

PART B

Scientific Council Meeting, 18-22 September 2006

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SCIENTIFIC COUNCIL MEETING, 18-22 SEPTEMBER 2006

Chair: Antonio Vázquez

Rapporteur: Anthony Thompson

I. PLENARY SESSIONS

The Scientific Council met at the Holiday Inn Harbourview, Dartmouth, NS, Canada during 18-22 September 2006. Representatives attended from Canada, European Union (Germany, Portugal, Spain, and United Kingdom), Russian Federation and United States of America. The Scientific Council Coordinator of the NAFO Secretariat was in attendance.

The Executive Committee met prior to the opening session of the Council, and the Provisional Agenda, plan of work and other related matters were discussed.

The opening session of the Council was called to order at 0945 hours on 18 September 2006.

The Chair welcomed everyone to Dartmouth, Canada, and to this venue for the Meeting. The SC Coordinator, NAFO Secretariat, was appointed rapporteur.

The Provisional Agenda was **adopted** with some minor additions and deletions (Part D, Agenda II, this volume). Additional items may be addressed subject to Fisheries Commission requests during the course of this meeting.

The Council noted the Provisional Agenda for the Scientific Council Meeting on shrimp during 25 October-2 November 2006 in Copenhagen, Denmark, was circulated in accordance with the Rules of Procedures on 24 August 2006.

Applications for observer status were made by WWF – Atlantic Region for Andrea Carew, and by Ecology Action Centre for Mark Butler. Having no objections, Andrea Carew and Marc Butler were invited as observers to the meeting.

The Council and its Standing Committees met through 18-22 September 2006. The concluding session was called to order at 0900 hours on 22 September 2006 when the Council addressed the outstanding agenda items, and considered and **adopted** the reports of the Standing Committees (STACFIS, STACREC and STACPUB). The Scientific Council then considered and **adopted** its report of this meeting. The meeting was adjourned at 1315 hours on 22 September 2006.

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

II. REVIEW OF SCIENTIFIC COUNCIL RECOMMENDATIONS FROM JUNE 2006

The Council reviewed the following recommendation made in June with the following comments:

6. Progress Report on Special Session in 2007: Reproductive Potential: NAFO Scientific Council approved the approach of having PICES and ICES as co-convenors and **recommended** that *each of the organizations provide financial contributions towards the Symposium. It is anticipated that the Symposium will have a broad appeal and be well attended.*

This is addressed under Agenda Item VIII(1).

III. FISHERIES SCIENCE

The Council **adopted** the Report of the Standing Committee on Fisheries Science (STACFIS) as presented by the Chair, Don Power. The full report of STACFIS is at Appendix I.

IV. RESEARCH COORDINATION

The Council **adopted** the Report of the Standing Committee on Research Coordination (STACREC) as presented by the Chair, Konstantin Gorchinsky. The full report of STACREC is at Appendix II.

V. PUBLICATIONS

The Council **adopted** the Report of Standing Committee on Publications (STACPUB) as presented by the Chair, Manfred Stein. The full report of STACPUB is at Appendix III.

VI. SPECIAL REQUESTS FROM FISHERIES COMMISSION

1. Update on Advice for Northern Shrimp in Division 3M (Item 1)

Scientific Council reviewed the EU multi-species bottom trawl survey index and the commercial catch data for Div. 3M northern shrimp (*Pandalus borealis*). The fishery is regulated by effort control. Catches in 2004 were 45 000 tons then dropped during 2005 and 2006 to 11 500 tons and 3 700 tons (to September). Catches dropped due to economic rather than resource conditions. The female biomass index in the 2006 EU survey was similar to that of 2003-2005. Scientific Council concluded that there was no basis for change in the 2007 advice for this stock.

2. Update on Advice for Northern Shrimp in Divisions 3LNO (Item 1)

Scientific Council reviewed the Div. 3LNO northern shrimp (*Pandalus borealis*) biomass and abundance indices from the autumn 2005 and spring 2006 Canadian Research Vessel bottom trawl surveys. Biomass from the autumn 2005 and spring 2006 surveys were similar in magnitude to the high values seen in 2002-2005. Catches during 2005 and 2006 were 14 000 and 19 000 tons (to September) against 13 000 and 22 000 ton TACs for the respective years. It is anticipated that the entire 22 000 ton TAC will be taken during 2006. Based on this review, Scientific Council concluded that there is no basis to change its 2007 advice for this stock.

VII. REVIEW OF FUTURE MEETING ARRANGEMENTS

1. Scientific Council Meeting on Shrimp, October/November 2006

Following discussions in November 2005, the Scientific Council reconfirmed the dates of 25 October-2 November 2006 for this meeting to be held jointly with the ICES *Pandalus* Assessment Working Group (WGPAND) at the ICES Headquarters, Copenhagen, Denmark.

2. Scientific Council Meeting, June 2007

Scientific Council noted that its June meeting will be held on 7-21 June 2007 with the meeting venue being the Alderney Landing, Dartmouth, Nova Scotia, Canada.

3. **Annual Meeting, September 2007**

Scientific Council noted that the Annual Meeting will be held on 24-28 September 2007 in Lisbon, Portugal. Due to overlapping dates with the ICES Annual Science Conference, the Scientific Council Symposium will be held the week following the Annual Meeting during 1-3 October 2007 also in Lisbon, Portugal.

4. **Scientific Council Meeting on Shrimp, 2007**

The dates and venue of the Scientific Council meeting will be decided at the October-November 2006 Meeting. Provisional dates were previously set for 24 October-1 November 2007 (*NAFO Sci. Coun. Rep.*, 2005, p. 224).

5. **Scientific Council Meeting, June 2008**

The Council agreed to the tentative dates of 6-18 June 2008 for this meeting to be held at the Alderney Landing, Dartmouth, Nova Scotia, Canada. Exact dates will be decided in June 2007. It was noted that this reflects a desire to shorten this meeting by two days, but to ensure that the second Sunday could be used for report writing.

VIII. FUTURE SPECIAL SESSIONS

1. **Progress on Special Session in 2007: Reproductive Potential**

Arrangements are actively underway under the overall supervision of the lead co-convenor Ed Trippel. PICES have committed to be co-sponsors and will select a co-convenor. ICES have received a request from NAFO to become a co-sponsor and ICES will consider this at their annual meeting that is currently in progress.

2. **Topics for Future Special Sessions**

Scientific Council considers that it is timely to hold a second session on the role of marine mammals in the ecosystem directly following their September 2008 Annual Meeting. This topic was last addressed by a joint NAFO/ICES Symposium on 'The Role of Marine Mammals in the Ecosystem' held at their special session during 6-8 September 1995. Comments will be requested from WGHARP prior to making a final decision on the special session. Scientific Council may then contact a suitable person for guidance on how to proceed and to identify an appropriate lead convenor.

IX. SCIENTIFIC COUNCIL WORKING PROCEDURES/PROTOCOL

1. **Timetable and Frequency of Assessments**

The timetable and frequency of assessments was discussed by Scientific Council based on the opinions of designated experts given to the SC Coordinator by email. It was generally felt that the time period between full assessments could be extended for certain stocks based on a combination of their biological capacity for the rate of change of stock status and on current or anticipated fishing pressure. Interim monitoring would be undertaken every year for all stocks that were not receiving a full assessment. Any changes to the status quo would be addressed immediately by Scientific Council and, if necessary, revisions would be made to the advice previously given to Fisheries Commission.

Scientific Council **recommended** that *the period of assessment be extended to the following assessment frequency for the following stocks:*

Two year basis

American plaice in Div. 3LNO
 Capelin in Div. 3NO
 Redfish in Div. 3M
 Thorny skate in Div. 3LNOPs
 White hake in Div. 3NOPs
 Yellowtail flounder in Div. 3LNO

Three year basis

American plaice in Div. 3M
 Cod in Div. 3NO
 Cod in Div. 3M
 Northern shortfin squid in SA 3+4
 Redfish in Div 3LN
 Redfish in Div. 3O
 Witch flounder in Div. 2J+3KL
 Witch flounder in Div. 3NO

The proposed frequency of assessment for stocks in future years is shown in Table 1. These proposals start to become effective from 2009, so that full assessments already planned for 2007 and 2008 remain unchanged.

TABLE 1. Proposed new assessment frequencies with interim and assessment schedule. (+ is assessment year, *i* is interim monitor, - is no assessment) subject to the Fisheries Commission and Coastal State requests for advice and concurrence:

Stock	Present (years)	Proposed (years)	2005	2006	2007	2008	2009	2010	2011
Multi-year Assessments									
American plaice in Div. 3LNO	2	2	+	<i>i</i>	+	<i>i</i>	+	<i>i</i>	+
Cod in Div. 3NO	2	3	+	<i>i</i>	+	<i>i</i>	<i>i</i>	+	<i>i</i>
Redfish in Div. 3LN	2	3	+	<i>i</i>	+	<i>i</i>	<i>i</i>	+	<i>i</i>
Witch flounder in Div. 2J + 3KL	2	3	+	<i>i</i>	+	<i>i</i>	<i>i</i>	+	<i>i</i>
Redfish in Div. 3M	2	2	+	<i>i</i>	+	<i>i</i>	+	<i>i</i>	+
Roughhead grenadier in SA 2+3	2	3	+	<i>i</i>	+	<i>i</i>	<i>i</i>	+	<i>i</i>
Redfish in Div. 3O	2	3	+	<i>i</i>	+	<i>i</i>	<i>i</i>	+	<i>i</i>
Redfish in SA 1	2	3	+	<i>i</i>	+	<i>i</i>	<i>i</i>	+	<i>i</i>
Other finfish in SA 1	2	3	+	<i>i</i>	+	<i>i</i>	<i>i</i>	+	<i>i</i>
Cod in Div. 3M	2	3	<i>i</i>	+	<i>i</i>	+	<i>i</i>	<i>i</i>	+
American plaice in Div. 3M	2	3	<i>i</i>	+	<i>i</i>	+	<i>i</i>	<i>i</i>	+
Witch flounder in Div. 3NO	2	3	<i>i</i>	+	<i>i</i>	+	<i>i</i>	<i>i</i>	+
Yellowtail flounder in Div. 3LNO	2	2	<i>i</i>	+	<i>i</i>	+	<i>i</i>	+	<i>i</i>
Squid (<i>Illex</i>) in SA 3+4	2	3	<i>i</i>	+	<i>i</i>	+	<i>i</i>	<i>i</i>	+
Capelin in Div. 3NO	2	2	+	<i>i</i>	+	<i>i</i>	+	<i>i</i>	+
Thorny skate in Div. 3LNOPs	2	2	<i>i</i>	+	<i>i</i>	+	<i>i</i>	+	<i>i</i>
White hake in Div. 3NOPs	2	2	+	<i>i</i>	+	<i>i</i>	+	<i>i</i>	+
Roundnose grenadier in SA 0+1	3	3	+	<i>i</i>	<i>i</i>	+	<i>i</i>	<i>i</i>	+
Roundnose grenadier in SA 2+3	-	3							
Annual Assessment									
Greenland halibut in SA 2 + Div. 3KLMNO	1	1	+	+	+	+	+	+	+
Greenland halibut in SA0+1 offshore & Div. 1B-F	1	1	+	+	+	+	+	+	+
Greenland halibut in Div. 1A inshore	1	1 or 2	+	+	+	?	+	?	+
Northern shrimp in Div. 3M	1	1	+	+	+	+	+	+	+
Northern shrimp in Div. 3LNO	1	1	+	+	+	+	+	+	+
Northern shrimp in SA 0+1	1	1	+	+	+	+	+	+	+
Northern shrimp in Denmark Strait	1	1	+	+	+	+	+	+	+

2. Coral identification keys and collection protocols

Scientific Council noted that a coral identification key for the Northwest Atlantic is available and encourages the Secretariat to make this key available on the NAFO website and to distribute the key in a color laminated format to observers to facilitate routine coral collection and identification in the NAFO Area, as recommended by Scientific Council (Scientific Council Rep., June 2006, Agenda Item VII(c)v).

X. OTHER MATTERS

1. Classification of Stocks (FIRMS)

The stock classification system proposed by FIRMS was discussed in relation to reference points developed earlier by NAFO in their Precautionary Approach framework (Table 2).

TABLE 2. The proposed modified* FIRMS classification for the Relative Stock Status descriptors.

Stock abundance status			Exploitation rate status		
Code	Status	NAFO Criterion	Code	Status	NAFO Criterion
A	Virgin or high abundance	$B \gg B_{buf}$	1	No or low fishing mortality	$F < F_{buf}$
B	Intermediate abundance	$B > B_{buf}$	2	Moderate fishing mortality	$F_{buf} \leq F \leq F_{lim}$
C	Low abundance	$B_{lim} \leq B \leq B_{buf}$	3	High fishing mortality	$F > F_{lim}$
D	Depleted	$B < B_{lim}$	0	Uncertain/Not assessed	
E	Uncertain/Not assessed				

* The modification is the utilization of numbers for exploitation rate status instead of letters.

The initial evaluations made by Scientific Council in this meeting, according to this classification, will be circulated to Designated Experts for verification and forwarded by the Secretariat to FIRMS when they meet in Rome, Italy, on 26 February-2 March 2007.

2. Initiatives for Approaching the Ecosystem Approach to Fisheries

This was discussed by Scientific Council and two initiatives were proposed.

Firstly, Scientific Council reiterated its recommendation made in June 2006 that Contracting Parties identify the expertise necessary to allow Scientific Council to address issues relating to safeguarding habitats within the Ecosystem Approach to Fisheries framework and **recommended** that *Contracting Parties take active steps to ensure that support is made available to Scientific Council*.

Secondly, the SC Chair will consult, as soon as possible, with other relevant organizations and individuals, and particularly with the ICES Advisory Committee on Ecosystems ACE (Chair: Simon Jennings), the Working Group on Deep-water Ecology WGDEC (Chair: Mark Tasker), or perhaps with groups in Australia or New Zealand, to further our understanding of these issues and on how best to cooperate with answering Fisheries Commission requests for advice.

Thirdly, Scientific Council will consider inviting an appropriate expert to give a presentation on safeguarding vulnerable habitats at the Scientific Council June 2007 meeting.

3. NAFO Reform Process

The Working Group on NAFO Reform met at the Oak Island Resort, Spa and Convention Centre, on 12-15 and 17 September 2006, in Lunenburg County, NS, Canada. The SC Chair attended these meetings of the Reform WG and presented the proposals made by Scientific Council in June 2006 (NAFO SCS Doc. 06/21). A new Chair's Working Paper was produced (Reform WG WP 06/1, Rev. 3, Corr.).

There was considerable discussion by Scientific Council on this new proposal of the NAFO Convention. It was noted that some of the changes suggested by Scientific Council had been incorporated, but it was also strongly noted that many of the changes suggested that define the role of Scientific Council within NAFO had not been adopted. Scientific Council further noted that a number of new articles had been included in Rev. 3 that were not acceptable by Scientific Council. Owing to the above, Scientific Council strongly rejected some of the

articles in this new revision and made the following comments and proposals to General Council (requested deletions are shown by stricken text):

The Scientific Council feels that the wording provided in their June 2006 paper (SCS Doc. 06/21), particularly as regards Article VII (Scientific Council), and as agreed by all contracting parties present at that Scientific Council meeting, was in most cases an improvement over the wording developed at the September Reform Meeting and used in Rev 3. Scientific Council feels that this new wording undermines the ability of Scientific Council to undertake its functions effectively and provide the most effective advice to the Commission. Scientific Council requests that the reasons for rejecting much of their earlier amendments be reconsidered.

Scientific Council requests that the following changes be made:

Article I – Use of Terms

1. *For the purpose of this Convention, the following terms are used:*

(g) *“Fishing activities” means harvesting fishery resources, processing operations of fishery resources, the transshipment of fishery resources or fishery resource products, and any other activity in preparation for or related to the harvesting of fishery resources in the Regulatory Area, including:*

(i)

(ii) *Engaging in any activity which can reasonably be expected to result in the locating, catching, taking, or harvesting of fishery resources for any purpose including scientific research;*

Article VI – The Commission

4. *The Commission shall in accordance with the principles set out in Article III exercise the following functions:*

~~*h) guide the Scientific Council in its work;*~~

Article VII – the Scientific Council

13. *The Scientific Council ~~Commission~~ may establish such subsidiary bodies and subcommittees as it considers desirable for the exercise of its duties and functions.*

Scientific Council requests that the following be clarified:

Article I – Use of Terms

2. *For the purpose of this Convention, the following terms are used:*

(h) *“Fishing vessel” means any vessel which is or has been engaged in fishing activities, including fish processing vessels and vessels engaged in transshipment or any other activity in preparation for or related to fishing activities, including experimental or exploratory fishing activities;*

Article VI – The Commission

5. *The Commission shall exercise the following functions in collaboration with the Scientific Council:*

d) *develop measures for the conduct of fishing for scientific purposes; and*

4. **Questions from the Fisheries Commission**

No questions were received from the Fisheries Commission.

5. **OTHER BUSINESS**

No other issues were raised.

XI. ADOPTION OF REPORTS

1. **Report of the 2006 Special Session**

The report of the 2006 symposium "Environmental and Ecosystem History in the Northwest Atlantic – What influences Living Marine Resources?" was accepted and **adopted**. Scientific Council noted that the symposium was well attended and achieved its objective of bringing together scientists from a range of organizations to hold relevant and informative discussions with regular NAFO participants. The report is given in Annex 1.

2. **Report of Scientific Council**

The Council at its concluding session on 22 September 2006 considered and **adopted** its own Report.

XII. ADJOURNMENT

The Chair thanked members of Scientific Council for their contributions during this meeting. The Chair also thanked the Standing Committee Chairs for their outstanding contributions. Appreciation was extended to the NAFO Secretariat for their dedicated support during the meeting.

Scientific Council expressed their gratitude to Ferne Perry and Dorothy Auby of the Secretariat who will soon retire from the Secretariat. The Committee thanked Ferne and Dorothy for their many years of dependable service to NAFO and in particular for their efforts in support of the work of Scientific Council.

There being no other business, the meeting was adjourned at 1315 hours on 22 September 2006.

ANNEX 1. REPORT OF SCIENTIFIC COUNCIL SPECIAL SESSION

"Environmental and Ecosystem Histories in the Northwest Atlantic – What Influences Living Marine Resources?"

The Symposium was held in Holiday Inn Harbourview in Dartmouth, Nova Scotia during 13-15 September 2006. The purpose of this Symposium was to better understand the ecosystems in the Northwest Atlantic and what influences them. The co-convenors were: Bill Brodie (Canada), Jason Link (USA), Helle Siegstad (Denmark/Greenland), and Manfred Stein (EU-Germany).

The Vice-Chair of Scientific Council opened the meeting by welcoming participants and explaining the role of Scientific Council. The Vice-Chair also introduced the work plan and objectives. Co-convenor Bill Brodie also welcomed participants and gave a brief overview of logistics and meeting arrangements.

Three theme sessions were held: 1) Climatic, Physical and Biological Factors Affecting NW Atlantic Ecosystems; 2) Dynamics of NW Atlantic Ecosystems (including a mini-session on capelin); and 3) Comparison of Ecosystems, and Social and Economic Consequences of Changes in the NW Atlantic. Summaries of each session, as well as the overall discussion, are contained below. A total of 62 people from 9 countries attended, and 26 papers were presented orally, and 6 as posters. Presenters were invited to submit their papers for publication, by 31 October 2006, in a special issue of the *Journal of Northwest Atlantic Fishery Science* (scheduled print date December 2007).

SESSION 1: CLIMATIC, PHYSICAL AND BIOLOGICAL FACTORS AFFECTING NW ATLANTIC ECOSYSTEMS

Session Chair: M. Stein

Ten lectures were given in Session 1. After a presentation on climate change impacts on NW Atlantic storm, wind and wave estimates, the second contribution dealt with a comparison of two large marine systems, the Northwest Atlantic and the Barents and Nordic Seas. This was followed by a presentation on remote forcing of marine ecosystem dynamics in the Gulf of Maine. Impacts of hydrographic fronts on the variation of abundance in some commercial stocks were considered in the fourth contribution of Session 1. A lecture on warming periods off Greenland during 1800-2005 and their possible influences on the abundance of cod and haddock was presented thereafter.

The afternoon lectures started with two presentations on phytoplankton in the Labrador Sea and on the Northwest Atlantic continental shelf, followed by a presentation on variations in over-wintering depth distributions of *Calanus finmarchicus* in the slope waters of the NW Atlantic continental shelf and the Labrador Sea.

A pan-North Atlantic wide study on the influence of the spring phytoplankton bloom on the life history and population dynamics of shrimp (*Pandalus borealis*), and a lecture on a near-universal metric for displaying the growth of fishes, formed the end of the afternoon oral presentations.

After the session discussion, six posters were presented in the lobby area.

SESSION 2 – DYNAMICS OF NW ATLANTIC ECOSYSTEMS - OVERVIEW/SUMMARY

Chair: W. B. Brodie

Six presentations were made in the first part of Session 2. Energy modeling of George's Bank noted that despite changes to this ecosystem, many fundamental features of the ecological network have remained remarkably consistent. A paper examining the effects of fishing exclusion on groundfish in the western Gulf of Maine revealed few differences in biodiversity, abundance, biomass or size distribution in areas inside and immediately outside the closed area, although sample sizes were small. At West Greenland, stock size indices for shrimp and cod do not indicate significant negative correlations, suggesting that bottom-up mechanisms in the ecosystem may have been responsible for increased shrimp abundance, rather than a release from cod predation. Another study of the West Greenland groundfish assemblages concluded that climate, ocean productivity, and fisheries are the main structuring

forces in the groundfish assemblage. A study of the fish community in NAFO Divisions 2J3KLNO noted that major changes in this ecosystem occurred in the last 30 years, and that collapses of main commercial species were accompanied, and sometimes preceded by, collapses in non-commercial species, noticeably large demersals. A presentation on marine sponge and coral bycatch in the NW Atlantic noted that the trend toward fishing deeper resulted in increased sponge by-catch, and that some of these species take decades to form large scale patches.

In the discussion, the similarities of cod and shrimp dynamics in the West Greenland and Newfoundland/Labrador areas were noted. However, this cod/shrimp switch did not appear to occur in the more southern areas. Other discussion focused on ecosystem dynamics, primarily on George's Bank, and how they may have changed over time.

MINI-SESSION ON CAPELIN (Part of Session 2)

Chair: H. Siegstad

At this session six different subjects related to capelin were presented. The first presentation showed preliminary results from a combined survey for capelin, polar cod, krill, marine mammals and birds over the West Greenland shelf from 73°N to about 60°N, including some fjords. The survey represents a first attempt to apply an "ecosystem approach" to pelagic survey work in Greenland waters. The next presentation discussed several reasons why capelin didn't have spawning success on Flemish Cap.

Biology and behaviour of capelin in Atlantic Canada have changed dramatically in recent years, and a collaborative, multidisciplinary initiative among university, government and commercial fishermen has investigated bio-physical mechanisms to understand reasons for the observed changes. The group presented one poster and four talks: 1) Acoustic seabed mapping for identification on capelin spawning sites, 2) Comparison between two reproductive strategies, 3) Seabirds as sensitive indicators of large capelin density, and 4) A model assessing the consequences of density shifts for top predators.

In the general discussion the role of capelin in the Northwest Atlantic ecosystem was addressed. This included the role of energy transfer: preying on invertebrates and in turn being preyed on by most large predators, including cod, seals, whales and birds. All changes in capelin biomass and distribution will have serious effects on the ecosystem – most pronounced in northern regions. The basis of the observed changes in capelin and climates is still not well understood and every piece of new information is therefore of great importance.

SESSION 3: COMPARISON OF ECOSYSTEMS, AND SOCIAL AND ECONOMIC CONSEQUENCES OF CHANGES IN THE NW ATLANTIC ECOSYSTEMS

Chair: Jason Link

A key talk in this session noted latitudinal gradients among North Atlantic ecosystems. All have both bottom-up and top-down processes operating, but some apparently are dominated more by one or another. Key considerations were temperature (as influencing vital rates) and food web complexity. The session discussion highlighted that there may be more to the story than solely species interactions, with some influence of environmental processes also worth examining. One recommendation would be to explore a multi-variate approach that simultaneously examines a wide range of processes as they might influence the major biological groups.

Other talks in the session emphasized socio-economic considerations, particularly landing time series from a wide range of NAFO areas and countries. The discussion noted that a systems, or operations research, approach is useful. Additionally, it was noted that some further consideration might be given to combining the fleet dynamics and fishing community dynamics with the standard biological trophic levels (Phytoplankton, Zooplankton, Forage Fish, Larger Fish) as additional trophic levels, all as part of the same model system.

Another talk noted the importance of data and databases as the basis for fisheries science and management. The discussion then led to a suggestion that as one way forward for EAF (Ecosystem Approach to Fisheries), we begin to incorporate a broad range of ecosystem considerations into standard single species assessments (e.g., more delineated natural mortality terms in a VPA, environmental factors in a stock-recruitment model, etc.).

FINAL DISCUSSION AND WRAP-UP

To focus the discussion at the end of the Symposium, the convenors prepared the following map, which roughly outlines some areas to be considered as different ecosystems. The boundaries are not meant to be exact, and some discussion focused on differences within and between adjacent areas. Table 3 was meant to capture some of the key ecosystem properties and dynamics, and was filled in using the knowledge of Symposium participants. Where there was no expertise available at the symposium, or there was known to be no information on a particular topic, the cell was filled with a question mark. Completing the table challenged the Symposium participants to compare the different regions, and allowed the similarities and differences in the “ecosystems” to be seen at a glance (Fig. 1).

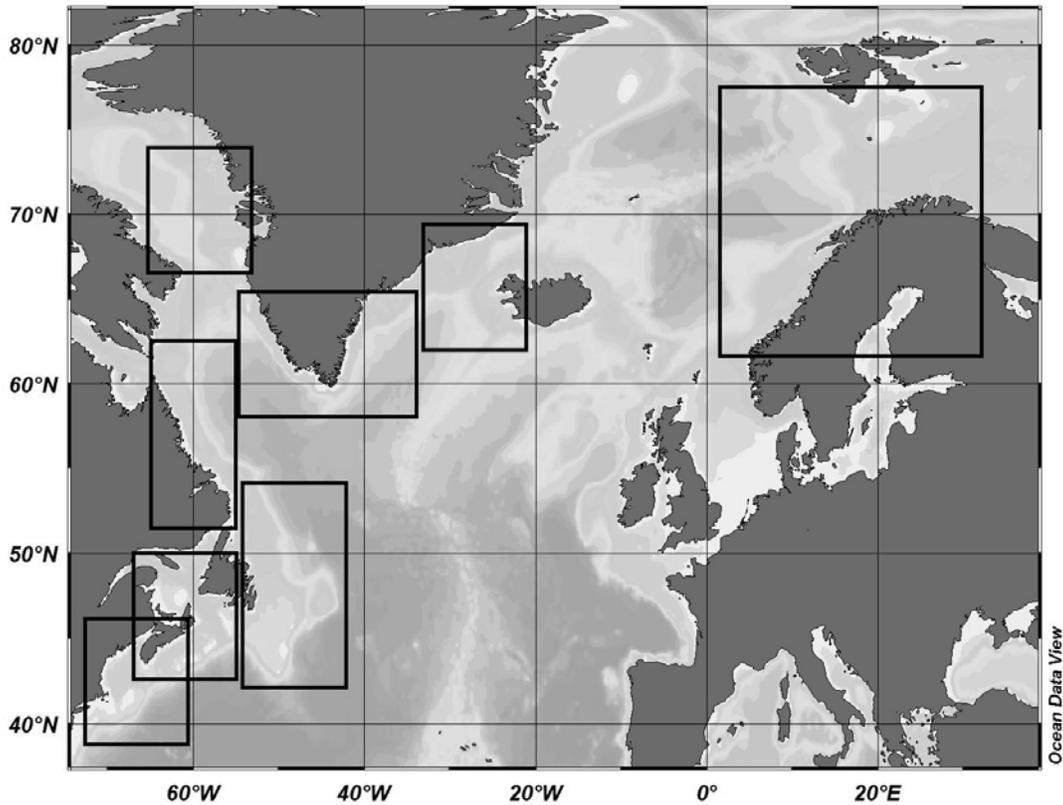


Fig. 1. Location of regions referred to in Table 3.

TABLE 3. Dynamic history and simple description of changes in major features of the NW Atlantic ecosystems. Table shows current trend (1995-2005) and what is known about present state of anomaly. Key: + is increasing; - is decreasing; 0 is stable; ? is unavailable, unknown or no data; N/A is not applicable.

	Barents Sea	E Greenland-W Iceland	S Greenland	W Greenland	Labrador	Grand Banks- Flemish Cap ¹	Scotian Shelf (GSL Later) ²	Gulf of Maine- Georges Bank ²
Meteorology & Climate	+	+	+	+	+	+	+	+
Ice Cover	0	-	-	-	-	-	N/A	N/A
Water Masses (T & S)	+	+	+	+	+	+	?/+	0/+
Phytoplankton	?	0/?	0/?	0/?	?/+	?/+	?/+	0
Zooplankton	?	0	0	0	?	?	?	+
Other Benthos	?	?	?	?	?	?	?	0
Commercial Benthos	?	-	?	?	+/?	?	+	+
Shrimp	?	0	-	+	+	+	+	0
Demersal Fish	?	-	-	-	-	-	-	-
Pelagic Fish	?	?	?	?	?	?/-	+	+
Seals	?	++	+	+	+	++	+	0
Birds	?	?	?	?	?	0	0	?
Total Landings	?	0	0	+	0	-	-	-
Total Value of Landings	?	?	0	0	?	-	+	+
Yes (Y) or No (N)								
Capelin		Y	Y	Y	Y	Y	N	N
Cod-Shrimp switch		Y	Y	Y	Y	Y	Y & N	N
Major Fishery targets		Shrimp, Gr Halibut, Pelagics (HMS)	Shrimp, Seals, Gr Halibut, Pelagics (HMS)	Shrimp, Seals, Gr Halibut, Pelagics (HMS)	Shrimp, Seals, Gr Halibut, Redfish, Snow Crab	Shrimp, Seals, Gr Halibut, Redfish, YT, Skates, Snow Crab, Capelin, Lobster	Snow Crab, Shrimp, Lobster, Haddock, Cod, Scallops, Small Pelagics	Scallops, Lobster, Flatfishes, Goosefish, Squids
Degree of influence on phytoplankton by physical oceanography	Y	Y	Y	Y	Y, ++	Y, moderate	Y	Mild
Scale of longer time series- comparison with historical time series (have we seen it before):		Y	Y	Y	N	Y	Y	Y

¹ Could be split north and south. ² Could be split east and west.

Following the discussion, the convenors thanked the participants and presenters for their contributions, and the NAFO Secretariat for their usual excellent support before and during the Symposium. The convenors also extended thanks to the NAFO Secretariat for hosting a reception during the poster display, which was very well received. The Vice-Chair of Scientific Council then extended his thanks, and officially closed the Session.

SYMPOSIUM SCHEDULE

"Environmental and Ecosystem Histories in the Northwest Atlantic – What Influences Living Marine Resources?"

13-15 September 2006

Holiday Inn Harbourview (Alderney Room)

Wednesday, 13 September 2006

0845-0915 Registration

0915-0930 Introduction (Scientific Council Chair, Convenors)

Session 1. Climatic, Physical and Biological Factors Affecting NW Atlantic Ecosystems

0930-1000 PERRIE, W. J. JIANG, Z. LONG, Y. YAO, W. ZHANG, and B. TOULANY. Climate change impacts on NW Atlantic storm, wind and wave estimates.

1000-1030 COLBOURNE, E. B., H. LOENG, K. F. DRINKWATER, and V. OZHIGIN. Ocean climate variability - comparisons of the Northwest Atlantic to the Barents and Nordic Seas.

1030-1100 **Break**

1100-1130 PERSHING, A. Remote forcing of marine ecosystem dynamics in the Gulf of Maine.

1130-1200 SIGAEV, I. K. Interannual variations of hydrological fronts in Northwest Atlantic and tendencies in the year-class abundance of some commercial stocks.

1200-1230 STEIN, M. Warming periods off Greenland during the 19th, 20th and 21st century – Their potential influence on the abundance of cod (*Gadus morhua*) and haddock (*Melanogrammus aeglefinus*) in Greenlandic waters.

1230-1330 **Lunch**

1330-1400 HARRISON, W. G. Phytoplankton growth and regulation in the Labrador Sea – light and nutrient limitation.

1400-1430 LI, W. K. W. Multiyear change in the phytoplankton community of the Northwest Atlantic continental shelf and the Labrador Sea.

1430-1500 HEAD, E. J. H. Variations in over wintering depth distributions of *Calanus finmarchicus* in the slope waters of the NW Atlantic continental shelf and the Labrador Sea.

1500-1530 **Break**

1530-1600 FUENTES-YACO, C., P. KOELLER, K. WIELAND, U. SKULADOTTIR, M. ASCHAN, T. PLATT, and S. SATHYENDRANATH. Influence of the spring phytoplankton bloom on the life history and population dynamics of shrimp (*Pandalus borealis*) in the North Atlantic.

1600-1630 NEUHEIMER, A. B., and C. T. TAGGART. Growth in fishes – a near-universal metric.

1630-1715 **Session Discussion**

1715-1745 **Poster presentations**

WWF-CANADA. Toward ecosystem-based fisheries management in the NAFO Regulatory Area.

CORKETT, C. J. Why an ecosystem approach is the wrong paradigm for the next stage of fisheries management.

DAVOREN, G. K., P. PENTON, C. MAY, B. REINFORT, N. RECORD, B. DEYOUNG, C. BURKE, W. A. MONTEVECCHI, D. ANDREWS, A. BUREN, M. KOEN-ALONSO, J. T. ANDERSON, C. ROSE-TAYLOR, T. BELL, and S. GARTHE. The importance of capelin (*Mallotus villosus*) in the Northwest Atlantic.

HEAVEN, C., L. ECKERSLEY, and R. SCROSATI. Rocky intertidal community structure across gradients of elevation, wave exposure, and ice scour in northern Nova Scotia.

BARRETT, R. T., G. CHAPDELAIN, T. ANKER-NILSSEN, A. MOSBECH, W. A. MONTEVECCHI, J. REID, and R. R. VEIT. Seabird numbers and prey consumption in the North Atlantic.

1800 **Reception/Poster Display**

Thursday, 14 September 2006

Session 2. Dynamics of NW Atlantic Ecosystems

0900-0930 LINK, J., W. OVERHOLTZ, J. O'REILLY, J. GREEN, D. DOW, D. PALKA, C. LEGAULT, J. VITALIANO, V. GUIDA, M. FOGARTY, and J. BRODZIAK. Comparisons of the Georges Bank Ecological Network: EMAX in historical context.

0930-1000 WIELAND, K., M. STORR-PAULSEN, and K. SÜNKSEN. Recent changes in the effect of predators on stock size and recruitment of Northern shrimp (*Pandalus borealis*) in West Greenland waters.

1000-1030 FOCK, H. O. Long-term trends in Greenland groundfish assemblages: Interplay of climate, ocean productivity and fisheries.

1030-1100 **Break**

1100-1130 BLINKOFF, K., L. KAUFMAN, R. BROWN, and J. LINK. The effects of fishing exclusion on the groundfish community in the Western Gulf of Maine.

1130-1200 KOEN-ALONSO, M., F. MOWBRAY, and G. LILLY. Changes in the fish community of the Newfoundland Shelf (NAFO Divisions 2J3KLNO) in the period 1981-2005: signals and trends from the Canadian multi-species bottom trawl survey.

1200-1230 FULLER, S., and R. MYERS. Marine sponge bycatch in the Northwest Atlantic.

1230-1330 **Lunch**

1330-1400 **Session Discussion**

1400-1430 BERGSTRØM, B., H. VILHJALMARSSON, K. WIELAND, S. JONSSON, M. SIMON, M. P. HEIDE-JØRGENSEN, and J. NYELAND. Results from a combined survey for capelin, polar cod, krill, marine mammals and birds off West Greenland.

1430-1500 BOROVKOV, V. A., A. L. KARSAKOV, and N. G. USHAKOV. Nature's experiments on capelin introduction on Flemish Cap – what are the reasons of failure?

Friday, 15 September 2006

- 0900-0930 ROSE-TAYLOR, C., J. T. ANDERSON, and T. BELL. Characterization and acoustic classification of demersal capelin spawning habitats in coastal northeast Newfoundland.
- 0930-1000 PENTON, P., and G. DAVOREN. Capelin (*Mallotus villosus*) spawning biology on the Northeast coast of Newfoundland: a comparison between two reproductive tactics.
- 1000-1030 BURKE, C. M., W. A. MONTEVECCHI, J. T. ANDERSON, and M. KOEN-ALONSO. Specialist (common murre *Uria aalge*) and generalist (Atlantic puffin *Fratercula arctica*) avian predators and forage fish availability.
- 1030-1100 **Break**
- 1100-1130 BUREN, A. D. M. KOEN-ALONSO, W. A. MONTEVECCHI, J. T. ANDERSON, B. DEYOUNG, and G. K. DAVOREN. Modeling the link between prey availability and diet: common murre (*Uria aalge*) and capelin (*Mallotus villosus*) interaction during the breeding season around Funk Island.
- 1130-1200 **Session Discussion**
- 1200-1300 **Lunch**
- Session 3. Comparison of Ecosystems, and Social and Economic Consequences of Changes in the NW Atlantic Ecosystems***
- 1300-1330 SHACKELL, N. (on behalf of K. Frank - Invited Paper). Comparative analysis of continental shelf ecosystems in the Northwest Atlantic.
- 1330-1400 LANE, D. Fishing in the NAFO Regulatory Area: integrated modeling of resources, social impacts and fleet. Viability
- 1400-1430 MOTTE H., and R. GARCIA-ORELLAN. Needs of changes on the Grand Banks Fisheries Organization, a drastic change of life for Western Maritime Europe and Eastern Canada.
- 1430-1500 **Break**
- 1500-1530 BRANTON, R. M., D. RICARD, L. BAJONA, and L. VAN GUELPEN. Methods for standardizing, validating and enriching taxonomic metadata.
- 1530-1600 **Session Discussion**
- 1600-1630 **Overall Discussion/Close**

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Symposium Conveners: Jason Link (USA), Helle Siegstad (Greenland), Manfred Stein (Germany) and Bill Brodie (Canada)



NAFO Symposium – Participants



NAFO Symposium in session, Holiday Inn Harbourview, Dartmouth, Nova Scotia, Canada during 13-15 September 2006

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

Chair: Don Power

Rapporteurs: Various

I. OPENING

The Committee met at the Holiday Inn Harbourview, Dartmouth, Nova Scotia, Canada, during 18-22 September 2006, to consider and report on matters referred to it by the Scientific Council, particularly those pertaining to the provision of scientific advice on certain finfish and invertebrate marine stocks. Representatives attended from Canada, European Union (Germany, Portugal, Spain, and United Kingdom), Russian Federation and United States of America. The SC Coordinator of the NAFO Secretariat was in attendance.

The Chair, Don Power (Canada), opened the meeting by welcoming participants. The provisional agenda was reviewed and adopted with no modifications.

II. NOMINATION OF DESIGNATED EXPERTS

STACFIS reviewed the list of Designated Experts for the stocks which would be assessed and for which management advice is requested by the Fisheries Commission and Coastal States. The final nomination of the Designated Experts will be conducted through the normal confirmation process between the various national institutes and Secretariat. The nominations to date by STACFIS for the 2007 assessment are:

From the Science Branch, Northwest Atlantic Fisheries Centre, Department of Fisheries and Oceans, P. O. Box 5667, St. John's, NL A1C 5X1, Canada [Telephone: listed below – Fax: + 709-772-4188 – E-mail: listed below], for

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American Plaice in Div. 3LNO	Karen Dwyer	Tel: +709-772-0573	dwyerk@dfo-mpo.gc.ca
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Witch flounder in Div. 2J+3KL	Dawn Maddock Parsons	Tel: +709-772-2495	parsonsa@dfo-mpo.gc.ca
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Greenland halibut in SA 2+3KLMNO	Brian Healey	Tel: + 709-772-8674	healeybp@dfo-mpo.gc.ca
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From AZTI Tecnalia, Food and Fisheries Technological Institute, Herrera kaia, Portualde z/g 20110 Pasaia (Basque Country), Spain [Phone: +34 943 004800 – Fax: +34 943 004801 –E-mail: hmurua@pas.azti.es], for

Cod in Div. 3M	Hilario Murua
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Roughhead grenadier in SA 2+3	Fernando Gonzalez-Costas
Roundnose grenadier in SA 2+3	Fernando Gonzalez-Costas

From the Instituto Nacional de Investigacao Agrária e das Pescas (INIAP/IPIMAR), Av. de Brasilia, 1449-006 Lisbon, Portugal [Telephone: +351 21 302 7000 – Fax: +351 21 301 5948 – E-mail: listed below], for

American plaice in Div. 3M	Ricardo Alpoim	ralpoim@ipimar.pt
Redfish in Div. 3M	Antonio Avila de Melo	amelo@ipimar.pt
Redfish in Div. 3LN	Antonio Avila de Melo	amelo@ipimar.pt

From the Greenland Institute of Natural Resources, P. O. Box 570, DK-3900 Nuuk, Greenland
[Telephone: +299 36 1238 – Fax: +299 39 1200 – E-mail: listed below], for

Redfish in SA1	Helle Siegstad	helle@natur.gl
Other Finfish in SA1	Helle Siegstad	helle@natur.gl
Greenland halibut in Div. 1A	Bjarne Lyberth	bjly@natur.gl
Northern shrimp in SA 0+1	Michael Kingsley	mcsk@natur.gl
Northern shrimp in Denmark Strait	Helle Siegstad	helle@natur.gl

From the Danish Institute for Fisheries Research, Charlottenlund Slot, DK-2920, Charlottenlund, Denmark
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Roundnose grenadier in SA 0+1	Ole Jørgensen
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Capelin in Div. 3NO	Serge Golovanov
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Northern Shortfin Squid in SA3+4	Lisa Hendrickson
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III. OTHER MATTERS

1. Review of SCR and SCS Documents

There were two biological papers presented at the meeting and both were taken under item 5(a) of the STACREC agenda.

2. Other Business

The Committee welcomed the participation of Philip Large (EU-UK) at this meeting and noted his stock assessment expertise may be available to the committee for several more years. A general discussion evolved concerning the number of regular participants to the Scientific Council. There had been some changes in participation in recent years due to conflicts with local priorities, and also to retirements. It was agreed that it was important to maintain sufficient capacity to allow the committee to continue its work and ensure adequate peer review. It was also agreed that Scientific Council representatives should bring this to the attention of their science directors to encourage additional participation from their institutes, particularly with expertise in stock dynamics.

Their being no further business, the Chair thanked the committee and the Secretariat for their assistance and then adjourned the meeting.

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

Chair: Konstantin Gorchinsky

Rapporteur: Chris J. Allen

The Committee met at the Holiday Inn Harbourview, Dartmouth, Nova Scotia during 20 September 2006 to discuss matters pertaining to statistics and research referred to it by the Scientific Council. Representatives attended from Canada, European Union (Germany, Portugal, Spain, and United Kingdom), Russian Federation and United States of America. The SC Coordinator of the NAFO Secretariat was in attendance.

1. Opening

The Chair opened the meeting by welcoming the participants and appointed Chris J. Allen (Canada) as rapporteur. The Provisional Agenda as presented, with the deletion of item 4(b), was **adopted**.

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

Most Contracting Parties have reported their data on time for the June 2006 Meeting. STACREC continues to reiterate the importance for Contracting Parties to submit STATLANT data in due time to allow Scientific Council to produce stock assessments.

ii) Publication of Statistical Information

The Statistical Bulletin has not been published since January 2002 when the last issue of Volume 49 containing the 1999 data was published. The Bulletin will no longer be published in a paper format, but the data is available on the website. Contracting Parties were requested to provide updated or outstanding data as soon as possible.

3. Research Activities**a) Surveys Planned for 2006 and Early 2007 (SCS Doc. 06/23)**

The planned surveys are outlined in this document. Participants were asked to please check this document for completeness and accuracy.

b) Consideration of a revisited edition of the Manual on Groundfish Surveys in the Northwest Atlantic (Doubleday, 1981)

A working group was formed at the June 2006 Meeting to revise the "Manual on Groundfish Surveys in the Northwest Atlantic" (Doubleday, W.G. [Ed.]. 1981. *NAFO Sci. Coun. Studies*, No. 2: 1-55). The revised edition will be presented at the June 2007 Meeting.

4. Stock Assessment Database**a) Evaluation of the Assessment Data Submission Procedure**

Data for one more stock has been added to the database since the June 2006 Meeting. It is recognized that while it is desirable to have data in advance of the assessments in June, this is not always possible for current data. It was agreed that when the Secretariat sends out notice of the June meetings, a reminder be added for the Designated Experts to get whatever data they have available submitted two months in advance of the meeting. This would include any revised data from previous years. The remaining data should be provided as soon as possible.

5. Other Matters

a) Review of SCR and SCS Documents

SCR Doc. 06/52, González C., Paz, X., Román, E. and M. Álvarez. Feeding Habits of Wolffishes (*Anarhichas denticulatus*, *A. lupus*, *A. minor*) in the North Atlantic

Feeding habits of 7 995 individuals of three wolffish species distributed in the north Atlantic were analyzed: 1 016 of northern wolffish (*Anarhichas denticulatus*), 4 783 of Atlantic wolffish (*A. lupus*) and 2 196 of spotted wolffish (*A. minor*). The individuals sampled were taken in the NAFO Area Divisions 3NO in spring in the period 2002-2005, Div. 3L in summer in the period 2003-2004, Div. 3M in summer in the period 1993-2005, and in the ICES Area Division IIb in autumn in the period 2004-2005. Feeding intensity was higher in the NAFO Area than in the northeast Atlantic, mainly in spotted wolffish in Div. 3M.

Wolffish species diet showed geographical differences. Ontogenic diet changes and prey variation throughout the studied period were observed, mainly in Atlantic and spotted wolffishes. This two species preyed primarily on bottom (echinoderms, gastropods and bivalves) and benthopelagic (northern shrimp and redfish) organisms on Flemish Cap and Grand Bank. However fish and northern shrimp predation were more important on the Flemish Cap, mainly in spotted wolffish, showing periods with higher predation on these preys when the biomass of these prey species increased. This fact might have been the cause of diet overlap between Atlantic and spotted wolffishes in some periods in Div. 3M. Less ontogenic, annual and geographical diet variations were found in northern wolffish in NAFO Area, feeding mainly on ctenophores; however in Svalbard area, this species showed to be highly piscivore. Three species showed cannibalism but only in the Div. 3M.

SCR Doc. 06/53, González. C, Román. E, Paz, X. and E. Ceballos. Feeding Habits and Diet Overlap of Skates (*Amblyraja radiata*, *A. hyperborea*, *Bathyrāja spinicauda*, *Malacoraja senta* and *Rajella fyllae*) in the North Atlantic

The contents of 5 061 stomach of five skate species - thorny (*Amblyraja radiata*), Arctic (*A. hyperborea*), spinytail (*Bathyrāja spinicauda*), smooth (*Malacoraja senta*) and round skates (*Rajella fyllae*) obtained from Bottom Trawl Research Surveys in northwest and northeast Atlantic (NAFO, Div. 3NO and Div. 3M; ICES, Division IIb) in the period 1996-2005 were analyzed to study the feeding intensity and food habits.

Feeding intensity was high in all skate species and areas, slightly higher in Division IIb, showing a general trend to decrease according to the predator size increase.

The main prey groups for thorny and Arctic skates were Pisces and Crustacea, but the importance of each group and prey species changed with area. Pisces has turn out to be the dominant prey taxa for spinytail skate in Div. 3NO and 3M. Crustacea have been the dominant prey group for smooth skate. Round skate has changed its main prey group in each area, but polychaetes have been prominent in Div. 3NO. Predation on fishing processed remnant was important for Arctic skate. Predation on several species of commercial importance was mainly relevant in Div. 3M.

Intra-specific diet overlap showed a different pattern varying with skate species and area. Inter-specific diet overlap reached its highest level in the Arctic area. Thorny skate showed a high diet overlap with the majority of the skate species studied in the NAFO Area, and round skate did not show diet overlap with other skate species in Div. 3NO. Thorny skate appear as dominant predator in NAFO Div. 3NO.

b) Other Business

There being no other business, the Chair thanked the rapporteur, all meeting participants, the NAFO Secretariat for their valuable support, and closed the meeting.

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

Chair: Manfred Stein

Rapporteur: Anthony Thompson

1. Opening

The Publications Committee met at the Holiday Inn Harbourview, Dartmouth, NS, Canada on 21 September 2006. Representatives attended from Canada, European Union (Germany, Portugal, Spain, and United Kingdom), Russian Federation and United States of America. The Scientific Coordinator of the NAFO Secretariat acted as Rapporteur.

The Chair welcomed all participants to the meeting.

2. Review of Recommendations from June 2006

The recommendations made by STACPUB in June 2006 were as follows:

- a) *accept the format changes and the single citation for the Journal as proposed by the Secretariat.*
- b) *adopt the Creative Commons license for the Journal and Studies as proposed by the Secretariat.*
- c) *adopt the Author/Owner consent form for the Journal and Studies as proposed by the Secretariat.*
- d) *the distribution of both the free reprints and the reprints at cost be discontinued for manuscripts submitted after 15 June 2006.*

There was no discussion on these recommendations.

3. Status of Scientific Publications**a) Papers from June 2006 Meeting**

No papers were brought forward from the June 2006 Meeting.

STACPUB noted the importance of two papers presented in STACREC and encouraged that these and other papers be submitted for consideration by *JNAFS*.

b) Status of the Fahay Publication

Proofreading has been completed for Volume 1 and is currently underway for Volume 2. The production of this monograph is on time and publication is expected to be in early 2007. Copies of the first three chapters of Volume 1 were seen by STACPUB members who were immediately impressed with the technical and production quality of this work.

c) Other Publications

There was a brief discussion on the timeliness of the publication of papers from the Flemish Cap Symposium held in 2004. To date, eight papers have been published on the web and one is in press. There are still several outstanding papers that are currently with reviewers or with authors for revision. The General Editor and Symposium Editors will attempt to encourage outstanding papers to be finalized by the end of 2006 so that the print volume (Volume 37) can be produced in early 2007.

4. Editorial Matters *e-JNAFS* Vols. 34-37 (Conversion to new format)

The General Editor reported that a plan has been made for the re-publication of the *e-JNAFS* Volumes (34-37) as *JNAFS* Volumes. The original publication (upload) date would remain unchanged and the link would be same as used for the *e-JNAFS* papers. A note of explanation would be provided on the web site to explain why the *e-JNAFS* has been discontinued. A proof of Volume 36 in the new format, as agreed in June 2006, was shown to participants and accepted as a good solution to remove the double citation problem.

5. **Other Matters**

a) **Associate Editorial Positions in JNAFS**

In order to widen the scope of *JNAFS*, it was decided in June 2006 to introduce two new Associate Editorial board positions for Economics and Social Science. A letter requesting "Expressions of Interest" was circulated widely to Fisheries Commission, Scientific Council and other relevant people on and soon after 8 August 2006. The closing date for applications was 15 September 2006.

After discussion and review of the six applications, the members selected Dr. Trond Bjørndal for the Economics Associate Editor position and Dr. Doug Wilson for the Social Science Associate Editor position. The General Editor will formally invite Drs Bjørndal and Wilson to become members of the editorial board of *JNAFS*.

It is proposed that the Associate Editor position for Biomathematics be filled and members are asked to suggest suitable candidates to the General Editor.

b) **Other Business**

There being no other business, the Chair thanked the rapporteur, all meeting participants, the NAFO Secretariat for their valuable support, and closed the meeting.



Scientific Council in Session