf@uaf.edu)
- Gallagher, C. M. P.O. Box 'R', Corvallis, OR  
Phone: +1-541-754-4950 – Fax: +1-541-754-5032 – E-mail: [gallagch@ucs.orst.edu](mailto:gallagch@ucs.orst.edu)

Hannah, R. Oregon Department of Fish & Wildlife, 2040 SE Marine Science Dr., Newport, OR 97365  
Phone: +1-541-867-4741 – Fax: +1-541-867-0311 – E-mail: [bob.hannah@hmssc.orst.edu](mailto:bob.hannah@hmssc.orst.edu)

Hoover Krutzikowsky, V. Hatfield Marine Science Center, Oregon State University, 2040 Marine Science Dr.,  
Newport, OR 97365  
Phone: +1-541-574-7711 – E-mail: [hooverv@ucs.orst.edu](mailto:hooverv@ucs.orst.edu)

Hurtubise, R. Tang of the Sea Inc., Box 214, Standish, ME  
Phone: +1-207-642-4244 – Fax: +1-207-727-5866

Mayo, R.K. US Dept. of Commerce, NOAA/NMFS, NEFSC, 166 Water St., Woods Hole, MA 02543  
Phone: +1-508-495-2310 – Fax: +1-508-495-2393 – E-mail: [ralph.mayo@noaa.gov](mailto:ralph.mayo@noaa.gov)

Norton, J. P. O. Box 389, Portland, ME  
Phone: +1-207-879-2665 – Fax: +1-207-879-2666 – E-mail: [cozyharbor@worldnet.att.net](mailto:cozyharbor@worldnet.att.net)

Richards, A. National Marine Fisheries Service, NEFSC, 166 Water St., Woods Hole, MA 02543  
Phone: +1-508-495-2000 – Fax: +1-508-4985-2393 – E-mail: [arichard@whsun1.wh.who.edu](mailto:arichard@whsun1.wh.who.edu)

Schick, A. 1444 "Eye" St. NW, 6th Floor, Washington, DC 20005  
Phone: +1-202-289-6400 – Fax: +1-202-289-6051 – E-mail: [aschick@asmfc.org](mailto:aschick@asmfc.org)

Schick, D. Dept. Marine Resources, McKown Point W. Boothbay Hbr., ME  
Phone: +1-207-633-9500 – Fax: +1-207-633-9579 – E-mail: [dan.schick@state.me.us](mailto:dan.schick@state.me.us)

**NAFO SECRETARIAT**

T. Amaratunga, Assistant Executive Secretary  
F. D. Keating, Administrative Assistant  
D. C. A. Auby, Secretary  
S. M. Goodick, Accounting Officer  
B. L. Marshall, Statistical Clerk  
C. L. Kerr, Statistical/Reception Clerk

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

Chairman: R. K. Mayo

Rapporteurs: Various

### I. OPENING

The Committee met at the Holiday Inn, Dartmouth, Nova Scotia, Canada, during 13-17 September 1999, to consider and report on matters referred to it by the Scientific Council. Representatives from Canada, Denmark (in respect of the Faroe Islands and Greenland), Estonia, European Union (France, Germany, Portugal and Spain), Japan, Russian Federation and the United States of America. The Assistant Executive Secretary was in attendance.

The Chairman, R. K. Mayo (USA), opened the meeting by welcoming participants. The agenda was reviewed and a plan of work developed for the meeting. The agenda was **adopted** as presented in the Provisional Agenda (see Part E of this volume).

### II. MATTERS RELATED TO STOCK ASSESSMENTS

#### 1. Nomination of Designated Experts

STACFIS reviewed current vacancies in the list of Designated Experts for several stocks. After some deliberation, STACFIS nominated for the following:

- From the Science Branch, Northwest Atlantic Fisheries Centre, Department of Fisheries and Oceans, P. O. Box 5667, St. John's, Newfoundland A1C 5X1, Canada  
[Tel. No.: +1-709-772-2054 – Fax: +1-709-772-4188 – E-mail: [boweringr@df-mpo.gc.ca](mailto:boweringr@df-mpo.gc.ca) or [powerd@df-mpo.gc.ca](mailto:powerd@df-mpo.gc.ca)]  

for Greenland halibut in SA 2+3KLMNO	- W. R. Bowering
Roundnose grenadier in SA 2+3	- D. Power
- From the Instituto de Investigacao das Pescas e do Mar (IPIMAR), Av. Brasilia, 1400 Lisbon, Portugal [Tel. No.: +3511 302 7000 – Fax: +3511 301 5948 – E-mail: [ralpoim@ipimar.pt](mailto:ralpoim@ipimar.pt)]  

for American plaice in Div. 3M	- R. Alpoim
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- From the Greenland Institute of Natural Resources, P. O. Box 570, DK-3900 Nuuk, Greenland [Tel. No.: +299 321095 – Fax: +299 325957 – E-mail: [helle@natur.gl](mailto:helle@natur.gl)]  

for Redfish in SA 1	- H. Siegstad
Other Finfish in SA 1	- H. Siegstad
- From the Greenland Institute of Natural Resources, Box 2151, DK-1016, Copenhagen K, Denmark [Tel. No. +45 33 69 34 57 – Fax: +45 33 69 34 06 – E-mail: [danmc@inet.un2.dk](mailto:danmc@inet.un2.dk)]  

for Shrimp in Denmark Strait	- D. M. Carlsson
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STACFIS noted the Assistant Executive Secretary shall request confirmation on these nominations from the respective institution authorities.

### III. OTHER MATTERS

#### 1. **Review of SCR Documents (SCR Doc. 99/96)**

STACFIS reviewed a paper on "by-catch in the shrimp fisheries in the NAFO Regulatory and other areas".

The paper noted that in Div. 3M, redfish continues to be the most common by-catch, estimated at 216 tons in 1998 (compared to the peak 1993 catch of 11 970 tons). Greenland halibut by-catch was estimated at 57 tons, American plaice by-catch at 1.4 tons and cod by-catch was negligible. The latter two species are under moratorium. Biomass of these species was near or at their lowest recorded level.

In the area ranging from Davis Strait to Div. 2G, the paper reported that by-catch in the shrimp fisheries continues to be near lowest historic levels. Redfish continues to be the largest by-catch in northern Davis Strait, southern Davis Strait, and Div. 2G, estimated at 85 tons, 51 tons and 101 tons, respectively. These estimates are substantially lower than the peak year 1992 (1 951 tons for northern Davis Strait, 258 tons for southern Davis Strait, and 215 tons for Div. 2G). Greenland halibut is the only other species taken in significant amounts in these areas, with by-catches estimated at 11 tons in northern Davis Strait, 14 tons in southern Davis Strait and 14 tons in Div. 2G for 1998, well below peak amounts observed in the early-1990s.

It was stated that in Div. 2HJ+3K, catches of shrimp have risen significantly in recent years. However, the by-catch of groundfish in these areas has remained low. In 1998, by-catch of redfish was estimated at 23 tons in Div. 2HJ and 52 tons in Div. 3K. Greenland halibut by-catch was estimated at 101 tons in Div. 2HJ and 143 tons in Div. 3K. American plaice by-catch was estimated at 9 tons in Div. 2HJ and 66 tons in Div. 3K. Cod by-catch was less than 1 ton in each area.

The Nordmore grate is now mandatory, and the deployment of this exclusion device is perhaps the most important factor in keeping by-catch at low levels across all areas. Low abundance of the various groundfish species is also a factor. The grate is less effective in excluding young fish that are approximately the same width as the shrimp.

#### 2. **Other Business**

There being no other business, the Chairman thanked the members for their contributions, 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: V. N. Shibanov

Rapporteur: L. Motos

The Committee met at the Holiday Inn, Dartmouth, Nova Scotia, Canada, on 14 September 1999, to discuss various matters pertaining to statistics and fisheries research, as referred to it by the Scientific Council. Representatives attended from Canada, Denmark (in respect of Faroe Islands and Greenland), Estonia, European Union (France, Germany, Portugal and Spain), Iceland, Japan, Norway, Russian Federation and United States of America.

### 1. Opening

The Chairman opened the meeting by welcoming participants. L. Motos (EU Spain) was appointed rapporteur. The Provisional Agenda was reviewed and the Committee adopted the agenda.

### 2. Fisheries Statistics

#### a) Progress Report on Secretariat Activities in 1999

##### i) Acquisition of STATLANT 21 data

The Assistant Executive Secretary presented the updated table (since June 1999) of STATLANT 21A and 21B data received to 14 September 1999.

Country	STATLANT 21A (deadline, 15 May)			STATLANT 21B (deadline, 30 June)		
	1996	1997	1998	1996	1997	1998
BGR	-	-	-	-	-	-
CAN-M	20 May 97	22 Jun 98	10 May 99	04 Mar 98	12 Jan 99	-
CAN-N	16 May 97	02 Jun 98	14 Jul 99	15 Feb 99	14 Jul 99	-
CAN-Q	20 Jun 97	15 May 98	10 May 99	26 Aug 97	02 Sep 98	-
CUB	30 May 97	10 Aug 99	10 Aug 99	30 May 97	10 Aug 99	10 Aug 99
EST	17 Sep 97	27 May 98	17 May 99	17 Sep 97	27 May 98	-
E/DNK	02 Feb 99	02 Feb 99	07 Jun 99	23 Mar 99	23 Mar 99	-
E/FRA-M	No fishing	No fishing	No fishing	No fishing	No fishing	No fishing
E/DEU	04 Jun 97	23 Mar 98	23 Apr 99	24 Jun 97	23 Mar 98	27 Apr 99
E/NLD	No fishing	No fishing	No fishing	No fishing	No fishing	No fishing
E/PRT	14 May 97	24 Apr 98	26 Apr 99	04 Sep 97	14 Sep 98	27 Aug 99
E/ESP	07 Jun 97	14 Sep 98	01 Jun 99	23 Jun 98	14 Sep 98	07 Sep 99
E/GBR	16 Jul 97	30 Mar 99	11 May 99	30 Mar 99	30 Mar 99	-
FRO	24 Oct 97	03 Feb 99	-	-	-	-
GRL	06 Jun 97	28 May 98	28 May 99	03 Feb 99	03 Feb 99	-
ISL	16 May 97	24 Jul 98	07 Jun 99	12 Jun 97	12 Nov 98	-
JPN	24 Apr 97	14 Apr 98	29 Apr 99	24 Apr 97	14 Apr 98	14 Apr 99
KOR	No fishing	No fishing	No fishing	No fishing	No fishing	No fishing
LVA	17 Apr 97	22 Apr 98	14 May 99	17 Apr 97	04 Jun 98	14 May 99
LTU	17 Feb 98	17 Feb 98	-	17 Feb 98	-	-
NOR	22 May 97	20 Nov 98	25 May 99	18 Jun 97	-	-
POL	-	-	10 May 99	-	-	-
ROM	-	-	-	-	-	-
RUS	22 Jul 97	02 Apr 98	01 Jun 99	11 Jul 97	08 Jul 98	01 Jun 99
USA	-	-	-	-	-	-
FRA-SP	06 Mar 97	29 Jan 99	02 Jun 99	06 Mar 97	29 Jan 99	02 Jun 99
HND*	-	-	-	-	-	-
VEN*	-	-	-	-	-	-

- No data.

\* Non-Contracting Party.

ii) **Publication of statistical information**

There were no statistical publications since the June 1999 Meeting of STACREC. STACREC was informed that the Secretariat will publish *NAFO Statistical Bulletin* No. 44 containing 1994 data in 1999 should the USA STATLANT 21B data become available. The Assistant Executive Secretary informed STACREC that the fishery trends in recent years might also be published as an SCS Document when the data become available. STACREC noted the value of this update with respect to the forthcoming November/December 1999 ACFR Meeting at FAO in Rome.

b) **Review of SCR and SCS Documents**

No documents were presented at the current STACREC Meeting.

c) **NAFO Observer Protocol**

i) **Report of the *Ad hoc* Working Group on NAFO Observer Protocol**

This agenda item was discussed within the agenda of the Scientific Council Meeting.

The harmonized scientific protocol for the NAFO Observer Program was presented to the Standing Committee on International Control (STACTIC) at the September 1999 Meeting. The draft protocol was well received by STACTIC, who congratulated Scientific Council on its progress in the development of this important work. STACTIC had noted that issues of confidentiality of concern to Contracting Parties must still be addressed.

Instructions for observers to complete the data collection forms, coding and sampling procedures were not included with the draft scientific protocol, and STACTIC requested these elements be made available for review. STACREC **recommended** that *the Working Group on NAFO Observer Protocol communicates by e-mail with STACREC members during development of the coding and sampling procedures in order to ensure concurrence with the recommendations tabled by STACTIC for consideration during the proposed STACTIC intersessional meeting in 2000.*

STACTIC noted that several observer manuals are currently in use by Contracting Parties, and had proposed that an intersessional meeting be held, with Scientific Council representation to incorporate all inspection and scientific elements of the NAFO Observer Program into a harmonized reporting format. STACREC noted that the Scientific Council was in agreement with this proposal. STACREC **recommended** that *noting that STACTIC will call an intersessional meeting in 2000 on Observer Protocol, M. Showell (Canada) and D. Kulka (Canada) should represent Scientific Council at that meeting.*

d) **Report of CWP 18<sup>th</sup> Session**

As recommended by the Scientific Council in 1998, the Assistant Executive Secretary, T. Amaratunga, Chairman STACREC, V. N. Shibanov (Russia), and Canadian representative, M. Showell, represented the NAFO Scientific Council at the 18<sup>th</sup> Session of the Coordinating Working Party on Fisheries Statistics (CWP-18), in Luxembourg, 5-9 July 1999. The Chairman presented a summary of the CWP-18 Session, pertaining to the Scientific Council (see Report of CWP-18 Session – SCS Doc. 99/22).

Twenty-eight experts representing 11 member organizations participated in CWP-18. Working Documents related to different CWP agenda items were presented by NAFO representatives. Main issues for NAFO interventions included:

- Dissemination of statistical data among fisheries organizations and general public.
- Exercises for statistical data harmonization among agency databases (NAFO, CCAMLR, ICCAT, FAO).
- Statistical implications of Precautionary Approach (PA), progress of NAFO approach towards PA, and harmonization of PA terminology.
- Collection of statistical data of Elasmobranchs, including a list of species.
- New definition of fishing effort.
- Vessel monitoring system.

The list of Elasmobranch species inhabiting the NAFO Convention Area will be finalized intersessionally by the Assistant Executive Secretary in consultation with STACREC members and the results will be forwarded by the NAFO Secretariat to CWP/FAO to be included in the STATLANT 21 questionnaires.

STACREC was informed that the Secretariat for the Pacific Community (SPC) had invited CWP to have its 19<sup>th</sup> Session in Noumea, New Caledonia. The suggested dates were during the week of 9-13 July 2001. STACREC noted that the Assistant Executive Secretary and the STACREC Chairman should as usual attend that meeting. STACREC **recommended** that *the Assistant Executive Secretary and STACREC Chairman attend the 19th Session of CWP in Noumea, New Caledonia in July 2001.*

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

### 3. Other Matters

#### a) Progress Report on Biological Database Format Exchange

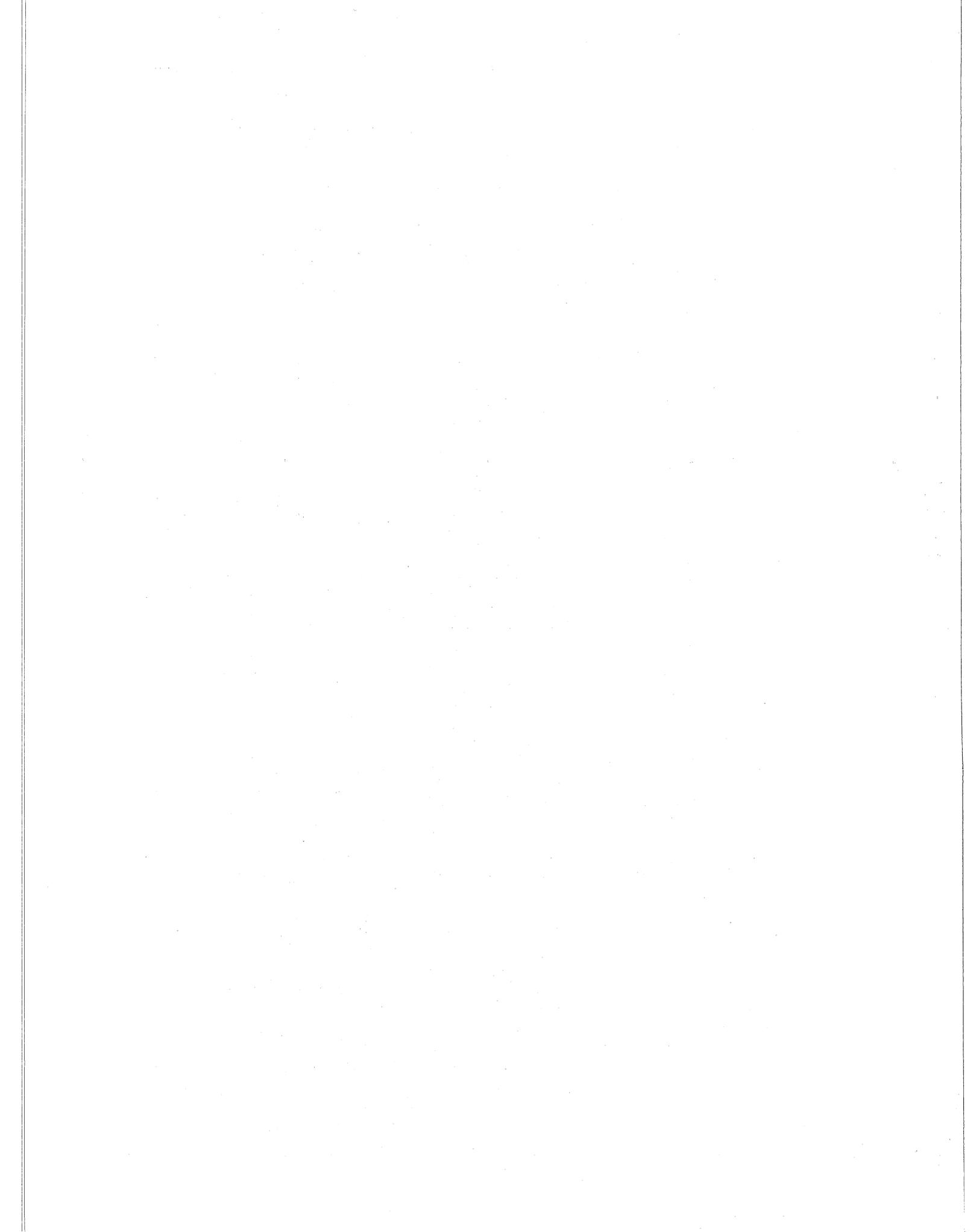
At the June 1999 Meeting, STACREC agreed that the Working Group on Biological Database Format Exchange use the Div. 3NO cod data as a pilot stock for checking a proposed spreadsheet. STACREC also agreed to work intersessionally to review this pilot dataset and evaluate whether the spreadsheet is adequate to compile the information for the other stocks. STACREC noted that the Working Group had not prepared any information for the current meeting in this regard, and agreed to defer the review of it to the Scientific Council Meeting of June 2000. In the interim, STACREC **recommended** that *the Designated Expert for cod in Div. 3NO complete the spreadsheet as proposed by the Working Group on Biological Database Format Exchange using the data for this stock and present it to the Scientific Council Meeting in June 2000.*

#### b) Other Business

No further business was presented for the consideration of the Committee.

#### c) Acknowledgements

The Chairman thanked all the participants for their valuable contributions and cooperation. He especially thanked the Assistant Executive Secretary and the other members of the NAFO Secretariat for the preparation of the documentation, and the Rapporteur for compiling the report. There being no further business, he closed the STACREC Meeting.



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

Chairman: W. B. Brodie

Rapporteur: W. B. Brodie

The Committee met at the Holiday Inn, Dartmouth, Nova Scotia, Canada, on 15 September 1999. In attendance were W. B. Brodie (Canada), V. A. Rikhter (Russian Federation), F. M. Serchuk (USA), M. Stein (EU-Germany), A. Vazquez (EU-Spain), and the Assistant Executive Secretary (T. Amaratunga). J. Morgan (Canada) provided information by correspondence.

#### 1. Opening

The Chairman welcomed the Committee, and the agenda was reviewed and adopted.

#### 2. Review of Scientific Publications

##### a) Status of Papers from June 1999 Meeting

STACPUB reviewed 12 SCR Documents (SCR Doc. 99/2, 7, 9, 10, 14, 16, 17, 18, 19, 24, 29 and 36) from the June 1999 Scientific Council Meeting, which authors had requested be considered for publication. Discussions were held on each paper, and the various recommendations made will be conveyed to the authors, along with comments offered by STACPUB members.

##### b) Status of Papers from 1999 Symposium

STACPUB noted that papers from the 1999 Symposium on "Pandalid Shrimp Fisheries – Science and Management at the Millennium" will undergo the usual peer review process for publication in a volume of the Journal of Northwest Atlantic Fisheries Science. The Symposium conveners have agreed to coordinate the review and editorial process in consultation with the Assistant Executive Secretary. Papers presented during the Symposium are due to be submitted to the Secretariat by the end of September 1999.

##### c) Other Reviews

The Secretariat had received the manuscript of the invitational paper by Sv. Aa. Horsted, "A Review of the cod fisheries at Greenland after the Second World War" and sent it to one of the Associate Editors of the NAFO Journal for an expedited technical/editorial review. It was noted that this was an extensive paper, which requires considerable amount of editorial work. It was agreed the Assistant Executive Secretary in consultation with the Associate Editor will address this additional work.

#### 3. Status of Scientific Council Studies

At the June 1999 meeting of STACPUB, three different options for the future of *Scientific Council Studies* were identified:

- (1) Continue to publish *Scientific Council Studies* as is (including non peer-reviewed research papers which are almost exclusively SCR Documents),
- (2) Continue to publish *Scientific Council Studies* but ONLY publish manuals, workbooks, database compilations, and papers of topical interest and importance to the current and future activities of the Council and its Standing Committees,
- (3) Discontinue the publication of *Scientific Council Studies*.

Further to intersessional communications among STACPUB members, and discussions at this meeting, it was decided that Option 2 was best. STACPUB particularly considered criteria for determining papers of topical interest, and agreed that they would include areas such as environmental studies, the Precautionary Approach, and occasional compilations (e.g. if there are a number of quality papers on a certain subject in a given year or over several years). It was noted that the availability of SCR Documents on the NAFO website means that they do not need to reappear in *Scientific Council Studies* as they have in the past. STACPUB **recommended** that *the final issue of Scientific Council Studies using the present criteria for selection of papers, should include papers of the June 1999 Meeting selected by STACPUB, and the paper selection using the new criteria come into effect thereafter.*

STACPUB also agreed the deadline for submission of the papers selected using the present criteria should be end of January 2000.

#### 4. **Review of Meeting with Editorial Board**

A meeting was held between STACPUB and members of the Editorial Board on 8 September 1999 at Holiday Inn, Dartmouth. In attendance were D.B. Atkinson, H. J. Rätz, and A. Richards of the Editorial Board, and A. Vazquez, M. Stein, and W. B. Brodie (Chair) representing STACPUB. Assistant Executive Secretary, T. Amaratunga was also present as a member of both groups. Participating in the discussion by conference call were P. Shelton (Editorial Board), J. Morgan (STACPUB), and F. Serchuk (both).

In summary, it was agreed that communication between the Editorial Board and STACPUB was a good idea. Editors thought that it would be most useful to have some editorial guidelines laid out to cover a number of areas (e.g. style and format guidelines, the extent to which English should be corrected). These would also be helpful to guest editors who are called upon to provide editorial services for NAFO symposium proceedings. STACPUB **recommended** that *the Assistant Executive Secretary take the lead in drafting editorial guidelines for Journal papers, and that STACPUB members and editors should provide input.*

It was generally agreed that editorial workloads associated with the NAFO publications were not excessive at present. It was also agreed that improvements should be possible in manuscript turnaround times between authors and editors, although the difficulty authors often have in adhering to deadlines was acknowledged. All Editors noted that they applied the same editorial standards to papers for the Journal and Studies. It was considered important that all documents should be submitted in both paper and electronic format.

Several ideas were discussed to try to increase the number of papers submitted to the Journal. These included identifying more SCR Documents submitted to Scientific Council meetings (STACPUB could take a more proactive role to encourage authors), increasing the exposure of the Journal (the NAFO Website should be useful in this regard), and have high quality papers which are submitted to other Journals but are more suitable for the NAFO Journal, be referred for consideration in the NAFO Journal. With regard to increased use of the NAFO Website and putting documents into an appropriate format (e.g. pdf files), STACPUB **recommended** that *additional resources be made available to the Secretariat, or technical support obtained in the form of service contracts, to develop the website for access to NAFO Journal publications.* It was noted that Volumes 22-24 of the Journal are now available in pdf format.

#### 5. **Other Matters**

- a) STACPUB **recommended** that *the blue covered SCS documents (i.e. final) containing meeting reports are distributed to Designated Experts and national representatives of the Scientific Council, in addition to the current mailing list and website circulation.*
- b) STACPUB endorsed the idea of a rotating membership, and **recommended** that *Scientific Council consider a change in its Rules of Procedure to accommodate the format of rotating membership of STACPUB.*

The following outlines the details:

The present Rules of Procedure for the Scientific Council only indicate (Rule 5.1.(c).(ii)) that STACPUB should consist of five other members (apart from the STACPUB Chairman) appointed by the Scientific Council.

The changes are proposed to the Rules of Procedure so that STACPUB appointments are for 3-year terms. It was also proposed that the Committee be enlarged to six members (apart from the STACPUB Chairman). Two appointed members of the Committee would be replaced each year. This would be facilitated by staggering the initial appointments to the Committee to 1-, 2- and 3-year terms. Thereafter, all appointments would be for 3-years. This would not only ensure continuity in the work of STACPUB – but also allow introduction of some new people with fresh ideas.

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

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

- c) STACPUB was informed that a publication of "NAFO century book – Northwest Atlantic Fisheries in the 20<sup>th</sup> Century" was being prepared by the Executive Secretary, L. I. Chepel, for publication by 2001. It was noted that the book intends to cover the history of ICNAF and NAFO. STACPUB was of the view that scientific material being incorporated in the book could often be relevant to the work of the Scientific Council. Accordingly, STACPUB recommended that, *any material related to ICNAF and NAFO scientific information being incorporated in the "NAFO Century book – Northwest Atlantic Fisheries in the 20<sup>th</sup> Century", should be reviewed by the Scientific Council prior to publication, and that this book when completed should be placed on the NAFO website.*

There being no other business, the Chairman thanked the members and the Assistant Executive Secretary for their work during STACPUB at this meeting and for the previous 2 years of the Chair's term. The meeting was adjourned.

