PART C: SCIENTIFIC COUNCIL MEETING, 20-24 SEPTEMBER 2010

Contents

I. Plenary Sessions 234

II. Review of Scientific Council Recommendations 234

III. Research Coordination 235

IV. Fisheries Science 236

V. Special Requests from the Fisheries Commission 236

1. From September 2009 236

a) Northern Shrimp in Div. 3M 236
b) Northern Shrimp in Div. 3LNO 238

2. Deferred from June 2010 Scientific Council Meeting 240

a) Evaluation of Rebuilding and Recovery Plans 240
b) Future Management of Div. 3M Shrimp 241
c) Mesh Size in Mid-water Trawls for Redfish 242

3. *Ad hoc* Requests from Current Meeting 243

a) Scientific Council Response to Fisheries Commission Requests - Seamounts 243
b) Scientific Council Response to Fisheries Commission Requests - Shrimp 247

VI. Meeting Reports 247

1. WGEAFM, February 2010 247

2. Report on FC WGMSE 247

3. Meetings Attended by the Secretariat 247

a) UN Meeting on Capacity Building, June 2010 247
b) ASFA Board Meeting, July 2010 249

VII. Review of Future Meeting Arrangements 249

1. Scientific Council, October 2010 249

2. Scientific Council, June 2011 249

3. Scientific Council, September 2011 249

4. Scientific Council, October 2011 250

5. Scientific Council, June 2012 250

6. Scientific Council Working Groups 250

a) WGEAFM, December 2010 250
b) WGRP, April 2011 250

7. ICES/NAFO Joint Groups 250

a) NIPAG, October 2010 250
b) WGDEC, February-March 2011 250
c) WGHARP, August 2011 250
d) NIPAG, October 2011 250

VIII. Future Special Sessions 250

1. Topics for Future Special Sessions 250

a) ICES/NAFO Hydrobiological Symposium, May 2011 250
b) Future Special Sessions 250

IX. Scientific Council Working Procedures and Protocol 250

1. Timetable and Frequency of Assessments 250

X. Other Matters 251
1. Coastal State Request from Greenland - Harp Seals 251
2. VMEs on the Corner Seamounts 251
3. Scientific Council Coordinator Position 252
4. The October Meeting of Scientific Council and NIPAG 252
XI. Adoption of Reports 252
1. Committee Reports of STACREC and STACFIS 252
2. Report of Scientific Council 252
XII. Adjournment 252
APPENDIX I. Report of Standing Committee on Research Coordination (STACREC) 253
1. Opening 253
2. Fisheries Statistics 253
a) Progress Reports on Secretariat Activities 253
i) Review of STATLANT 21 253
b) Gear Codes 253
3. Research Activities 253
a) Surveys Planned for 2010 and Early-2011 253
4. External Cooperation 253
a) ICES Strategic Initiative on Stock Assessment Methods (SISAM) 253
5. Review of Recommendations 254
6. Other Matters 254
a) Review of SCR and SCS Documents 254
b) Other Business 254
i) Compilation of catches 254
APPENDIX II. Report of Standing Committee on Fisheries Science (STACFIS) 256
1. Opening 256
2. Interim Monitoring Updates 256
a) Northern Shrimp in Div. 3M 256
b) Northern Shrimp in Div. 3LNO 257
3. Nomination of Designated Experts 258
4. Other Matters 260
a) Review of SCR and SCS Documents 260
b) Other Business 260

Front Row (left to right): Kathy Sosebee, Jean-Claude Mahé, Ricardo Alpoim (Chair), Carsten Hvingel, Vasily Mishin, Alexander Pavlenko, Estelle Couture

Back Row: Antonio Avila de Melo, Bill Brodie, Silver Sirp, Herlé Goraguer, Antonio Vázquez, Enrique de Cárdenas, Dave Orr, Vladimir Babayan, Mariano Koen-Alonso, Rafael Duarte, Ilya Skryabin, Anthony Thompson

REPORT OF SCIENTIFIC COUNCIL MEETING

20-24 September 2010

Chair: Ricardo Alpoim Rapporteur: Anthony Thompson

I. PLENARY SESSIONS

The Scientific Council met at the World Trade and Conference Centre (WTCC), Halifax, Nova Scotia, Canada, during 20-24 September 2010, to consider the various matters in its Agenda. Representatives attended from Canada, European Union (Estonia, France, Portugal and Spain), France (with respect to St. Pierre et Miquelon), Norway, Russian Federation and USA. The Executive Secretary and Scientific Council Coordinator were in attendance.

The Executive Committee met prior to the opening session of the Council to discuss the provisional agenda and plan of work.

The opening session of the Council was called to order at 1015 hours on 20 September 2010.

The Chair welcomed participants to the 32nd annual meeting.

The Provisional Agenda was adopted with minor additions. A coastal state request was also added and the 60-day advance noticed waived. The Council appointed Anthony Thompson, the Scientific Council Coordinator, as rapporteur.

The Chair welcomed the Ecology Action Centre, the International Coalition of Fisheries Associations, the Atlantic Canada Chapter, Sierra Club Canada, and the World Wildlife Fund, as observers to this annual meeting.

The Council and its Standing Committees met through 20-24 September 2010 to address various items in its agenda. The Council considered and adopted the reports of the STACFIS and STACREC Standing Committees on 24 September 2010. The final session was called to order at 1000 hours on 24 September 2010. The Scientific Council then considered and adopted its report of this meeting. The meeting was adjourned at 1230 hours on 24 September 2010.

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

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

II. REVIEW OF SCIENTIFIC COUNCIL RECOMMENDATIONS

From Scientific Council Meeting, September 21-25 2009

X. Other Matters

1. Mesh size in the redfish fishery

Scientific Council reviewed a document (SCR Doc. 09/52) relevant to the Fisheries Commission request (Annex 1, Item 13) as well as a review of information from previous Council reports on issues of mesh size in redfish fisheries. Scientific Council discussed the selectivity results presented in the research document and continue to be concerned that there appears to be little difference in the size-ranges of redfish retained by meshes of different sizes over the 90-130 mm mesh range. In addition, details on the configurations and hanging ratios of the codend mesh used in the research trials and those of commercial vessels were lacking. Scientific Council **recommended** that *further at-sea trials be conducted using square and diamond shaped meshes in the codend and that greater detail of the exact specifications of the research and commercial gears in use be documented.* Scientists from the Russian Federation recorded that they expect to be able to conduct such trails and to provide a report back to Scientific Council in 2010.

STATUS: The results of a preliminary study on "Some aspects of choosing the optimal mesh size in codends in beaked redfish fishery in Div. 3M of the NAFO Regulatory Area" (SCR Doc. 10/20). Further supporting analyses and studies, including information on bycatch in Div. 3M, will be presented to Scientific Council at this September 2010 meeting.

It was noted that a codend containing redfish rapidly rises to the surface due to hydrostatic pressures and rather special conditions develop within the codend that results in the tension being taken off the meshes, thus allowing them to open up and cause fish loss. It was therefore felt that the change of mesh size alone may not be a solution to the problem, and that some other gear modification may be more effective. Therefore, Scientific Council **recommended** that *the loss of redfish by mid-water and bottom trawls, during the later stages of hauling when the net comes to the surface, be referred to ICES for possible submission as a TOR to the ICES-FAO Working Group on Fishing Technology and Fish Behaviour (WGFTFB) to investigate possible technical measures that could reduce the loss of redfish at the surface due to their developed buoyancy.*

STATUS: This was referred to the ICES-FAO Working Group on Fishing Technology and Fish Behaviour (WGFTFB) to consider at their meeting on 31 May-4 June 2010. Owing to the need to synthesis recent information, a reply is anticipated at this September meeting of Scientific Council.

From Scientific Council Meeting, 3-16 June 2010

VII.1.d.iv. VME Fishery Impact Assessments

Regarding the Exploratory Fishery Data Collection Form adopted by Fisheries Commission in 2009 and published in the 2010 NAFO Conservation and Enforcement Measures (FC Doc. 10/1), the Scientific Council **recommended** that:

a) Catches of the quantities of coral and sponges are requested to be recorded but this should be revised to live corals and sponges, in line with existing threshold regulations and recorded to species level when possible using the NAFO Coral Guide.

b) Zero catches of VME-indicator species (e.g. live coral and sponge) should be recorded.

c) Further, the distinction between actual and estimated weights needs to be clarified. Estimated weights presumably refer to weights raised from catch sub-samples (as opposed to guesstimates based on visual inspection). Given the threshold approach to monitoring presence/absence of VMEs, actual catch weights should be collected where possible.

d) Some gear types (e.g., bottom set longlines and gillnets) can take bycatches of corals and sponges. Therefore, general information on gear dimensions and amount of gear, irrespective of the specific gear type, are necessary parameters to record.

STATUS: The Exploratory Fishery Data Collection Form was modified by Fisheries Commission Working Group of Fishery Managers and Scientists (WGFMS) to include the above recommendations.

X.4. Working Group on Reproductive Potential, March 2010

Scientific Council was pleased that a workshop on '*Implementation of Stock Reproductive Potential into Assessment and Management Advice for Harvested Marine Species*' is planned for the spring of 2011. Council noted the importance of this workshop to the improvement of scientific advice and **recommended** that *Designated Experts attend the workshop.*

STATUS: This was included in the Scientific Council budget request and will be presented to STACFAD at the September 2010 meeting.

III. RESEARCH COORDINATION

The Council adopted the Report of the Standing Committee on Research Coordination (STACREC) as presented by the Chair, Carsten Hvingel. The full report of STACREC is at Appendix I.

IV. FISHERIES SCIENCE

The Council adopted the Report of the Standing Committee on Fisheries Science (STACFIS) as presented by the Interim Chair, Jean-Claude Mahé. The full report of STACFIS is in Appendix II.

V. SPECIAL REQUESTS FROM THE FISHERIES COMMISSION

1. From September 2009

a) Northern Shrimp in Div. 3M

Background: The shrimp fishery in Div. 3M began in 1993. Initial catch rates were favourable and, shortly thereafter, vessels from several nations joined. The number of vessels participating in the fishery has decreased by more than 60% since 2004 to 13 vessels in 2009.

Fishery and catches: This stock is under effort regulation. The effort allocations were reduced to 50% in 2010. Catches are expected to decline in 2010. Recent catches were as follows:

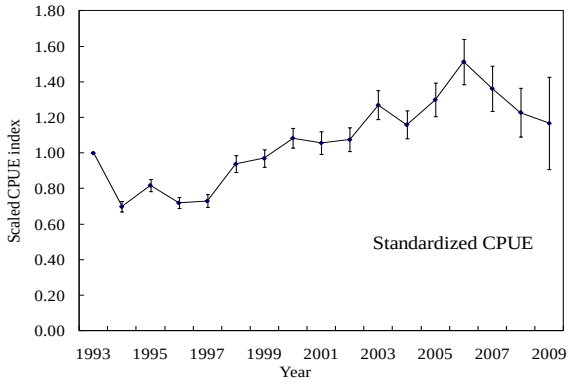
Year	Catch ('000 t)		TAC ('000 t)	
	STACFIS	21A	Recom-mended	Agreed
2006	18	15[1]	48	er
2007	21	18[1]	48	er
2008	13	13[1]	17-32	er
2009	5	5[1]	18-27	er
2010	(1[2])		ndf	er

[1] Provisional.
[2] Preliminary to September, 2010
er - Effort regulated
ndf - no directed fishery

Data: Catch, effort and biological data were available from several Contracting Parties. Time series of size and sex composition data were available mainly from two countries between 1993 and 2005 and survey indices were available from EU research surveys (1988-2010). Only provisional catch data were available for 2010.

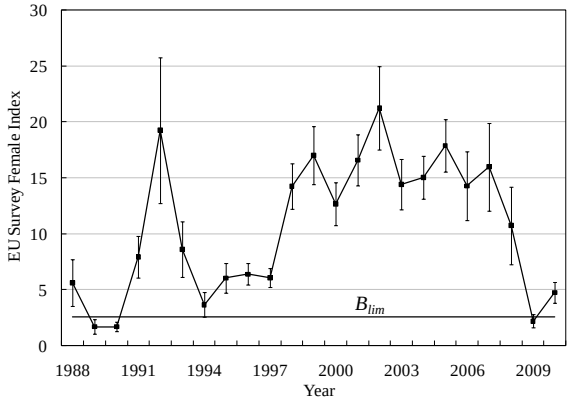
Assessment: No analytical assessment is available and fishing mortality is unknown. Evaluation of stock status is based upon interpretation of commercial fishery and research survey data.

CPUE: Indices for both biomass and female biomass from the commercial fishery showed increasing trends from 1996 to 2006. Although still high, both indices have decreased from 2006 to 2009.

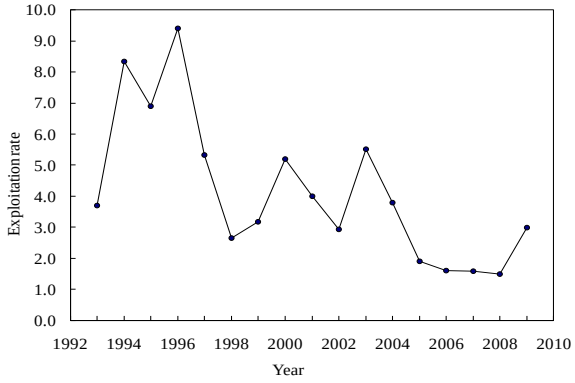


Recruitment: All year-classes since 2002 (i.e. age 2 in 2004) have been weak.

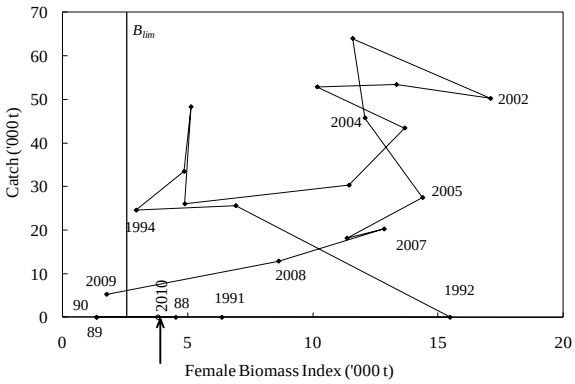
SSB: The survey index of female biomass increased from 1997 to 1998 and fluctuated without trend between 1998 and 2007. Since 2007 the survey index decreased and in 2009 it was the lowest since 1990. The index increased in 2010 to just above B_{lim}.



Exploitation rate: From 2005 to 2008 exploitation rates (nominal catch divided by the EU survey biomass index of the same year) remained stable at relatively low values. In 2009, the low levels of stock estimated from survey have caused the increase of the exploitation rate to levels prior to 2005.



State of the Stock: The indices of biomass decreased sharply in 2009 to below B_{lim} although exploitation levels have been low since 2005. The indices of biomass in the July 2010 survey were slightly higher and the stock size was just above B_{lim}.



Reference Points: Scientific Council considers that the point at which a valid index of stock size has declined by 85% from the maximum observed index level provides a proxy for B_{lim}, for Div. 3M shrimp, 2 600 t of female survey biomass. The female biomass index was below B_{lim} in 2009, and it is slightly above it in 2010. It is not possible to calculate a limit reference point for fishing mortality.

Recommendations: The 2009-2010 survey biomass index indicates the stock is around the B_{lim} proxy and remains in a state of impaired recruitment. To favour future recruitment, Scientific Council reiterates its October 2009 recommendation for 2011 that the fishing mortality be set as close to zero as possible.

Special comments: The next assessment will be in October 2010.

Sources of Information: SCR Doc. 10/47

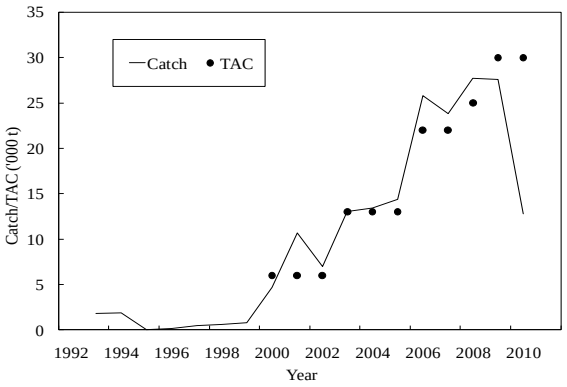
b) Northern Shrimp in Div. 3LNO

Background: Most of this stock is located in Div. 3L and exploratory fishing began there in 1993. The stock came under TAC regulation in 2000, and fishing has been restricted to Div. 3L.

Fishery and catches: Several countries participated in the fishery in 2010. The use of a sorting grid to reduce bycatches of fish is mandatory for all fleets in the fishery. Recent catches from the stock are as follows:

Year	Catch ('000 t)		TAC ('000 t)	
	STACFIS	21A	Recom-mended	Agreed
2006	26	23	22	22[3]
2007	24[2]	23	22	22[3]
2008	27[2]	26[1]	25	25[3]
2009	27[2]	27[1]	25	30[3]
2010	(13[1,4])		See footnote 5	30

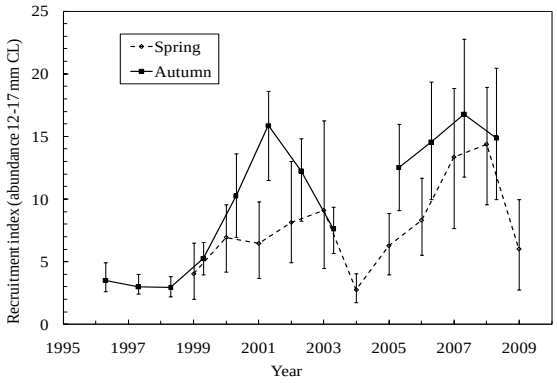
[1] Provisional.
[2] Preliminary to 1 September 2010.
[3] Denmark in respect of the Faroe Islands and Greenland did not agree to their quotas of 245 t (2006-2007), 278 t (2008), or 334 t (2009) and therefore set their own TAC of 2 274 t (2006-2008) and 3 101 t (2009). The increase is not included here.
[4] Data from various sources to be updated in (October 2010).
[5] The recent exploitation rates of about 14% may be too high. Scientific Council therefore urges caution in the exploitation of the stock and considers that exploitation rates should not be raised, but kept below recent levels.



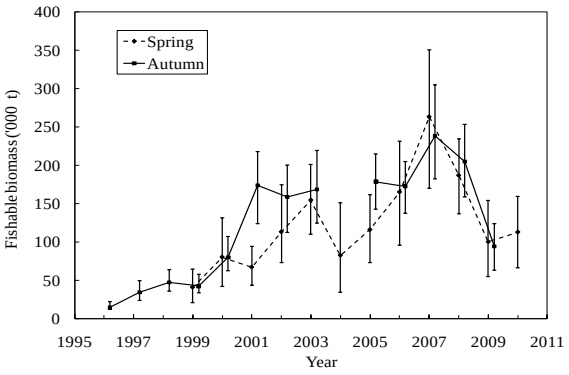
Data: Catch data were available from the commercial fishery. Biomass (total, fishable and female spawning stock) indices were available from research surveys conducted in Div. 3LNO during spring (1999 to 2010) and autumn (1996 to 2009). The Canadian survey in autumn 2004 was incomplete.

Assessment: Analytical assessment methods have not been established for this stock. Evaluation of the status of the stock is based upon interpretation of commercial fishery and research survey data.

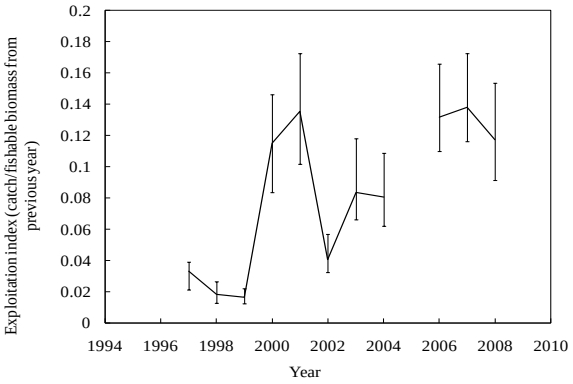
Recruitment: Recruitment indices from 2006-2008 were among the highest in the spring and autumn time series. Spring recruitment indices decreased to mean levels in 2009.



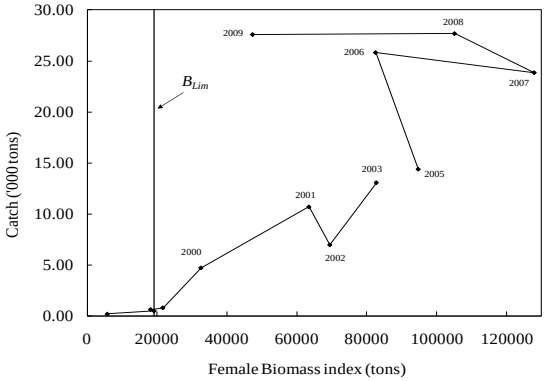
Biomass: Spring and autumn biomass indices generally increased to record levels by 2007, but decreased substantially by autumn 2009. Spring biomass indices remained low in 2010.



Fishing mortality: The index of exploitation has remained relatively stable since 2006, at a level less than 14%.



Precautionary Approach Reference Points: Scientific Council considers that the point at which a valid index of stock size has declined by 85% from the maximum observed index level provides a proxy for B_{lim} (approximately 19 000 t of female SSB). There is no target exploitation rate established for this stock, and no PA reference points based on fishing mortality.



State of the Stock: Biomass levels peaked in 2007, then decreased substantially by 2009 and remained at this lower level in 2010. Female biomass index has been low over the past three surveys and is currently above B_{lim}, although its position relative to the safe zone is unknown.

The average fishable biomass of the four most recent surveys is calculated to be 120 200 t.

Recommendation: Based on the average fishable biomass, the following table shows exploitation rates at various catch levels in 2011, including the last three catch options requested by Fisheries Commission:

Catch options (t)	12 000	17 000	24 000	27 000	30 000
Exploitation rates	10%	14%	20%	22.5%	25%

At TACs of 24 000 t and above, the exploitation rate is estimated to be 20% or higher, which is well beyond the range of previous exploitation rates in this fishery. Given recent declines in stock biomass, catches at this level are likely to result in further declines.

Exploitation rates over the period 2006-2008 have been near 14% and were followed by stock decline. Scientific Council considers TAC options at 14% exploitation rate or higher to be associated with a relatively high risk of continued stock decline. TACs lower than that will tend to reduce this risk in proportion to the reduction in the exploitation rate. Scientific Council is not able to quantify the absolute magnitude of the risk associated with alternative TAC options.

Special Comment: Scientific Council notes that the weighted average of the four most recent survey biomass estimates includes one point (autumn 2008) which is close to double the level of the three most recent survey points in 2009 and 2010. Based upon the last three surveys, the average fishable biomass is 100 000 t.

Scientific Council expressed some concerns over using the 2008 point in the average and recommended that the issue of basing TAC calculations on a weighted average of a number of surveys be examined.

From an ecosystem perspective, Scientific Council also notes that positive signs observed in some fish stocks on the Newfoundland Shelf could translate into increased natural mortality levels for shrimp given its role as a forage species in this ecosystem. In this context, a particularly cautious approach to setting the TAC is to be encouraged.

Sources of Information: SCR Doc. 10/46

2. Deferred from June 2010 Scientific Council Meeting

a) Evaluation of Rebuilding and Recovery Plans

Fisheries Commission requested:

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

a) information on the research and monitoring required to more fully evaluate and refine the reference points described in paragraphs 1 and 3 of Annex II of the Agreement; these research requirements should be set out in the order of priority considered appropriate by the Scientific Council;

Response: Many NAFO stocks have limit reference points (LRP) or proxies, but few have all the reference points necessary to fully delineate the NAFO PA framework (e.g. buffer RPs). In some cases, neither reference points nor proxies can be calculated (or agreed) with the data available. In other cases, proxies for biomass-based LRP have been derived from time series of survey data, but in general, some population modeling is required to produce limit reference points.

In the NAFO PA framework, there are no stocks where buffer reference points have been defined. This prevents the full application of the PA framework, in that the "Safe Zone" cannot be fully delineated. In some cases, where stocks are shown to be above B_{msy}, and F is below F_{msy}, stocks have been assumed to be in the Safe Zone. In some other jurisdictions, the buffer reference points have been replaced by points such as B_{msy}, or some fraction thereof, referred to in language such as an Upper Stock Reference. Perhaps the concept of reference points is worth revisiting for certain stocks under the NAFO PA Framework.

b) any other aspect of Article 6 and Annex II of the Agreement which the Scientific Council considers useful for implementation of the Agreement's provisions regarding the precautionary approach to capture fisheries;

Response: Paragraph 2 of Annex II introduces the concept of target reference points. Few NAFO stocks have explicit target RPs, or a complete suite of pre-agreed conservation and management actions in all the PA zones.

Scientific Council considers it is important that RPs and Harvest Control Rules be properly tested, to ensure that they are compliant with the Precautionary Approach (PA). Management strategy evaluation to test harvest control rules is a good solution, recognizing that this is labor intensive and requires specialized expertise not generally available within Scientific Council. The NAFO PA framework does not explicitly deal with rebuilding scenarios, although Fisheries Commission has asked Scientific Council to consider these situations in is advice for stocks below B_{lim}. One approach would be to consider developing rebuilding strategies for any particular stocks in conjunction with Fisheries Commission.

c) propose criteria and harvest strategies for new and developing fisheries so as to ensure they are maintained within the Safe Zone.

Response: In the case of reopened or new fisheries, initial TACs should be conservative enough to ensure high probability that the stock does not fall below the prescribed limit, as indicated in Paragraph 6 of Article 6. Scientific Council has followed this practice in its advice for re-opened stocks such as Div. 3LNO yellowtail, Div. 3M cod, and Div. 3LN redfish.

d) *Provide, at its annual meeting in 2010, an overview of strategies to recover depleted fish stocks in the Northwest Atlantic, taking into account the proceedings of the NAFO co-sponsored "ICES PICES UNCOVER Symposium on Rebuilding Depleted Fish Stocks - Biology, Ecology, Social Science and Management Strategies" which is to take place November 3-6 2009 in Warnemünde, Germany.*

Response: The following are some key observations from the UNCOVER Symposium in 2009, as contained in the summary report (SCS Doc. 10/18) reviewed by Scientific Council in June 2010:

- There is a rich knowledge of stock rebuilding experiences available to draw upon. The current evidence is overwhelming that management can be effective in rebuilding of fisheries and restoring the economic and social benefits derived from sustainable fisheries.

- Stock recovery needs to be carefully considered as the end points may not be well known. While stock rebuilding may be possible, stock recovery may not. If fisheries-induced evolutionary changes have occurred, or if ecosystem and climate changes have significantly altered depleted fish stocks, restored stocks (in terms of biomass) may differ markedly from their status prior to depletion. In some cases, recovery to former biomass levels may not be possible.

- Uncertainties will always exist with respect to the stock rebuilding/stock recovery process, but these uncertainties should not undermine the development and implementation of recovery plans. A precautionary and adaptive approach may be required to avoid delays in taking effective action, not only for stocks already in dire straits, but to keep those that are beginning to show signs of reduction from becoming depleted.

- Significant investments will be required in fishery science. New assessment tools will be needed when stocks are managed at much lower rates (e.g, $F = M$). Fishery science will need to more integrated in the future and incorporate habitat, environmental, and ecosystem aspects.

- The human and economic costs of stock recovery to society need to be documented and communicated. Recognition of the considerable costs and resources involved in recovery efforts should help management to vigorously avoid stock collapses in the future. Stock recovery invariably implies significant transition costs.

It was also thought that most successful rebuilding programs have incorporated substantial, measurable reductions in fishing mortality at the onset, rather than relying on incremental small reductions over time.

In considering NAFO-managed stocks below B_{lim} and therefore in need of rebuilding, Scientific Council advises that the main strategy to consider is keeping fishing mortality as low as possible, as even when directed fisheries are closed, by-catches in other fisheries often generate fishing mortalities which hinder rebuilding. This may be necessary for extended periods. Rebuilding targets should be set so as to achieve sustainable long-term yields; one rebuilding target with well-known properties which has been agreed to in many jurisdictions is B_{msy}. Rebuilding plans should include a reasonable timeframe for stock recovery, recognizing the uncertainties involved. B_{lim} is not a rebuilding target for stocks, and rebuilding plans must include harvest strategies which have low risks of stocks again declining below B_{lim}, once fisheries are reopened. Harvest control rules should be compliant with the NAFO precautionary approach framework, and be tested through simulations where possible, rather than be chosen on an *ad hoc* basis. For stocks with a biomass below B_{buf} or fishing mortality greater than F_{buf}, yield must be balanced against stock growth by reducing F below F_{buf}, while ensuring a low probability that biomass will decline below B_{lim}.

Scientific Council further noted that most NAFO rebuilding actions for stocks below B_{lim} are related to bycatch control, which poses additional difficulties. The NAFO PA framework has not been revised since its adoption in 2004 (FC Doc. 04/17), and should be examined particularly with regard to how rebuilding could be achieved for depleted stocks - whether under bycatch or directed fishing. Again, one approach would be to consider developing rebuilding strategies for any particular stocks in conjunction with Fisheries Commission.

b) Future Management of Div. 3M Shrimp

The Fisheries Commission, at its intersessional meeting, noted that *whereas the Scientific Council in its advice to the Fisheries Commission contained in Report of the Scientific Council Meeting, 21-29 October 2009 reiterated its*

September 2009 recommendation for 2010 and 2011 that the fishing mortality be set as close to zero as possible, the current Effort Allocation Scheme for 3M Shrimp Fishery allows for a high effort in the fishery.

Conscious of the efforts to reach agreed management measures based on the best available science, and challenges contained to reach consensus on the scope of possible adjustments of the current Effort Allocation Scheme or any specific quota allocation, the Fisheries Commission requests the Scientific Council to explore other possible mechanisms to assist in achieving the objective of sustainable management of the 3M shrimp, including but not limited to further seasonal or spatial closure of the fishery, gear modification, any additional requirements for scientific data reporting needed from the fisheries, or any other conservation or technical measure appropriate to achieving the objective.

The Fisheries Commission further requests the Scientific Council to explore the viability and usefulness of a second annual scientific survey in the spring season.

The Fisheries Commission requests the Scientific Council to consider these issues and report back to the Fisheries Commission at the Annual Meeting of NAFO in 2010.

Response:

Further seasonal or spatial closures are unlikely to have a significant effect on the stock. Recruitment measured as abundance of 2 year old shrimp has been weak since 2002. As discussed in the answer to Fisheries Commission on "Distribution of shrimp in Division 3M" (SC Report, Sep 2002, page 187, agenda item VI.1) some reduction in the removal of small shrimp may be accomplished by closing shallower areas (<140 fathoms) for fishing. The effect was estimated to increase escapement from the fishery of 2-year-olds by 12.4% for a January-May closure and 2.9% for a June-December closure. Although the effect of such measures on overall stock status could not be accurately quantified, SC estimates them to relatively small.

Assessments are dependent upon accurate and unbiased estimates of catch and effort. In the past, there have been concerns regarding mis-reporting of shrimp catches between 3M and 3L. Initiatives to address this concern would be welcome.

A spring survey would improve the precision of our assessments. The benefits of this additional survey would not be realised in the short term but would be seen after several years.

c) Mesh Size in Mid-water Trawls for Redfish

Fisheries Commission requested Scientific Council to provide advice on: *to examine the consequences resulting from a decrease in mesh size in the mid-water trawl fishery for redfish in Div. 3M, to 100 mm or lower*. (Item 13 of 2008 FC request)

Discussion:

The research on redfish mesh selectivity during Russian research cruises from 1980-2009 was presented to Scientific Council (SCR Doc. 10/49). Scientific Council recognized that there is considerable escapement at the surface and that this represents a loss of yield to the fishery. It was suggested that a solution to avoid this escapement of dead redfish was to use a smaller mesh in the codend. This would have the tendency to shift the size range of the fish lost to a smaller size. Scientific Council also concluded that the fish bycatch is low when the pelagic trawls are used well above the sea bed. However, it was also noted that some of the reported fish bycatch species were typically demersal species. This indicates that the newer pelagic trawls that are capable of fishing very near bottom could have bycatch concerns.

Scientific Council received a response during this September meeting from the ICES working group on Fish Behavior and Fish Technology (WGFTFB) to a request from Scientific Council. This report will be considered in full when addressing next year's request regarding redfish escapement.

Response:

The results of the research on decreasing the mesh size in pelagic trawls directed to beaked redfish (*Sebastes mentella*) was discussed by Scientific Council.

It was observed that beaked redfish escaping from the trawl codend during haul-up die as a result of trauma. The trauma is caused by rapid change in hydrostatic pressure and the weight of the catch in the codend.

Furthermore the Div. 3M mid water redfish fishery is a clean fishery: 95% of the hauls do not have bycatch and so its impact on other stocks is minimal.

The Scientific Council also notes that the same mesh size (90 mm) for mid-water trawl as already implemented on the pelagic redfish fishery on Div. 3O.

Therefore, Scientific Council concluded that the reduction of mesh size from 130 mm to not less than 90 mm for the pelagic redfish fishery appears not to be harmful to the Div. 3M redfish stock.

3. *Ad hoc* Requests from Current Meeting

Scientific Council received two separate requests from Fisheries Commission shown in a and b below. Scientific Council noted that these responses are only for the clarification of the advice and do not in any way alter or change the advice published in the reports of the Scientific Council.

a) Scientific Council Response to Fisheries Commission Requests - Seamounts

The following six questions were received by Scientific Council from the Fisheries Commission. Responses are provided after each question.

QUESTION 1

Scientific Council is requested to explain how the FAO guidelines are used in the reply to the Fisheries Commission request on seamount closures (p. 46 in FC Working Paper 10/1) and provide references to relevant articles in the FAO guidelines.

Response:

The United Nations General Assembly (UNGA) in its Sustainable Fisheries Resolution 61/105, paragraph 80, calls upon "States to take action immediately, individually and through regional fisheries management organizations and arrangements, and consistent with the precautionary approach and ecosystem approaches, to sustainably manage fish stocks and protect vulnerable marine ecosystems, **including seamounts**, hydrothermal vents and cold water corals, from destructive fishing practices, recognizing the immense importance and value of deep-sea ecosystems and the biodiversity they contain".

To assist in the implementation of this resolution FAO developed its "International guidelines for the management of deep-sea fisheries in the high seas". This document, in its article 13, indicates that "*many deep-sea marine living resources have low productivity and are only able to sustain very low exploitation rates. Also, when these resources are depleted, recovery is expected to be long and is not assured*"; while its article 21.ii. indicates that RFMOs need to "*identify areas or features where VMEs are known or likely to occur, and the location of fisheries in relation to these areas and features*".

In addition, the annex of the Guidelines provides "*examples of potentially vulnerable species groups, communities and habitats, as well as features that potentially support them*" and identifies "*summits and flanks of seamounts, guyots, banks, knolls, and hills*" as "*examples of topographical, hydrophysical or geological features, including fragile geological structures, that potentially support the* [VME] *species groups or communities*".

Even though detecting the presence of an element (e.g. seamount) in itself is not sufficient to identify VMEs, it indicates a place where VMEs are likely to exist. The Scientific Council used these guidelines in determining that the six seamount closures contain or are likely to contain vulnerable marine ecosystems. Although there is no *in situ* data for the Fogo and Newfoundland seamounts, the available information for **all** other seamounts (e.g. findings and research summarized in WGEAFM reports, results from the NEREIDA project) indicates the presence of VME-defining corals and sponges.

QUESTION 2

Is evidence of the potential impact of pelagic trawl or midwater pelagic trawl on seamounts VMEs well documented?

Response:

Mid-water trawls are often used to fish on seamounts (Clark *et al.* 2006, 2007; Clark 2009); their use has been reported in seamount fisheries around the world and involving at least 11 fish target species (orange roughy, alfonsino, cardinal fish, redfish, pelagic armourhead, mackerel, roundnose grenadier, scabbard fish, bluenose, rubyfish, and pink maomao). These mid-water trawls may have only a small impact on benthic habitats if they are deployed well above the sea floor, however, in many cases the gear is used very close to or sometimes even touching the bottom. In such cases there is an increased potential for contact and damage to corals and sponges. These gears can also affect fish species with VME-defining life history traits (see also answer to question 3 below).

QUESTION 3

What is the link between the possible impacts of pelagic trawl or midwater pelagic trawl on seamounts VMEs and Scientific Council concerns about the effects on populations of aggregations of deep-sea species and the possibility of higher proportions of juvenile fish in catches?

Response:

Article 42 of the FAO guidelines describes five criteria to be used in the identification of VMEs. Among these criteria, three of them are directly applicable to address this question. These criteria are:

i. *Uniqueness or rarity - an area or ecosystem that is unique or that contains rare species whose loss could not be compensated for by similar areas or ecosystems. These include:*

• *habitats that contain endemic species;*

• *habitats of rare, threatened or endangered species that occur only in discrete areas; or*

• *nurseries or discrete feeding, breeding, or spawning areas.*

ii. *Functional significance of the habitat - discrete areas or habitats that are necessary for the survival, function, spawning/reproduction or recovery of fish stocks, particular life history stages (e.g. nursery grounds or rearing areas), or of rare, threatened or endangered marine species.*

iv. *Life-history traits of component species that make recovery difficult - ecosystems that are characterized by populations or assemblages of species with one or more of the following characteristics:*

• *slow growth rates;*

• *late age of maturity;*

• *low or unpredictable recruitment; or*

• *long-lived*

Seamount ecosystems, like islands, can be described as realtively closed, small and isolated ecosystems, and are characterized for a high levels of endemism. It has been estimated that 11.6% of fishes and 15.4% of invertebrates reported from seamounts were endemic (Stocks and Hart, 2007).This feature of seamount communities falls under criteria ***i (uniqness or rarity)***. Some of these species can be vulnerable to pelagic fishing.

The characteristics described under criteria ***iv (life-history traits)*** clearly apply to corals and sponges, but they also apply to some fish species. In this context, fish species that aggregate in seamounts typically possess biological characteristics that make them highly vulnerable to exploitation (Morato *et al*., 2006).

In relation with criteria ***ii (functional significance of the habitat),*** some seamounts are known to aggregate juvenile fish. For example, the Cross Seamount near Hawaii, is known to aggregate large schools of juvenile bigeye, and to a lesser degree, yellowfin tuna (Holland *et al*., 1999; Itano and Holland, 2000; Sibert *et al*., 2000; Adam *et al*., 2003). There is a growing body of empirical evidence that pelagic fishing near seamounts results in higher catch rates of juvenile and undersized tunas (Fonteneau, 1991; Itano and Holland, 2000; Sibert *et al.*, 2000; Adams *et al*., 2003; Litvinov 2007; Morato *et al*., 2008). In these cases, even though these species are not endemic to seamounts nor they remain there for their entire life cycle, seamounts may play an important role in the recruitment of these oceanic populations.

Although many of the issues detailed above are likely to apply to the seamounts within the NRA, the knowledge of their fish communities and their dynamics is still scarce. Therefore, and in accordance with the *UN Fish Stock Agreement* and the *FAO Code of Conduct for Responsible Fisheries*, the exercise of caution is required when fishing on these communities is being considered.

QUESTION 4

What are the deep-sea species in question?

Response:

The fish species identified as targets in seamount fisheries worldwide include Alfonsino, Orange roughy, Oreos, Cardinalfish, Redfish, Southern boarfish, Pelagic armourhead, Mackerel species, Roundnose grenadier, Blue ling, Scabbard fish, Sablefish, Bluenose, Rubyfish, Pink maomao, and Notothenid cods (FAO, 2008; Clark *et al*., 2007; Clark, 2009).

QUESTION 5

How is "occasional impact of fishing on benthic VMEs" determined?

Response:

The term "occasional" is used in reference to those cases where an unintentional contact with the benthic communities takes place. For example, mid-water trawls, even though not intended to contact the bottom, may in occasions accidentally touch it or fish very close to it. For example, available information on by-catch for pelagic fishing for redfish in the Flemish Cap suggests that by-catch may occurs when the gear fishes near the bottom.

QUESTION 6

How well is the relationships between seamounts, pelagic fishing, pelagic species and benthic VMEs understood?

Response:

There are over 1 million seamounts in the world's oceans, with 100 000 to 200 000 reaching heights of greater than a kilometer (Kitchingman *et al.*, 2007). Very few of these have been studied in detail but a number have been studied for several decades and the information from these has been compared and contrasted to produce a global synthesis of the ecology, fisheries and conservation of seamounts.

"Pelagic and benthic components of seamount ecosystems may be functionally linked, such that pelagic fisheries' removal of seamount-associated pelagic species may indirectly affect seamount benthic communities" (Passfield and Gilman, 2010). There is a trophic link between bentho-pelagic species and seamount benthos, where bentho-pelagic species, such as the alfonsino, have been found to feed both on pelagic and benthic prey species (Lehodey, 1994; Parin *et al*., 1997). The trophic link between large pelagic species and the benthic component of seamounts is less well established and likely to be indirect in nature. However, there is an ontogenetic link between pelagic and benthic seamount habitats with most seamount benthic species, including fish, having a pelagic stage, usually as juveniles (e.g. armorhead) (Passfield and Gilman, 2010).

References

Adam, M. S., Sibert, J. R., Itano, D., Holland, K. N. 2003. Dynamics of bigeye (*Thunnus obesus*) and yellowfin (*T. albacares*) tuna in Hawaii's pelagic fisheries: analysis of tagging data with a bulk transfer model incorporating size-specific attrition. Fishery Bulletin 101: 215-228.

Clark MR, Tittensor D, Rogers AD, Brewin P, Schlacher T, Rowden A, Stocks K, Consalvey M. 2006. Seamounts, deep-sea corals and fisheries: vulnerability of deep-sea corals to fishing on seamounts beyond areas of national jurisdiction. UNEPWCMC, Cambridge, UK.

Clark, M.R. 2009. Deep-sea seamount fisheries: a review of global status and future prospects. *in* P. Arana, J.A.A. Perez & P.R. Pezzuto (eds.) "Deep-sea fisheries off Latin America" Lat. Am. J. Aquat. Res. 37(3): 501-512, 2009

Clark, M.R., V.I. Vinnichenko, J.D.M. Gordon, G.Z. Beck-Bulat, N.N. Kukharev & A.F. Kakora. 2007. Large scale distant water trawl fisheries on sea-mounts. *in* T.J, Pitcher, T. Morato, P.J.B. Hart, M.R. Clark, N. Haggan, and R.S. Santos (eds) "Seamounts: Ecology, Fisheries, and Conservation", Blackwell Publishing.

FAO. 2008. Report of the Expert Consultation on International Guidelines for the Management of Deepsea Fisheries in the High Seas. Bangkok, 11-14 September 2007. FAO Fisheries Report. No. 855. Rome, FAO. 2008. 39p.

Fonteneau, A. 1991. Seamounts and tuna in the tropical Atlantic. *Aquatic Living Resources* 4: 13-25.

Holland, K. N., Kleiber, P., Kajiura, S. M. 1999. Different residence times of yellowfin tuna, *Thunnus albacares*, and bigeye tuna, *T. obesus*, found in mixed aggregations over a seamount. Fishery Bulletin **97**, 392-395.

Itano, D., Holland, K. N. 2000. Movement and vulnerability of bigeye (*Thunnus obesus*) and yellowfin (*Thunnus albacares*) in relation to FADs and natural aggregation points. Aquatic Living Resources 13: 213-223.

Kitchingman A, Lai S, Morato T, Pauly D (2007) How many seamounts are there and where are they located? *in* T.J, Pitcher, T. Morato, P.J.B. Hart, M.R. Clark, N. Haggan, and R.S. Santos (eds) "Seamounts: Ecology, Fisheries, and Conservation", Blackwell Publishing.

Lehodey P (1994) Les monts sous-marins de Nouvelle-Caledonie et leurs resources halieutiques. 1-401.

Litvinov, F. 2007. Fish visitors to seamounts: aggregations of large pelagic sharks above seamounts. *in* T.J, Pitcher, T. Morato, P.J.B. Hart, M.R. Clark, N. Haggan, and R.S. Santos (eds) "Seamounts: Ecology, Fisheries, and Conservation", Blackwell Publishing.

Morato, T., W.W.L. Cheung, and T.J. Pitcher. 2006. Vulnerability of seamount fish to fishing: fuzzy analysis of life-history attributes. Journal of Fish Biology 68:209-221.

Morato T, Varkey DA, Damaso C, Machete M, Santos M, Prieto R, Santos RS, Pitcher TJ. 2008. Evidence of a seamount effect on aggregating visitors. Marine Ecology-Progress Series 357: 23-32.

Parin NV, Mironov AN, Nesis KN (1997) Biology of the Nazca and Sala y Gomez submarine ridges, an outpost of the Indo-West Pacific Fauna in the Eastern Pacific Ocean: Composition and Distribution of the Fauna, its communities and history. Advances in Marine Biology 32: 147-221.

Passfield K, Gilman E (2010) Effects of Pelagic Longline Fishing on Seamount Ecosystems Based on Interviews with Pacific Island Fishers. International Union for the Conservation of Nature, Oceania Regional Office, Suva, Fiji.

Sibert, J., Holland, K., Itano, D. 2000. Exchange rates of yellowfin and bigeye tunas and fishery interaction between Cross seamount and nears-shore FADs in Hawaii. *Aquatic Living Resources* 13: 225-232.

Stocks, K.I., and P.J.B. Hart. 2007. Biogeography and biodiversity of seamounts. Pages: 255-281 *in* T.J, Pitcher, T. Morato, P.J.B. Hart, M.R. Clark, N. Haggan, and R.S. Santos (eds) "Seamounts: Ecology, Fisheries, and Conservation", Blackwell Publishing.

b) Scientific Council Response to Fisheries Commission Requests - Shrimp

QUESTION

The Scientific Council is asked: *to provide information on exploitation rates applied in shrimp fisheries in other regions of the world*.

Response:

'Exploitation rate' (catch/survey biomass) is an index of fishing mortality. The values within one time series can be compared, but values between series can only be compared if the surveys used in the calculation are of identical design or it is know how the different surveys scale to absolute biomass, e.g. the exploitation rate calculated for the Div. 3LNO shrimp cannot be compared to a similar index calculated for the West Greenland or Barents Sea stocks, as the surveys are of different design and therefore relates differently to the absolute stock size. A good example of how these differences in survey design frame the derived exploitation index series on different scales may be found by comparing the 2-14% exploitation rate in Div. 3LNO to the 200-900% in Div. 3M.

The survey of the Div. 3LNO stock extends into the Canadian SFA 5 and 6 (NAFO Div. 2HJ3K) and therefore the exploitation rate indices for these two stock components may be compared assuming that these surveys relate in a similar way to the absolute biomass.

Shrimp Fishing Area (NAFO Divisions)	Year range (catch year)	Exploitation rate index % Average (range)
5 (Div. 2HJ)	1997-2009	16 (8-21)
6 (Div. 2J3K)	1997-2009	13 (4-18)
7 (Div. 3LNO)	2000-2009	10 (4-14)

VI. MEETING REPORTS

1. WGEAFM, February 2010

The information contained within the report of WGEAFM was presented to Scientific Council at their June 2010 meeting (SCS Doc. 10/19).

2. Report on FC WGMSE

Antonio Vázquez (Scientific Council representative at WGMSE) informed the Scientific Council of the work done on these Fisheries Commission working groups. Scientific Council appreciated the update and thanks both for their commitment and contribution.

3. Meetings Attended by the Secretariat

a) UN Meeting on Capacity Building, June 2010

The eleventh meeting of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea that will be held at United Nations Headquarters in New York from 21 to 25 June 2010 and was attended by the NAFO Executive Secretary Vladimir Shibanov in a capacity of observer. The meeting was attended by representatives of 89 members States, 27 intergovernmental organizations (including NAFO) and 11 non-governmental organizations. Pursuant to UN General Assembly Resolution 64/71 meeting focused on the topic entitled "Capacity-building in ocean affairs and the law of the sea, including marine science".

Two Co-Chairpersons, namely Paul Baji (Senegal) and Don MacKay (New Zealand) were appointed and the report of the UN Secretary-General on oceans and the law of the sea was presented. The report of the Consultative Process will be circulated as a Document of the 65th session of the UN GA under the Agenda item entitled "oceans and a law of the sea".

The main note by UN was stated that "The adequate capacity-building could enable States to effectively implement the UN Convention on the law of the sea and other legal instruments, and support the achievement of commitments set out in the plan of implementation of the World Summit on Sustainable Development (Johannesburg plan of implementation).

After the general exchange of views the discussions were held under 4 Areas of focus formulated well in advance of the Meeting.

1. Capacity-building in ocean affairs and the law of the sea, including marine science.

Four segments of interests were identified under this area:

a) Assessing the need for capacity-building in ocean affairs and the law of the sea, including marine science,

b) Overview of capacity-building activities/initiatives in ocean affairs and the law of the sea, including marine science and transfer of technology,

c) Challenges for achieving effective in ocean affairs and the law of the sea, including marine science and transfer of technology; and

d) New approaches, best practices and opportunities for improved in ocean affairs and the law of the sea, including marine science.

The general view was expressed that capacity-building needed to encompass a wide range of assistance, including financial, human resource, institutional and scientific capacity, and be sustainable. It was suggested that international organizations should encourage capacity-building through the creation and strengthening of national and regional Centers for technological and scientific research.

It was identified as a critical need of capacity-building in the conservation, management and sustainable use of fisheries resources. Capacity is necessary to enhance the availability of scientific advice; the collection and processing of data, including on fisheries and the status of the stocks; monitoring, control and surveillance, in particular to combat IUU fishing; compliance and enforcement.

The general view was expressed that the sustainable use of the oceans depended on marine science and adequate scientific knowledge. It was noted also that capacity building for marine science had two objectives: to create and improve the knowledge about resources and understanding of the nature and biology of marine ecosystems; and to inform the adoption of conservation and management measures. In the context of regional fisheries management organizations and arrangements, the insufficient interface between science and policy was partly due to lack of data reporting and analysis, as well as poor fisheries statistics.

2. Overview of capacity-building in ocean affairs and the law of the sea, including marine science and transfer of technology,

3. Challenges for achieving effective capacity-building in ocean affairs and the law of the sea, including marine science,

4. New approaches, best practices and opportunities for improved capacity-building in ocean affairs and the law of the sea, including marine science and transfer of technology.

The wide range of views of UN Parties was expressed and reflected in the final document to be discussed during coming General Assembly meeting. No formal decisions were reached.

The complete text of the Report is available on the relevant page of UN WEB-site at http://www.un.org/Depts/los/consultative_process/consultative_process.htm .

b) ASFA Board Meeting, July 2010

The annual meeting of the board of Aquatic Sciences and Fisheries Abstracts (ASFA) met at the Oum Palace Hotel, Casablanca, Morocco, on 5-9 July 2010 to review progress over the past year and to identify activities for the coming year. The meeting organized by the Institut National de Recherche Halieutique (INRH) with the assistance of the FAO ASFA Secretariat. Representative from the UN partner FAO, two international ASFA partners (NAFO and SPC), 21 national partners, and the publisher ProQuest. The NAFO Secretariat was represented by Anthony Thompson.

ASFA was established in 1971 to produce a bibliographic database using a network of input centres that feed information, *via* the Secretariat, to the commercial publisher ProQuest. It is truly global in extent with partners coming from all corners of the world. There are four UN Co-sponsoring partners, 11 International partners, 50 national partners, and a further 44 collaborating partners. Over 1.3 million records are on the database which is published online, and as a CD and hardcopy. Both primary and secondary (grey) literature is included, with recent emphasis being placed on grey literature input by partners. Such literature is hard to find though conventional searches and often form the mainstay of fisheries and aquaculture often by way of internal reports. Further details of ASFA are available at http://www.fao.org/fishery/asfa/2/en .

The minutes of the previous meeting were reviewed and progress on action items presented. The partnership agreement with the publisher was discussed and noted that it will be up for review in 2011. This was followed by the reports of the partners followed by a general discussion.

There was considerable discussion regarding the "quality" of the database, particularly in relation to secondary descriptors added to the records by inputters. This can aid in searching if undertaken correctly, but is both difficult to do well and time consuming. A recent initiative by the publisher involving auto-indexing was tested by two ASFA members, MBA Plymouth, England, and NAFO, Dartmouth, Canada. The *NAFO Report Evaluating Auto-Indexing* was presented in detail and, although results were mixed, it was agreed that input centres could use auto-indexing upon notifying the ASFA Secretariat. It was also agreed to form a working group to investigate quality issues further.

Repositories were also discussed and partners encouraged to continue and to develop their use of repositories such as Aquatic Commons and OceanDocs, and also to further links with IAMSLIC as a coordinating centre for information exchange. Currently, NAFO houses its literature in its own digital archives and is not a member of IAMSLIC. The use of additional external repositories would add to security and membership to IAMSLIC would be useful when acquiring published literature. Associated with digital repositories is the scanning of hardcopy literature which is fully encouraged and supported by ASFA. Small awards are given to partners for scanning primary and grey literature.

The meeting closed with some general discussions on challenges faced by partners operating under a wide range of challenges. The next meeting in 2011 will be held in Ecuador.

VII. REVIEW OF FUTURE MEETING ARRANGEMENTS

1. Scientific Council, October 2010

The Scientific Council agreed that the dates and venue of the next Scientific Council /NIPAG meeting will be held from 20-27 October 2010 at the ICES Headquarters, Copenhagen, Denmark.

2. Scientific Council, June 2011

Scientific Council agreed that its June meeting will be held on 3-16 June 2011 at the Johann Heinrich von Thünen Institute, Federal Research Institute for Rural Areas, Forestry and Fisheries, Institute of Sea Fisheries, Hamburg, Germany.

3. Scientific Council, September 2011

Scientific Council noted that the Annual Meeting will be held on 19-23 September 2011. The meeting will be in Halifax, NS, Canada unless an invitation to host the meeting is extended by a Contracting Party.

4. Scientific Council, October 2011

The dates and venue of the Scientific Council/NIPAG meeting will be decided at the October 2010 meeting.

5. Scientific Council, June 2012

Scientific Council agreed that its June meeting will be held on 1-14 June 2012 with the meeting venue being the Alderney Landing, Dartmouth, Nova Scotia, Canada.

6. Scientific Council Working Groups

a) WGEAFM, December 2010

WGEAFM will meet at the NAFO Secretariat, Dartmouth, Canada, on 1-10 December 2010.

b) WGRP, April 2011

The next planned meeting of the working group on reproductive potential will take the form of a workshop to be held in Aberdeen, Scotland, during 12-14 April 2011.

7. ICES/NAFO Joint Groups

a) NIPAG, October 2010

The dates and venue of this NIPAG meeting will be 20-27 October 2010 at the ICES Headquarters, Copenhagen, Denmark.

b) WGDEC, February-March 2011

The Working Group on Deep-water Ecology will meet at ICES, Copenhagen, Denmark, during 28 February - 4 March 2011.

c) WGHARP, August 2011

The next meeting of WGHARP is tentatively scheduled for the Russian Federation or the U.S. in August 2011.

d) NIPAG, October 2011

The dates and venue of this NIPAG meeting will be decided at the October 2010 meeting.

VIII. FUTURE SPECIAL SESSIONS

1. Topics for Future Special Sessions

a) ICES/NAFO Hydrobiological Symposium, May 2011

The 2011 special session will be the ICES/NAFO symposium on "The Variability of the North Atlantic and its Marine Ecosystems during 2000-2009" will be held in Santander, Spain on 10-12 May 2011.

b) Future Special Sessions

There were no suggestions for future special sessions.

IX. SCIENTIFIC COUNCIL WORKING PROCEDURES AND PROTOCOL

1. Timetable and Frequency of Assessments

Assessment frequencies within a full assessment and interim monitoring schedule, as agreed in September 2006. Advice by the Fisheries Commission and Coastal State is requested annually, bi-annually or tri-annually as indicated

beginning in 2007(+ is full assessment year, i is interim monitor, - no assessment undertaken or currently planned). The i (+) is a specially requested full assessment instead of a planned interim monitoring, and + (i) is an interim assessment when a full assessment was planned.

Stock	Frequency (pre-2006)	Frequency (from 2006)	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Multi-year Assessments												
American plaice in Div. 3LNO	2	2	+	i	+	i	+	i (+)	+	i	+	i
Cod in Div. 3NO	2	3	+	i	+	i	i	+	i	i	+	i
Redfish in Div. 3LN	2	~~3~~2	+	i	+	i (+)	i	+	i	+	i	+
Witch flounder in Div. 2J + 3KL	2	3	+	i	+	i	i	+	i	i	+	i
Redfish in Div. 3M	2	2	+	i	+	i	+	i	+	i	+	i
Roughhead grenadier in SA 2+3	2	3	+	i	+	i	i	+	i	i	+	i
Redfish in Div. 3O	2	3	+	i	+	i	i	+	i	i	+	i
Redfish in SA 1	2	3	+	i	+	i (+)	i	i	+	i	i	+
Other finfish in SA 1	2	3	+	i	+	i (+)	i	i	+	i	i	+
Cod in Div. 3M	2	~~3~~2	i	+	i	+	i (+)	+	+	+	i	+
American plaice in Div. 3M	2	3	i	+	i	+	i	i	+	i	i	+
Witch flounder in Div. 3NO	2	3	i	+	i	+	i	i	+	i	i	+
Yellowtail flounder in Div. 3LNO	2	2	i	+	i	+	i (+)	i	+	i	+	i
Squid (*Illex*) in SA 3+4	2	3	i	+	i	+ (i)	i	+	i	i	+	i
Capelin in Div. 3NO	2	2	+	i	+	i	+	i	+	i	+	i
Thorny skate in Div. 3LNOPs	2	2	i	+	i	+	i	+	i	+	i	+
White hake in Div. 3NOPs	2	2	+	i	+	i	+	i	+	i	+	i
Roundnose grenadier in SA 0+1	3	3	+	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	+	+	+	+	+	+	+	+	+	+

X. OTHER MATTERS

1. Coastal State Request from Greenland - Harp Seals

Scientific Council received the following coastal State request from Greenland on 15 September 2010:

"*The Scientific Committee is requested to evaluate how a projected increase in the total population of Northwest Atlantic harp seals might affect the proportion of animals simmering in Greenland. The Scientific Council is also asked to advise on any other management measures it deems appropriate to ensure the sustainability of the resources*."

Scientific Council unanimously agreed to waive the 60-day advance notice period, according to Rule of Procedure 4.3. The request has been forwarded to the joint ICES/NAFO WGHARP who will discuss this issue at their next meeting in August 2011.

2. VMEs on the Corner Seamounts

Scientific Council received a request for advice from Fisheries Commission in September 2009 regarding the temporary closures of six seamount areas to bottom-contact fishing. Scientific Council deferred the request to WGEAFM who provided the necessary scientific guidance to Scientific Council to provide an answer to the request in June 2010 (SCS Doc. 10/18, Agenda Item VII.1.d.v). Russia have since further considered this request and presented additional information regarding seamount closures. Scientific Council is not in a position to enter into

detailed discussions regarding scientific issues relating to seamount closures at this September 2010 meeting. The WGEAFM will meet in Dartmouth, Nova Scotia, Canada, on 1-10 December 2010, and Scientific Council notes that this is the appropriate forum to discuss issues related to seamounts and vulnerable marine ecosystems.

3. Scientific Council Coordinator Position

The SC Coordinator will resign his post with the NAFO Secretariat in Dartmouth effective 17 December 2010. The Executive Secretary has informed the Scientific Council Chair regarding the recruitment process and vacancy announcement for the new Scientific Council Coordinator. The Chair discussed this with members of Scientific Council.

Scientific Council recognizes the importance of the Scientific Council Coordinator in support of both their sessional and intersessional work. This has become increasingly the case in recent years when the work of Council has become both more diverse and more challenging. Scientific Council would like the Secretariat to ensure that the impact to Scientific Council during the interim period is minimized.

4. The October Meeting of Scientific Council and NIPAG

Scientific Council thanked Institute of Marine Research, Tromsø (IMR), Norway for their invitation to host the October 2011 Scientific Council and NAFO ICES *Pandalus* Assessment Group (NIPAG) meetings to assess shrimp stocks in the north Atlantic. Scientific Council noted that for some years, the autumn shrimp meeting of SC and NIPAG has alternated between the NAFO headquarters in Dartmouth, Canada, and the ICES headquarters in Copenhagen, Denmark. Under this schedule the 2011 meeting would occur at the NAFO HQ, and moving the meeting to IMR, Norway would result in extra cost to the Secretariat and some Contracting Parties. These same concerns would not exist for an invitation made in 2012 when the meeting would normally be held in Copenhagen, Denmark. The Chair of Scientific Council will discuss the matter further with IMR, Norway.

XI. ADOPTION OF REPORTS

1. Committee Reports of STACREC and STACFIS

The Council reviewed and adopted the Reports of the Standing Committees (STACREC and STACFIS).

2. Report of Scientific Council

The Council at its concluding session on 24 September 2010 considered and adopted its own report.

XII. ADJOURNMENT

The Scientific Council Chair thanked the Chairs of STACFIS and STACREC, the Designated Experts, and the members of Scientific Council, and members of the Secretariat, for their hard work and valuable contributions to the meeting. The Chair acknowledged the invaluable support he received from the Scientific Council Coordinator, Dr. Anthony Thompson as well as the support of Barb Marshall. The Chair also wanted to recognize the tremendous effort of the members of its Working Group on the Ecosystem Approach to Fisheries Management (WGEAFM). The Chair is also grateful for the support given by Dr Vladimir Shibanov and the NAFO Secretariat throughout the meeting.

There being no other business, the meeting was adjourned at 1230 hours on 24 September 2010.

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

Chair: Carsten Hvingel Rapporteur: Barbara Marshall

The Committee met at the World Trade and Conference Centre (WTCC), Halifax, Nova Scotia, Canada, during 23 September 2010, to consider the various matters in its Agenda. Representatives attended from Canada, European Union (Estonia, France, Portugal and Spain), France (with respect to St. Pierre et Miquelon), Norway, Russian Federation and USA. The Scientific Council Coordinator was in attendance.

1. Opening

The Chair opened the meeting. The Agenda was adopted with the addition of a new item 5 "Review of Previous Recommendations" pertaining to data sharing arrangements. Barbara Marshall was appointed the Rapporteur.

2. Fisheries Statistics

a) Progress Reports on Secretariat Activities

i) Review of STATLANT 21

It was noted that the 21 data extraction tool that was presented in June by George Campanis is now fully functional on the NAFO website. Any feedback is welcomed by the Secretariat.

Updates on submission of 21B data will be discussed further next June.

b) Gear Codes

It was noted that FAO will be looking at gear modifications in the near future. STACREC was asked whether they wished the Secretariat to send the current list of gears or if some discussion should take place. It was agreed that the Secretariat would contact Designated Experts to see how to move forward.

3. Research Activities

a) Surveys Planned for 2010 and Early-2011

Designated Experts were requested to check and update the information contained in SCS Doc. 10/20.

4. External Cooperation

a) ICES Strategic Initiative on Stock Assessment Methods (SISAM)

ICES has invited NAFO to participate in its three year *Strategic Initiative on Stock Assessment Methods* (SISAM). Quoting from the invitation letter of 2 July 2010:

"There have been many recent advances in fish stock assessment methods and techniques. Many of these advances are conceptual and others are technological. ICES seeks to further advance and incorporate many of these developments into its advisory system in order to be among the world leaders in the development of stock assessment methods. This will allow better use of the available data resources, particularly in cases where the lack of standard catch-at-age and classic fisheries independent time series has in the past precluded analytical assessments, even when potentially useful information for these “data poor” stocks existed. As the client organizations of ICES require a broader portfolio of fisheries advice, as well as integrated regional advice, ICES need to ensure that the stock assessment methods it uses are able to provide the necessary basis for such advice.

The Initiative is a means by which ICES can reinvigorate the stock assessment methods it uses, and stimulate the development of new techniques and concepts. As this must be done without re-inventing the wheel, ICES requires a review of methods used around the world for fish stock assessment. It is hoped that this review will advance not just ICES knowledge but also the operation of its stock assessment experts and the advisory system as a whole. It is also

hoped to make stock assessment software freely available to all fisheries scientists. Thus we invite you to join the initiative and hopefully we, as partners, can move stock assessment tools forward."

The first meeting is a workshop in Nantes, France (WKADSAM) from 27 September to 1 October 2010, and will serve to identify the key techniques and approaches and plan the review process. Brian Healey from the Northwest Atlantic Fisheries Centre, DFO, St. John's will be attending as the representative from Scientific Council and will report to Scientific Council.

The report of this meeting will be discussed in June and then decisions can be made as to how to the Scientific Council wants to deal with this matter.

5. Review of Recommendations

From the June Meeting:

The work of WGEAFM involves spatial analyses to identify and delineate areas with high concentration of VME-forming species (like corals and sponges). These analyses require unprocessed data (raw-data) e.g. from research surveys carried-out by different contracting parties combined in a single data set. There is no established practice for the sharing of raw data within NAFO.

STACREC **recommended** *that Scientific Council encourage research institutions from all Contracting Parties to share their survey data at the level of detail necessary for WGEAFM*. Equally important, STACREC **recommended** *Scientific Council to instruct WGEAFM that any data shared as part of its work towards addressing Scientific Council requests should neither be distributed outside WGEAFM nor used for purposes other than addressing WGEAFM ToRs without documented permission from the institution where the data originated and properly cited in all documents produced.*

There is a need to established protocols for the sharing of aggregated and/or raw data among NAFO Contracting Parties and Scientific Committees.

STACREC **recommended** *that the NAFO Secretariat prepare a document for presentation at the next meeting of STACREC on (1) "Guidelines for data acquisition from Contracting Parties" and (2) a draft pro-forma MOU between NAFO and the data-owners (here taken to usually be the national research labs who collected the data) to cover data use agreements.*

To date no progress has been made drafting guidelines for a general MoU regarding data sharing. It was agreed that the NAFO Secretariat circulate in November some draft data sharing protocols for Scientific Council members to review before further discussion in June.

There are now some informal arrangements in place to share the data needed by the WGEAFM to complete ToRs at its December meeting. It was noted, however, that a more formal written agreement between the WG and data holding institutes would also be helpful. Canada and Spain had recently signed a data sharing arrangement for information collected during the NEREIDA mission. It was suggested to use this agreement as a template for such a document.

6. Other Matters

a) Review of SCR and SCS Documents

No documents were reviewed during this meeting.

b) Other Business

i) Compilation of catches

It was noted that the current method of compiling the catches used for stock assessment in STACFIS is not ideal.

Since the June 2010 meeting the STACREC Chair had been in contact with the STACTIC Chair to discuss ways to compile reliable catch statistics outside of the Scientific Council and to improve the quality of the data.

Some Contracting Parties have also been discussing ways to get more reliable data. It was pointed out that there had been some discussion in STACTIC regarding input from Scientific Council and the possible use of catch data that is presently being used for compliance.

The STACREC Chair will continue to follow-up on these discussions and the matter will be further discussed in June 2011.

The meeting was adjourned at 10:55 am on 23 September 2010.

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

Interim Chair : Jean-Claude Mahé Rapporteur: Various

The Committee met at the World Trade and Conference Centre (WTCC), Halifax, Nova Scotia, Canada, during 20-24 September 2010, to consider the various matters in its Agenda. Representatives attended from Canada, European Union (Estonia, France, Portugal and Spain), France (with respect to St. Pierre et Miquelon), Norway, Russian Federation and USA. The Scientific Council Coordinator was in attendance.

1. Opening

The Chair, Jean-Claude Mahé, opened the meeting by welcoming participants. The provisional agenda was reviewed and adopted, and a plan of work developed for the meeting.

2. Interim Monitoring Updates

STACFIS was asked to update the assessments of Northern shrimp in Div. 3M and Northern shrimp in Div. 3LNO that had been reviewed at the meeting of NIPAG in October 2009.

a) Northern Shrimp in Div. 3M

(SCR Doc. 10/47)

Interim Monitoring Report

a) Introduction

The fishery on this stock is managed by effort regulation. Full assessments of this stock are based on the review of series of indices of survey biomass, CPUE, recruitment potential (numbers at age 2), and catch. Poor recruitment occurred in recent years, although biomass indices remained at high levels. The indices of female biomass in the July 2009 survey indicated a sharp decline and that the stock was below B_{lim} i.e., had entered the collapse zone defined by the NAFO PA framework. Scientific Council recommended in October 2009 that the fishing mortality be set as close to zero as possible in 2010 and 2011. Total allowed fishing effort was reduced 50% from 2009 to 2010.

b) Data

The interim monitoring report was based on updates of survey biomass index series with 2010 values for total and female survey biomasses, and of the recruitment index series, and on catch-to-date information for the current year. Surveys use a Lofoten trawl with 35-mm codend mesh, but fitted with a juvenile bag with 10-mm mesh.

c) Results

Catches to early September 2010, 1 087 t; there are no effort measures associated with these catches. Survey indices of both total and female biomass for 2010 were slightly higher that the low in 2009. The index of potential recruitment, estimated numbers of age-2 shrimps, remained low since 2004.

STACFIS concluded that the information available does not change the perception of a significant decline in stock biomass.

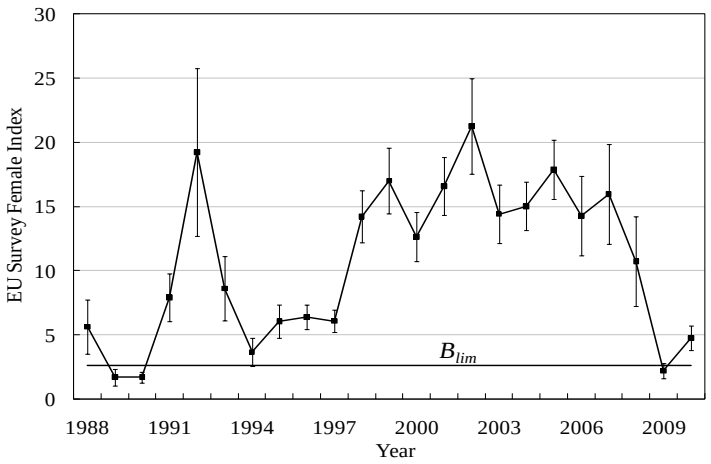


Fig. 1.1. Northern Shrimp in Div. 3M: EU Survey index of female biomass, 1988-2010.

b) Northern Shrimp in Div. 3LNO

(SCR Doc. 10/46)

Interim Monitoring Report

a) Introduction

The fishery on this stock is restricted to Div. 3L, where over 95% of the total survey biomass in these Divisions is found. Since 2000 it has been managed by TAC, 83% of which is allocated to Canada.. Fisheries Commission set the TAC for 2008 at 25 000 t, and at 30 000 t for 2009 and 2010. Full assessments are based on the review of series of indices of biomass from 3 research trawl surveys, Canadian small and large vessel standardized CPUE index series, catches, and size distributions in samples from surveys and from commercial catches by some fleets.

This interim monitoring report also provides a response to the Fishery Commission request to:

"provide information on the effect of the following catch levels in 2011 of 24 000 t, 27 000 t and 30 000 t on the projected SSB and provide risk analysis where possible."

b) Data

The interim monitoring report was based on updates of the Canadian survey biomass index series from autumn 2009 and spring 2010. These surveys use a Campelen shrimp trawl, with a 12.7-mm-mesh liner in a 44-mm-mesh codend. Biomass estimates were calculated using ogive mapping.

c) Results

Spring and autumn biomass indices peaked in 2007, but decreased substantially by 2009 and remained low in 2010. Female biomass has been low over the past three surveys, but is currently above B_{lim}, although its position relative to the safe zone is unknown.

STACFIS concluded that there were no significant changes since the last assessment of this stock that occurred in October 2009 as the drop in survey biomass observed then is confirmed with the most recent data.

The inverse variance weighted average fishable biomass of the four most recent surveys is calculated to be 120 200 t. Based on this value, the following table shows exploitation rates at various catch levels in 2011, including the last three points as requested by Fisheries Commission:

Catch options (t)	12 000	17 000	24 000	27 000	30 000
Exploitation rates (%)	10	14	20	22.5	25

At TACs of 24 000 t and above, the exploitation rate is estimated to be 20% or higher, which is well beyond the range of exploitation rates previously seen in this fishery. Given recent declines in stock biomass, catches at this level are likely to result in further declines.

Exploitation rates over the period 2006-2008 have been near 14% and were followed by stock decline. To increase stock biomass, exploitation rates should be below this level.

Precautionary Approach Reference Points: Scientific Council considers that the point at which a valid index of stock size has declined by 85% from the maximum observed index level provides a proxy for B_{lim} (approximately 19 000 t of female SSB). There is no target exploitation rate established for this stock, and no PA reference points based on fishing mortality.

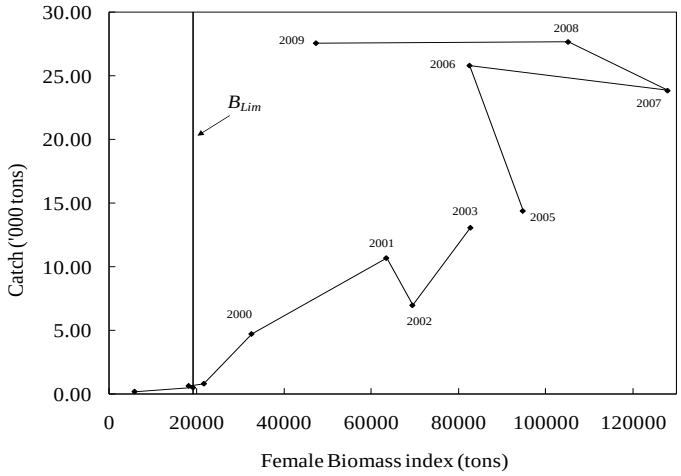


Fig. 2.1. Shrimp in Div. 3LNO: Catch against female biomass index from Canadian autumn survey. Line denoting B_{lim} (approximately 19 000 t) is drawn where female biomass is 85% lower than the maximum point in 2007.

3. Nomination of Designated Experts

The Designated Experts for all stocks have kindly agreed to continue as Designated Experts for 2011, with the exception of the Designated Expert for American Place in Div. 3LNO and Witch flounder in Div. 3NO. The Committee thank Karen Dwyer, the Designated Expert for these stocks, for hard enthusiasm and hard work.

The nominated Designated Experts for 2011 are:

From the Science Branch, Northwest Atlantic Fisheries Centre, Department of Fisheries and Oceans, P. O. Box 5667, St. John's, NL, Canada A1C 5X1, Canada (Fax: + 709-772-4188)

Cod in Div. 3NO	Don Power	Tel: +1 709-772-4935	don.power@dfo-mpo.gc.ca
Redfish Div. 3O	Don Power	Tel: +1 709-772-4935	don.power@dfo-mpo.gc.ca
American Plaice in Div. 3LNO	Rick Rideout	Tel: +1 709-772-6975	rick.rideout@dfo-mpo.gc.ca
Witch flounder in Div. 3NO	Bill Brodie	Tel: +1 709-772-3288	bill.brodie@dfo-mpo.gc.ca
Witch flounder in Div. 2J+3KL	Dawn Maddock Parsons	Tel: +1 709-772-2495	dawn.parsons@dfo-mpo.gc.ca
Yellowtail flounder in Div. 3LNO	Dawn Maddock Parsons	Tel: +1 709-772-2495	dawn.parsons@dfo-mpo.gc.ca
Greenland halibut in SA 2+3KLMNO	Brian Healey	Tel: +1 709-772-8674	brian.healey@dfo-mpo.gc.ca
Northern shrimp in Div. 3LNO	David Orr	Tel: +1 709-772-7343	david.orr@dfo-mpo.gc.ca
Thorny skate in Div. 3LNO	Mark Simpson	Tel: +1 709-772-4148	mark.r.simpson@dfo-mpo.gc.ca
White hake in Div. 3NO	Mark Simpson	Tel: +1 709-772-4148	mark.r.simpson@dfo-mpo.gc.ca

From the Instituto Español de Oceanografia, Aptdo 1552, E-36200 Vigo (Pontevedra), Spain (Fax: +34 986 49 2351)

Roughhead grenadier in SA 2+3	Fernando Gonzalez-Costas	Tel: +34 986 49 2111	fernando.gonzalez@vi.ieo.es
Roundnose grenadier in SA 2+3	Fernando Gonzalez-Costas	Tel: +34 986 49 2111	fernando.gonzalez@vi.ieo.es
Cod in Div. 3M	Diana Gonzalez-Troncoso	Tel: +34 986 49 2111	diana.gonzalez@vi.ieo.es
Shrimp in Div. 3M	Jose Miguel Casas Sanchez	Tel: +34 986 49 2111	mikel.casas@vi.ieo.es

From the Instituto Nacional de Recursos Biológicos (INRB/IPIMAR), Av. de Brasilia, 1449-006 Lisbon, Portugal (Fax: +351 21 301 5948)

American plaice in Div. 3M	Ricardo Alpoim	Tel: +351 21 302 7000	ralpoim@ipimar.pt
Redfish in Div. 3M	Antonio Avila de Melo	Tel: +351 21 302 7000	amelo@ipimar.pt
Redfish in Div. 3LN	Antonio Avila de Melo	Tel: +351 21 302 7000	amelo@ipimar.pt

From the Greenland Institute of Natural Resources, P. O. Box 570, DK-3900 Nuuk, Greenland (Fax: +299 36 1212)

Redfish in SA1	Rasmus Nygaard	Tel: +299 36 1200	rany@natur.gl
Other Finfish in SA1	Rasmus Nygaard	Tel: +299 36 1200	rany@natur.gl
Greenland halibut in Div. 1A	Bjarne Lyberth	Tel: +299 36 1200	bjly@natur.gl
Northern shrimp in SA 0+1	Michael Kingsley	Tel: +299 36 1200	mcsk@natur.gl
Northern shrimp in Denmark Strait	Nanette Hammeken	Tel: +299 36 1200	nanette@natur.gl

From the Danish Institute for Fisheries Research, Charlottenlund Slot, DK-2920, Charlottenlund, Denmark (Fax: +45 33 96 33 33)

Roundnose grenadier in SA 0+1	Ole Jørgensen	Tel: +45 33 96 33 00	olj@dfu.min.dk
Greenland halibut in SA 0+1	Ole Jørgensen	Tel: +45 33 96 33 00	olj@dfu.min.dk

From Knipovich Polar Research Institute of Marine Fisheries and Oceanography (PINRO), 6 Knipovich Street, Murmansk, 183763, Russia (Fax: +7 8152 47 3331)

Capelin in Div. 3NO	Ilya Skryabin	Tel: +7 8152 450568	skryabin@pinro.ru

From National Marine Fisheries Service, NEFSC, 166 Water St., Woods Hole, MA 02543

Northern Shortfin Squid in SA 3 & 4	Lisa Hendrickson	Tel: +1 508 495-2285	lisa.hendrickson@noaa.gov