

Northwest Atlantic Fisheries Organization (NAFO)



Meeting Proceedings of the General Council and Fisheries Commission for 2010/2011

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Foreword

This issue of the Proceedings contains the reports of all meetings of the General Council (GC) and Fisheries Commission (FC) including their subsidiary bodies held in the twelve months preceding the Annual Meeting in September 2011 (between 1 September 2010 and 31 August 2011). This follows a NAFO cycle of meetings starting with an Annual Meeting rather than by calendar year.

This present 2010/2011 issue is comprised of the following sections:

SECTION I contains the Report of the FC Working Group on Greenland Halibut Management Strategy Evaluation (WGMSE), 16-17 September 2010, Halifax, Nova Scotia, Canada.

SECTION II contains the Report of the General Council including its subsidiary body (STACFAD) 32nd Annual Meeting, 20-24 September 2010, Halifax, Nova Scotia, Canada.

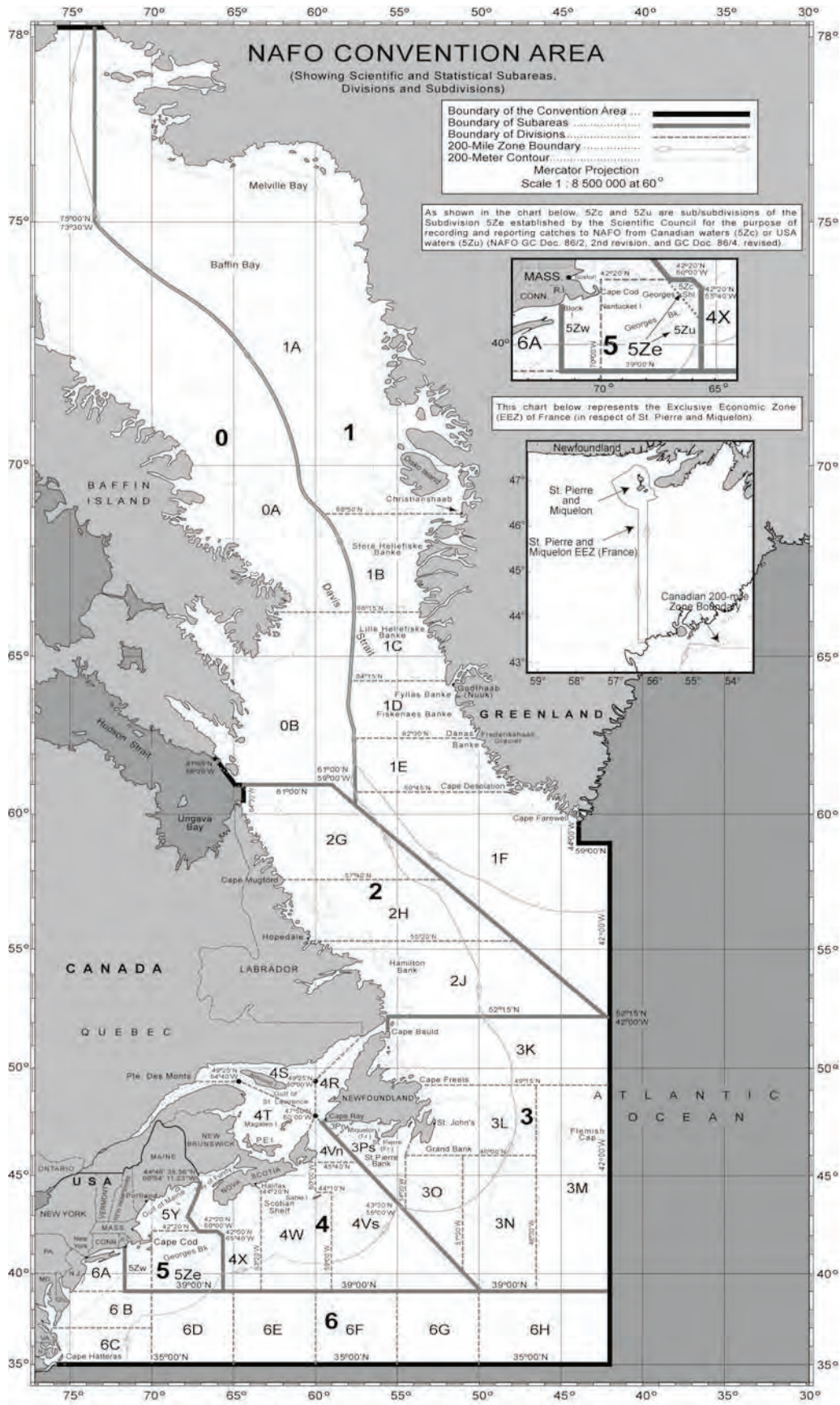
SECTION III contains the Report of the Fisheries Commission including its subsidiary body (STACTIC), 32nd Annual Meeting, 20-24 September 2010, Halifax, Nova Scotia, Canada.

SECTION IV contains the Report of the FC Working Group of Fishery Managers and Scientists on Conservation Plans and Rebuilding Strategies (WGFMS-CPRS), 7 April 2011 (via WebEx).

SECTION V contains the Report of the Standing Committee on International Control (STACTIC), 9-10 May 2011, NEAFC Headquarters, London, UK.

SECTION VI contains the Report of the FC Working Group of Fishery Managers and Scientists on Conservation Plans and Rebuilding Strategies (WGFMS-CPRS), 26-28 June 2011, Halifax, Nova Scotia, Canada.

SECTION VII contains the Report of the Working Group of Fishery Managers and Scientists on Vulnerable Marine Ecosystems (WGFMS-VME), 29-30 June 2011, Halifax, Nova Scotia, Canada.



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**Structure of the Northwest Atlantic Fisheries Organization (NAFO)
(as at 01 August 2011)**

Contracting Parties

Canada, Cuba, Denmark (in respect of the Faroe Islands and Greenland), European Union (EU), France (in respect of St. Pierre et Miquelon), Iceland, Japan, Republic of Korea, Norway, Russia, Ukraine and United States of America (USA).

President

T. Lobach (Norway)

Constituent Bodies

General Council	Canada, Cuba, Denmark (in respect of the Faroe Islands and Greenland), EU, France (in respect of St. Pierre et Miquelon), Iceland, Japan, Republic of Korea, Norway, Russia, Ukraine and USA.	<i>Chair</i> – Terje Lobach (Norway) <i>Vice-Chair</i> – Vincent Grimaud (EU)
Scientific Council	Canada, Cuba, Denmark (in respect of the Faroe Islands and Greenland), EU, France (in respect of St. Pierre et Miquelon), Iceland, Japan, Republic of Korea, Norway, Russia, Ukraine and USA.	<i>Chair</i> – Ricardo Alpoim (EU-Portugal) <i>Vice-Chair</i> – Carsten Hvingel (Norway)
Fisheries Commission	Canada, Cuba, Denmark (in respect of the Faroe Islands and Greenland), EU, France (in respect of St. Pierre et Miquelon), Iceland, Japan, Republic of Korea, Norway, Russia, Ukraine and USA.	<i>Chair</i> – Kate Sanderson (Denmark in respect of the Faroe Islands & Greenland) <i>Vice-Chair</i> – Sylvie Lapointe (Canada)

Standing Committees

General Council	Standing Committee on Finance and Administration (STACFAD)	<i>Chair</i> – Deirdre Warner-Kramer (USA) <i>Vice-Chair</i> – Olga Sedykh (Russian Federation)
Scientific Council	Standing Committee on Fishery Science (STACFIS) Standing Committee on Research and Coordination (STACREC) Standing Committee on Publications (STACPUB) Standing Committee on Fisheries Environment (STACFEN)	<i>Chair</i> – Joanne Morgan (Canada) <i>Chair</i> – Carsten Hvingel (Norway) <i>Chair</i> – Margaret Treble (Canada) <i>Chair</i> – Gary Maillet (Canada)
Fisheries Commission	Standing Committee on International Control (STACTIC)	<i>Chair</i> – Gene Martin (USA) <i>Vice-Chair</i> – Stein-Åage Johnsen (Norway)

Secretariat

Executive Secretary	Vladimir Shibanov
Deputy Executive Secretary / Senior Finance and Staff Administrator	Stan Goodick
Fisheries Commission Coordinator	Ricardo Federizon
Scientific Council Coordinator (from 21 Mar 2011)	Neil Campbell
Scientific Council Coordinator (to 31 Dec 2010) / Interim Scientific Council Coordinator (to 31 Mar 2011)	Anthony Thompson
Senior Personal Assistant to the Executive Secretary	Bev McLoon
Information Officer	Barb Marshall
Fisheries Information Manager	Cindy Kerr
IT Manager	George Campanis
Office Manager	Lisa Pelzmann
Publications Manager	Alexis Pacey
Interim Office Manager (Jan-Dec 2011)	Lesley Torbacioglu

Headquarters Location

2 Morris Drive, Dartmouth, Nova Scotia, Canada

SECTION I
(pages 1 to 60)

**Report of the FC Working Group on Greenland Halibut Management
Strategy Evaluation (WGMSE)
16-17 September 2010
Halifax, Nova Scotia, Canada**

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**Report of the FC Working Group on Greenland Halibut Management
Strategy Evaluation (WGMSE)**
(FC Doc. 10/30)

**16-17 September 2010
Halifax, Nova Scotia, Canada**

1. Opening

The Co-Chair (Sylvie Lapointe, Canada) opened the meeting at 1000 hrs on Thursday, 16 September 2010 at the World Trade and Convention Centre and welcomed the participants to Halifax (Annex 1). She recapped the discussions and accomplishments by the working group at the two previous meetings. She reminded the participants as per the terms of reference of this group, an outstanding deliverable remained -- the formulation of recommendations and options concerning Management Strategy Evaluation (MSE)-approach in the determination of Total Allowable Catch (TAC) for Greenland halibut.

2. Appointment of Rapporteur

Ricardo Federizon (NAFO Secretariat) was appointed Rapporteur.

3. Adoption of Agenda

The provisional agenda as previously circulated was adopted (Annex 2).

4. Presentation of Consultants' Reports on SCAA and XSA

Peter Shelton (Canada) presented the results of the MSE from Extended Survival Analysis (XSA)-conditioned operating models (FCWGMSE WP 10/16 Draft 2); and Douglas Butterworth (EU) presented the results of the MSE from Statistical Catch-at-age (SCAA)-conditioned operating models (FCWGMSE WP 10/13-15). The Consultants' Reports are compiled in Annex 3.

The MSE were run on the operating models agreed upon at the May 2010 Meeting. A suite of Management Strategies (MS) were developed on the combinations of alternative choices on three factors: the λ values in the Harvest Control Rule (HCR), the starting TAC control parameter values, and constraints on the extent of TAC variation from one year to the next – the latter two elements being explored for the first time during this meeting. A smaller set of MS were selected for further consideration based on their performance relative to the established Performance Targets (See FC Doc. 10/5).

5. New Management Strategies Specifications for Evaluation

Discussions on the Management Strategies Specifications centered on:

- Comparability of the results between XSA- and SCAA-conditioned operating models in the MSE runs, and
- Starting TAC input, constraint levels, and λ values in the Harvest Control Rule.

A number of MS were considered by the Working Group and after considerable discussion no consensus could be reached as to what single MS could be recommended to the Fisheries Commission. Subsequently, two options were identified for consideration by the Fisheries Commission.

The initial input parameters in the HCR vary between the two MS: 16 000 and 17 500 t as starting TAC; 1.25 and 2.00 as λ values when slope is negative; and $\pm 10\%$ and $\pm 5\%$ constraint levels. A λ value of 1.00 applies to both MS when the slope is positive.

6. Recommendations to be forwarded to the Fisheries Commission

In the formulation of recommendations/management strategy specifications for the Fisheries Commission, the Working Group discussed how the MSE approach complements the current Greenland Halibut Rebuilding Plan and "exceptional circumstances" under which management strategy output for a TAC should be over-riden.

While no consensus could be reached on a single MS, participants broadly endorsed the MSE approach and agreed to put forth a recommendation to the Fisheries Commission which included two management strategies for consideration. The recommendation also included guidance on and follow-up related to implementation.

As such, it was agreed that the following recommendations be forwarded to the Fisheries Commission on behalf of the Working Group:

Recognizing that Contracting Parties agreed in 2003 to implement a fifteen-year rebuilding programme for the Greenland halibut stock in Subarea 2 + Divisions 3KLMNO,

Acknowledging the continued uncertainty of the 2009 assessment for the Greenland halibut stock in Subarea 2 + Divisions 3KLMNO,

Desirous to move forward with a risk management approach for this stock,

Desirous to achieve the objectives of the rebuilding programme,

Recalling that at the 2009 annual meeting of NAFO, the Fisheries Commission established a Working Group to develop a Management Strategy Evaluation (MSE) framework to help inform management of Greenland halibut in Subarea 2 + Divisions 3KLMNO (FC Doc 09/18),

Consistent with its terms of reference, the Working Group considered alternative management strategies with their harvest control rules, selected appropriate performance indicators, defined acceptable levels of risk, and projected/evaluated outputs of the risk management framework utilizing a range of assessment models,

Noting that the Fisheries Commission will consider the report from this Working Group including any recommendations contained therein as the basis for a risk management based decision on the TAC level for 2011 and beyond,

The following recommendations will be forwarded to the Fisheries Commission.

1. Management Strategy Evaluation (MSE)

The Fisheries Commission shall implement an MSE approach for Greenland halibut stock in Subarea 2 + Divisions 3KLMNO.

2. Management Strategy (Harvest Control Rule)

A simple model-free management strategy shall be adopted consistent with NAFO SCR 09/37. The harvest control rule (HCR) will adjust the total allowable catch (TAC) from year (y) to year (y+1), according to:

$$TAC_{y+1} = TAC_y (1 + \lambda \times \text{slope})$$

where :

slope = measure of the recent trend in survey biomass. The TAC is subject to constraints on a percentage change from one year to the next.

Two management strategies were put forward for consideration by Fisheries Commission based on the HCR identified above:

	Management Strategy 1	Management Strategy 2
Starting TAC Control Parameter	16, 000 t	17, 500 t
λ if slope is negative	1.25	2.00
λ if slope is positive	1.00	1.00
Constraint on the rule-generated TAC change	$\pm 10\%$	$\pm 5\%$

Full details of the application of the management strategies are provided in Annex 4. Results of these applications are provided in Annex 5.

3. Implementation

The management strategy shall be implemented initially for 4 years. It shall be annually monitored by the Scientific Council to ensure that the data being input into the management strategy is consistent with the MSE process. If exceptional circumstances arise, this shall provide a scientific justification for over-riding the TAC provided by the HCR

Guidelines on how to address exceptional circumstances for adoption by Fisheries Commission in 2011 shall be developed intersessionally by WGMSE with the advice of the Scientific Council.

The Fisheries Commission shall review the progress of this management strategy in four (4) years with advice from Scientific Council.

[The FC shall consider undertaking a revision of the Greenland halibut rebuilding programme to reflect the implementation of the Management Strategy.]

The WGMSE will remain in place at least until 2011 to allow for further refinement of the MSE following initial implementation.

7. Other Matters

The Co-Chair Antonio Vazquez (European Union) would communicate with the Scientific Council and keep it informed concerning the results of this meeting.

8. Adoption of Report

This report was adopted through correspondence after the meeting.

9. Adjournment

The meeting was adjourned at 18hrs on Friday, 17 September 2010.

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Annex 2. Agenda

1. Opening
2. Appointment of Rapporteur
3. Adoption of the Agenda
4. Presentation of Consultants' Reports on SCAA and XSA
5. New Management Strategies Specifications for Evaluation
6. Recommendations to be forwarded to the Fisheries Commission
7. Other Matters
8. Adoption of Report
9. Adjournment

Annex 3. Compilation of Consultants' Reports

(FCWGMSE WP 10/16 Draft 2)

Performance Statistics for NAFO Greenland halibut management strategy evaluation from XSA-conditioned operating models

Peter Shelton¹, David Miller², Brian Healey¹, and Bill Brodie¹

¹DFO St John's, Canada

²Independent Consultant, The Netherlands

Background

A study funded by the Canadian International Governance Programme commenced work in 2007 on developing a management strategy evaluation (MSE) for NAFO 2+3KLMNO Greenland halibut. A Study Group on Rebuilding Strategies for Greenland halibut was struck by NAFO SC in 2007 based on promising preliminary results (NAFO SCR Doc. 07/58). The SG met in Vigo in February 2008 to make further progress (NAFO SCS Doc, 08/13). Research documents providing the results of analyses were tabled at the June SC meetings in both 2008 and 2009 (NAFO SCR Docs. 08/25 and 09/037) and advice was provided by NAFO SC to NAFO FC in both years regarding the desirability of adopting a prescribed management strategy (MS) based on a feedback harvest control rule.

Based on progress, NAFO FC struck the Working Group on Greenland Halibut Management Strategy Evaluation (WGMSE) in 2009. WGMSE met in Brussels in January 2010 (NAFO/FC Doc. 10/2) and in Halifax in May 2010 (NAFO/FC Doc. 10/5). The decision was taken to review two sets of results for management strategy evaluation at a further meeting in September 2010 just prior to the Annual NAFO meeting – results from analyses conditioned on the NAFO SC June 2010 XSA assessment of the stock and results from an alternative Statistical Catch at Age Approach (SCAA) applied to the same input data.

Update on assessment and status from the June 1010 NAFO SC meeting

Estimates of exploitable biomass from the June 2010 assessment are higher than previously reported estimates over 2004-2008 (Fig. 1). This difference primarily arises as a result of the addition of the deep-water information from the EU survey to the analysis as well as a reduction in the amount of F-shrinkage applied. (see Healey *et al.* (2010) NAFO SCR 10/40 for technical detail and rationale for these changes.)

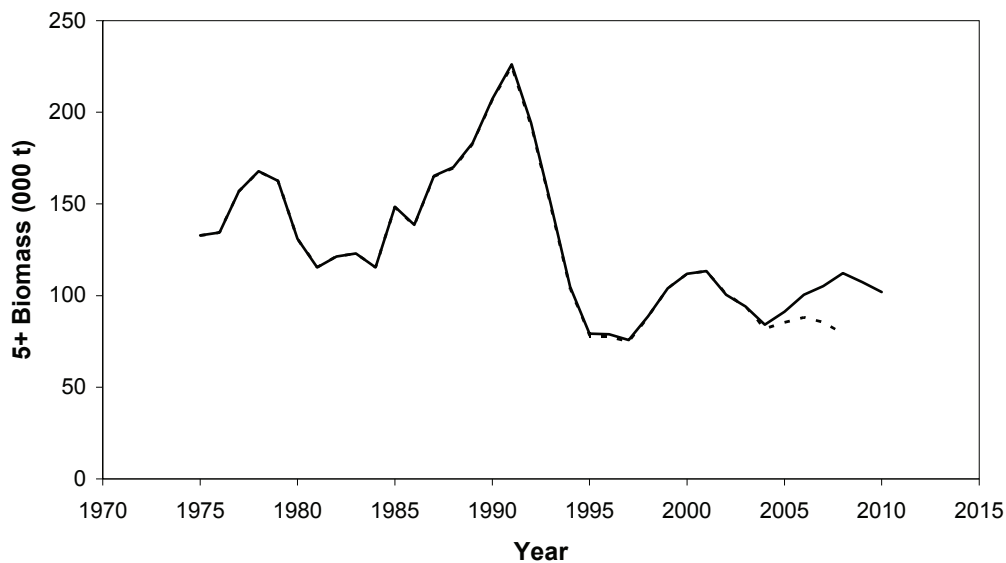


Fig. 1. Estimated ages 5+ biomass (000 t) from the 2008 SC assessment (dashed line) and from the 2010 SC assessment.

Brief review of MS, OMs and HCRs

More details can be found in the above cited NAFO documents available online. Management Strategy Evaluation (MSE) involves evaluating candidate Management Strategies (MSs) against alternative hypotheses regarding how the real world behaves, captured in a set of simulations called Operating Models (OMs). Depending on the management objectives, a set of Performance Statistics (PSs) can be developed to compare alternative MSs. The PSs comprise explicit quantifications of the management objectives and typically incorporate risk tolerances that are desired to be met with regard to not achieving specific objectives. PSs were suggested in Brussels and refined in Halifax (see NAFO/FC Doc. 10/5, especially Annex 3).

The core of an MS is typically a feedback Harvest Control Rule (HCR). It was agreed by the WGMSE that the model-free (survey-based) HCR described in NAFO SCR Doc. 09/037 would be applied. Assuming the first year is 2010 and the TAC is known to be 16kt, this HCR adjusts TACs in 2011 and onwards based on the trend in the survey indices. The rule as described in NAFO/FC Doc. 10/5 has a parameter λ that adjusts the change in TAC based on the estimated average survey slope. It was decided to have the option of setting different values for λ depending on whether the average survey slope is negative or positive, termed λ -down and λ -up. Tuning the HCR involves finding the set of λ parameters that best meet the management objectives for the fishery as quantified through the PSs.

Graphical illustration of the relationship between change in TAC and λ

In the application of the survey-based HCR, next year's total allowable catch (TAC) in the simulations is computed from trends in the survey data. Specifically, the TAC in year ($y+1$) is defined by:

$$TAC_{y+1} = TAC_y (1 + \lambda \cdot slope)$$

where:

slope=the average of the slopes of regression models fit to the log values of each of the survey data series over the past 5 years – considered to be indicative of the change in the size of the stock.

λ is a scaling parameter which can be altered to “tune” the rule to optimize its performance with respect to the PSs and the associated risk of not meeting the risk tolerances defined for each PS (except the magnitude of catch PSs). In several instances, a pair of λ values are applied in a single MSE, by setting:

$$\lambda = \begin{cases} \lambda_u & \text{if } slope > 0 \\ \lambda_d & \text{otherwise} \end{cases}$$

Independent choices of λ in the case of a perceived increase ($slope > 0$) or decrease in the stock permits a different “rate of reaction” in the TAC depending on the trajectory of the stock.

Parameterizing the HCR

The initial TAC generated by the HCR within the MSE is for the fishery in 2011. It is computed from the 2010 TAC (16kt), the trend in the survey data over the period 2005-2009 (via $slope$) and the scaling parameter λ .

Of interest in 2011 and subsequent years is not just the magnitude of the TAC, but the one-year relative change in the TAC:

$$\Delta TAC = \frac{TAC_{y+1} - TAC_y}{TAC_y} = \lambda \cdot slope$$

Thus the change in TAC is fully determined by the product of the slope and the scaling parameter.

Note that:

- TAC is unchanged in a year (i.e. relative change=0) if $slope=0$. Also true if $\lambda = 0$, but this case is unhelpful as annual TAC would remain at TAC_{2010} over all years.
- The TAC change is constant provided product $\lambda \cdot slope$ is constant. For example the TAC would increase by 25% if either $\lambda=1$ and $slope=1.25$ or $\lambda=1.25$ and $slope=1$.

Fig. 2a illustrates the one-year percent change in TAC over a range of slope and λ values. It is meant as a guide towards informative choices for λ (or alternatively, λ_d and λ_u). This is the only parameter selection for the WG to make as the value of slope is computed directly from the survey data within the MSE simulation (unless alternative starting TAC levels for 2010 are considered).

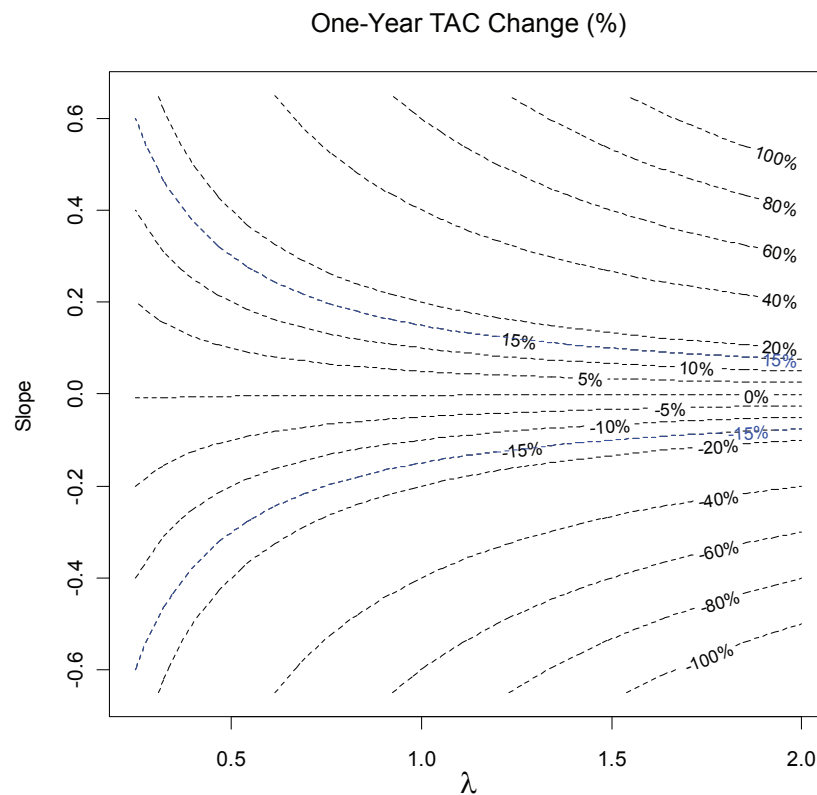


Fig. 2a. Contour plot of One-Year change in TAC (%). The +/-15% contours are highlighted, as they relate to the maximum average annual variation in TAC agreed to by the WG at its May meeting.

Note that the range of TAC change is decreasing as λ decreases. By way of example, slope values in the range of (-0.2, 0.2) will lead to TAC changes of +/- 40% if $\lambda = 2$. However, if $\lambda = 0.5$ the TAC change for the same ranges of slope will be only 10%. An illustration of the one year TAC change if $\lambda_d = 1.5$ and $\lambda_u = 1.0$ is provided in Fig. 2b.

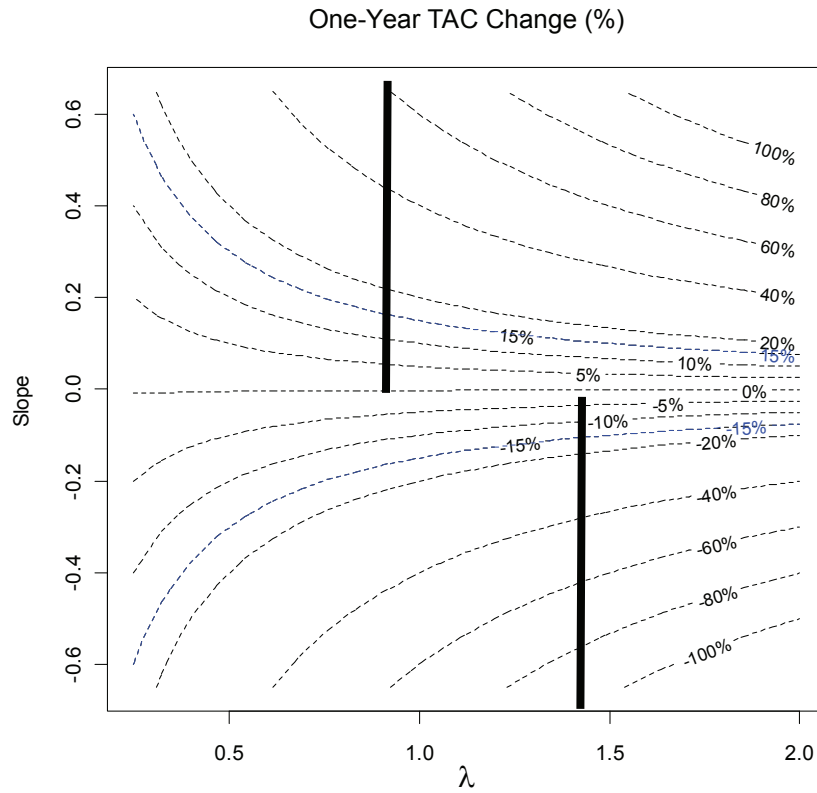


Fig. 2b. Contour plot of One-Year change in TAC (%). Vertical lines indicate what the TAC change would be across slope values of -0.7 to 0.7, assuming $\lambda_d = 1.5$ and $\lambda_u = 1.0$.

Further information that is useful in making decisions on λ is available from the survey data over 1996 – 2009. Over this time period, we can compute the *slope* parameter as specified in the HCR (red horizontal lines) and overlay this on the profile of the TAC change (Fig. 3). From this plot it can be seen that for $\lambda > 1.5$ a number of the historic slopes values would have lead to TAC changes $> 15\%$.

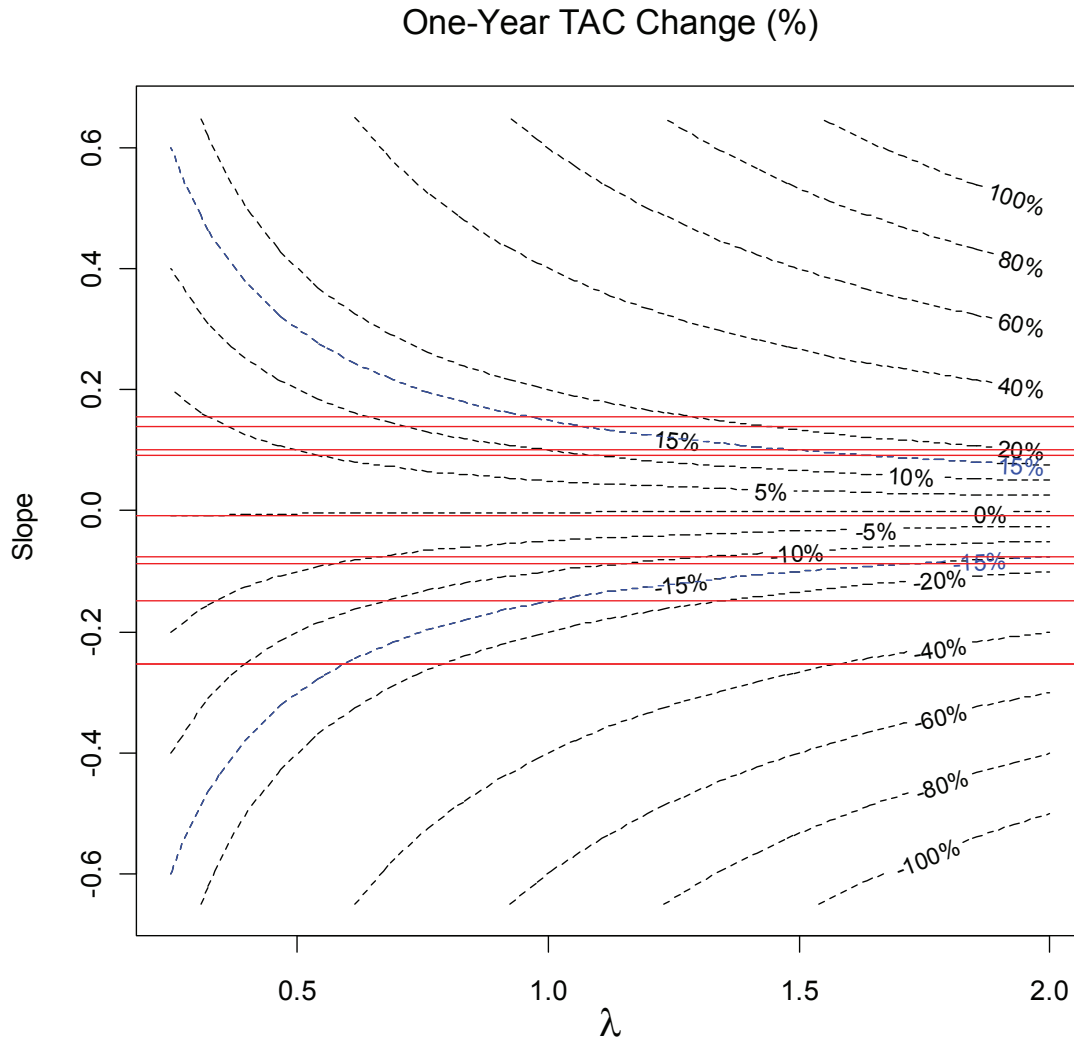


Fig. 3. Contour plot of One-Year change in TAC (%), with 'survey slope' from each five-year window in 1996-2009 overlaid (red lines). Slope is computed as per the HCR specifications.

The historic percentage change in TAC that would have occurred based on observed survey slopes is illustrated in Fig. 4 for three sets of λ values. This historic trajectory over time is purely illustrative in nature as the catches which impacted stock dynamics were very different from the TACs that would have been generated by historic application of the HCR. Note that the average of the log survey slopes for the most recent 5 year interval (2005-2009) gives a small percentage decrease in TAC in 2011 for a range of λ 's, the first year for which the harvest control rule will be generated by the HCR, if adopted.

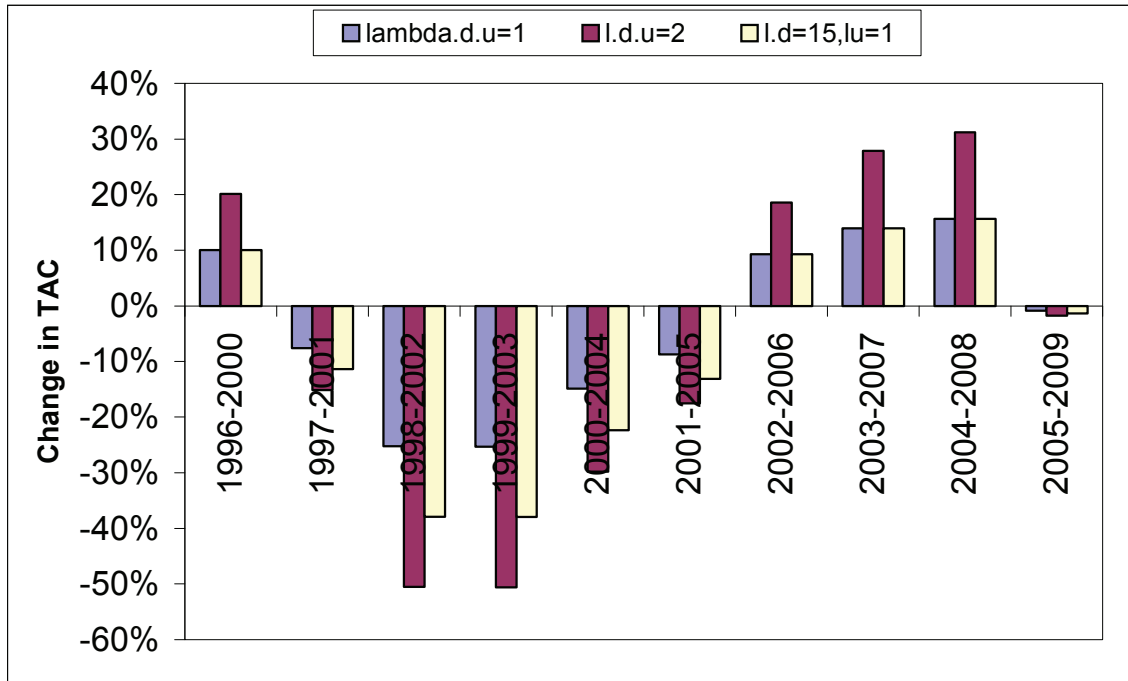


Fig. 4. Historic percentage change in TAC that would have occurred based on survey slopes given λ values (both up and down) of 1, 2 or down 1.5 and up 1.

Performance statistics

The PSs for 14 pairs of λ values are provided in Appendix Table 1. The first column gives the λ values applied. (The nomenclature “ld” refers to lambda down, the value of lambda if slope <0. Similarly, “lu” refers to lambda up.) The next column lists the PSs as described in NAFO/FC Doc. 10/5. An additional statistic is computed, PS4_alt, representing the original NAFO rebuilding target which was to rebuild the 5+ biomass to 140kt by 2019, which corresponds to the 1975-1999 mean value by 2019. The next column gives a brief description of what is measured by the PS (see NAFO/FC Doc. 10/5 Annex 3 for details). The next column indicates what aspect of the performance statistic is given under each OM. For PS1 and PS4 this indicates that “All” the data are used to compute the straight probability from the 100 replicates under each OM. For PS2 it is the median “50%” of the distribution of probabilities from the 100 replicates under each OM and for PS3 it is the median catch. The following 6 columns to the right provide the probabilities or catch values under each OM. The second last column from the right gives the risk tolerance as specified by managers and industry at the May 2010 Halifax WGMSE meeting. The probabilities need to be compared against these risk tolerances to determine whether or not the specific tuning of the harvest control rule being evaluated has performed satisfactorily or not. The last column on the right gives the outcome in terms of Pass or Fail for PS1, 2, 4 and in terms of mean of the medians of the catch for PS3.

Guidance to decision-makers in selecting an appropriate tuning of the HCR

A two step approach is recommended in dealing with the results from the MSE (see NAFO SCR Doc. 09/037). In the first step each MS (in this case alternative tunings of the HCR) must “satisfice” the risk tolerances specified by the decision-makers. In the second step, MSs that pass the first step are subject to trade-off analysis as quantified by the performance statistics.

All HCR tunings meet the specified risk tolerances for the “conservation” PS1. All HCR tunings also meet the risk tolerance for PS4 with the exception of λ -down=2 λ -up=2 which fails for the CAV_domed OM (Annex Table 1, Fig. 5). All tunings meet a <25% risk tolerance for PS4_alt across all OMs except for MP16 and barely in the case of CAV_domed for λ -down=2 λ -up=2 (Fig. 6). PS4_alt corresponds to the FC target of rebuilding the exploitable

biomass to 140kt by 2019, but is not an agreed PS from the May WGMSE meeting in Halifax because it was thought to be difficult to achieve under the then more pessimistic XSA-based analyses.

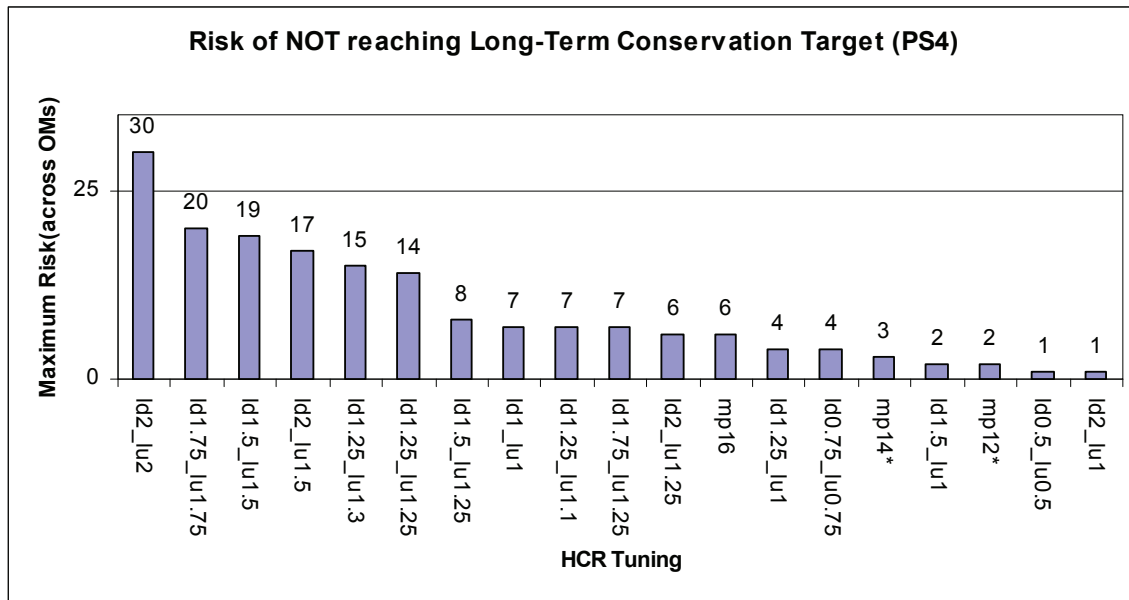


Fig. 5. Risk of not reaching the long-term interim conservation target or milestone by 2031 (PS4). The maximum risk across OMs is plotted for each HCR tuning. The horizontal line indicates the risk tolerance specified by decision-makers.

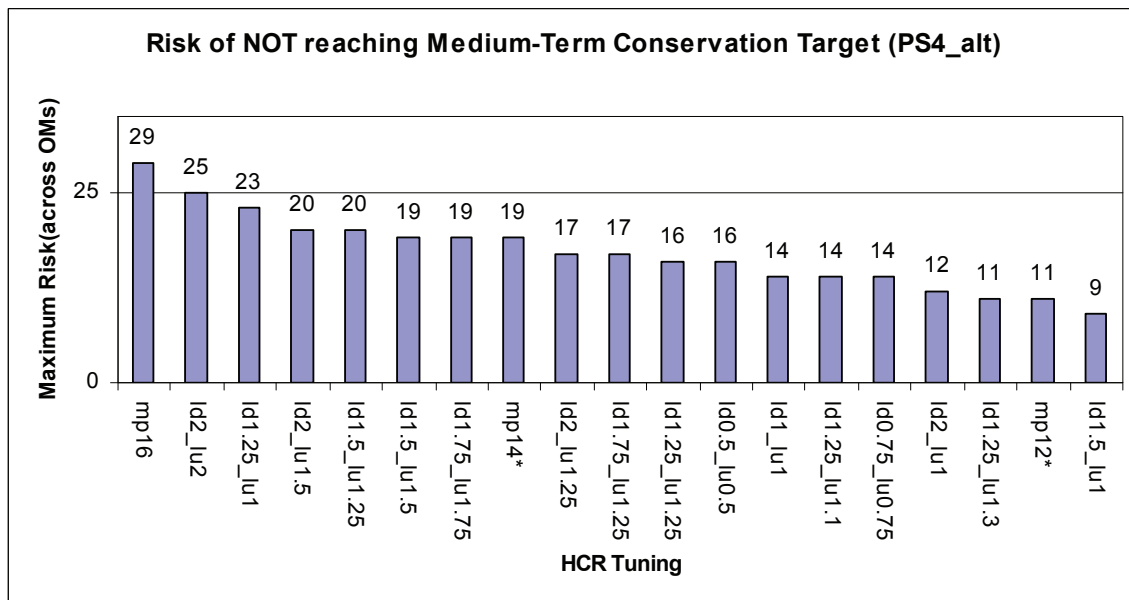


Fig. 6. Risk of not reaching the NAFO interim target or milestone by 2019 (PS4_alt). The maximum risk across OMs is plotted for each HCR tuning. The horizontal line indicates the risk tolerance specified by decision-makers with respect to the long-term meeting of the milestone.

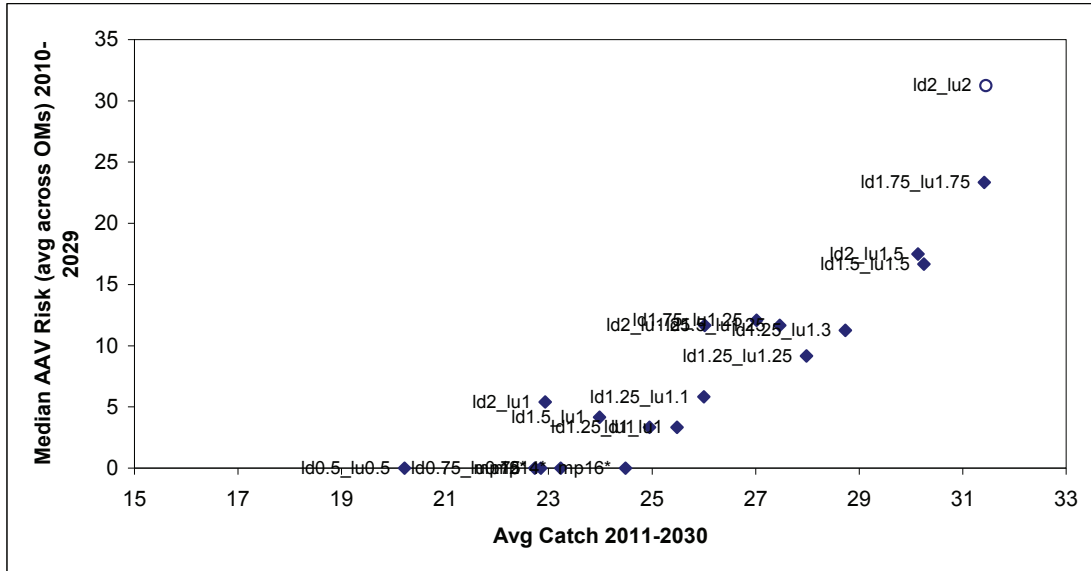
With regard to “exploitation” PSs, there are three types of PSs: variation in catch (PS2a, PS2b), minimum catch (PS2c), and the average catch (PS3). The risk tolerance for PS2ai is met for all HCR tunings examined whereas for PSaii failure to meet the specified risk tolerance occurs for λ -up>1.5. It should be noted that this is associated with

increases in TAC rather than reductions. The specified risk tolerance for PS2b is generally not met for most HCR tunings examined, except for tunings with $\lambda < 1$ or those HCRs with forced constraints on the amount of TAC variation allowed (MP14* and MP16). The specified risk tolerance for PS2c is met by all HCR tunings examined.

To summarize the average catch, (PS3i, 3ii and 3iii) median catch across the 6 OMs is averaged. For the range of λ values considered, the short term catch (2011-2015; PS3i) ranges from 13.7 to 16.3kt. Average catches over 2016-2020 (PS3ii) range from 18.3 to 26.2kt and for 2011-2030 (PS3iii) the average catch ranges from 22.9 to 31.5kt.

The trade-off between annual catch variation (PS2a_{ii}) and the average catch (PS3iii) is clearly illustrated in Fig. 7 (average catch variation across OMs) and Fig. 8 (maximum catch variation across OMs). The greater the long-term average catch, the greater the year-to-year catch variation that has to be accommodated. These trade-offs are less evident in short-term data (PS2a_i vs PS3i; Fig. 9).

Average across Oms



Same plot as above, but zoom in for greater clarity

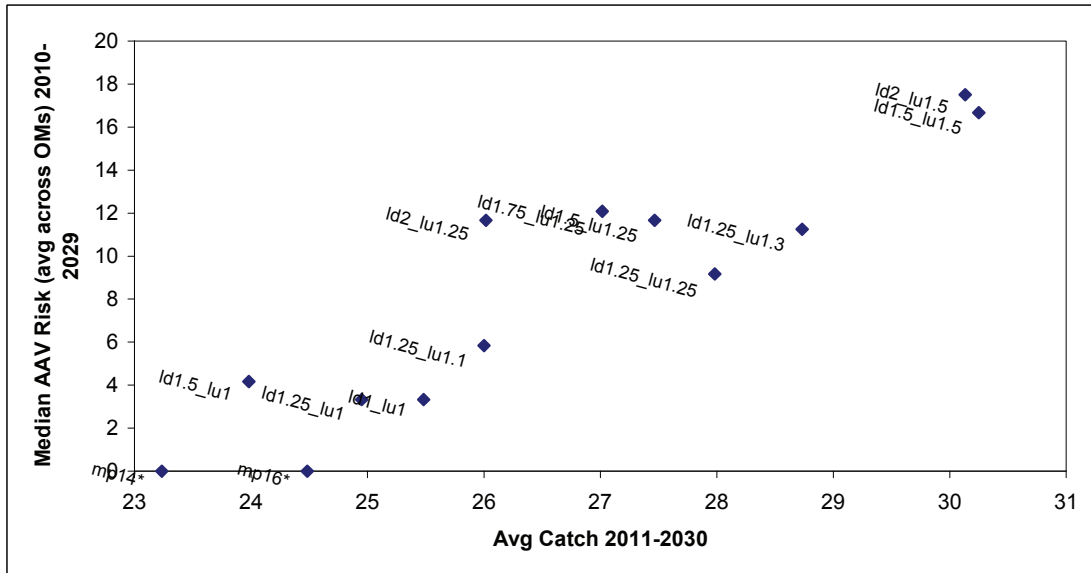
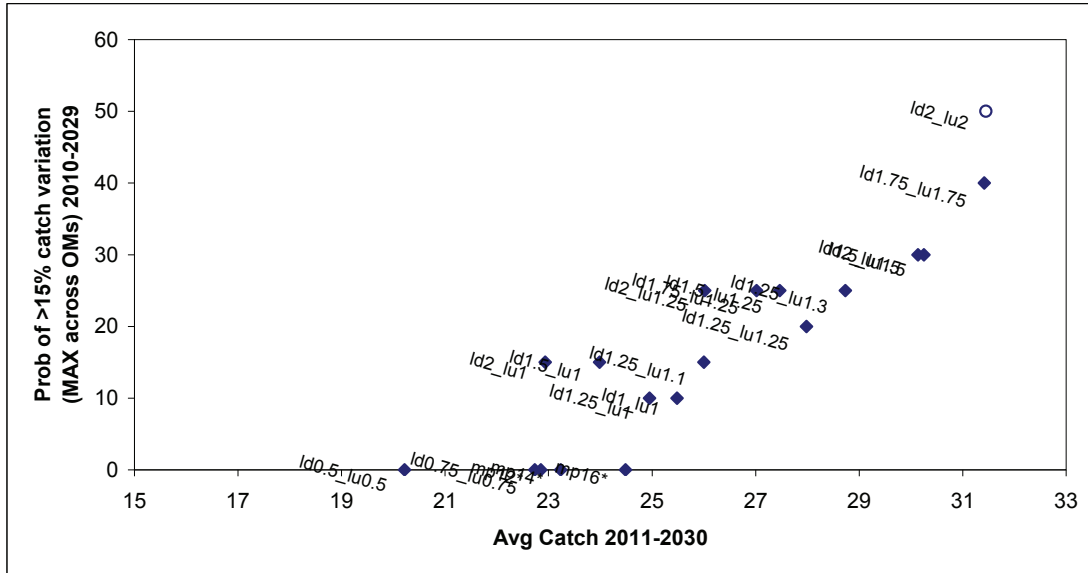


Fig. 7. Trade-off in the long-term between catch variation (average across OMs of the median risk of a greater than 15% annual catch variation ;PS2aii) on the y-axis plotted against the average of the median catches across OMs (PS3iii) on the x-axis for a range of HCR tunings.

Maximum across Oms



Same plot as above, but zoom in for greater clarity

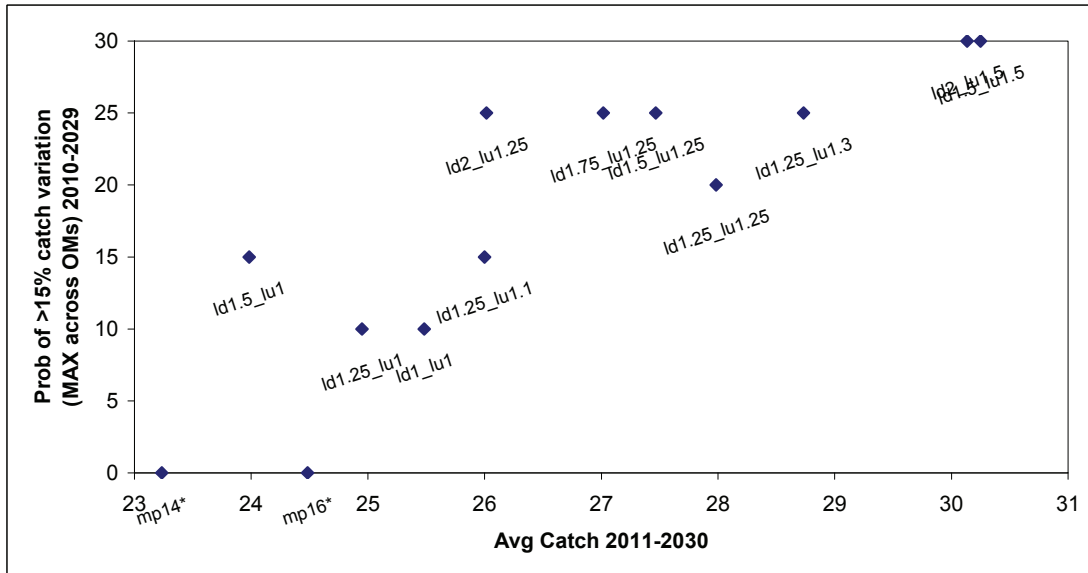


Fig. 8. Trade-off in the long-term between catch variation (maximum across OMs of the median risk of a greater than 15% annual catch variation ;PS2aii) on the y-axis plotted against the average of the median catches across OMs (PS3iii) on the x-axis for a range of HCR tunings.

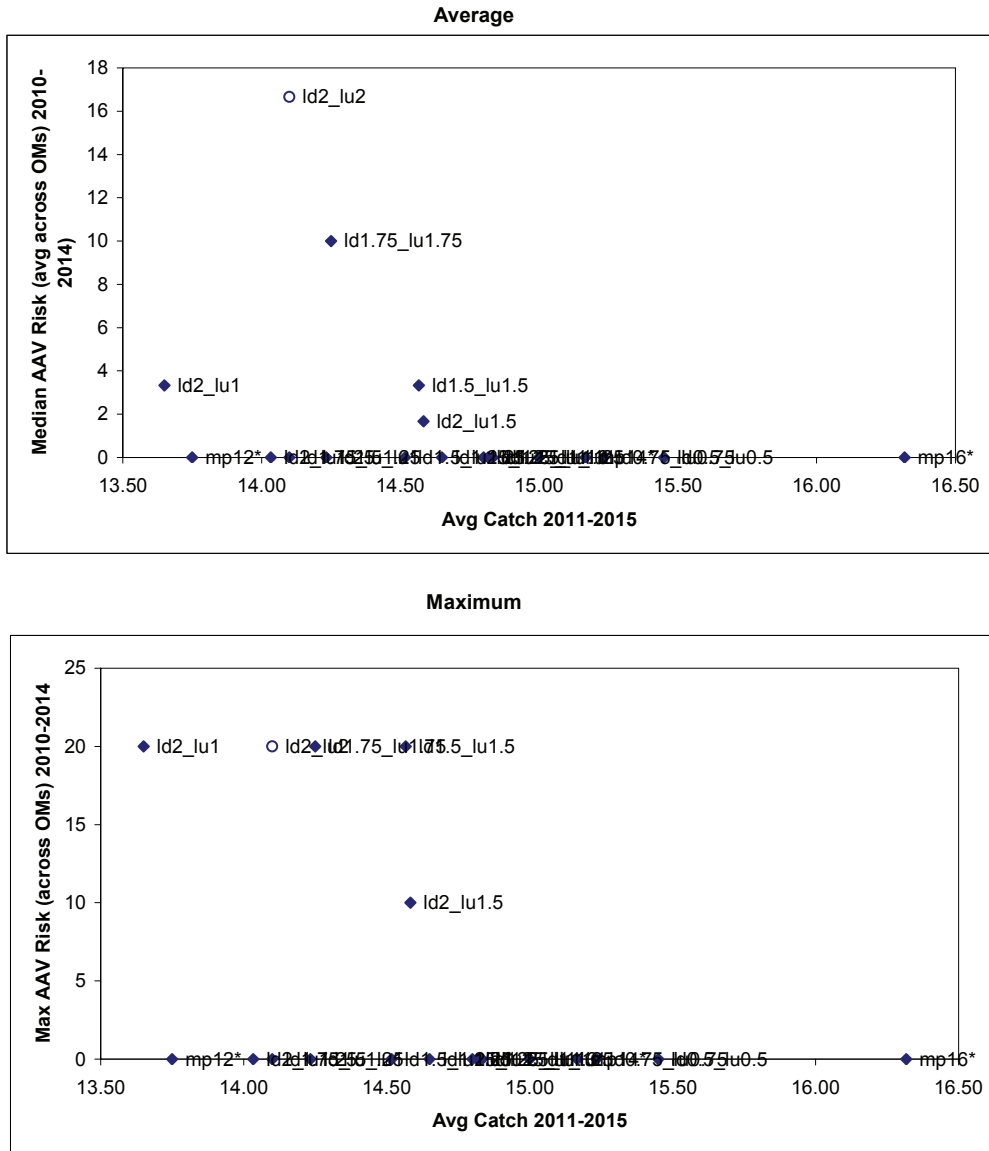


Fig. 9. Trade-off in the short-term between catch variation (average (top) and maximum (bottom) across OMs of the median risk of a greater than 15% annual catch variation ;PS2ai) on the y-axis plotted against the average of the median catches across OMs (PS3i) on the x-axis for a range of HCR tunings.

FCWGMSE WP 10/13

Greenland Halibut MSE Results for Updated SCAA Reference Case and Robustness Test Operating Models

DS Butterworth and RA Rademeyer
September 2010

ABSTRACT

This paper reports the results of the application of 18 potential Management Procedures (MPs) to the Base Case and seven robustness test operating models based on SCAA assessments of the Greenland halibut resource. One of these MPs is selected as a preferred candidate (subject to its performance for XSA-based operating models) on the basis of satisfying virtually all performance targets identified at the May NAFO WGMSE meeting and achieving relatively high catches. The one drawback for this MP (and also all others considered) is failure to meet the specified resource recovery target under robustness test SCAA5 (a lower stock-recruitment steepness), and suggestions are made in that regard. Suggestions are also made in relation to “exceptional circumstances” provisions where over-riding the TAC recommendation output by the MP becomes scientifically justified, and for catering for possible future TAC over-runs. Following discussions of these analyses with our EU principals, results for four further variants of these MPs have been added for consideration.

INTRODUCTION

This document reports results of testing of candidate Management Procedures (MPs) for Greenland halibut for a set of SCAA operating models for the population dynamics which have been updated using the most recent data for the resource as considered at the 2010 NAFO SC meeting (Butterworth and Rademeyer, 2010a). This set includes a Reference Case (SCAA0) and seven robustness tests (SCAA1 to SCAA7).

The projection methodology utilised for these tests is detailed in Butterworth and Rademeyer (2010b), which also lists the performance statistics agreed at the May NAFO WGMSE meeting (NAFO, 2010). Results for 18 alternative MPs are contrasted below in terms in line with the forms and the performance targets and statistics agreed at that meeting.

RESULTS AND DISCUSSION

All the MPs follow the form of the NAFO (2010) default control rule:

$$TAC_{y+1} = \begin{cases} TAC_y \times (1 + \lambda_u \times slope) & \text{if } slope \geq 0 \\ TAC_y \times (1 + \lambda_d \times slope) & \text{if } slope < 0 \end{cases} \quad (1)$$

Three factors/tuning parameters are varied, with the alternatives reflected here culled from a wider set investigated:

- 1) the λ_u and λ_d control parameters: a) $\lambda_u=1.0$ and $\lambda_d=1.25$; b) $\lambda_u=1.0$ and $\lambda_d=2.0$;
- 2) the starting TAC control parameter: a) 16 000t; b) 17 500t; c) 19 000t;
- 3) the inter-annual TAC change constraints: a) +10%, -10%; b) +10%; -5%; c) +15%, -5%.

Note that our earlier Greenland halibut MSE analyses (e.g. Rademeyer and Butterworth, 2010) had imposed inter-annual TAC constraints of 20% and later 15%. These relatively large values were necessitated by the poor status of the resource indicated by earlier XSA assessments, so that sufficient adaptive TAC adjustment could be achieved if these reflected the actual underlying resource situation. However the updated XSA assessment from the 2010 NAFO

SC meeting reflects notably improved results as regards resource status (which is now also closer to SCAA results), motivating consideration of tighter constraints in the interests of enhanced industrial stability.

A full cross of the factors/parameters listed above is reported, yielding 18 candidate MPs (mp01 to mp18) in all. The linkage between MP names and factor/parameter values is provided in Table 1a, which lists results in terms of a format corresponding to the performance targets agreed in NAFO (2010), with results for a 16 000 t constant catch MP also added to provide a convenient benchmark for comparisons. Note that in this Table, statistics that do not meet the targets specified in NAFO (2010) are shown shaded.

These same results are shown in Fig. 1 in the form of graphical projections for the annual catch (assumed equal to the TAC in projections under MPs) and exploitable biomass (B_{5-9}), with both medians and lower 2.5%iles of probability distributions plotted. In this Figure, the 18 MPs are grouped by the starting TAC control parameter value.

In the authors' view, mp14 provides the best trade-off amongst the performance statistics under SCAA0, satisfying all performance targets, and yielding the highest catches amongst the other MPs which do likewise. It is thus used as a "baseline" MP in Figure 2, which illustrates the sensitivity of the results for mp14 to single factor variations of the starting TAC control parameter (Fig. 2a), the inter-annual TAC change constraints (Fig. 2b) and the λ control parameters (Fig. 2c). Note that the impact of variation of the first two of these factors on results is much greater than the third. It is possible to "mimic" TAC change constraints by decreasing λ values, but for reasons of longer-term stability of abundance projections (i.e. adequate feedback), λ_d values in particular should preferably not be set less than 1.

The performance of the Baseline mp14 across the SCAA Base Case and robustness tests is shown in Table 1b and Fig. 3. Performance targets are met in all cases except for a marginal failure for $P_{\text{achieved}}/P_{\text{milestone}}$ (resource recovery) for SCAA4 (increasing natural mortality at larger ages), and a much greater extent of failure for SCAA5 (stock-recruitment steepness $h = 0.6$ in contrast to the $h = 0.9$ preferred for SCAA0 because of a much better fit to the data). Fig. 3 shows that behavior for SCAA5 is qualitatively different to that for the other robustness tests which manifest quite similar behavior to that of the Base Case SCAA0. In contrast to increases in both catches and exploitable biomasses for these other scenarios, for SCAA5 these both remain fairly steady into the future. Table 1c shows results for SCAA5 across all 18 of the MPs considered, and demonstrates that the failure to meet recovery targets for this scenario is general and not peculiar to mp14. Further comments on this are made below.

In response to a suggestion from Canadian scientists for selection of the three best performing MPs, our selections in addition to the Baseline mp14 are mp12 and mp16 (it must be stressed that these constitute the authors' selections, and do not necessarily reflect the views of the EU). These choices are seen by the authors to provide the best balances between achieving recovery targets, maximizing catches, and minimising TAC variations. We do not consider the marginal failure of mp16 to meet certain TAC change performance targets to be critical, both because these particular targets were chosen primarily with TAC decrease being the concern whereas it is TAC increases that are resulting in these "failures", and further because if such targets are considered critical, they could readily be hard-wired into the control rules without any great impact on other performance statistics. Results for these three MPs applied to the Base Case SCAA operating model (SCAA0) are given in Table 2 in a format different from Table 1, with the statistics for mp14 under robustness test SCAA5 also added there. Graphical comparisons are shown in Figs 4 and 5. Except for the earliest years mp14 achieves the highest catches for only marginal lesser recovery, and also shows appreciably less TAC variation.

An alternative graphical form for contrasting performance statistics for the various MPs applied to SCAA0 is shown in Fig 6a, with comparisons restricted to the authors' three preferred MP choices shown in Fig. 6b.

SUMMARY AND RELATED CONSIDERATIONS

Subject to showing satisfactory performance also under the various XSA based operating models, mp14 appears to the authors to be a strong candidate for adoption as the MP to provide TAC recommendations for Greenland halibut. It meets all the performance targets set at the May WGMSE meeting (NAFO, 2010) while also being likely to achieve relatively high catches. It provides a good example of a major strength of the MSE approach that has been evident in its application to other fisheries, *viz.* that of being able to provide a scientifically defensible basis to constrain inter-annual TAC variation in a manner that nevertheless secures adequate safeguards for the risk of

unintended resource depletion. Thus in the first few future years in this case, the TAC change constraints imposed prevent unnecessary reduction of the TAC as a consequence of following more of the noise than the signal in the survey data (nearly all recent residuals in the assessment fits to the survey indices of abundance are positive), and in a manner which does not compromise resource recovery.

The one concern is the failure of mp14 (or indeed any of the other MPs considered) to secure the desired level of resource recovery under robustness test SCAA5 (lower steepness). The lower 2.5%ile plot for exploitable biomass shown in Fig. 3 for this situation does at least indicate that application of mp14 would prevent any continuing deterioration. This is a manifestation of a potential problem with derivative-control-based MP approaches such as that of equation (1), which arises because their targets are emergent properties which cannot be pre-specified and therefore may turn out to be different to what is desired. The simplest solution to this problem is to include a target-based term as an extension of equation (1). This might better secure some recovery under SCAA5 while not compromising the desirable performance achieved under mp14 for the other SCAA scenarios.

Two other more general issues merit attention in moving towards agreement of an MSE approach for Greenland halibut with its associated decision rule in the form of a TAC formula. The first is that it is usual to pre-agree some guidance concerning “exceptional circumstances” – unexpected future events which provide scientific justification for over-riding the TAC recommendation provided by an MP’s control rule. A customary criterion for what need to be compelling reasons to take such action is future data falling outside the range considered in the MSE process, thus indicating that circumstances have arisen outside the range for which the control rule has been tested to show adequate robustness. To aid consideration of this possible approach, Fig. 7 shows probabilistic projections of future survey results expected under SCAA0 (and implementation of mp14).

A second concern is TAC over-runs, given an empirical MP (equation 1) which takes no explicit account of any mismatch between the TAC set and the catch subsequently taken (as, in contrast, a population model based MP would do). The feedback nature of MPs ensures that they do react to this, but typically slower than needed to make fully compensatory TAC adjustments in the short term. Furthermore, none of the robustness tests considered for these evaluations have considered the impact of possible future catch over-runs. Ideally there should be pre-agreement, as part of any Management Procedure of this type that is adopted, on how to make appropriate adjustments for such over-runs to recommendations output by an MP for TACs.

ADDENDUM

In discussion of the above with our EU principals, suggestions were made that the following further options warranted analysis to allow consideration of the results:

mp14*: this MP is as mp14 (i.e. starting TAC control parameter of 17 500t; $\lambda_u=1$ and $\lambda_d=2$; and constraints on the inter-annual TAC changes of +10% and -5%), but the 2011 MP output is over-ridden by a pre-set TAC of 16 000t. To compute the TAC in 2012 the original 2011 MP output (17 182t) is used in the control rule (equation 1).

mp14**: as mp14*, but the 2012 MP output is also over-ridden by a pre-set TAC of 16 000t.

mp14***: as mp14* but with a pre-set TAC of 14 500t instead of 16 000t in 2011.

mp19: starting TAC control parameter of 14 500t; $\lambda_u=1$ and $\lambda_d=2$; and constraints on the inter-annual TAC changes of +10% and -5%.

Results for these four further MPs are compared to mp14 and mp11 (starting TAC of 16 000t) in Tables 3 and 4, while the exploitable biomass and TAC are plotted in Fig. 8. In terms of the biomass projections (Fig. 8), the original mp14 and its three variants are virtually indistinguishable. The catches over time for all the mp14's (starting TAC control parameter of 17 500t) are appreciably higher than for mp11 (starting TAC control parameter of 16 000t) and mp19 (starting TAC control parameter of 14 500t) without compromising mp14 reaching the specified biomass recovery targets.

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- NAFO. 2010. Report of the Working Group on Greenland Halibut Management Strategy Evaluation (WGMSE), 2 – 4 May 2010, Halifax, Nova Scotia, Canada. NAFO/FC Doc. 10/5, 11 pp.
- Rademeyer RA and Butterworth DS. 2010. Overview of progress with Management Strategy Evaluation (MSE) for Greenland halibut. NFO document NAFO FCWGMSE WP 10/6, 18 pp.

Table 1a: Performance statistics for a series of MPs for the Base Case SCAA operating model (SCAA0), where these are reported in a format that relates to specified targets in NAFO (2010). Instances where those targets are not met are shown shaded.

SCAA0	1		2a		2b		2c				3		4				
	$\lambda_{up}, \lambda_{down}$	starting TAC	bounds	B^{5-9}	Prob	Prob* (2011-2015)	Prob* (2010-2014)	Prob (2011-2030)	Prob (2010-2029)	Prob (2010-2027)	Prob	Prob	Prob	Prob	Prob	$P_{achieved} / P_{milestone}$	
cteC	1; 1.25	16000t		3%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	16000	16000	4%
mp01	1; 1.25	16000t	+10%; -10%	0%	0%	20%	0%	0%	5%	25%	0%	0%	0%	0%	13413	13800	2%
mp02	1; 1.25	16000t	+10%; -5%	2%	0%	20%	0%	0%	5%	17%	0%	0%	0%	0%	14628	16093	12%
mp03	1; 1.25	16000t	+15%; -5%	2%	0%	20%	0%	0%	5%	22%	0%	0%	0%	0%	14628	16425	19%
mp04	1; 1.25	17500t	+10%; -10%	1%	0%	0%	0%	0%	0%	28%	0%	0%	0%	0%	14638	14953	2%
mp05	1; 1.25	17500t	+10%; -5%	2%	0%	0%	0%	0%	0%	17%	0%	0%	0%	0%	15988	17461	21%
mp06	1; 1.25	17500t	+15%; -5%	2%	0%	0%	0%	0%	0%	22%	0%	0%	0%	0%	15988	17726	30%
mp07	1; 1.25	19000t	+10%; -10%	2%	0%	0%	0%	0%	0%	22%	0%	0%	0%	0%	15884	16079	8%
mp08	1; 1.25	19000t	+10%; -5%	4%	0%	0%	0%	0%	0%	11%	0%	0%	0%	0%	17333	18717	31%
mp09	1; 1.25	19000t	+15%; -5%	4%	0%	0%	0%	0%	0%	17%	0%	0%	0%	0%	17333	18959	33%
mp10	1; 2	16000t	+10%; -10%	0%	0%	20%	0%	0%	5%	28%	0%	0%	0%	0%	13283	13437	1%
mp11	1; 2	16000t	+10%; -5%	1%	0%	20%	0%	0%	5%	17%	0%	0%	0%	0%	14513	15855	11%
mp12	1; 2	16000t	+15%; -5%	1%	0%	20%	0%	0%	5%	22%	0%	0%	0%	0%	14513	16211	17%
mp13	1; 2	17500t	+10%; -10%	1%	0%	20%	0%	0%	5%	28%	0%	0%	0%	0%	14517	14511	2%
mp14	1; 2	17500t	+10%; -5%	2%	0%	20%	0%	0%	5%	14%	0%	0%	0%	0%	15857	17218	20%
mp15	1; 2	17500t	+15%; -5%	2%	0%	20%	0%	0%	5%	22%	0%	0%	0%	0%	15857	17545	28%
mp16	1; 2	19000t	+10%; -10%	2%	0%	0%	0%	0%	0%	28%	0%	0%	0%	0%	15746	15561	3%
mp17	1; 2	19000t	+10%; -5%	4%	0%	0%	0%	0%	0%	11%	0%	0%	0%	0%	17203	18570	27%
mp18	1; 2	19000t	+15%; -5%	4%	0%	0%	0%	0%	0%	17%	0%	0%	0%	0%	17203	18797	33%

Table Ib: Performance statistics formulated as in Table 1a for the Base Case SCAA operating model (SCAA0) and its associated robustness tests.

mp14	1	2a		2b		2c		3		4	
		Prob	Prob*	Prob	Prob	Prob	Prob	Prob	Prob	Prob	Prob
	B^{5-9}	(2011-2015)	(2010-2014)	(2010-2015)	(2010-2014)	(2010-2015)	(2010-2014)	(2010-2015)	(2010-2015)	(2010-2015)	(2010-2015)
SCAA0	2%	0%	0%	5%	14%	0%	0%	15857	17218	18102	20%
SCAA1	4%	0%	0%	5%	17%	0%	0%	15756	16314	17816	22%
SCAA2	2%	0%	0%	5%	22%	0%	0%	15765	16676	19198	1%
SCAA3	2%	0%	0%	5%	17%	0%	0%	16016	18306	18329	17%
SCAA4	2%	0%	0%	5%	17%	0%	0%	15812	17310	18776	27%
SCAA5	14%	0%	0%	5%	11%	0%	0%	15579	14355	15366	100%
SCAA6	2%	0%	0%	5%	17%	0%	0%	15923	17636	18598	6%
SCAA7	2%	0%	0%	5%	17%	0%	0%	15847	17450	18849	16%

Table Ic: Performance statistics formulated as in Table 1a for a series of MIPs for SCAA5.

SCAA5	1	2a		2b		2c		3		4		
		Prob	Prob*	Prob	Prob	Prob	Prob	Prob	Prob	Prob	Prob	
	$\lambda_{up}, \lambda_{down}$	starting TAC	bounds	B^{5-9}	(2011-2015)	(2010-2014)	(2010-2014)	(2010-2015)	(2010-2015)	(2010-2015)	(2010-2015)	$P_{achieved} / P_{milestone}$
cteC	1; 1.25	16000t	+10%; -10%	16%	0%	20%	0%	5%	0%	0%	16000	100%
mp01	1; 1.25	16000t	+10%; -10%	5%	0%	20%	0%	5%	28%	0%	13153	97%
mp02	1; 1.25	16000t	+10%; -5%	11%	0%	20%	0%	5%	17%	0%	14465	100%
mp03	1; 1.25	16000t	+15%; -5%	11%	0%	20%	0%	5%	19%	0%	14381	100%
mp04	1; 1.25	17500t	+10%; -10%	8%	0%	0%	0%	0%	28%	0%	14364	99%
mp05	1; 1.25	17500t	+10%; -5%	14%	0%	0%	0%	0%	11%	0%	15715	100%
mp06	1; 1.25	17500t	+15%; -5%	14%	0%	0%	0%	0%	17%	0%	15715	100%
mp07	1; 1.25	19000t	+10%; -10%	13%	0%	0%	0%	0%	22%	0%	15574	100%
mp08	1; 1.25	19000t	+10%; -5%	21%	0%	0%	0%	0%	11%	0%	17039	100%
mp09	1; 1.25	19000t	+15%; -5%	21%	0%	0%	0%	0%	11%	0%	17039	100%
mp10	1; 2	16000t	+10%; -10%	4%	0%	20%	0%	5%	33%	0%	13025	94%
mp11	1; 2	16000t	+10%; -5%	11%	0%	20%	0%	5%	17%	0%	14243	100%
mp12	1; 2	16000t	+15%; -5%	11%	0%	20%	0%	5%	19%	0%	14243	100%
mp13	1; 2	17500t	+10%; -10%	8%	0%	20%	0%	5%	33%	0%	14209	98%
mp14	1; 2	17500t	+10%; -5%	14%	0%	20%	0%	5%	11%	0%	15579	100%
mp15	1; 2	17500t	+15%; -5%	14%	0%	20%	0%	5%	17%	0%	15579	100%
mp16	1; 2	19000t	+10%; -10%	12%	0%	0%	0%	0%	33%	0%	15998	100%
mp17	1; 2	19000t	+10%; -5%	20%	0%	0%	0%	0%	11%	0%	16914	100%
mp18	1; 2	19000t	+15%; -5%	20%	0%	0%	0%	0%	14%	0%	16914	100%

Table 2: Performance statistics for mp12, mp14 and mp16 for the Base Case SCAA operating model (SCAA0) and for mp14 for SCAA5.

SCAA0	Performance target:	1		2a			2b			2c					3		4		
		B^{5-9}	P_{2016} / P_{2011}	Prob* (2010- 2014)	Prob* (2011- 2015)	Prob (2010- 2029)	Prob (2011- 2030)	Prob (2010- 2027)	Prob (2011- 2028)	C_{2011}	C_{2012}	C_{2013}	C_{2014}	C_{2015}	$C_{2011-2015}$	$C_{2016-2020}$	$C_{2011-2030}$	AAV ₂₀₁₁₋₂₀₂₉	B^{5-9}
constant catch	median	1.15	20%	0%	0%	5%	0%	0%	0%	16000	16000	16000	16000	16000	16000	16000	16000	1.1%	1.22
	low 2.5%	0.75	20%	0%	0%	5%	0%	0%	0%	16000	16000	16000	16000	16000	16000	16000	16000	0.9%	0.98
	high 2.5%	1.52	20%	0%	0%	5%	0%	6%	0%	16000	16000	16000	16000	16000	16000	16000	16000	1.6%	1.53
mp12	median	1.18	20%	0%	0%	5%	0%	22%	17%	15709	14939	14207	13511	14165	14513	16211	17485	6.8%	1.17
	low 2.5%	0.81	20%	0%	0%	5%	0%	6%	0%	15709	14939	14207	13511	12849	14243	12249	14993	5.1%	0.81
	high 2.5%	1.54	20%	0%	0%	5%	0%	42%	36%	15709	14939	14207	15043	16767	15303	21124	22118	8.5%	1.48
mp14	median	1.16	20%	0%	0%	5%	0%	14%	11%	17182	16340	15539	14778	15420	15857	17218	18102	5.9%	1.17
	low 2.5%	0.78	20%	0%	0%	0%	0%	0%	0%	17182	16340	15539	14778	14054	15579	13253	15683	4.6%	0.85
	high 2.5%	1.53	20%	0%	0%	5%	0%	33%	28%	17182	16340	15539	16407	17840	16627	20785	21741	7.1%	1.46
mp16	median	1.17	0%	0%	0%	0%	0%	28%	22%	18655	16808	15144	13645	14279	15746	15561	15930	7.2%	1.23
	low 2.5%	0.80	0%	0%	0%	0%	0%	6%	3%	18655	16808	15144	13645	12294	15309	11197	13422	5.5%	1.00
	high 2.5%	1.53	20%	0%	0%	5%	0%	53%	47%	18655	16808	15325	16015	17510	16837	19399	19696	8.6%	1.51
SCAA5																			
mp14	median	0.96	20%	0%	0%	5%	0%	11%	11%	17182	16340	15539	14778	14054	15579	14355	15366	5.7%	0.61
	low 2.5%	0.57	0%	0%	0%	0%	0%	0%	0%	17182	16340	15539	14778	14054	15579	12118	12880	4.6%	0.39
	high 2.5%	1.34	20%	0%	0%	5%	0%	25%	22%	17182	16340	15539	14868	15658	15937	18261	19299	6.7%	0.86

Table 3: Performance statistics for a series of further MPs for the Base Case SCAA operating model (SCAA0) requested for addition by our EU principals, where these are reported in a format that relates to specified targets in NAFO (2010). All MP options shown meet all the NAFO (2010) performance targets.

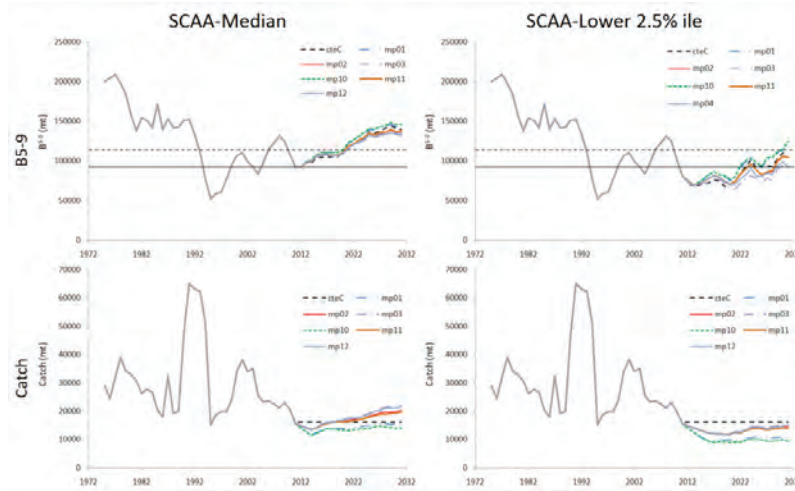
SCAA0	starting TAC	override of MP recommendation	1		2a		2b		2c		3		4				
			Prob	Prob*	Prob*	Prob	Prob	Prob	Prob	Prob	Prob	Prob	Prob	Prob	Prob		
	B^{5-9}		(2011-2015)	(2010-2014)	(2011-2030)	(2010-2029)	(2010-2027)	(2010-2027)	2011	2012	2013	2014	2015	$C_{2011-2030}$	$C_{2011-2030}$	$P_{\text{milestone}}^{\text{achieved}} / P_{\text{milestone}}$	
mp11	16000t		0%	20%	0%	5%	17%	0%	0%	0%	0%	0%	0%	14513	15855	16674	11%
mp14	17500t		0%	20%	0%	5%	14%	0%	0%	0%	0%	0%	0%	15857	17218	18102	20%
mp14*	17500t	$C_{2011}=16000t$	0%	20%	0%	5%	17%	0%	0%	0%	0%	0%	0%	15625	17252	18045	20%
mp14**	17500t	C_{2011} and $C_{2012}=16000t$	0%	20%	0%	5%	17%	0%	0%	0%	0%	0%	0%	15559	17260	18026	20%
mp14***	17500t	$C_{2011}=14500t$	0%	20%	0%	5%	17%	0%	0%	0%	0%	0%	0%	15334	17295	17960	20%
mp19	14500		0%	20%	0%	5%	17%	0%	0%	0%	0%	0%	0%	13405	14765	15520	5%

Table 4: Performance statistics for a series of further MPs for the Base Case SCAA operating model (SCAA0).

SCAA0	starting TAC	override of MP recommendation	1		2a		2b		2c		3		4						
			Performance target	B^{5-9}	Prob*	Prob	Prob*	Prob	Prob	Prob	Prob	Prob	Prob	Prob	Prob				
	P_{2015}	P_{2011}	(2010-2014)	(2011-2015)	(2010-2030)	(2011-2029)	(2010-2030)	(2010-2027)	(2010-2028)	C_{2011}	C_{2012}	C_{2013}	C_{2014}	C_{2015}	$C_{2011-2015}$	$C_{2016-2020}$	$C_{2011-2030}$	AAV ₂₀₁₁₋₂₀₂₉	$P_{\text{milestone}}^{\text{achieved}} / P_{\text{milestone}}$
mp11	16000t		median	1.18	0.20	0.00	0.05	0.00	0.17	0.11	15709	14939	14207	13511	14165	14513	15855	16674	6.3%
			low 2.5%	0.81	0.20	0.00	0.05	0.00	0.06	0.00	15709	14939	14207	13511	12849	14243	12249	14532	5.1%
			high 2.5%	1.54	0.20	0.00	0.05	0.00	0.33	0.28	15709	14939	14207	15043	16359	15221	19038	20096	7.4%
mp14	17500t		median	1.16	0.20	0.00	0.05	0.00	0.14	0.11	17182	16340	15539	14778	15420	15857	17218	18102	5.9%
			low 2.5%	0.78	0.00	0.00	0.00	0.00	0.00	0.00	17182	16340	15539	14778	14054	15579	13253	15683	4.6%
			high 2.5%	1.53	0.20	0.00	0.05	0.00	0.33	0.28	17182	16340	15539	16407	17840	16627	20785	21741	7.1%
mp14*	17500t	$C_{2011}=16000t$	median	1.16	0.20	0.00	0.05	0.00	0.17	0.11	16000	16340	15539	14778	15443	15625	17252	18045	6.0%
			low 2.5%	0.78	0.20	0.00	0.05	0.00	0.00	0.00	16000	16340	15539	14778	14054	15342	13273	15615	4.8%
			high 2.5%	1.53	0.20	0.00	0.05	0.00	0.33	0.28	16000	16340	15539	16435	17876	16403	20791	21686	7.2%
mp14**	17500t	$C_{2011}=16000t$	median	1.16	0.20	0.00	0.05	0.00	0.17	0.11	16000	16000	15539	14778	15449	15559	17260	18026	5.8%
			low 2.5%	0.78	0.20	0.00	0.05	0.00	0.00	0.00	16000	16000	15539	14778	14054	15274	13282	15605	4.6%
			high 2.5%	1.53	0.20	0.00	0.05	0.00	0.33	0.28	16000	16000	15539	16436	17872	16335	20792	21669	7.0%
mp14***	17500t	$C_{2011}=14500t$	median	1.16	0.20	0.00	0.05	0.00	0.17	0.11	14500	16340	15539	14778	15474	15334	17295	17960	6.9%
			low 2.5%	0.78	0.20	0.00	0.05	0.00	0.00	0.00	14500	16340	15539	14778	14054	15042	13311	15583	5.7%
			high 2.5%	1.53	0.20	0.00	0.05	0.00	0.33	0.28	14500	16340	15539	16470	17911	16127	20799	21615	8.0%
mp19	14500t		median	1.21	0.20	0.00	0.05	0.00	0.17	0.14	14500	13790	13114	12471	13128	13405	14765	15520	6.6%
			low 2.5%	0.84	0.20	0.00	0.05	0.00	0.06	0.00	14500	13790	13114	12471	11860	13147	11458	13557	5.4%
			high 2.5%	1.56	0.20	0.00	0.05	0.00	0.33	0.28	14500	13790	13114	13918	15141	14052	17599	18712	7.7%

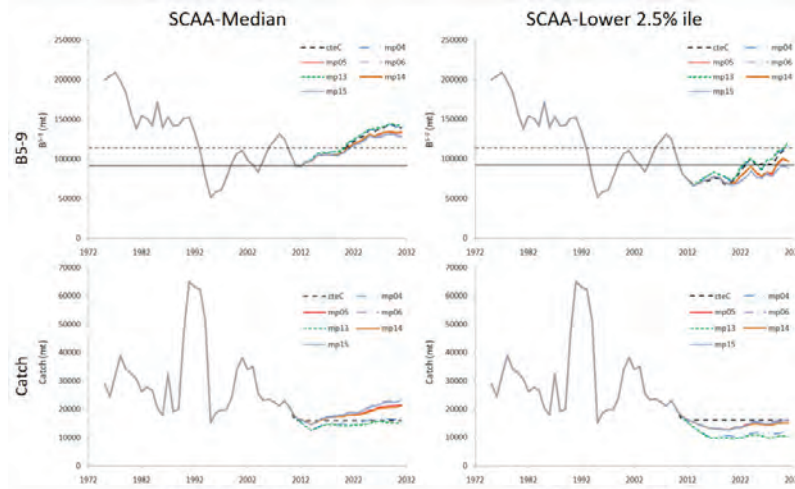
Starting TAC:

16 000t



Starting TAC:

17 500t



Starting TAC:

19 000t

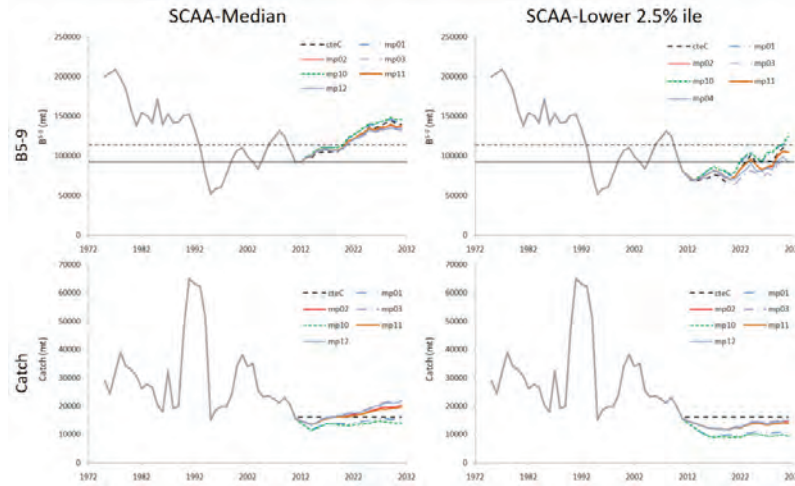


Fig. 1: Medians (left) and lower 2.5%iles (right) TAC and exploitable biomass for a series of MPs for the **Base Case SCAA** operating model (SCAA0). Here and in subsequent biomass plots the full horizontal line represents the 2011 median level while the dashed horizontal line represents the target level (1985-1999 average).

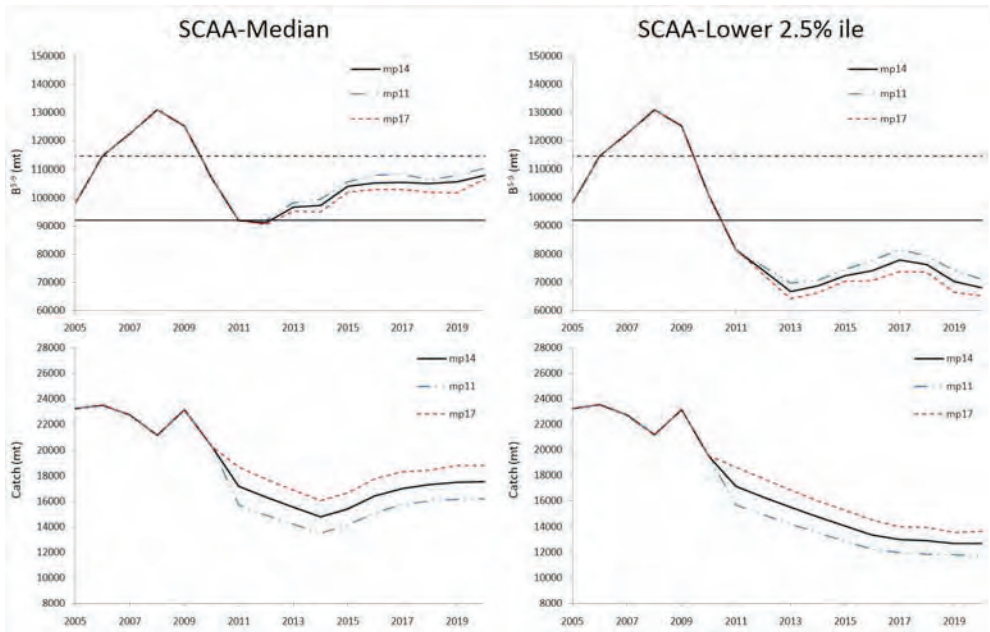


Fig. 2a: Medians (left) and lower 2.5%iles (right) TAC and exploitable biomass for three MPs with different starting TAC control parameters (mp14: 17 500t; mp11: 16 000t and mp17: 19 000t) for SCAA0. Note that here and below to magnify around where most differences are evident, the axes no longer intersect at a zero value on the vertical axis.

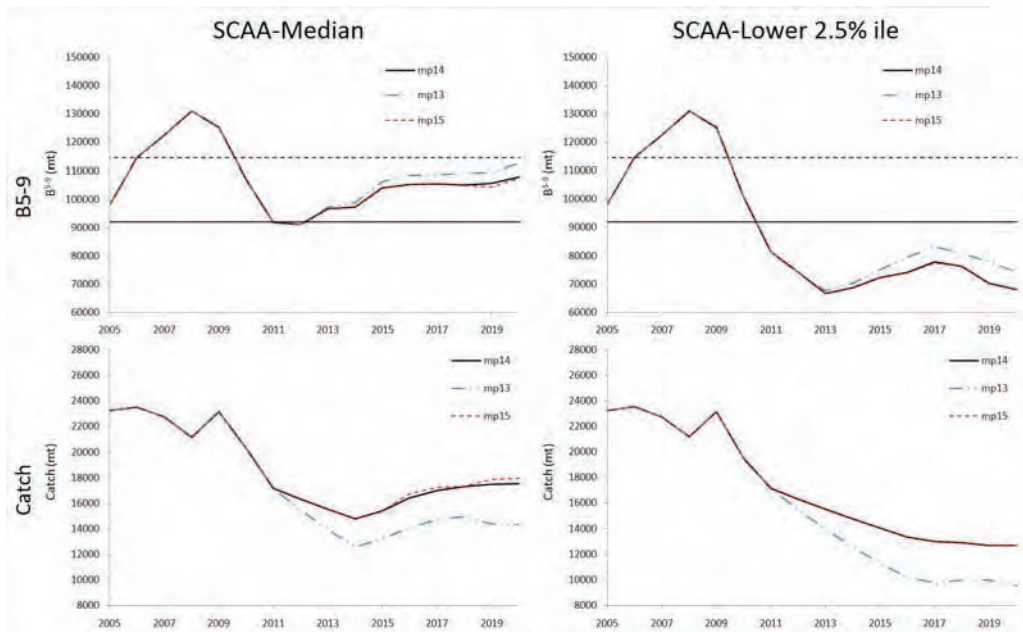


Fig. 2b: Medians (left) and lower 2.5%iles (right) TAC and biomass for three MPs with different bounds on maximum annual TAC change (mp14: +10%, -5%; mp13: +10%, -10% and mp15: +15%, -5%) for SCAA0.

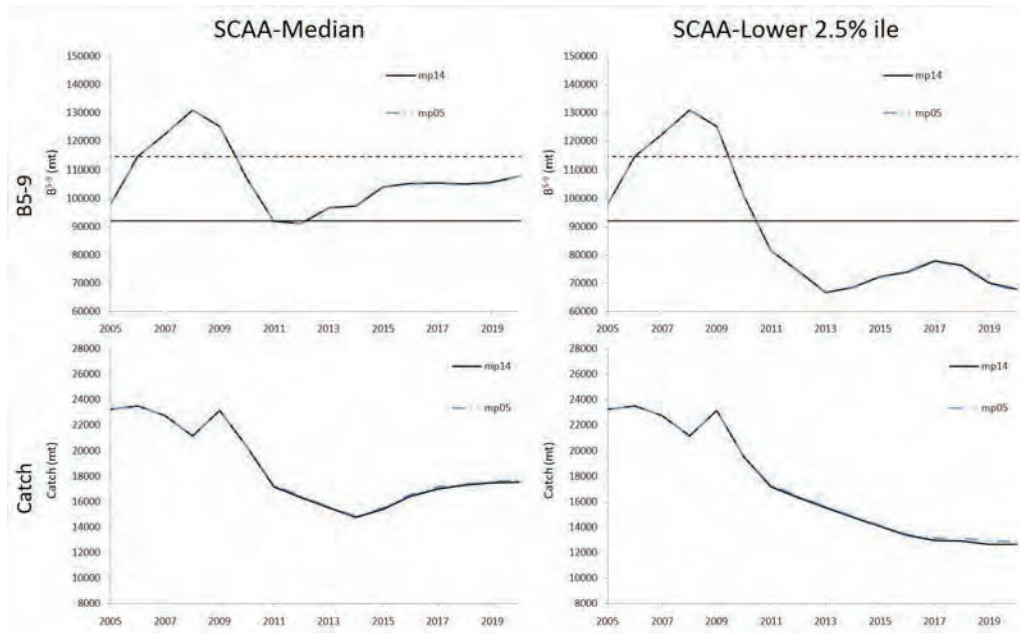


Fig. 2c: Medians (left) and lower 2.5%iles (right) TAC and exploitable biomass for three MPs with different values for down (mp14: 1.25 and mp05: 2.0) for SCAA0.

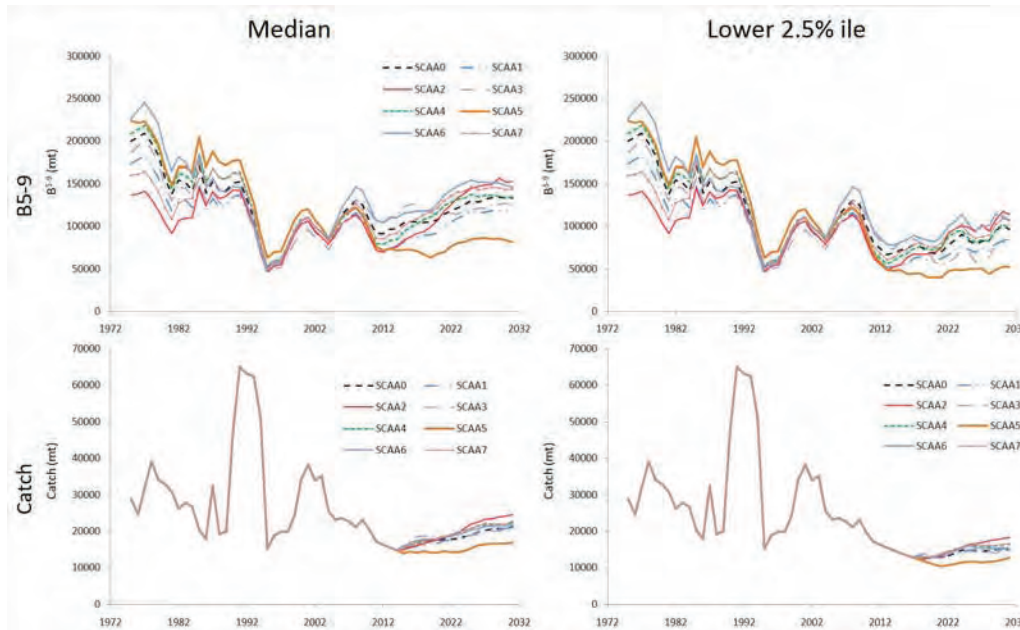


Fig. 3: Medians (left) and lower 2.5%iles (right) TAC and exploitable biomass for the SCAA Base Case operating model (SCAA0) and a series of robustness tests (SCAA1 – SCAA7) for mp14.

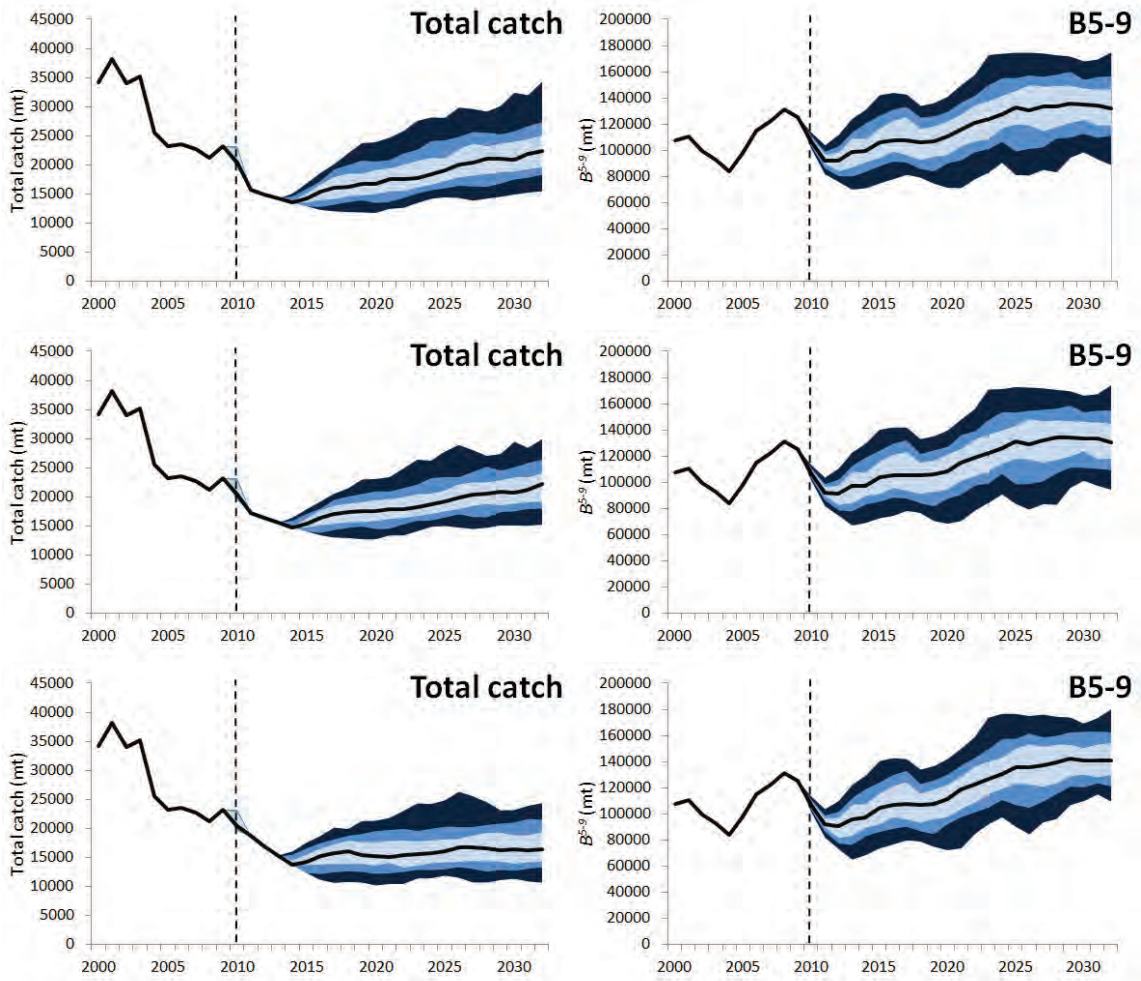


Fig. 4: 95, 75 and 50% PIs and medians for the total catch and exploitable biomass projections for mp12 (top), mp14 (middle) and mp16 (bottom) for SCAA0.

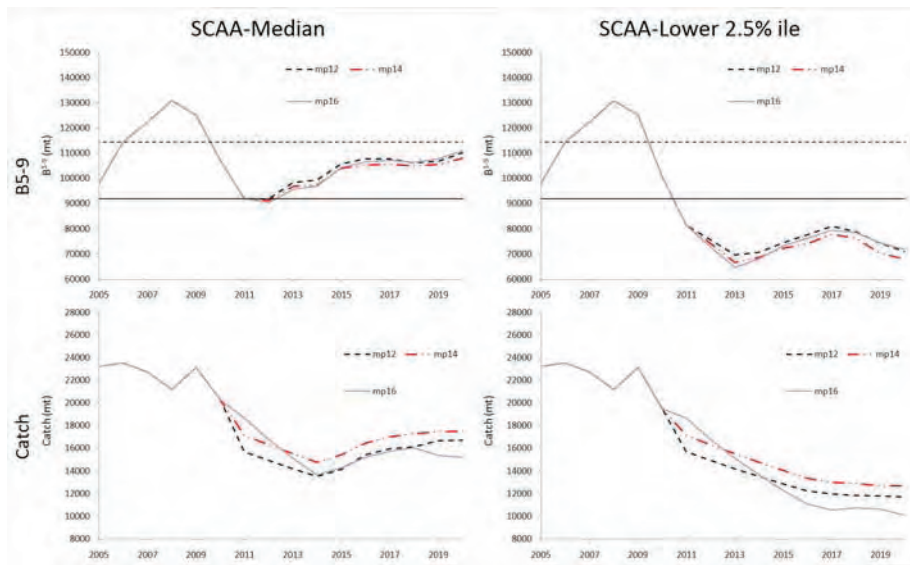


Fig. 5: Medians (left) and lower 2.5%iles (right) TAC and exploitable biomass for the SCAA Base Case for mp12, mp14 and mp16.

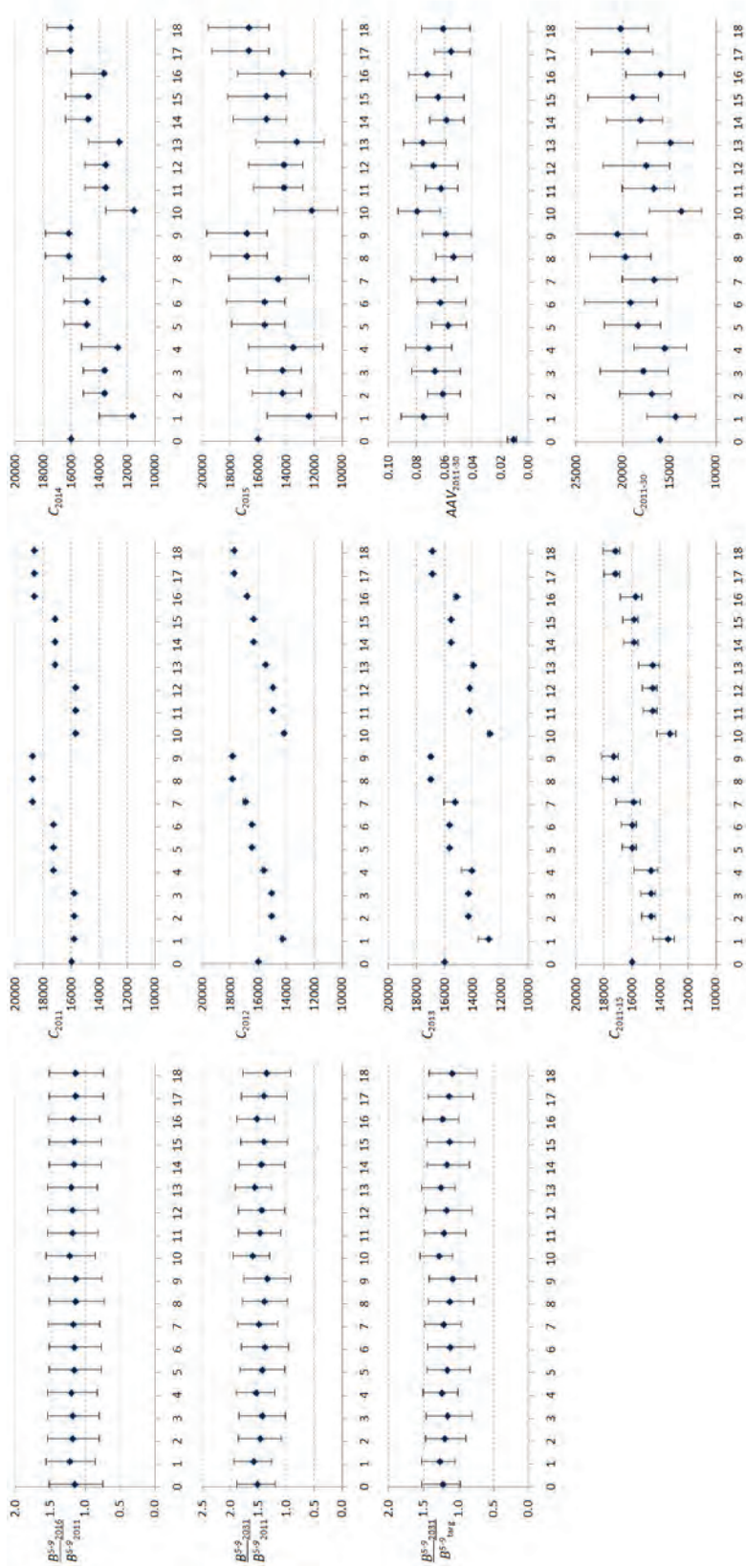


Fig. 6a: Median and 95%-iles for a series of performance statistics for the Base Case SCAA under a series of MPs (0=cteC; 1=mp1, 2=mp2...).

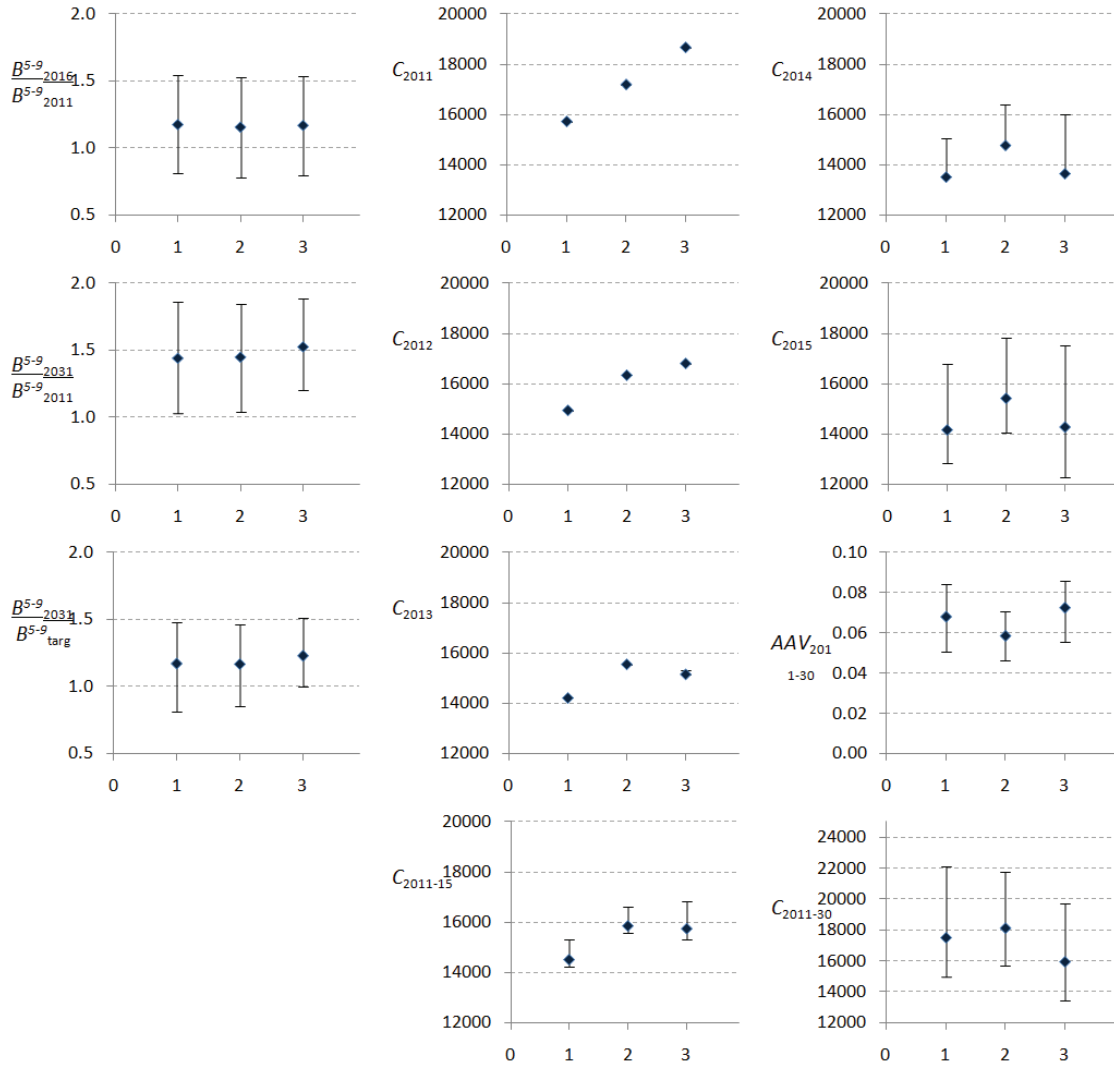


Fig. 6b: Median and 95%-iles for a series of performance statistics for the Base Case SCAA under mp12, mp14 and mp16 (in that order).

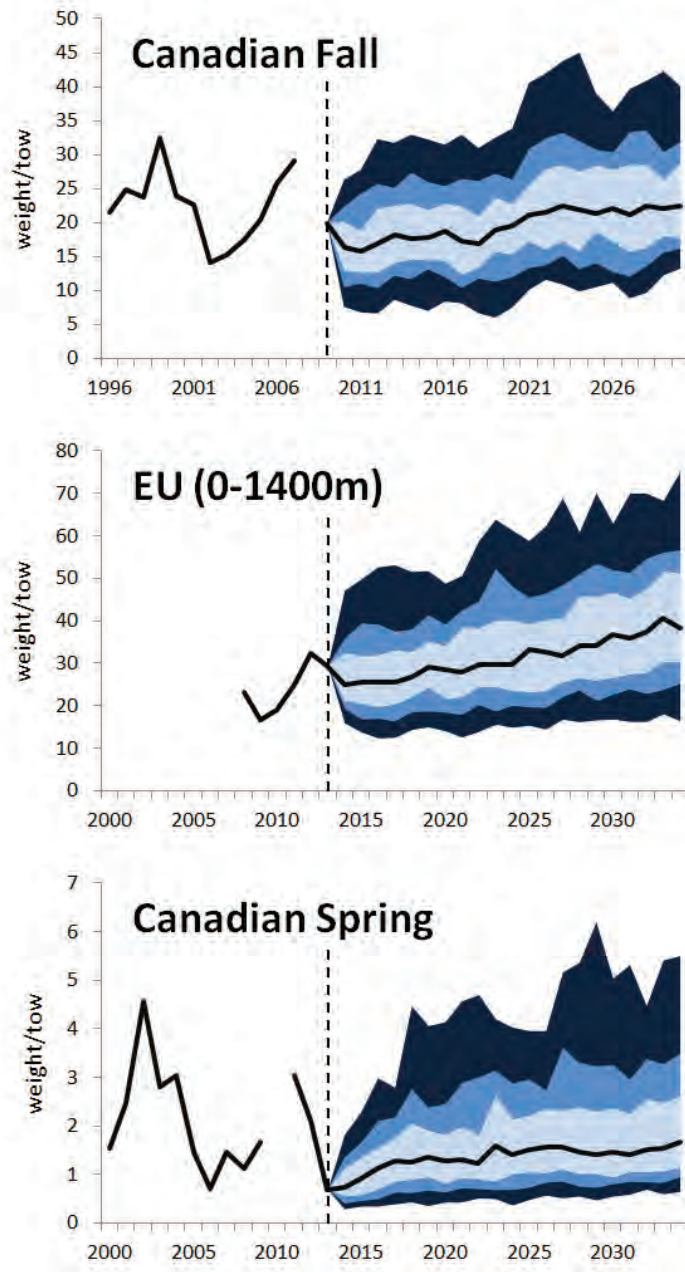


Fig. 7: 95, 75 and 50% PIs and medians for the survey projections for SCAA0 under implementation of mp14.

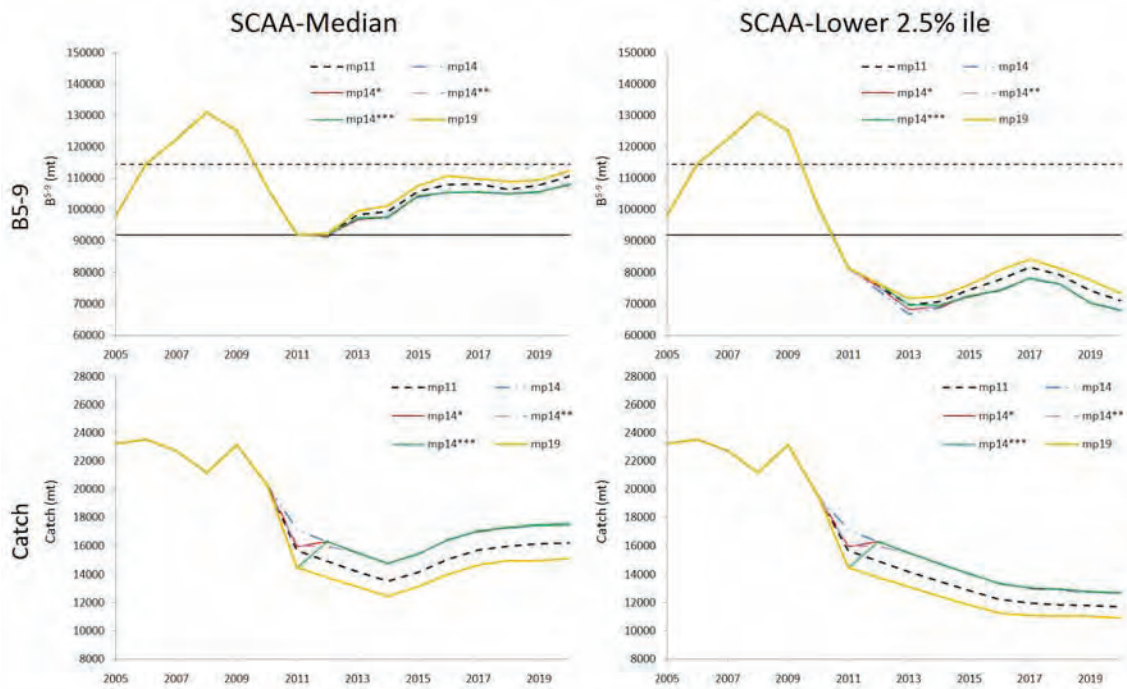


Fig. 8: Medians (left) and lower 2.5%iles (right) TAC and exploitable biomass for some further MPs (requested for addition by our EU principals) for the **Base Case SCAA** operating model (SCAA0). Here and in subsequent biomass plots the full horizontal line represents the 2011 median level while the dashed horizontal line represents the target level (1985-1999 average).

(FCWGMSE WP 10/14)

Greenland Halibut Updated SCAA Reference Case and Robustness TestsDS Butterworth and RA Rademeyer
August 2010**INTRODUCTION**

The Greenland halibut SCAA Reference Case (RC) and robustness test operating models (Butterworth and Rademeyer, 2010a) have been updated to take into account data now available up to 2009. The updated data (Appendix A) are:

- 1) 2008 and 2009 catches (Table A1) (Healey *et al.* 2010);
- 2) 2008 and 2009 commercial catches-at-age (Table A2) (Healey *et al.* 2010);
- 3) updated weights-at-age to age 20 (Table A3) (ages 1-13, Healey *et al.* 2010; ages 14-20+, Miller, pers. commn);
- 4) updated maturity-at-age to age 20 (Table A4) (Morgan, pers. commn);
- 5) 2008 and 2009 survey data: numbers-at-age (Table A5) and total weight per tow (Table A6).

The EU summer survey has been split into two series in order to make use of the deep-water portion (0-1400m) of the survey which has taken place since 2004. The model is therefore fit to four survey series: a) Canadian Fall survey (2J3K) (1996-2009), b) Canadian Spring survey (3LNO) (1996-2009), c) EU summer 0-700m survey (1995-2003) and d) EU summer 0-1400m survey (2004-2009).

In fitting the survey CAA, the plus and minus groups have been changed slightly compared to the assessments presented in Butterworth and Rademeyer (2010a). The table below compares the plus and minus groups used in each instance. The splitting of The EU survey series prompted the one change; the change for the Canadian Fall series was made because of the small proportions of fish in the age classes above 8.

	Butterworth and Rademeyer (2010a)		Updated assessment	
	minus	plus	minus	plus
Canadian Fall	1	13	1	8
EU (0-700m)	1	11	1	9
EU (0-1400m)	-	-	4	11
Canadian Spring	1	8	1	8

Furthermore a selectivity smoothing penalty has been included in the negative log likelihood:

$$PenS = \sum_i \sum_{a=a^-+1}^{a^+-1} 3(S_{a-1}^i - 2S_a^i + S_{a+1}^i)^2 + \sum_{a=a^-+1}^{a^+-1} 3(S_{a-1}^{com} - 2S_a^{com} + S_{a+1}^{com})^2$$

where

S_a^i is the selectivity at age a for survey i (before adding variability);

S_a^{com} is the commercial selectivity at age a (before adding variability); and

a^- and a^+ are the minus and plus groups.

This addition was prompted by the large upward spike that otherwise occurs in selectivity at age 10 for the EU (0-1400m) survey. Introduction of this term hardly affects estimates of abundance trends.

In other respects the structure of these operating models remains identical to that detailed In Appendix B of Butterworth and Rademeyer (2009a), with two updates detailed in Butterworth and Rademeyer (2009b). In particular note that first order autocorrelation in time is estimated in fitting to the survey indices of abundance, and similarly in both time and age in fitting to the survey catch-at-age proportions. Fishing selectivity functions

change at two-yearly intervals, with the extent of the change constrained by treating these as random effects with standard deviation $\sigma_{\Omega} = 2.0$ for the commercial selectivity and $\sigma_{\Omega} = 0.5$ for the survey selectivities.

RESULTS AND DISCUSSION

The following SCAA Reference Case (RC) and robustness test operating models for the Greenland Halibut, which are straightforward updates of those reported in Butterworth and Rademeyer (2010a), will be used in the MSE process.

- 0) Reference Case: Update of Case 2 of Butterworth and Rademeyer (2010b): Beverton-Holt, $h=0.9$, $M=0.2$, exponential decrease in selectivity for ages 11+;
- 1) RC with flat commercial selectivity (estimated in the fit to be 0.27) for ages 11+;
- 2) RC with flat commercial selectivity (fixed to 0.3, which is equal to the new XSA average value over 2005-2009) for ages 11+;
- 3) RC with $M=0.1$;
- 4) RC with $M=0.2$ for ages 0-10, linear increase to $M=0.4$ for age 14, and constant thereafter;
- 5) RC with $h = 0.6$ in the assessment, to simulate a stock that has a large maximum recruitment which has been severely recruitment-overfished;
- 6) RC with a modified Ricker stock-recruitment relationship: $R_y = \alpha B_y^{sp} \exp\left(-\beta (B_y^{sp})^\gamma\right)$;
- 7) RC with fixed flat commercial selectivity (as in 2 above) and increasing M with age (as in 4 above).

The results of the SCAA variants explored are listed in Table 1, with corresponding biomass trajectories plotted in Fig. 1 and stock-recruitment relationships shown in Fig. 2. Results for the RC presented in Butterworth and Rademeyer (2010a) are shown in Table 1 and Fig. 1 for comparative purposes. The commercial and survey selectivities estimated in the RC are plotted in Fig. 3. The commercial selectivities of the two OMs with flat selectivity at older ages are also shown in Fig. 3. The RC stock-recruitment curve, and time series of recruitment and standardised recruitment residuals are shown in Fig. 4. The fit of the RC to the survey indices and the commercial and survey CAA are shown in Fig. 5. It is notable that these CAA residual plots (which are outputs after adjustment for auto-correlation) all now show few obvious and substantial patterns, and thus constitute a considerable improvement over results for this SCAA methodology (Butterworth and Rademeyer, 2009b) prior to this update of the data.

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- Healey BP, Mahé J-C and Morgan MJ. 2010. An assessment of Greenland Halibut (*Reinhardtius hippoglossoides*) in NAFO Subarea 2 and Divisions 3KLMNO. NAFO SCR Doc. 10/40, Ser. No. N5799.

Table 1: Results of fits of SCAA Reference Case and the intended robustness test operating models to the commercial catch and survey data. Values fixed on input rather than estimated are shown in **bold**. Quantities shown in parenthesis are Hessian-based CVs. Where autocorrelation coefficients are shown for fits to the survey catch-at-age proportions, they correspond to the following order of the surveys: Canadian Fall, EU 0-700m, EU 0-1400m and Canadian spring

	0) Reference Case	1) flat commercial selectivity for ages 11+ estimated	2) flat commercial selectivity for ages 11+ fixed to XSA value	3) $M = 0.1$	4) $M_{10} = 0.2, M_{11} = 0.4$, linear in between	5) $\beta = 0.6$	6) Modified Ricker	7) fixed flat comm. sel. for ages 11+ (as in 2) and increasing M with age (as in 4)
Openv) Buerterworth and Rademeyer (2010a) Reference Case	-630.8	-694.4	-690.6	-698.4	-701.6	-697.7	-703.3	-693.8
-lnL overall	-36.0	-36.8	-36.5	-31.4	-36.8	-37.8	-34.2	-36.6
-lnL_Survey	-222.8	-230.1	-218.3	-231.8	-232.0	-230.7	-235.1	-222.4
-lnL_CAA	-531.1	-530.7	-530.6	-532.8	-530.8	-528.3	-532.1	-531.3
-lnL_CAA_Surv	17.6	19.9	17.7	17.7	20.0	18.7	17.1	20.8
-lnL_RecPes	73.2	77.2	69.6	73.8	72.7	74.7	75.2	70.2
-lnL_SciPen	5.6	-	-	-	-	-	-	-
SelfSmoothing	-	-	-	-	-	-	-	-
β	0.90	0.90	0.90	0.90	0.90	0.60	1.43	0.90
M	0.20	0.20	0.20	0.10	0.20	0.20	0.20	0.20
θ	0.31	0.13	0.05	0.26	0.25	0.45	0.22	0.14
ϕ	0.28	0.34	0.42	0.30	0.30	0.16	0.37	0.35
ρ - surveys	0.60	0.54	0.53	0.64	0.53	0.53	0.63	0.55
ρ_{CAA}	0.28 0.35 0.35	0.48 0.30 0.32 0.23	0.48 0.31 0.32 0.22	0.48 0.30 0.32 0.24	0.48 0.31 0.32 0.23	0.48 0.31 0.31 0.23	0.48 0.31 0.31 0.22	0.48 0.31 0.32 0.23
ρ_{CAA}	-0.32 -0.49 -0.49	-0.68 -0.26 -0.90 -0.58	-0.68 -0.25 -0.91 -0.59	-0.68 -0.26 -0.90 -0.60	-0.68 -0.27 -0.90 -0.58	-0.68 -0.26 -0.87 -0.56	-0.68 -0.26 -0.91 -0.59	-0.68 -0.27 -0.91 -0.59
K^{SP}	340	439 (0.06)	422 (0.08)	1754 (0.07)	166 (0.05)	557 (0.19)	304 (0.21)	174 (0.05)
B^{SP}_{2009}	37	21 (0.34)	16 (0.33)	169 (0.40)	8 (0.30)	42 (0.27)	22 (0.16)	8 (0.20)
B^{SP}_{2009}	128	126 (0.11)	109 (0.11)	131 (0.13)	115 (0.12)	114 (0.12)	142 (0.15)	120 (0.08)
B^{SP}_{2009}	53	46 (0.25)	38 (0.24)	206 (0.37)	30 (0.22)	68 (0.24)	51 (0.30)	31 (0.17)
MSY^{SP}	0.18	0.15 (0.15)	0.16 (0.16)	0.17 (0.06)	0.16 (0.14)	0.28 (0.09)	0.24 (0.23)	0.16 (0.07)
B^{SP}_{MSY}	60	67 (0.17)	69 (0.16)	89 (0.09)	26 (0.15)	157 (0.20)	72 (0.20)	28 (0.09)
MSY	27	26 (0.06)	26 (0.09)	27 (0.06)	27 (0.05)	19 (0.19)	31 (0.10)	29 (0.05)
σ_{SCAA}	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Survey	$q^s \times 10^6$ σ_{Surv} σ_{marCAA}	$q^s \times 10^6$ σ_{Surv} σ_{marCAA}	$q^s \times 10^6$ σ_{Surv} σ_{marCAA}	$q^s \times 10^6$ σ_{Surv} σ_{marCAA}	$q^s \times 10^6$ σ_{Surv} σ_{marCAA}	$q^s \times 10^6$ σ_{Surv} σ_{marCAA}	$q^s \times 10^6$ σ_{Surv} σ_{marCAA}	$q^s \times 10^6$ σ_{Surv} σ_{marCAA}
CanFall	421 0.17 0.02	494 0.14 0.02	501 0.14 0.02	670 0.20 0.02	468 0.14 0.02	469 0.14 0.02	426 0.16 0.02	462 0.14 0.02
EU (0-700m)	219 0.28 0.05	365 0.28 0.05	375 0.29 0.05	366 0.29 0.05	349 0.28 0.05	291 0.24 0.05	359 0.30 0.05	347 0.28 0.05
EU (0-1400m)	- - -	386 0.23 0.02	398 0.23 0.02	318 0.25 0.02	371 0.23 0.02	345 0.24 0.02	317 0.22 0.02	363 0.22 0.02
CanSpr	22 0.41 0.05	29 0.45 0.05	29 0.45 0.05	34 0.47 0.05	28 0.45 0.05	27 0.44 0.05	26 0.47 0.05	28 0.45 0.05
σ_{z_out}	0.21	0.22	0.22	0.21	0.22	0.21	0.20	0.22

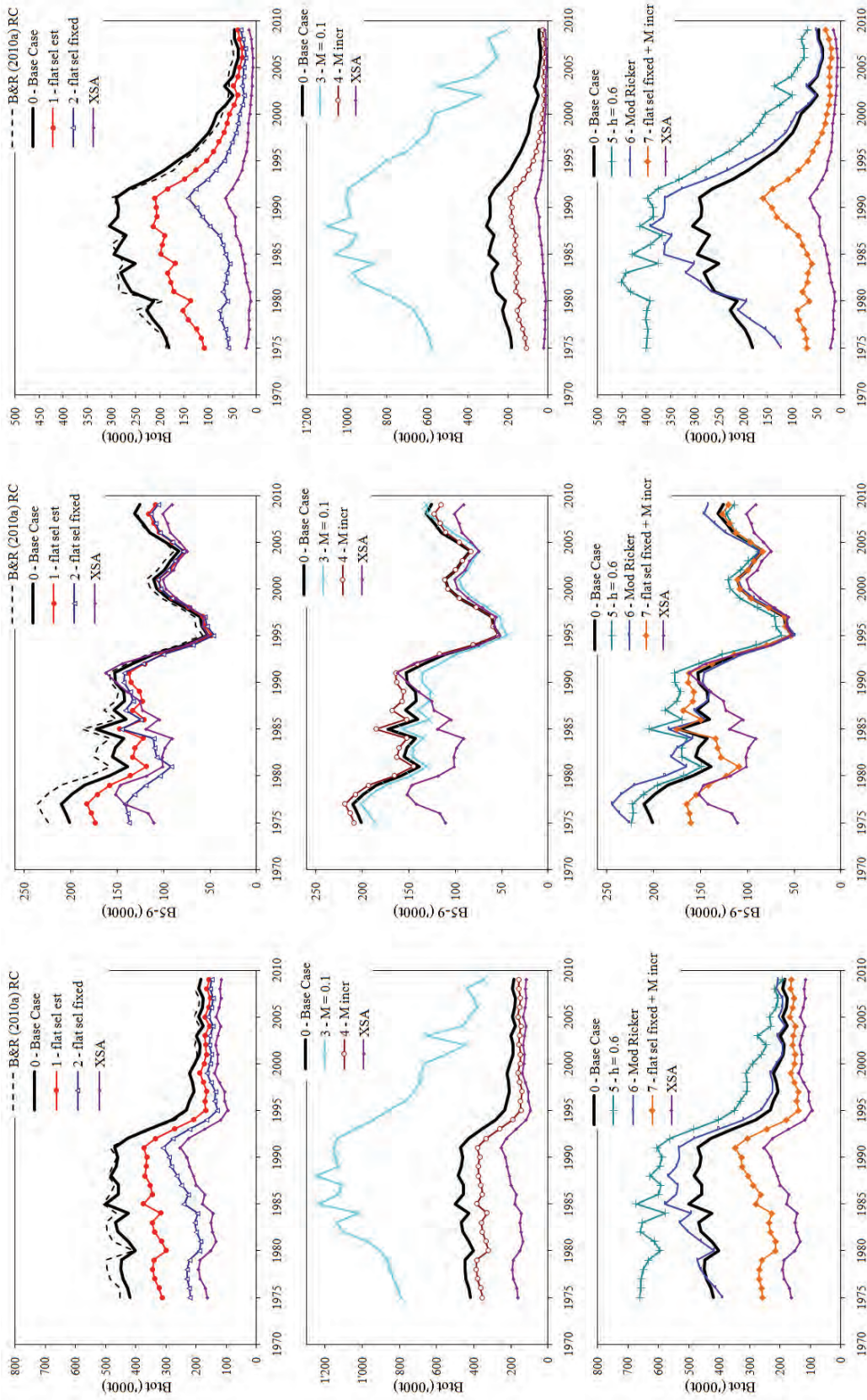


Fig. 1: Biomass trajectories for a series of SCAA variants and the 2009 XSA (Healey *et al.* 2010).

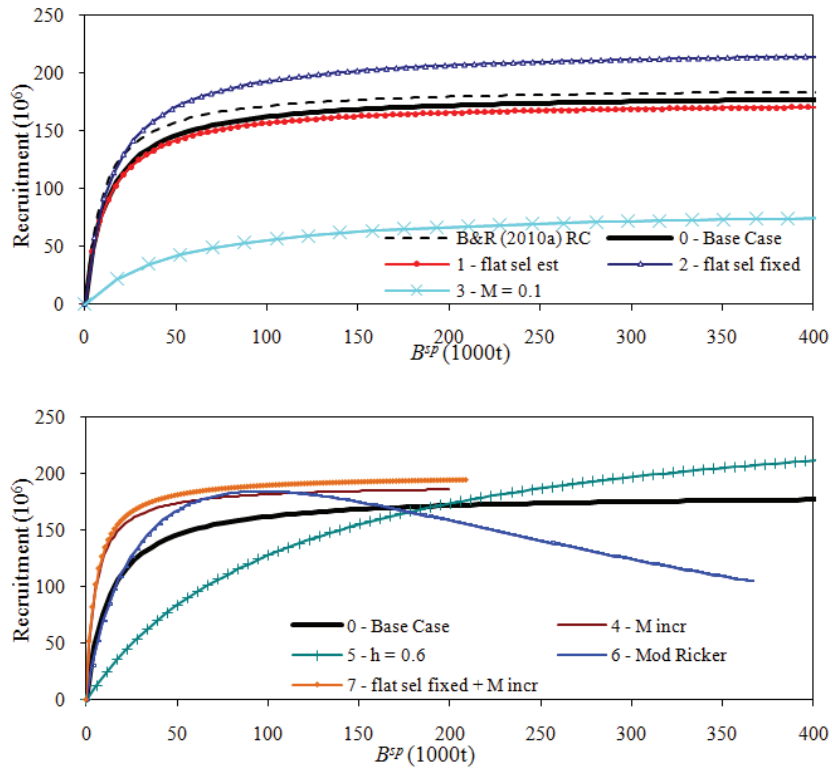


Fig. 2: Stock-recruitment relationships for a series of SCAA variants.

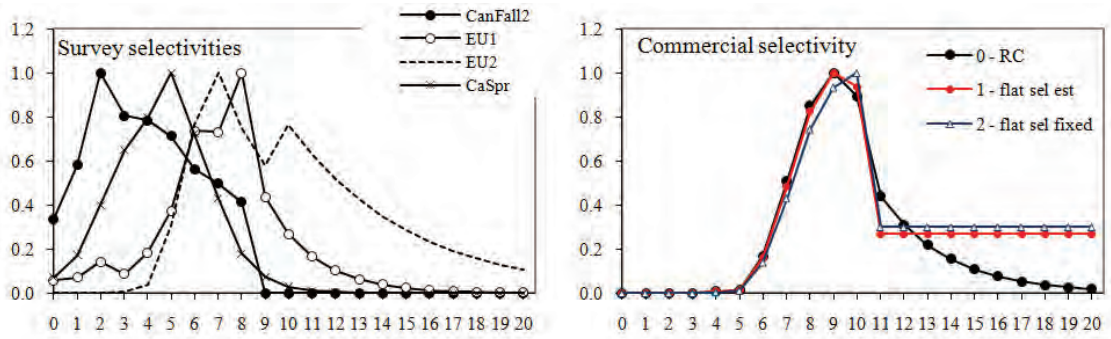


Fig. 3: Survey and commercial selectivities-at-age estimated for the RC. Commercial selectivity estimates are also shown for robustness tests 1) and 2) for which selectivity is flat for ages 11+.

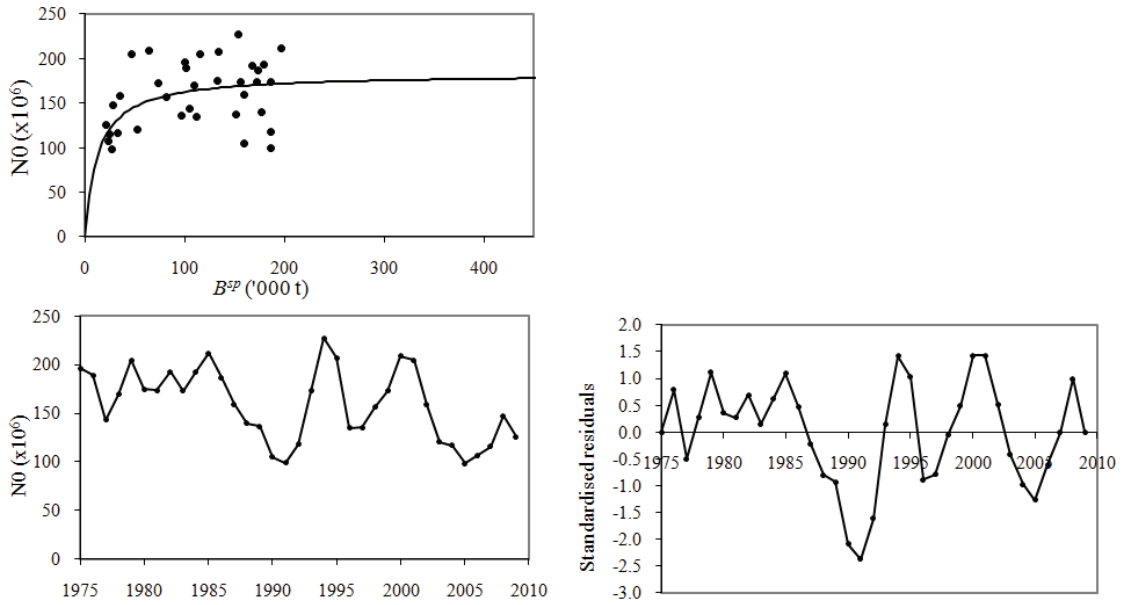


Fig. 4: Estimated stock-recruitment curve, and time series of recruitment and standardised residuals for the RC.

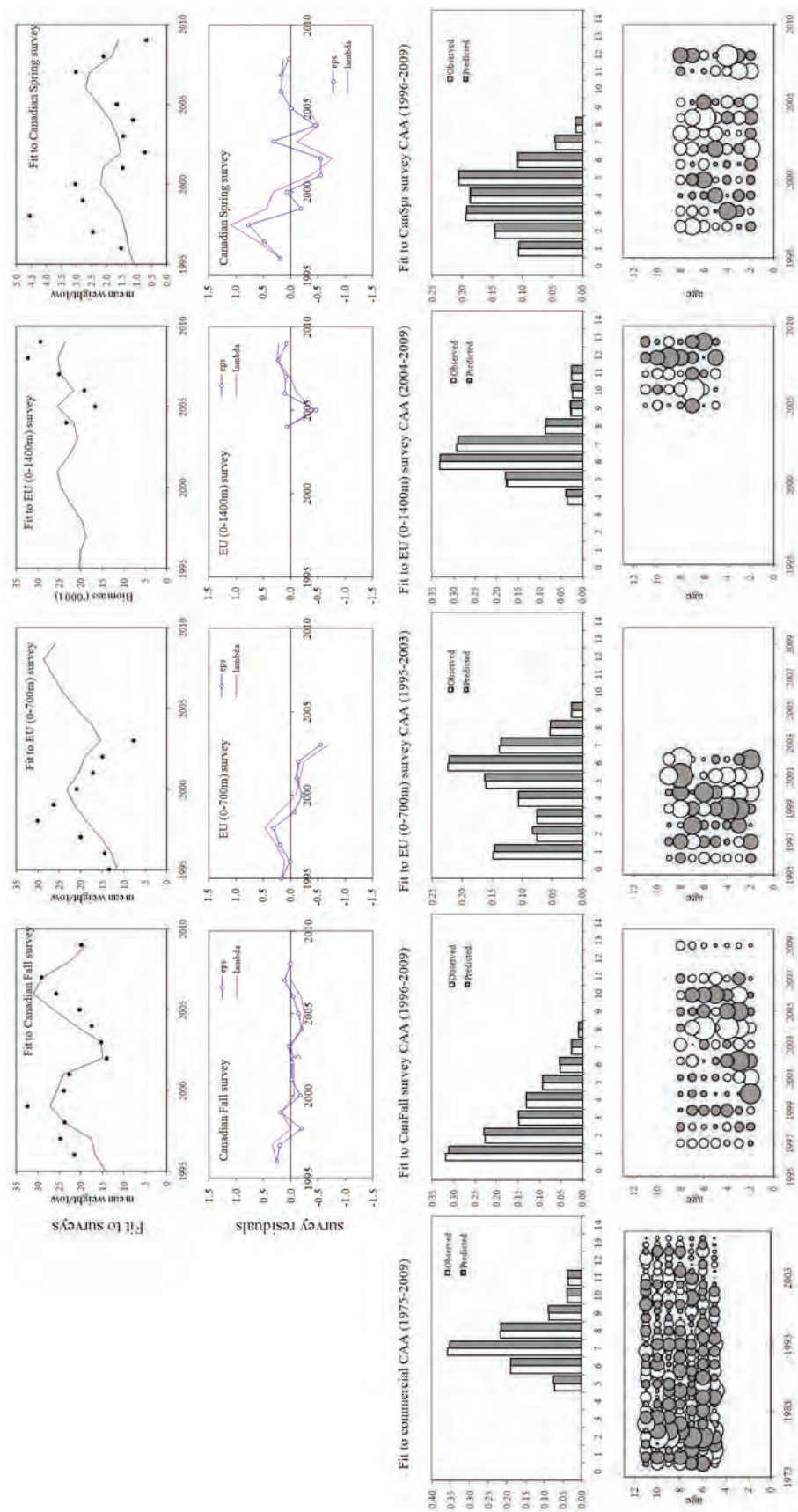


Fig. 5: Fit of the RC to the survey indices and the commercial and survey CAA. For the survey index residuals, lambda and eps refer respectively to before and after adjusting for the estimated autocorrelation. For the CAA bubble plots of residuals for the surveys, these also pertain to values after adjustment for estimated autocorrelation in both year and age. The size (area) of the bubbles are proportional to the magnitude of the corresponding standardised residuals. For positive residuals, the bubbles are grey, whereas for negative residuals, the bubbles are white.

APPENDIX A – Data**Table A1:** Landings (tons) for Greenland Halibut in Sub-area 2 and Div. 3KLMNO (Healey *et al.* 2010).

Year	Landings (t)	Year	Landings (t)
1960	938	1985	20347
1961	741	1986	17976
1962	588	1987	32442
1963	1621	1988	19215
1964	4252	1989	20034
1965	10069	1990	47454
1966	19276	1991	65008
1967	26525	1992	63193
1968	32392	1993	62455
1969	37275	1994	51029
1970	36889	1995	15272
1971	24834	1996	18840
1972	30038	1997	19858
1973	29105	1998	19946
1974	27588	1999	24226
1975	28814	2000	34177
1976	24611	2001	38232
1977	32048	2002	34062
1978	39070	2003	35151
1979	34104	2004	25486
1980	32867	2005	23225
1981	30754	2006	23531
1982	26278	2007	22747
1983	27861	2008	21178
1984	26711	2009	23156

Table A2. Catch at age matrix (000s) for Greenland Halibut in Sub-Area 2 and Divisions 3KLMNO (Healey *et al.* 2010).

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14+
1975	0	0	0	0	334	2819	5750	4956	3961	1688	702	135	279	288
1976	0	0	0	0	17	610	3231	5413	3769	2205	829	260	101	53
1977	0	0	0	0	534	5012	10798	7346	2933	1013	220	130	116	84
1978	0	0	0	0	2982	8415	8970	7576	2865	1438	723	367	222	258
1979	0	0	0	0	2386	8727	12824	6136	1169	481	287	149	143	284
1980	0	0	0	0	209	2086	9150	9679	5398	3828	1013	128	53	27
1981	0	0	0	0	863	4517	9806	11451	4307	890	256	142	43	69
1982	0	0	0	0	269	2299	6319	5763	3542	1684	596	256	163	191
1983	0	0	0	0	701	3557	9800	7514	2295	692	209	76	106	175
1984	0	0	0	0	902	2324	5844	7682	4087	1259	407	143	106	183
1985	0	0	0	0	1983	5309	5913	3500	1380	512	159	99	87	86
1986	0	0	0	0	280	2240	6411	5091	1469	471	244	140	70	117
1987	0	0	0	0	137	1902	11004	8935	2835	853	384	281	225	349
1988	0	0	0	0	296	3186	8136	4380	1288	465	201	105	107	129
1989	0	0	0	0	181	1988	7480	4273	1482	767	438	267	145	71
1990	0	0	0	95	1102	6758	12632	7557	4072	2692	1204	885	434	318
1991	0	0	0	220	2862	7756	13152	10796	7145	3721	1865	1216	558	422
1992	0	0	0	1064	4180	10922	20639	12205	4332	1762	1012	738	395	335
1993	0	0	0	1010	9570	15928	17716	11918	4642	1836	1055	964	401	182
1994	0	0	0	5395	16500	15815	11142	6739	3081	1103	811	422	320	215
1995	0	0	0	323	1352	2342	3201	2130	1183	540	345	273	251	201
1996	0	0	0	190	1659	5197	6387	1914	956	504	436	233	143	89
1997	0	0	0	335	1903	4169	7544	3215	1139	606	420	246	137	89
1998	0	0	0	552	3575	5407	5787	3653	1435	541	377	161	92	51
1999	0	0	0	297	2149	5625	8611	3793	1659	623	343	306	145	151
2000	0	0	0	271	2029	12583	21175	3299	973	528	368	203	129	104
2001	0	0	0	448	2239	12163	22122	5154	1010	495	439	203	156	75
2002	0	0	0	479	1662	7239	17581	6607	1244	659	360	224	126	81
2003	0	0	0	1279	4491	10723	16764	6385	1614	516	290	144	76	85
2004	0	0	0	897	4062	8236	10542	4126	1307	529	289	184	87	75
2005	0	0	0	534	1652	5999	10313	3996	1410	444	244	114	64	46
2006	0	0	0	216	1869	6450	12144	4902	1089	372	136	47	32	40
2007	0	0	0	88	570	3732	11912	5414	1230	472	163	80	41	29
2008	0	0	0	29	448	3312	10697	5558	1453	393	115	46	26	15
2009	0	0	0	61	476	3121	8801	7276	1949	508	206	67	31	34

Table A3. Catch weights-at-age (kg) matrix for Greenland Halibut in Sub-Area 2 and Divisions 3KLMNO (ages 1-13: Healey *et al.* 2010; ages 14-20+: Miller pers. commn).

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20+
1975	0.000	0.000	0.126	0.244	0.609	0.760	0.955	1.190	1.580	2.210	2.700	3.370	3.880	4.560	5.920	7.140	7.890	8.916	9.718	10.204
1976	0.000	0.000	0.126	0.244	0.609	0.760	0.955	1.190	1.580	2.210	2.700	3.370	3.880	4.560	5.920	7.140	7.890	8.916	9.718	10.204
1977	0.000	0.000	0.126	0.244	0.609	0.760	0.955	1.190	1.580	2.210	2.700	3.370	3.880	4.560	5.920	7.140	7.890	8.916	9.718	10.204
1978	0.000	0.000	0.126	0.244	0.609	0.760	0.955	1.190	1.580	2.210	2.700	3.370	3.880	4.560	5.920	7.140	7.890	8.916	9.718	10.204
1979	0.000	0.000	0.126	0.244	0.609	0.760	0.955	1.190	1.580	2.210	2.700	3.370	3.880	4.560	5.920	7.140	7.890	8.916	9.718	10.204
1980	0.000	0.000	0.126	0.244	0.514	0.659	0.869	1.050	1.150	1.260	1.570	2.710	3.120	4.420	5.040	7.020	10.100	11.413	12.440	13.062
1981	0.000	0.000	0.126	0.244	0.392	0.598	0.789	0.985	1.240	1.700	2.460	3.510	4.790	5.940	8.060	8.710	9.580	10.825	11.800	12.390
1982	0.000	0.000	0.126	0.244	0.525	0.684	0.891	1.130	1.400	1.790	2.380	3.470	4.510	5.850	7.530	8.680	11.500	12.995	14.165	14.873
1983	0.000	0.000	0.126	0.244	0.412	0.629	0.861	1.180	1.650	2.230	3.010	3.960	5.060	6.060	7.310	8.600	11.300	12.769	13.918	14.614
1984	0.000	0.000	0.126	0.244	0.377	0.583	0.826	1.100	1.460	1.940	2.630	3.490	4.490	5.730	6.850	8.330	9.570	10.814	11.787	12.377
1985	0.000	0.000	0.126	0.244	0.568	0.749	0.941	1.240	1.690	2.240	2.950	3.710	4.850	6.130	7.160	8.920	11.800	13.334	14.534	15.261
1986	0.000	0.000	0.126	0.244	0.350	0.584	0.811	1.100	1.580	2.120	2.890	3.890	4.950	6.090	7.640	9.810	10.100	11.413	12.440	13.062
1987	0.000	0.000	0.126	0.244	0.364	0.589	0.836	1.160	1.590	2.130	2.820	3.600	4.630	5.480	6.670	7.850	9.840	11.119	12.120	12.726
1988	0.000	0.000	0.126	0.244	0.363	0.569	0.805	1.163	1.661	2.216	3.007	3.925	5.091	5.858	7.233	8.485	11.444	12.932	14.096	14.800
1989	0.000	0.000	0.126	0.244	0.400	0.561	0.767	1.082	1.657	2.237	2.997	3.862	4.919	5.812	7.002	7.547	9.659	10.915	11.897	12.492
1990	0.000	0.000	0.090	0.181	0.338	0.546	0.766	1.119	1.608	2.173	2.854	3.731	4.691	5.686	7.082	8.776	9.826	11.103	12.102	12.707
1991	0.000	0.000	0.126	0.244	0.383	0.592	0.831	1.228	1.811	2.461	3.309	4.142	5.333	6.189	7.301	9.363	9.546	10.787	11.758	12.346
1992	0.000	0.000	0.175	0.289	0.430	0.577	0.793	1.234	1.816	2.462	3.122	3.972	5.099	6.197	7.170	8.267	10.057	11.364	12.387	13.006
1993	0.000	0.000	0.134	0.232	0.368	0.547	0.809	1.207	1.728	2.309	2.999	3.965	4.816	5.917	7.151	8.487	9.793	11.066	12.062	12.665
1994	0.000	0.000	0.080	0.196	0.330	0.514	0.788	1.179	1.701	2.268	2.990	3.766	4.882	5.984	7.540	7.688	9.456	10.685	11.647	12.229
1995	0.000	0.000	0.080	0.288	0.363	0.531	0.808	1.202	1.759	2.446	3.122	3.813	4.893	5.957	6.928	7.471	9.311	10.521	11.468	12.042
1996	0.000	0.000	0.161	0.242	0.360	0.541	0.832	1.272	1.801	2.478	3.148	3.856	4.953	5.876	6.848	7.946	8.369	9.456	10.307	10.823
1997	0.000	0.000	0.120	0.206	0.336	0.489	0.771	1.159	1.727	2.355	3.053	3.953	5.108	5.914	6.633	8.280	8.290	9.368	10.211	10.721
1998	0.000	0.000	0.119	0.228	0.373	0.543	0.810	1.203	1.754	2.351	3.095	4.010	5.132	5.884	6.445	7.269	8.218	9.286	10.122	10.628
1999	0.000	0.000	0.176	0.253	0.358	0.533	0.825	1.253	1.675	2.287	2.888	3.509	4.456	5.195	6.131	7.481	8.623	9.744	10.621	11.152
2000	0.000	0.000	0.000	0.254	0.346	0.524	0.787	1.192	1.774	2.279	2.895	3.645	4.486	5.082	5.909	6.919	8.363	10.157	11.071	11.625
2001	0.000	0.000	0.000	0.249	0.376	0.570	0.830	1.168	1.794	2.367	2.950	3.715	4.585	5.075	6.129	7.196	7.433	8.400	9.156	9.613
2002	0.000	0.000	0.217	0.251	0.369	0.557	0.841	1.193	1.760	2.277	2.896	3.579	4.407	5.181	5.631	6.584	7.076	7.345	7.426	7.797
2003	0.000	0.000	0.188	0.247	0.389	0.564	0.822	1.199	1.651	2.166	2.700	3.404	4.377	5.296	5.913	6.737	9.566	11.462	12.494	14.408
2004	0.000	0.000	0.180	0.249	0.376	0.535	0.808	1.196	1.629	2.146	2.732	3.538	4.381	5.099	6.127	7.086	7.489	8.463	9.225	9.686
2005	0.000	0.000	0.252	0.301	0.396	0.564	0.849	1.247	1.691	2.177	2.705	3.464	4.264	4.726	5.745	6.576	6.637	7.500	8.328	8.744
2006	0.000	0.000	0.129	0.267	0.405	0.605	0.815	1.092	1.495	1.874	2.396	3.139	3.747	4.298	5.225	6.236	6.603	6.977	7.605	7.985
2007	0.000	0.000	0.000	0.276	0.389	0.581	0.833	1.137	1.590	1.948	2.607	3.057	3.869	4.579	5.294	5.437	7.088	8.009	8.730	9.167
2008	0.000	0.000	0.000	0.278	0.404	0.617	0.891	1.195	1.605	2.038	2.804	3.247	4.232	4.400	5.800	6.831	8.014	9.056	9.871	10.364
2009	0.000	0.000	0.000	0.279	0.390	0.599	0.86													

Table A4: Proportion mature-at-age for Greenland Halibut in Sub-Area 2 and Divisions 3KLMNO (Morgan pers. commn).

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20+
1975	0.000	0.001	0.001	0.001	0.007	0.003	0.010	0.036	0.037	0.027	0.119	0.205	0.335	0.501	0.666	0.796	0.883	0.934	0.964	0.980
1976	0.000	0.000	0.001	0.001	0.002	0.012	0.006	0.020	0.063	0.067	0.064	0.205	0.335	0.501	0.666	0.796	0.883	0.934	0.964	0.980
1977	0.000	0.000	0.000	0.002	0.002	0.004	0.022	0.013	0.041	0.107	0.117	0.143	0.335	0.501	0.666	0.796	0.883	0.934	0.964	0.980
1978	0.000	0.000	0.000	0.001	0.004	0.005	0.009	0.038	0.029	0.083	0.177	0.196	0.290	0.501	0.666	0.796	0.883	0.934	0.964	0.980
1979	0.000	0.000	0.000	0.001	0.002	0.007	0.009	0.018	0.064	0.060	0.158	0.277	0.310	0.499	0.666	0.796	0.883	0.934	0.964	0.980
1980	0.000	0.000	0.000	0.000	0.001	0.003	0.012	0.017	0.036	0.108	0.123	0.282	0.406	0.453	0.709	0.796	0.883	0.934	0.964	0.980
1981	0.000	0.000	0.000	0.000	0.000	0.002	0.006	0.021	0.034	0.070	0.177	0.232	0.451	0.549	0.604	0.856	0.883	0.934	0.964	0.980
1982	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.011	0.038	0.064	0.132	0.275	0.397	0.632	0.685	0.738	0.936	0.934	0.964	0.980
1983	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.008	0.021	0.067	0.119	0.236	0.401	0.588	0.782	0.795	0.839	0.973	0.964	0.980
1984	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.003	0.016	0.039	0.114	0.211	0.384	0.542	0.756	0.882	0.874	0.905	0.989	0.980
1985	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.008	0.029	0.071	0.190	0.345	0.558	0.676	0.870	0.940	0.925	0.946	0.995
1986	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.023	0.054	0.126	0.297	0.509	0.719	0.787	0.936	0.970	0.957	0.970
1987	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.002	0.015	0.060	0.099	0.215	0.434	0.672	0.838	0.867	0.969	0.986	0.975
1988	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.005	0.000	0.006	0.038	0.152	0.173	0.343	0.581	0.801	0.913	0.920	0.986	0.993
1989	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.015	0.001	0.023	0.092	0.332	0.285	0.498	0.715	0.888	0.955	0.953	0.993
1990	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.003	0.007	0.051	0.158	0.081	0.209	0.581	0.432	0.653	0.820	0.940	0.977	0.973
1991	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.010	0.017	0.154	0.971	0.249	0.406	0.794	0.592	0.781	0.892	0.969	0.989
1992	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.007	0.032	0.045	0.384	1.000	0.557	0.640	0.915	0.735	0.872	0.937	0.984
1993	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.003	0.003	0.021	0.097	0.111	0.680	1.000	0.826	0.822	0.968	0.841	0.928	0.964
1994	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.007	0.010	0.062	0.257	0.250	0.879	1.000	0.947	0.923	0.988	0.910	0.961
1995	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.006	0.017	0.028	0.168	0.526	0.471	0.961	1.000	0.986	0.969	0.996	0.951
1996	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.016	0.041	0.079	0.364	0.781	0.703	0.988	1.000	0.996	0.988	0.998
1997	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.014	0.039	0.097	0.203	0.606	0.920	0.864	0.997	1.000	0.999	0.995
1998	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.002	0.002	0.037	0.095	0.213	0.430	0.806	0.974	0.944	0.999	1.000	1.000
1999	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.004	0.001	0.009	0.017	0.092	0.212	0.405	0.692	0.922	0.992	0.978	1.000	1.000
2000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.003	0.011	0.009	0.042	0.124	0.211	0.409	0.632	0.870	0.972	0.997	0.992	1.000
2001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.009	0.028	0.069	0.181	0.533	0.412	0.640	0.812	0.952	0.990	0.999	0.997
2002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.007	0.026	0.070	0.364	0.529	0.902	0.648	0.820	0.916	0.983	0.997	1.000
2003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.006	0.024	0.072	0.166	0.817	0.851	0.987	0.829	0.921	0.965	0.994	0.999
2004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.005	0.022	0.074	0.188	0.346	0.972	0.967	0.998	0.927	0.968	0.986	0.998
2005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.006	0.020	0.076	0.209	0.406	0.584	0.996	0.993	1.000	0.971	0.987	0.994
2006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.006	0.022	0.078	0.234	0.466	0.663	0.788	1.000	0.999	1.000	0.989	0.995
2007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.006	0.022	0.076	0.259	0.529	0.742	0.846	0.908	1.000	1.000	1.000	0.996
2008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.006	0.022	0.076	0.234	0.592	0.800	0.905	0.938	0.963	1.000	1.000	1.000
2009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.006	0.022	0.076	0.234	0.529	0.858	0.933	0.969	0.977	0.986	1.000	1.000

Table A5: Survey data (mean numbers per tow) of Greenland Halibut in Sub-Area 2 and Divisions 3KLMNO (Healey *et al.* 2010)

2J3K Canadian Fall, 1995-2009

	1	2	3	4	5	6	7	8	9	10	11	12	13+
1996	98.68	47.82	32.01	9.54	6.28	2.47	0.84	0.19	0.18	0.04	0.02	0.01	0.02
1997	28.05	58.62	43.61	21.13	10.37	5.01	2.00	0.64	0.20	0.06	0.03	0.02	0.01
1998	23.35	25.07	31.19	21.87	10.86	4.45	2.07	0.57	0.13	0.06	0.03	0.02	0.02
1999	15.99	34.42	24.07	28.28	20.04	10.53	3.81	0.70	0.14	0.07	0.02	0.01	0.03
2000	38.57	21.94	16.43	13.20	13.76	7.21	2.16	0.50	0.06	0.03	0.02	0.00	0.01
2001	43.90	22.72	17.00	14.07	9.77	7.59	3.40	0.69	0.11	0.02	0.01	0.00	0.01
2002	40.67	24.08	12.50	9.68	6.03	1.97	0.72	0.19	0.04	0.01	0.00	0.00	0.00
2003	45.70	26.67	11.69	9.49	6.39	2.27	0.89	0.27	0.04	0.02	0.01	0.01	0.00
2004	32.49	32.93	13.89	12.31	9.21	2.68	1.20	0.36	0.08	0.03	0.01	0.00	0.01
2005	16.06	16.15	8.56	13.84	10.98	6.85	3.96	0.66	0.12	0.03	0.03	0.01	0.01
2006	32.34	17.98	8.50	17.60	13.03	9.11	4.18	1.15	0.18	0.03	0.02	0.01	0.00
2007	32.61	14.51	12.81	18.77	9.57	10.35	6.17	2.14	0.34	0.08	0.04	0.02	0.01
2008						Survey not completed							
2009	50.62	19.15	11.40	8.42	9.89	5.40	3.59	1.39	0.25	0.08	0.02	0.01	0.01

EU Summer 0-700m, 1995-2003

	1	2	3	4	5	6	7	8	9	10	11	12+
1995	12.41	2.54	2.23	1.91	2.66	5.10	3.77	2.12	1.31	0.26	0.07	0.02
1996	5.84	7.97	2.42	3.04	4.20	5.82	2.49	1.62	0.42	0.09	0.03	0.04
1997	3.33	3.78	6.00	6.50	7.11	8.46	4.99	2.15	0.66	0.22	0.03	0.02
1998	2.74	2.13	7.69	11.00	12.33	11.30	7.84	2.62	0.75	0.20	0.03	0.01
1999	1.06	0.70	3.01	10.47	13.41	12.58	5.55	1.82	0.35	0.10	0.01	0.00
2000	3.75	0.29	0.60	2.17	7.09	14.10	5.40	2.32	0.45	0.11	0.05	0.00
2001	8.03	1.43	1.81	0.99	2.79	7.79	6.63	3.21	0.18	0.05	0.01	0.00
2002	4.08	2.94	2.80	1.67	3.79	5.59	5.73	1.28	0.13	0.06	0.02	0.01
2003	2.20	1.00	0.61	1.51	2.48	2.94	1.93	0.47	0.13	0.10	0.02	0.01

EU Summer 0-1400m, 2004-2009

	1	2	3	4	5	6	7	8	9	10	11	12	13+
2004	1.40	2.19	2.92	1.54	6.80	9.16	4.95	1.46	0.73	0.37	0.26	0.16	0.15
2005	0.36	0.53	2.09	1.73	5.28	6.79	3.42	0.99	0.26	0.41	0.23	0.13	0.06
2006	0.45	0.26	0.44	0.91	5.85	8.56	4.68	1.39	0.42	0.36	0.30	0.15	0.05
2007	0.25	0.05	0.39	0.29	3.84	9.09	8.57	2.88	0.72	0.59	0.30	0.17	0.07
2008	0.13	0.07	0.10	0.16	2.03	9.00	12.53	3.18	1.14	0.87	0.44	0.25	0.13
2009	0.05	0.01	0.03	0.08	1.13	6.80	11.43	3.55	0.93	1.03	0.36	0.28	0.25

3LNO Canadian Spring, 1996-2009

	1	2	3	4	5	6	7	8+
1996	1.62	4.24	4.60	2.18	0.83	0.28	0.06	0.00
1997	1.16	3.92	5.16	3.23	1.46	0.51	0.10	0.01
1998	0.22	0.81	3.85	6.19	4.96	1.24	0.33	0.07
1999	0.29	0.55	1.15	1.98	3.39	1.09	0.24	0.05
2000	0.79	1.07	1.07	1.51	1.95	2.04	0.56	0.03
2001	0.57	0.71	0.74	0.68	0.80	0.72	0.28	0.02
2002	0.64	0.57	0.60	0.58	0.61	0.21	0.05	0.01
2003	0.93	2.14	1.66	1.57	1.06	0.21	0.05	0.01
2004	0.66	0.57	1.18	1.18	1.16	0.26	0.04	0.02
2005	0.35	0.31	1.09	0.95	1.37	0.82	0.21	0.03
2006						Survey not completed		
2007	1.60	0.52	0.80	0.40	1.41	1.49	1.12	0.18
2008	0.44	0.77	0.96	0.71	1.25	0.75	0.64	0.28
2009	0.27	0.22	0.19	0.39	0.45	0.26	0.13	0.07

Table A6: Survey data (kg per tow) for ages combined: 2J3K Fall and 3LNO Spr, and EU summer 0-700m and 0-1400m surveys (Healey pers. commn).

	Canadian Fall 2J3K	EU summer (0-700m)	EU summer (0-1400m)	Canadian Spring 3LNO
1995		13.52		
1996	21.58	14.42		1.53
1997	24.80	20.01		2.46
1998	23.83	30.13		4.56
1999	32.48	26.37		2.81
2000	23.89	21.08		3.04
2001	22.69	17.25		1.46
2002	14.07	15.05		0.72
2003	15.31	7.73		1.45
2004	17.45		23.33	1.12
2005	20.34		16.71	1.67
2006	25.73		19.17	
2007	29.12		25.10	3.03
2008			32.35	2.10
2009	19.88		29.44	0.68

(FCWGMSE WP 10/15)

Candidate Management Procedures Testing MethodologyDS Butterworth and RA Rademeyer
August 2010**Projection methodology**

Projections into the future under a specific Candidate Management Procedure (CMP) are to be evaluated using the following steps.

Step 1: Begin-year numbers at age

The components of the numbers-at-age vector at the start of 2010 ($N_{2010,a} : a = 1, \dots, m$) are obtained from the MLE of an assessment of the resource (SCAA or XSA). For SCAA the 2009 catch-at-age data are used in the assessment, whereas for XSA the estimated numbers-at-age at the start of 2009 are projected forward one year using these data. For XSA, the 2009 recruitment ($N_{2009,1}$) is generated deterministically from the estimated stock-recruitment relationship. Error is included for ages 0 to 5 (1 to 5 for XSA) because these are poorly estimated in the assessment given limited information on these year-classes, i.e.:

$$N_{2010,a} \rightarrow N_{2010,a} e^{\varepsilon_a} \quad \varepsilon_a \text{ from } N\left(0, (\sigma_R)^2\right) \quad (1)$$

where σ_R is the standard deviation of the stock-recruitment residuals estimated by the SCAA, and for XSA is estimated in the process of fitting a stock-recruitment relationship to the outputs from that assessment as described below. Equation 1 is approximate in that it omits to adjust for past catches from the year-class concerned, but these are so small that the differential effect is negligible.

Step 2: Catch

These numbers-at-age are projected one year forward at a time given a catch for the year concerned.

For 2010:

$$C_y = 16000 \chi_y \quad \chi_y \text{ from } U(1.27;1.22;1.27;1.42;1.32;1.45) \quad (2)$$

From 2011 onwards:

C_y is as specified by the CMP.

This requires specification of how the catch is disaggregated by age to obtain $C_{y,a}$, and how future recruitments are specified.

Step 3: Catch-at-age

For SCAA the $C_{y,a}$ values are obtained under the assumption that the commercial selectivity function estimated continues to vary by 2-year block, as assumed in the assessment:

$$S_{y,a} = S_a e^{\Omega_{y,a}} \quad (3)$$

where

$$\Omega_{y,a} \text{ from } N\left(0, (\sigma_\Omega)^2\right) \text{ for ages 5 to 10,}$$

$$\Omega_{y,a} = 0 \text{ for ages 4- and 11+, and}$$

$$\sigma_\Omega = 2.0.$$

Since the selectivity function varies by 2-year block starting in 1975, $S_{2009,a}$ and $S_{2010,a}$ are equal and already specified and $S_{y,a}$ is generated from the random process above from 2011 onwards.

For XSA, the selectivity each year is selected randomly from the selectivity vectors for the last 10 years (1997 to 2006) estimated in the assessment. The selectivity vectors for 1997 to 2006 are computed as follows:

$$S_{y,a} = F_{y,a} / \max(F_{y,a}) \quad (4)$$

where the maximum is taken across the ages for that year.

From this it follows that:

$$F_y = C_y / \sum_a w_{y,a}^{mid} N_{y,a} e^{-M_a/2} S_a \quad (5)$$

where $w_{y,a}^{mid}$ is each year selected randomly from the weight-at-age vectors for the last 10 years (2000 to 2009) used in the assessment (Table 1), and hence that:

$$C_{y,a} = N_{y,a} e^{-M_a/2} S_a F_y \quad (6)$$

The numbers-at-age can then be computed for the beginning of the following year (y+1):

$$N_{y+1,1} = R_{y+1} \quad (7)$$

$$N_{y+1,a+1} = (N_{y,a} e^{-M_a/2} - C_{y,a}) e^{-M_a/2} \quad \text{for } 1 \leq a \leq m-2 \quad (8)$$

$$N_{y+1,m} = (N_{y,m-1} e^{-M_{m-1}/2} - C_{y,m-1}) e^{-M_{m-1}/2} + (N_{y,m} e^{-M_m/2} - C_{y,m}) e^{-M_m/2} \quad (9)$$

These equations reflect Pope's approximation. The XSA uses the Baranov equations rather than Pope's approximation; these equations can be adjusted accordingly for XSA projections. The plus-group m is 20 for both the SCAA and XSA.

Step 4: Recruitment

Future recruitments for the reference case SCAA operating model (RC) are provided by a Beverton-Holt stock-recruitment relationship:

$$R_y = \frac{4hR_0 B_y^{sp}}{K^{sp}(1-h) + (5h-1)B_y^{sp}} e^{(\zeta_y - \sigma_R^2/2)} \quad (10)$$

Log-normal fluctuations are introduced by generating ζ_y factors from $N(0, \sigma_R^2)$ where σ_R is estimated from the residuals of the model fit for years 1976 to 2006. K^{sp} is as estimated for that RC assessment. For the Reference Case SCAA, h is fixed (0.9).

$$B_y^{sp} = \sum_{a=1}^m f_{y,a} w_{y,a}^{mid} N_{y,a} \quad (11)$$

where

$f_{y,a}$ is each year selected randomly from the maturity-at-age vectors for the last 10 years (2000 to 2009) used in the assessment (Table 2).

For XSA, σ_R is computed as follow:

$$\sigma_R = \sqrt{1/32 \sum_{y=1975}^{2006} (\ln(N_{y,0}) - \ln(R_y))^2} \quad (11)$$

where the recruitment is assumed to follow a segmented regression:

$$R_{y+1} = \begin{cases} \alpha B_y^{sp} & \text{if } B_y^{sp} < \beta \\ \alpha \beta & \text{if } B_y^{sp} \geq \beta \end{cases} \quad (12)$$

with the α and β parameters as estimated from the results of that assessment and provided by D Miller.

At a later stage in the process, these approaches should be extended to take account of first order serial correlation in recruitment residuals.

Step5:

The information obtained in Step 1 is used to generate values of the abundance indices I_{2010}^i (in terms of biomass or of numbers). The EU survey is assumed to continue sampling the 0-1400m depth zone. Indices of abundance in future years will not be exactly proportional to true abundance, as they are subject to observation error. Log-normal observation error is therefore added to the expected value of the abundance index evaluated, taking account of the serial correlation i.e.:

$$I_y^i = q^i B_y^i e^{\lambda_y^i} \quad (13)$$

$$\varepsilon_y^i = \lambda_y^i - \rho^i \lambda_{y-1}^i \quad (14)$$

$$\varepsilon_y^i \quad \text{from } N\left(0, (\sigma^i)^2\right) \quad (15)$$

where B_y^i is the biomass (or numbers) available to the survey:

$$B_y^{surv.spring} = \sum_{a=1}^m w_{y,a}^{mid} S_{y,a}^{surv} N_{y,a} e^{-M_a/4} (1 - S_{y,a} F_y / 4) \quad (16)$$

for spring surveys,

$$B_y^{surv.summer} = \sum_{a=1}^m w_{y,a}^{mid} S_{y,a}^{surv} N_{y,a} e^{-M_a/2} (1 - S_{y,a} F_y / 2) \quad (17)$$

for summer surveys, and

$$B_y^{surv.fall} = \sum_{a=1}^m w_{y,a}^{mid} S_{y,a}^{surv} N_{y,a} e^{-M_a 3/4} (1 - S_{y,a} F_y 3/4) \quad (18)$$

for fall surveys.

As for the commercial selectivity, the survey selectivities for the SCAA are obtained under the assumption that the selectivity functions estimated in that assessment continue to vary by 2-year block, as assumed for the assessment:

$$S_{y,a}^{surv} = S_a^{surv} e^{\Omega_{y,a}^{surv}} \quad (19)$$

where

$\Omega_{y,a}^{surv}$ from $N\left(0, (\sigma_{\Omega^{surv}})^2\right)$ for ages 1 to 8 for the Canadian Fall and Spring surveys, and for ages 4 to 11 for the EU 0-1400m survey,

$\Omega_{y,a}^{surv} = 0$ for ages 9+ for the Canadian Fall and Spring surveys, and 12+ for the EU 0-1400m survey, and

$$\sigma_{\Omega^{surv}} = 0.5$$

For the Canadian and the EU 0-1400m surveys, $S_{2009,a}^{surv}$ is already specified, while $S_{2010,a}^{surv}$ is generated from the random process above.

For the XSA, the survey selectivities are taken as the catchabilities (q_a^i) estimated in that assessment, renormalized so that $\max(q_a^i) = 1$. For each survey, the selectivity is assumed to be zero after the last age for which data are specified (13,12, 13 and 8 for the Canadian Fall, EU 0-700m, EU 0-1400m and Canadian Spring surveys respectively) to the plus group (age 20).

For the SCAA, for the indices related to biomass, the constant of proportionality q^i , the σ^i and ρ^i are estimated directly in the assessment. For other cases, the following procedure is used.

The constant of proportionality q^i is as estimated for the assessment in question by:

$$\ln \hat{q}^i = 1/n_i \sum_{y=y1}^{2009} (\ln I_y^i - \ln \hat{B}_y^i) \quad (20)$$

$$\hat{\sigma}^i = \sqrt{1/n_i \sum_{y=y1}^{2009} (\varepsilon_y^i)^2} \quad (21)$$

where n_i is the number of data points in the series, $y1=1996$ for the Canadian surveys, and 2004 for the EU 0-1400m survey,

$$\varepsilon_y^i = \lambda_y^i - \rho^i \lambda_{y-1}^i \quad (22)$$

$$\lambda_y^i = \ln(I_y^i) - \ln(q^i \hat{B}_y^i) \quad (23)$$

$$\rho^i = \frac{\sum_{y1}^{y2} \lambda_{y+1}^i \lambda_y^i}{\sum_{y1}^{y2} (\lambda_y^i)^2} \quad (24)$$

where $y1=1996$ for the Canadian surveys, and 2004 for the EU 0-1400m survey; and $y2=2008$ for the EU 0-1400m and Canadian spring surveys, but 2006 for the Canadian Fall survey because of the missing data in 2008.

To commence this data generation process and compute I_{2010}^i , a value for λ_{2009}^i is required. For each of the three surveys, this is given by:

$$\lambda_{2009}^i = \ln(I_{2009}^i) - \ln(q^i \hat{B}_{2009}^i) \quad (25)$$

for the assessment concerned, using the known values for the outputs from these surveys for 2009.

Step 6:

Given the new survey indices I_y^i compute TAC_{y+1} using the CMP.

Step 7:

Steps 1-6 are repeated for each future year in turn for as long a period as desired, and at the end of that period the performance of the candidate MP under review is assessed by considering statistics such as the average catch taken over the period and the final spawning biomass of the resource.

Performance Targets and Statistics

During the January 2010 Brussels meeting it was agreed that four properties would be evaluated in a risk management context:

- I) the risk of steep decline be kept moderately low;

- II) the risk of annual average catch variation of greater than 15% be kept moderately low;
 III) the magnitude of the average catch in the short, medium term and long term be maximized; and
 IV) the risk of failure to meet an interim target within a prescribed period of time should be kept moderately low.

A number of mathematical expressions (Performance Statistics) were then proposed to capture these four properties:

- (a) $\frac{P_{2031}}{P_{2011}}$, where P_y is the population size in year y ;
 (b) $\frac{P_{2016}}{P_{2011}}$;
 (c) $\frac{P_{lowest}}{P_{2011}}$, where P_{lowest} is the lowest population size during evaluation period (2011-2031);
 (d) $\frac{P_{lowest}}{P_{min}}$, where P_{min} is the lowest population size during the assessment period (1975-2010);
 (e) $\frac{P_{2031}}{P_{target}}$, where P_{target} is pre-defined recovery target population size, for which the average value over the period 1975 to 1999 for the assessment/operating model concerned will be used for the moment pending further discussions;
 (f) $\frac{P_{2031}}{P_{MSY}}$ where P_{MSY} is the population level when maximum sustainable yield is achieved; this will be pursued only after the next meeting at which methods to compute P_{MSY} will be discussed.

In each of them, population can be measured as total numbers (N_y^{tot}), total biomass (B_y^{tot}), exploitable numbers (ages 5 – 9) (N_y^{5-9}), exploitable biomass (B_y^{5-9}), survey index (B_y^{surv}) or spawning biomass (B_y^{sp}), (though with primary focus on exploitable biomass for P_{target}) where:

$$N_y^{tot} = \sum_{a=0}^m N_{y,a} \quad (26)$$

$$B_y^{tot} = \sum_{a=0}^m w_{y,a}^{mid} N_{y,a} \quad (27)$$

$$N_y^{5-9} = \sum_{a=5}^9 N_{y,a} \quad (28)$$

$$B_y^{5-9} = \sum_{a=5}^9 w_{y,a}^{mid} N_{y,a} \quad (29)$$

B_y^{surv} : equations 16 to 18

$$B_y^{sp} = \sum_{a=1}^m f_{y,a} w_{y,a}^{mid} N_{y,a} \quad (30)$$

The primary PS (I) and (III) above can be captured by:

- (g) (Average) annual catch over short, medium and long terms:

$$C_{2011}, C_{2012}, \sum_{y=2011}^{2015} C_y / 5, \sum_{y=2016}^{2020} C_y / 5 \text{ and } \sum_{y=2011}^{2030} C_y / 20$$

- (h) Average annual variation in catch over short and long terms:

$$AAV_{2011-2015} = \frac{1}{5} \sum_{y=2011}^{2015} |C_y - C_{y-1}| / C_{y-1} \text{ and}$$

$$AAV_{2011-2030} = \frac{1}{20} \sum_{y=2011}^{2030} |C_y - C_{y-1}| / C_{y-1}$$

$$P(> 15\%) \text{ being the proportion of years in the projection period where } \left| \frac{C_y - C_{y-1}}{C_{y-1}} \right| > 0.15$$

Subsequently, at the May 2010 Halifax meeting, the four properties (or Performance Targets) were refined as follows:

- I) The probability of the decline of 25% or more in terms of exploitable biomass from 2011 to 2016 is kept at 10%* or lower.
- II) a) The probability of annual TAC variation of greater than 15% be kept at 25% or lower and
 b) The probability of variation of TAC more than 25% over any period of 3 years should be kept at 25% or lower.
- If the conditions a) **and** b) are not met, then an alternate performance target should be considered as follows:
- c) The TAC should not be below 10 000 t for the period 2011-2015 in any one year with a probability of 25% on a year by year basis.
- III) The magnitude of the average TAC in the short, medium and long term should be maximized.
- IV) The probability of failure to meet or exceed a milestone within a prescribed period of time should be kept at 25% or lower. *Milestone* means the average exploitable biomass for the period 1985-1999 to be compared with the exploitable biomass in 2031.

The following corresponding Performance Statistics were then also agreed:

Performance Statistic for Performance Target I:

$$\frac{P_{2016}}{P_{2011}},$$

where P_y is the exploitable biomass computed at the start of the year indicated.

Performance Statistics for Performance Target II a):

$$\left\{ \sum_{y=2010}^{y=2029} \left| \frac{C_{y+1} - C_y}{C_y} \right| \right\} / 20; \quad X_y = \frac{|C_{y+1} - C_y|}{C_y} - 0.15;$$

$$I_y = \begin{cases} 1 & \text{if } X_y > 0 \\ 0 & \text{if } X_y \leq 0 \end{cases}; \quad \left\{ \begin{array}{l} \text{Prob}^* = \frac{1}{5} \sum_{y=2010}^{2014} I_y \\ \text{Prob} = \frac{1}{20} \sum_{y=2011}^{2030} I_y \end{array} \right\}$$

Performance Statistic for Performance Target II b):

$$\left\{ \sum_{y=2010}^{y=2027} \frac{|C_{y+3} - C_y|}{C_y} \right\} / 18; \quad X_y = \frac{|C_{y+3} - C_y|}{C_y} - 0.25;$$

$$I_y = \begin{cases} 1 & \text{if } X_y > 0 \\ 0 & \text{if } X_y \leq 0 \end{cases}; \quad \text{Prob} = \frac{1}{18} \sum_{y=2010}^{2027} I_y$$

where C_y is the TAC for the year indicated.

Performance Statistics for Performance Target IIc):

$$C_{2011}; C_{2012}; C_{2013}; C_{2014}; C_{2015}$$

Performance Statistics for Performance Target III:

$$\frac{1}{5} \sum_{y=2011}^{2015} C_y; \frac{1}{5} \sum_{y=2016}^{2020} C_y; \frac{1}{20} \sum_{y=2011}^{2030} C_y$$

Performance Statistic for Performance Target IV:

$$\frac{P_{achieved}}{P_{milestone}} \text{ where } P_{achieved} = P_{2031} \text{ and } P_{milestone} = \frac{1}{15} \sum_{y=1985}^{1999} P_y$$

A total of 100 forward projections will be run for each trial, with results presented as the 5th, average of 50th and 51st and 96th in an ordered set (i.e. median with 90% probability intervals).

Plots of annual catch and B^{5-9} may be produced for each trial, the first showing the median and 90% probability envelopes, and the second showing the first 5 realisations (“worm plots”).

Annex 4. Application of the Management Strategies

The management strategy to calculate the TAC for year $y+1$ is defined by the following formulae:

$$TAC_{y+1}^* = Z_y (1 + \lambda_y slope_y)$$

$$\text{where } Z_y = \begin{cases} Z & y = 2010 \\ TAC_y^* & y \geq 2011 \end{cases}$$

$$\lambda_y = \begin{cases} \lambda_u & slope_y > 0 \\ \lambda_d & slope_y \leq 0 \end{cases}$$

and where

$$\text{if } TAC_{y+1} - TAC_y > TAC_y (1 + x\%) \quad \text{then } TAC_{y+1} = TAC_y (1 + x\%)$$

$$\text{if } TAC_{y+1} - TAC_y < TAC_y (1 - y\%) \quad \text{then } TAC_{y+1} = TAC_y (1 - y\%)$$

where Z , λ_u , λ_d , x and y are control parameters to be selected.

For the MP selected the values of the control parameters are:

Z	16 000 t	or	17 500 t
λ_u	1.00	or	1.00
λ_d	1.25	or	2.00
x	0.10	or	0.05
y	0.10	or	0.05

The quantity $slope_y$ is calculated as follows:

For each survey, linearly regress $\ln I_y^i$ vs year y' for $y' = y - 5$ to $y' = y - 1$, to yield a regression slope value $slope_y^i$, an average of the slopes is taken to provide a composite value:

$$slope_y = (slope_y^{CanFall} + slope_y^{CanSpring} + slope_y^{EU(0-1400m)}) / 3$$

where I_y is the survey biomass result in terms of mean weight per tow of fish for all ages.

Annex 5. Results of the MSE Application

Performance statistics (medians) for two Management Strategies as averaged over the SCAA- and the XSA-conditioned operating models.

	SCAA average		XSA average	
	MS 1 (mp01)	MS 2 (mp14 (+-5%))	MS 1 (mp01)	MS 2 (mp14 (+-5%))
C ₂₀₁₁₋₂₀₁₅	13374	15766	14800	16400
C ₂₀₁₆₋₂₀₂₀	13566	15827	19600	19100
C ₂₀₁₁₋₂₀₃₀	14335	16195	23100	21400
B ₂₀₁₁₋₂₀₁₅	91530	89361	69446	66588
B ₂₀₁₆₋₂₀₂₀	107715	103211	131854	128102
B ₂₀₁₁₋₂₀₃₀	117766	113381	127975	127612
B ₂₀₁₁₋₂₀₁₅ /B ₂₀₁₁	1.05	1.03	1.04	1.02
B ₂₀₁₆₋₂₀₂₀ /B ₂₀₁₁	1.26	1.20	1.98	1.98
B ₂₀₁₁₋₂₀₃₀ /B ₂₀₁₁	1.36	1.31	1.93	1.97

SECTION II
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(STACFAD), 32nd Annual Meeting
20-24 September 2010
Halifax, Nova Scotia, Canada**

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PART I

Report of the General Council (GC Doc. 10/5)

32nd Annual Meeting, September 20-24, 2010 Halifax, Nova Scotia, Canada

I. Opening Procedure (*Agenda items 1-6*)

1. Opening by the Chair

The 32nd Annual Meeting of NAFO was convened on 20 September 2010 at 0900 hrs at the World Trade and Convention Centre, Halifax, NS, Canada, with 180 delegates present from all NAFO Contracting Parties (Annex 1). The NAFO President and GC Chair, Terje Lobach (Norway) introduced the Honourable Gail Shea, P.C., M.P., Canadian Minister of Fisheries and Oceans, who made an opening address to all delegates. The GC Chair also made a welcoming speech to the participants, followed by statements by Canada, the European Union, the United States of America, Denmark (in respect of the Faroe Islands and Greenland), Cuba, Japan and the Russian Federation. (Annexes 2-10).

Opening statements were also made by Observers from the Ecology Action Centre (EAC), the International Coalition of Fisheries Association (ICFA), the Atlantic Chapter of Sierra Club Canada, and the World Wildlife Fund (WWF) (Annexes 11-14). The opening statement by the FAO was distributed to participants later (Annex 15).

2. Appointment of Rapporteur

Vladimir Shibanov, the NAFO Executive Secretary, was appointed as Rapporteur.

3. Adoption of Agenda

The agenda was adopted as circulated (Annex 16).

4. Admission of Observers

In accordance with the Rules for Observers and in advance of the meeting, the Executive Secretary had invited the following intergovernmental organizations to attend: FAO, CCAMLR, CPPS, ICCAT, ICES, NAMMCO, NASCO, NEAFC, NPAFC, PICES, SEAFO. FAO was present, EU observed on behalf of CCAMLR, Denmark (in respect of the Faroe Islands and Greenland) on behalf of NEAFC and Iceland on behalf of NAMMCO. Furthermore, the following NGOs which had been granted observer status were also present: the Ecology Action Centre (EAC), the International Coalition of Fisheries Association (ICFA), the Atlantic Chapter of the Sierra Club of Canada (SCC) and the World Wildlife Fund (WWF).

5. Publicity

The meeting agreed that no public statements would be made until after the conclusion of the meeting when a Press Release would be prepared by the Executive Secretary in collaboration with the Chairs of the General Council, Fisheries Commission and Scientific Council.

6. Guidance to STACFAD necessary for them to complete their work (Monday)

In addition to its regular tasks, STACFAD was asked to consider the budgetary implications related to the agreed Performance Review.

STACFAD was also asked to make a special effort to look to opportunities for cost savings in order that any increases to Contracting Parties' contributions are kept to a minimum.

II. Supervision and Coordination of the Organizational, Administrative and other Internal Affairs *(Agenda items 7-11)*

7. Review of membership of the General Council and Fisheries Commission

The membership has not changed since 2008 and all twelve Contracting Parties were present: Canada, Cuba, Denmark (in respect of the Faroe Islands and Greenland), the European Union, France (in respect of St. Pierre and Miquelon), Iceland, Japan, Republic of Korea, Norway, the Russian Federation, Ukraine, and the United States of America.

8. Status of Ratification process resulting from the adoption of the amended Convention

To-date Norway and Canada have completed the ratification process. Other Contracting Parties reported on progress made in their internal processes.

9. Status of the NAFO Headquarters Agreement

Canada reported that its domestic approval process for the Headquarters Agreement is proceeding, and will be ready for signature in the coming months.

10. Report of the Performance Assessment Working Group, April 2010

The Chair gave an overview of the PAWG report (GC Doc. 10/1), and opened the floor for discussion. A few amendments were made to the recommendation to the Working Group based on these discussions. The amended framework for the Performance Review was presented as GC Doc. 10/4 which was adopted by the General Council.

The General Council agreed that the Secretariat will establish a "Performance Assessment" Area on the NAFO web-pages in order to allow stakeholders to submit their comments and contributions to the Panel. In addition, it was noted that there would be other usual ways for stakeholders to submit comments and contributions.

11. Administrative Report

The Executive Secretary presented the Administrative and Financial report (GC Doc. 10/3 (Revised)). The Report was accepted with no comments. He expressed his appreciation to the Scientific Council Coordinator, Dr. Anthony Thompson, for the excellent job done during his time with the Organization.

III. Coordination of External Affairs *(Agenda items 12-13)*

12. Report of the Executive Secretary on External Meetings

Since the last Annual Meeting, the Executive Secretary was involved in the following UN activities in an observer capacity: Ninth Round of Informal Consultations of States Parties to the United Nations Fish Stocks Agreement (March 2010), Resumed Review Conference (May 2010) and the 11th Meeting of the UN Open-ended Informal Consultative Process on Oceans and Law of the Sea (June 2010).

As well, members of the Secretariat also actively participated in the following external meetings: Advisory Group (AGDC October 2009), D4Science World User Meeting (November 2009), Coordinating Working Party on Fishery Statistics (CWP, February 2010), Fishery Resources Monitoring System (FIRMS, February 2010), International Fisheries Commissions Pension Society (IFCPS) (April 2010), Deep-sea Fisheries Guidelines Workshop (FAO, May 2010), and Aquatic Sciences and Fisheries Abstracts (ASFA) Advisory Board Meeting (July 2010).

Staff members also took part in two outside activities: World Oceans Day 2010 at the Maritime Museum of the Atlantic, in Halifax, NS (June 2010) and the International Ocean Institute (IOI) round-table discussion at Dalhousie University, Halifax, NS (August 2010).

13. International Relations

At the last Annual Meeting (September 2009), it was agreed that the following Contracting Parties will act as NAFO Observers at upcoming meetings: Norway at SEAFO and NAMMCO, Denmark (in respect of Faroe Islands and Greenland) at NEAFC, and USA at NPAFC. Reports by NAFO Observers were presented.

For 2010-2011, Norway will represent NAFO at meetings of the South East Atlantic Fishery Organisation (SEAFO) and the North Atlantic Marine Mammal Commission (NAMMCO), Denmark (in respect of Faroe Islands and Greenland) will represent NAFO at the North East Atlantic Fisheries Commission (NEAFC) and the United States of America will represent NAFO at the North Pacific Anadromous Fish Commission (NPAFC).

IV. Finance (Agenda items 14-15)

14. Report of STACFAD at the Annual Meeting

The STACFAD Chair, Bob Steinbock (Canada), presented the STACFAD Report (Part II of this Report). He noted that there were a few additional items that the Committee had dealt with during the week, and these included expenses related to the Performance Assessment and the process for replacing the Scientific Council Coordinator.

With regards to the timing of the 2013 NAFO Annual Meeting, a proposal that the date be moved to the subsequent week (23 – 27 September) from the usual third full week in September, on a one time basis only, was made. Concerns were expressed that this may conflict with other international meetings.

15. Adoption of the Budget and STACFAD recommendations for 2010

STACFAD made the following recommendations to the General Council:

- (1) that the 2009 Auditors' Report be adopted;
- (2) that the amount maintained in the accumulated surplus account be set at \$285,000 of which \$200,000 would be sufficient to finance operations during the first three months of 2011, and of which \$85,000 would be available for use in emergency situations;
- (3) that the Report of the STACFAD Working Group, April 2010 be adopted noting that the issue of the submission deadline for proposals for the NCEM stated in Rule 4.5 of the Rules of Procedure could be revisited;
- (4) that Staff Rule 5.3 be amended as follows (changes underlined and in italics): The Executive Secretary may appoint a Coordinator *or the Senior Finance and Staff Administrator* to be the Deputy Executive Secretary for the term of one or two years (renewable). This appointment will be compensated with 10% of the *Coordinator's or the Senior Finance and Staff Administrator's* annual salary;
- (5) that the budget for 2011 of \$1,886,000 (Annex 3) be adopted;
- (6) that the General Council re-appoint the three nominees to the Staff Committee (Bill Brodie, Deirdre Warner-Kramer and Bob Steinbock);
- (7) that the dates of the 2013 Annual Meeting (to be held in Halifax, N.S., Canada, unless an invitation to host is extended by a Contracting Party and accepted by the Organization) are as follows:

Scientific Council	-	[16 – 20] or [23 – 27] September
General Council	-	[16 – 20] or [23 – 27] September
Fisheries Commission	-	[16 – 20] or [23 – 27] September

General Council adopted the first six recommendations presented by STACFAD.

General Council agreed to revisit the potential dates for the 2013 Annual Meeting during the 2011 Annual Meeting.

Canada expressed appreciation to STACFAD for their work. As well, Canada complimented the NAFO Secretariat for their work throughout the year and also complimented all Contracting Parties for submitting the required funds for the financial stability of NAFO.

V. Closing Procedure (*Agenda items 16-20*)

16. Election of Vice-Chair

Vincent Grimaud (EU) was elected as the General Council Vice-Chair for a term of two years.

17. Time and Place of Next Annual Meeting

The next annual meeting will be held 19-23 September 2011 in Halifax, Nova Scotia, Canada.

18. Other Business

There were no other matters raised under this item.

19. Press Release

It was agreed that the Executive Secretary and the NAFO President finalize the Press Release from this meeting (Annex 17) and circulate it to the press. The Chairs of Fisheries Commission and Scientific Council were also invited to give their input for inclusion in the Press Release.

20. Adjournment

The meeting was adjourned on Friday, 24 September 2010 at 1700 hours.

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**Annex 2. Opening Address by The Honourable Gail Shea, P.C., M.P.
Minister of Fisheries and Oceans**

Mr. President, distinguished delegates, observers, ladies and gentlemen.

On behalf of the Government of Canada, it is a great pleasure to welcome you to Halifax for the 32nd Annual Meeting of the Northwest Atlantic Fisheries Organization.

If you have the opportunity, I invite you to experience some of the beauty and warmth that Halifax and Nova Scotia have to offer.

We all know how important the fishery is to all of our countries, and this is why NAFO's work is so important to us.

Here in Atlantic Canada, our economy and our communities were founded on the wealth of the fishery. And today, our prosperity is still directly linked to its abundance.

I come from a fishing family and community myself — in Prince Edward Island. So I know from experience the importance of fisheries, and I recognize the need to focus on the long-term economic viability of this important resource.

Here in Nova Scotia, the fishery has long been a cornerstone of everyday life. One third of our total Atlantic landings comes from just off this province's coast.

The global economic downturn has had a significant impact on the fishing industry and other sectors in recent years. Here in Canada, we have made strategic investments to strengthen our financial system, to support development and growth, and to stimulate spending. We are beginning to see signs of recovery.

Over the years, we have also invested to diversify and strengthen our fishery. We continue to work hard to help individuals and communities adjust and to transform our fishery — to better match capacity to supply, and to bring more stability and predictability.

And we have made progress. Today, we have a smaller, more viable fleet — one that is better matched to the state of our fish stocks. We have also learned an important lesson — conservation must always come first.

We have worked hard with people throughout the fishing industry to promote responsible fishing and processing practices.

We have adopted strict conservation measures for Canada's fisheries, to protect and rebuild our fish stocks, and secure a brighter future for the thousands of people who rely on them.

And we have not shied away from making tough decisions in the name of conservation.

For example, I reduced the 2010 quota for shrimp in the area adjacent to Newfoundland and southern Labrador, in Canadian waters, by close to 30 per cent for conservation reasons. These are not easy decisions on any level. But as leaders, we must be willing to make decisions that may be unpopular in order to ensure the health of our fish stocks for generations to come.

Canadian harvesters have made sacrifices to rebuild our fish stocks, but we also know that we cannot do it alone. Rebuilding our stocks means ensuring sustainability both inside and outside Canada's 200-mile limit.

This is why NAFO is so important.

To Canada, NAFO is an essential institution that has to work and work well. Our fishers and coastal communities depend on healthy and sustainable fisheries in the Northwest Atlantic for their economic future.

In this regard, I am pleased that NAFO has made significant progress in a number of important areas:

- Conservation,
- Improving enforcement and compliance,
- Commitment to reform, and
- Progress in protecting vulnerable marine ecosystems.

Our collective commitment to putting conservation as the number one priority in managing fisheries resources is a tremendous step. NAFO decisions to maintain moratoria on a number of fish stocks, consistent with the scientific advice, have clearly demonstrated its commitment to protecting stocks over the long term.

These efforts have brought recovery to two important groundfish stocks — 3M cod and 3LN redfish. These fisheries were reopened at last year's annual meeting. Those who have sacrificed during the moratoriums can look forward with optimism to resuming their traditional fisheries with a renewed sense of stewardship and conservation.

The commitment to improving enforcement and compliance is a key achievement and complements conservation efforts. In this regard, Canada has made a considerable investment in the Joint Inspection Scheme in the NAFO Regulatory Area. There is increasing enforcement collaboration with a number of Parties in the form of joint patrols and inspections.

In 2006, NAFO adopted a number of enforcement-related amendments to its conservation and enforcement measures. Consequently, for the most part, the rules of the fishery are now being followed. There are still cases involving NAFO citations for serious infringements, but they are increasingly the exception. We must continue this process, for although there has been a significant improvement in compliance in the NAFO Regulatory Area, parties recognize the need for continued vigilance to ensure the continued recovery and growth of important NAFO stocks.

I am also pleased to see that NAFO has adopted the amendments to the 1978 Convention and decided last year to undertake a Performance Review of the organization. Norway and Canada have ratified the amendments to date. I encourage all parties to pursue ratification to ensure a strengthened NAFO Convention comes into force as early as possible.

Lastly, I would like to applaud the progress that NAFO has made in protecting vulnerable marine ecosystems in the NAFO Regulatory Area, in response to the United Nations General Assembly Sustainable Fisheries Resolution. Last year, NAFO decided to close eleven additional areas of coral and sponge concentrations equivalent to an area the size of my home province of Prince Edward Island — in other words, more than five thousand square kilometres. Now that is significant.

In closing, let us mark the occasion of this 32nd annual meeting of NAFO by rededicating ourselves to this goal: Let us demonstrate our shared commitment to the future of our precious fisheries and oceans resources, and the future of those who rely on them.

I wish you a successful and productive meeting.

Thank you.

Annex 3. Opening Statement by the Chair of General Council – Terje Lobach (Norway)

Distinguished delegates, ladies and gentlemen,

It is an honour and a pleasure for me to serve as your Chair also at this year's annual meeting.

First of all, I would like to welcome you all back to Canada after three successive annual meetings in Europe, and I wish to thank the Executive Secretary and his staff for their excellent work in coordinating and arranging this meeting.

Although NAFO in recent years taken has numerous steps to rebuild fish stocks, many stocks continue to be at very low levels. But there are also some promising signs, and the improved status of some of the stocks is encouraging. Last year NAFO reopened a fishery that had been under moratoria for many years, and it seems that the status of this stock continues its move in the right direction. There are also positive indications for other stocks that may allow for reopening of additional fisheries.

Protection of ocean habitats and deep sea biodiversity has become an important item on the international agenda. NAFO has adopted a comprehensive framework in response to the calls from the United Nations General Assembly to address bottom fishing and vulnerable marine ecosystems. These responses have been examined in New York and elsewhere with some positive results. Although NAFO now has a set of regulations in place, there are still work to be done, both in the Scientific Council and the Fisheries Commission, to refine the details of this important framework.

Three years ago a new convention was adopted, taking into account modern principles concerning management of living marine resources. But ratification seems slow, and I would urge all Contracting Parties to speed up the internal processes. Significant progress has been, through the NAFO Reform process, also made in improved conservation measures and actions taken to ensure that these measures are implemented and complied with. NAFO has also recognized the need for a good and strong science base as fundamental for proper management of marine living resources.

In response to several calls from the international community, the annual meeting last year agreed that a Performance Review shall be undertaken. We will in the coming days discuss the recommendations from the Working Group that met in April and developed terms of reference, assessment criteria, panel composition as well as considered budgetary and administrative implications.

NAFO has been in the forefront in the fight against IUU fishing. The importance of coordinated port State measures has been recognised by the international community, and members of FAO agreed last November on the global, binding agreement. This is a milestone in the fight of IUU fishing, and NAFO should probably, like other regional fisheries management organisations consider the impact this Agreement may have on its system of port State measures.

Close cooperation and collaboration are essential to achieving our common goals of stock recovery, conservation and sustainable use of marine living resources, as well as control that agreed measures are adhered to. I am confident that together we will manage to meet these challenges.

Thank you. I would now like to open for statements by Contracting Parties, followed by possible statements by others.

Annex 4. Opening Statement by the Representative of Canada

Mr. Chairman, Distinguished Representatives, Observers, Ladies and Gentlemen

It's a pleasure for the Canadian delegation to participate at this annual meeting in Halifax. I want to commend the Secretariat for selecting this venue and the excellent arrangements that have been made.

NAFO has made significant progress in moving from words to action, in reforming the Organization to ensure that together we can responsibly address the conservation challenges before us.

NAFO's progress can be attributed, in large part, to the strengthened collaboration among Contracting Parties to make NAFO work.

As a result, we have seen improved compliance in the NAFO Regulatory Area and in the coordinated responses by Contracting Parties to address infringements.

Our cooperation has also enabled NAFO to take significant steps towards protecting vulnerable marine ecosystems in response to the calls by the United Nations General Assembly. Canada would like to highlight the ongoing collaborative research initiatives by Contracting Parties to verify the locations of vulnerable marine ecosystems in the NAFO Regulatory Area. Research undertaken by the Spanish vessel *Miguel Oliver* and the Canadian vessel the *Hudson* during the past two years has been instrumental and recognized internationally.

While significant progress has been achieved, we must recognize that there are a number of outstanding issues that require further cooperation.

We must now commit to a responsible path forward to ensure the rebuilding of the 2+3KLMNO Greenland halibut stock. We need to take action to reduce bycatch in all NAFO-managed fisheries, especially bycatch of moratorium species. We need to adhere to a precautionary approach for NAFO-managed stocks, and in particular those fisheries that have established reference levels.

Canada is encouraged by the continuing signs of recovery of important groundfish stocks. Contracting Parties that made enormous sacrifices can now look forward to the possibility of re-engaging in their traditional fisheries. However, it is critical that we treat these fisheries with a renewed sense of stewardship and conservation. To do this, effective and cautionary controls must be implemented to allow these stocks to continue their recovery.

We also need to remain vigilant to ensure compliance by fleets operating in the NAFO Regulatory Area to help to protect stocks that remain under moratorium, such as American plaice and 3NO cod, and to ensure that recently reopened stocks continue to recover.

Above all, we must not lose sight of our ultimate goal of conserving the NAFO-managed stocks for future generations.

We look forward to working with all Contracting Parties this week so we can achieve our common goals of stock recovery, conservation and sustainable use of the marine living resources.

Thank you.

Annex 5. Opening Statement by the Representative of the European Union

Mr Chair, Distinguished Delegates, Ladies and Gentlemen,

It is an honour and a pleasure for me to head the delegation of the European Union at this Annual Meeting in beautiful Halifax.

This year, probably like most years, we are facing issues that are crucial both to the performance of NAFO as a regional fisheries management organization but also key to its success and its ability to execute and carry out its mandate.

The report of the Scientific Council includes both encouraging and worrying signs for a range of stocks. We have been pleased to see that the stocks for which the fishery was reopened last year are in an increasingly good shape which shows the success of the painful management decisions taken in the past. This should serve as an encouragement for NAFO to take difficult decisions for stocks which today are in a poorer shape, in order to allow them to rebuild.

The consideration of the Greenland halibut stock is probably one the most important matters facing NAFO this year. This year however, we have the advantage of the results of the Working Group on the Greenland Halibut Management Strategy Evaluation. Considerable amount of resources and energy have been invested in the work of this Group, so let us reap the benefits of this work and take the right decisions.

This year, we will again face decisions concerning the Vulnerable Marine Ecosystems. The EU believes that we have a sound basis for discussions on this issue, thanks to the work of the Working Group of Fisheries Managers and Scientists and the recommendations of the Scientific Council and that we will continue to make progress to fully implement the UNGA Resolution 61/105 in this respect.

Finally, the EU expects NAFO to launch a Performance Review of the Organisation at this Annual Meeting to ensure that NAFO can systematically identify and address any shortcomings in its performance.

The EU delegation looks forward to working with all Parties around the table in order to achieve the best possible result for the conservation and management of stocks under the NAFO purview.

Thank you.

Annex 6. Opening Statement by the Representative of the United States of America

Mr. Chairman, distinguished delegates, observers, ladies and gentlemen:

The United States is pleased to be here with our colleagues in beautiful Halifax, Nova Scotia, for the 32nd NAFO Annual Meeting. We look forward to an interesting and productive week and would like to take this opportunity to communicate our thoughts regarding the work before us.

First, we would like to express strong support for the work currently underway in the Greenland Halibut Management Strategy Evaluation Working Group. After three intersessional meetings during 2010, we feel that the alternative management approach developed by the GHMSE offers an excellent tool for NAFO to increase the effectiveness of Subarea 2 and Divisions 3KLMNO Greenland halibut management. The Scientific Council advice for 2010 reflects increased optimism for this stock; this is the perfect time for NAFO to adopt a new management procedure and get this stock back on track. We are also encouraged that this work can be a useful model for how NAFO can improve its management overall. We note that, although its current terms of reference expire at this annual meeting, the United States supports continued work by the GHMSE WG.

The United States also looks forward to continuing discussions that will further ensure that conservation and management measures for all NAFO-managed stocks are consistent with scientific advice and the precautionary approach. These discussions take on significant importance in light of new SC recommendations regarding Div. 3M shrimp. Additionally, we remain particularly concerned that the TACs set for NAFO thorny skate and white hake remain in excess of scientific advice.

Five years after the requirements to submit data on shark catches in Article 17.1 of the NCEM were adopted, we are very concerned that few CPs are fully complying. NAFO still lacks a clear picture of the extent and nature of shark bycatch in its fisheries. It is our further hope that NAFO will commit to work with other RFMOs as necessary to address the management of relevant Atlantic shark species. For instance, the United States continues to support a joint meeting of the Chairs or representatives of the RFMOs concerned in the fisheries of Atlantic porbeagle, to examine the possibility of adopting compatible management measures, in accordance with the FAO International Plan of Action on sharks.

The United States also supports on-going efforts by NAFO Contracting Parties to address the impacts of bottom fishing on vulnerable marine ecosystems (VMEs). The Working Group of Fishery Managers and Scientists (WGFMS) on VMEs continues to move this issue forward, and we support an extension of this WG for 2011 and beyond. We must continue to improve and update the current NAFO encounter procedures and also agree on the necessary components for a VME impact assessment. We welcome the new advice of the Scientific Council regarding assessments. Additionally, we would like to examine the viability of developing and implementing a GIS-based procedure for predicting the presence of VMEs in advance of fishing operations. The June 2010 Scientific Council Report contains a reference to such a process and other information on implementing such an approach is available from other sources. We look forward to discussions on this topic during this meeting.

We would like to express our pleasure regarding the outcomes of the recent meeting of the NAFO Performance Assessment Working Group. Although some details remain to be resolved, we think that the recommendations of this group put NAFO in an excellent position to undertake this very important task during 2011.

Finally, the United States wishes to bring attention to the upcoming Fifth International Marine Debris Conference that will take place March 20-25, 2011, in Honolulu, Hawaii. The U.S. National Oceanic and Atmospheric Administration and the United Nations Environment Programme are co-sponsoring this conference. International cooperation is needed to increase public awareness and develop ways to reduce the serious and growing impacts of marine debris on oceans and sea life. Please consider attending the conference and visiting its website, www.5imdc.org.

Thank you all for your attention. We look forward to working with you.

**Annex 7. Opening Statement by the Representative of Denmark
(in respect of the Faroe Islands and Greenland)**

Mr Chairman, distinguished Delegates, Observers, Ladies and Gentlemen

After our last three years of successful annual meetings in the European cities of Lisbon, Vigo and Bergen, the Faroe Islands and Greenland are very pleased to be back here on this side of the North Atlantic in beautiful Halifax for the 32nd Annual Meeting of NAFO.

Last year we agreed to reopen fisheries on cod in 3M and redfish in 3LN. We are pleased to see that our precautionary measures over the last decade have allowed these stocks to grow and that we can benefit from the further development of these fisheries.

With respect to the shrimp fishery, we have noted with concern a rather pessimistic trend in the biological advice, especially for 3M. Our delegation acknowledges that we have a difficult and important task ahead of us to design and agree appropriate management measures for both of these stocks.

We have made a lot of progress in designing measures to protect vulnerable marine ecosystems in the NAFO regulatory area from significant adverse impacts from bottom trawling. This includes the useful mapping of existing fishing areas. Our delegation favours a pragmatic approach to the system we have in place. We need now to gain further experience from its implementation in practice, so that we can make sure it is both effective, and realistic in relation to the actual risks to VMEs from fishing operations. The main emphasis in this regard should therefore be on the collection of data.

Work is well under way to begin a performance assessment review of NAFO, in line with similar initiatives taken by other RFMOs, including NEAFC, our sister organisation in the Northeast Atlantic, which was the first RFMO to have such a review done. We look forward to reaching agreement this week on the necessary details for the assessment panel to be appointed, so that we can have a report in time for next year's annual meeting.

Mr Chairman, our delegation would like to take this opportunity to convey our sincere appreciation and warm thanks to the Secretariat for once again having prepared this annual meeting so well.

Finally Mr. Chairman, the Faroe Islands and Greenland can assure you that we are fully prepared to work in a constructive way with all delegations in the week ahead of us to bring the many issues on our agenda to a successful conclusion.

Thank you.

Annex 8. Opening Statement by the Representative of Cuba

Good morning.

Mr. President, Dear delegates,

On behalf of the Cuban delegation, let me express our gratitude to the authorities of Canada for the opportunity to meet again in this beautiful city of Halifax.

We are looking forward to a constructive meeting and, of course, we all know that we have ahead of us a very busy week.

Throughout the last decades, NAFO has achieved important milestones to become a modern, efficient and strong fisheries organization and to this end has been taking some measures such as the precautionary and ecosystem approaches, strengthened the monitoring, control and surveillance scheme, the fishing moratoria on a large number of stocks, by-catch reducing measures, multi-year protection plans and enhanced the transparency of the Organization.

The Amendment to the Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries constitutes the first formal step towards a reformed Convention for NAFO and we hope that in the near future it will be ratified by all Contracting Parties as a sign of their commitment with the Organization and the responsibility for the effects of fisheries on the marine ecosystems in the Convention area.

As a result of all these efforts, the compliance of fishing vessels with the NAFO regulations has increased, whereas illegal, unreported and uncontrolled fishing has decreased and some fish stocks are already showing signs of recovery, example of what is that for 2010 two stocks under moratoria for more than 10 years have been reopened for directed fishing.

However, the abundance of many traditional stocks continues to be low which is an indication that the rebuilding process will take time and compromise of all parties involved to ensure that those stocks have a chance to recover.

We look forward to work with all delegations present at this meeting and that the discussions and decisions to be taken at this 32nd Annual Meeting will be testimonies of the NAFO's serious efforts in responding to the significant changes in the marine ecosystem as a result of adverse impacts of overfishing, climate changes and also a commitment to manage fisheries in a sustainable way for futures generations.

Thank you very much.

Annex 9. Opening Statement by the Representative of Japan

Mr. Chairman, distinguished delegates, observers/ Ladies and Gentlemen,

Japanese delegation is very pleased to be able to visit this beautiful city of Halifax for the thirty-second Annual Meeting of NAFO. We would like to express our appreciation for the hospitality extended by the Canadian Government and for the excellent preparations done by our new Executive Secretary and his staff members.

NAFO has made a significant progress over the last few years. Particularly we are pleased to note that at the last annual meeting two stocks that had been under moratoria for more than ten years were reopened for direct fishing, demonstrating the successful management of our important fisheries resources done by this organization.

There still remain several outstanding issues, including the management of Greenland Halibut. This is a controversial issue and has been discussed among the countries concerned for a long period of time. But, the message we received from the Working Group on Greenland Halibut Management Strategy Evaluation which met last week is encouraging. I do hope that we would be able to find responsible and workable solution based on the best possible scientific advice during this week. I take this opportunity to thank all the participants of the Working Group for their effort.

Finally Mr. Chairman, we look forward to working with all the delegations around the table so that NAFO remains at the forefront of good management in international fisheries.

Thank you, Mr. Chairman.

Annex 10. Opening Statement by the Representative of the Russian Federation

Mr. Chairman, distinguished delegates, ladies and gentlemen,

Let me first of all express our sincere gratitude to Canada for its hospitality as the hosting country and the NAFO Secretariat for its highly professional preparatory work and excellent organization of the 32nd NAFO Annual Meeting in the beautiful city of Halifax.

On behalf of the Russian fishermen I am pleased to greet all the participants of this meeting.

The Russian Federation takes active part in the international fisheries cooperation at bilateral, regional and global level. Having joined a number of international agreements on fisheries and conservation of living marine resources of the World Ocean, we consider the NAFO activities, aimed at sustainable and long-term exploitation of fishery resources of the Northwest Atlantic, to be very important.

The Russian Federation has always focused serious efforts on implementation of decisions adopted by NAFO. In particular special attention is paid to scientific research in the North West Atlantic area, which has been historically very important and still remains of great significance for the Russian fishery.

During the week ahead we shall address a number of issues related to long-term conservation of stocks and efficient management of fisheries in the NAFO Regulatory Area.

In recent years the NAFO Scientific Council reported positive trends in status of stocks, which had been closed to fishing, such as 3LN Redfish and 3M Cod. We believe that thanks to our joint efforts the situation with fishery resources, the status of which does not allow to conduct sustainable fishing today, will improve in the nearest future. I hope that our productive work in the coming days will result in taking the necessary decisions and wish every success to the 32nd NAFO Annual Meeting.

Thank you.

**Annex 11. Opening Remarks from WWF at the 32nd NAFO Annual Meeting
by Dr. Bettina Saier, Director for Oceans, WWF-Canada,
representing the global organization**

- The World Wildlife Fund (WWF) would like to thank our Canadian hosts and NAFO for welcoming us here in Halifax.
- We've participated in these meetings for the past five years because we are committed to the vision of a rebuilt Grand Banks ecosystem and its valuable fisheries.
- We are also committed to helping NAFO achieve its objectives: optimum utilization and conservation of fishery resources in its regulatory area.
- At this Annual Meeting, WWF will measure NAFO's success using 4 priorities:
 1. Allowing further stock growth of Southern Grand Banks cod through minimizing bycatch and through a rebuilding strategy that is compliant with the United Nations Fish Stock Agreement's Precautionary Approach.
 2. Applying further protection to vulnerable marine ecosystems in accordance with FAO guidelines.
 3. Increasing the transparency and accountability of NAFO's decision-making processes.
 4. Addressing the need for transparent and independent performance reviews.

Concerning recovery of southern Grand Banks cod:

- NAFO took an important step three years ago in adopting a Rebuilding Strategy that included a voluntary cod bycatch reduction target of 420 tonnes.
- The bycatch target has been greatly exceeded in every year since implementation.
- This year, the Scientific Council reported an increase in Grand Banks cod stocks.
- NAFO should recognize that an increase in 3NO spawning cod represents a great opportunity for establishing a cod recovery strategy incorporating robust management tools such as those implemented with success in the Barents Sea cod fishery.
- NAFO will be able to demonstrate success this week by:
 1. Not increasing the current bycatch target of 420 tonnes and ensuring that all Contracting Parties abide to it
 2. Establishing a **Fisheries Commission Working Group** to draft a rebuilding strategy in line with the Precautionary Approach. Such a rebuilding strategy includes target and limit reference points, and harvest control rules that incorporate reference points. The strategy should be adopted at the 2011 Annual Meeting.

Concerning protection of Vulnerable Marine Ecosystems:

- WWF applauds steps NAFO has taken in recent years towards meeting the 2006 United Nations General Assembly (UNGA) Resolution on Sustainable Fisheries (61/105).
- In order to continue the progress:

1. Standardized impact assessments in accordance with the FAO guidelines will be needed;
 2. Fishery management plans in accordance with FAO Guidelines would be essential tools for ensuring long-term sustainability of deep-sea stocks and further protection of VMEs;
 3. Orphan Knoll, Fogo Seamounts 1 and 2, Corner seamounts, Newfoundland Seamounts, and New England Seamounts should have long-term protection with VME status;
 4. The adoption of non-intrusive sampling methods to monitor and delineate the extent of VMEs will have considerable ecological benefits.
- In addition to Grand Banks cod recovery and the protection of VMEs, WWF is recommending that NAFO improve transparency and accountability of its decision-making processes, and ensures that independent and transparent performance review are conducted on a regular basis.
 - The need for precautionary and ecosystem approaches to fisheries management is incorporated in NAFO's amended convention. It is also an issue of concern to an increasing number of retailers pledging to source only sustainable seafood.
 - To highlight the business case for sustainable seafood and smart oceans management, WWF would like to invite all of you to our **reception on Wednesday, September 22nd from 6pm to 8pm, Room 100 on the lower level in this building**. The reception is co-hosted by the Marine Stewardship Council (MSC), and locally produced sustainable seafood will be served.
 - WWF would also like to invite you to meet with us anytime this week to further discuss our priorities and conservation approaches. You are also welcome to visit us in our WWF office just across the street in Duke Tower (Suite 1202).

This is the first year in many that there has been a glimmer of light on the horizon for Grand Banks cod. We believe there is a future in this fishery and that NAFO can play a major role in making sure that there will indeed be a shining future.

**Annex 12. Opening Statement of the International Coalition of Fisheries Associations (ICFA)
to the 32nd Annual Meeting of the Northwest Atlantic Fisheries Organization (NAFO)
September 20, 2010, Halifax, Canada**

The International Coalition of Fisheries Associations (ICFA) is a coalition of the national fish and seafood industry trade associations from the world's major fishing nations. ICFA members represent countries harvesting more than 85% of the globe's fish. The group was formed in 1988 to provide decision-makers a unified voice on global fish and seafood issues.

ICFA is a recognized Non-Governmental Organization observer for United Nations agencies. We appreciate the opportunity to attend this Annual Meeting of NAFO for the first time, as an official observer. While commercial interests have had effective input to NAFO through the delegations of respective contracting parties, it seems appropriate for ICFA to join the increasing ranks of official observers at NAFO, to provide a collective commercial fishing perspective where it may be appropriate to do so.

ICFA members advocate policies for the long-term sustainable use of living marine resources for the benefit of global food security and prosperity. ICFA members are deeply committed to science-based and fully participatory fishery conservation and management processes.

NAFO ranks among the leading and more long-standing regional fisheries management organizations in the world. Among with other international and national jurisdictions, NAFO has experienced various difficulties in the past, as it struggled to address declining abundance in groundfish resources associated in large part with shifting productivity regimes, complex surveillance and enforcement issues, and quota sharing disputes. These types of challenges will ebb and flow depending on changing circumstance. However, past experiences have served to inform all participants about how to balance and manage both conservation priorities and economic objectives within evolving international standards and frameworks.

It is noteworthy to observe the significant progress that NAFO has achieved towards implementing effective measures to conserve vulnerable marine ecosystems. It is also gratifying to observe that significant recovery is taking place with some of the groundfish stocks in the NAFO Regulatory Area. However, while progress has been made, more progress needs to be made. Examples of this might be the need to implement modern dispute resolution processes, and to implement reasonably the precautionary approach framework that was adopted by NAFO at the policy level some years ago. There is a need for TAC-setting to evolve towards a more effective risk management process that addresses both conservation priorities and economic objectives. In this regard, and as one version of this process, we look forward to seeing how the Management Strategy Evaluation (MSE) initiative for Greenland Halibut comes to fruition.

We urge NAFO and its contracting parties to continue to make effective strides with these and other important matters, and commit the collective cooperation of commercial interests among the major fishing nations of the world.

Thank you.
Bruce Chapman

**Annex 13. Opening Statement by the Ecology Action Centre to the 32nd Annual Meeting
of the Northwest Atlantic Fisheries Organization (NAFO)
September 20, 2010, Halifax, Canada**

Mister Chairman, Distinguished Delegates, Fellow Observers and guests,

On behalf of the Ecology Action Centre, Nova Scotia's oldest and most established environmental organization, we welcome you to Halifax, the city and we have called home for the past 40 years.

I am Susanna Fuller, the Marine Conservation Coordinator at the Centre. We are honored to be observers at this meeting, as we have been at past NAFO meetings.

As a member of the Deep Sea Conservation Coalition, an organization of over 60 groups across the globe, we have been encouraged at the progress of NAFO since 2006 in implementing the United Nations General Assembly Resolution 61/105. We recognize that NAFO and Contracting Parties have cooperated through science and management measures to protect fragile elements and unique ecosystems that make up the valued and historic fishing areas of the Grand Bank, the Flemish Cap and surrounding waters. The research that has gone on in the past three years on corals and sponges in particular has renewed a sense of wonder for all those involved in seeing the diversity of marine life on the sea floor.

However, we remind you that at the time of its adoption, the UNGA Resolution was considered a compromise, and many of you here today, hoped for a stronger Resolution in New York in 2006. We also remind you that the VME protection provisions of the UNGA 61/105 were to have been implemented by December 31st, 2008. In 2009, States unanimously passed the UNGA Sustainable Fisheries Resolution 64/72 which further urged the implementation of 61/105 and in particular environmental impact assessments of all bottom fisheries. Therefore, at this meeting, we ask that NAFO require these assessments by December 31, 2010 or not allow fisheries to proceed.

We also note that the current encounter protocols for corals and sponges are also far above biologically meaningful limits, and we hope these will be revisited at this meeting.

Additionally, we encourage NAFO and its working groups to re-visit the FAO Guidelines on Deep Sea Fisheries and implement conservation measures for all VMEs, including long-lived fish species.

64/72 also calls for increased protection and reporting on shark landings in the NRA, which has been raised repeatedly at NAFO meetings in the past 4 years.

In September 2011, the implementation of these two Resolutions will be reviewed at the UN and we hope that NAFO will be awarded top marks, by the UN and by NGOs.

We encourage Contracting Parties to make decisions in full plenary at this meeting. Transparency and accountability are key principles in the United Nations Fish Stocks Agreement.

As one of the most established RFMOs, NAFO has the opportunity to continue its leadership to protect vulnerable marine ecosystems (VMEs) on the high seas and regulating the impacts of bottom fisheries. Indeed, the benefits of past conservation measures – which were not necessarily popular at the time – are now being realized with some fisheries formerly under moratoria showing continued signs of recovery.

We invite you to review our complete recommendations to NAFO for which are supported by 10 conservation organizations from Canada, the European Union, the United States and Iceland.

We look forward to the meetings this week and further progress in building NAFO's conservation reputation.

Thank you.

**Annex 14. Opening Statement by the Sierra Club Canada to the 32nd Annual Meeting
of the Northwest Atlantic Fisheries Organization (NAFO)
September 20, 2010, Halifax, Canada**

On behalf of Sierra Club Canada I wish to say thank you to NAFO and its contracting parties for granting us observer status at these meetings. I know we will learn a good deal here, but I also hope we are able to make positive contributions to NAFOs deliberations. As the oldest environmental organization in North America, we possess a wealth of information, and experience, concerning the dynamics of sustainable human interaction with natural environments. We understand the importance of employing the "precautionary principle" and of identifying and using the best science available. These are vital tools needed to re-establish healthy marine environments and abundant stable commercial fisheries. We also believe that contracting parties in NAFO must meet their international obligations to protect biodiversity and fish stocks. In Canada we also have to meet the requirements of our Oceans Act and our Fisheries Act.

As Canadians, the lack of ocean habitat recovery and commercial fishery recovery in the North-west Atlantic is of grave concern to us. Many of our members and supporters have deep fishery related connections with this part of the world often going back several centuries.

The serious overfishing of the past 60 years underscores the need to protect vulnerable marine ecosystems and rebuild the ocean food web. This runs much beyond the narrower scope of determining annual commercial fishing quotas. We see this as part of NAFO's evolving role from managing commercial fish stocks to functioning as stewards and managers of the Northwest Atlantic. The United Nations, the FAO, and many countries recognize this new role for regional fisheries management organizations. The challenge now is to make it happen.

Thank You.

Fred Winsor, PhD.
Conservation Chair
Atlantic Canada Chapter
Sierra Club Canada
Halifax, Nova Scotia

**Annex 15. FAO Statement to the 32nd Annual Meeting
of the Northwest Atlantic Fisheries Organization (NAFO)**

Jessica Sanders, Fishery Officer
FAO Fisheries and Aquaculture Department
FAO
Rome, Italy

Halifax, Canada
20 September 2010

The FAO wishes to thank the Secretariat of the Northwest Atlantic Fisheries Organization (NAFO) for extending an invitation to attend the Thirty-second Annual Meeting held in the historic city of Halifax. The FAO is thankful for the effective working relationship that the Organization has always enjoyed with NAFO and hopes to continue collaborative work on the many joint topics of common concern.

The FAO would like to emphasize the unique role Regional Fishery Bodies (RFBs) play in facilitating international cooperation for the conservation and management of shared, straddling and high seas fish stocks. RFBs represent the primary means of governing these stocks. Therefore, strengthening RFBs to ensure effective conservation and management of fish stocks and their associated ecosystems remains a priority in international fisheries governance and, of course, for FAO.

The FAO has undertaken a variety of activities which may be of interest and useful for the discussions over the coming days. Many of you have been involved in the development and adoption of *the FAO International Guidelines for the Management of Deep-sea Fisheries in the High Seas* which were agreed upon in August 2008. During its 28th Session the FAO Committee on Fisheries (COFI) recognized that regional fisheries management organizations (RFMOs) are among the primary driving forces in the implementation of the Guidelines and that several RFMOs, including NAFO, and a number of coastal States have been working on the implementation of the Deep-seas Guidelines and United Nations General Assembly (UNGA) Resolution 61/105. In order to support these efforts, FAO, with the assistance of the Republic of Korea, held a workshop in May 2010 examining the challenges in the implementation of the Deep-sea Guidelines and possible solutions. The results are being published as an FAO report and the recommendations of this meeting will be incorporated into the ongoing FAO Programme on the Implementation of the Deep-Sea Guidelines. This Programme, currently supported by Japan and France includes, among the initial activities, the development of a vulnerable marine ecosystem (VME) information system, guidance on collaboration with the deepwater fishing industry and species identification guides. A discussion group for experts interested in deep-sea fisheries in the high seas has also been initiated to facilitate communication between stakeholders. FAO is committed to the continuation of its activities in support of the important efforts by NAFO and other RFMOs to implement the Deep-sea Guidelines.

Many distinguished delegates may also be aware that the legally-binding FAO Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing was adopted by FAO Members in late 2009 and is now open for signature. As of today a total of 16 countries have now signed the Agreement. Both the Review Conference of the 1995 UN Fish Stocks Agreement and the UNGA, in resolution 64/72, encouraged States to become parties to the 2009 FAO Agreement and to cooperate to adopt all necessary port State measures consistent with international law.

FAO is in the process of initiating a programme to build human and material capacity through regional capacity-development activities to ensure that countries will be better placed to enhance and harmonize the implementation of the 2009 FAO Agreement.

There are two upcoming technical consultations at FAO which may be of importance to delegates. The first is the Technical Consultation to Identify a Structure and Strategy for the Development and Implementation of the Global Record of Fishing Vessels, Refrigerated Transport Vessels and Supply Vessels which will be held from 8 to 12 November 2010 in Rome. A second technical consultation will be held from 6 to 10 December 2010 on the development of International Guidelines for Bycatch Management and Reduction of Discards. This meeting was agreed by the twenty-eighth session of COFI in March 2009.

I also wish to touch briefly upon the issue of climate changes and fisheries. A partnership was recently developed – the Global Partnership for Climate, Fisheries and Aquaculture (PaCFA)¹- comprising 20 organizations and including both ICES and PICES. This group was established out of a mutual desire to draw together potentially fragmented and redundant climate change activities and to address the pressing need to raise the profile of fisheries and aquaculture in the global climate change discussions. PaCFA has been active in raising awareness on the issues facing the sector and actively participated in UNFCCC 15th Conference of the Parties in Copenhagen. Also in regard to climate change, FAO is participating in a symposium on Energy Use in Fisheries to be held November 2010 in Seattle, USA with a focus on improved alternative operational and management strategies to reduce energy use in fisheries and aquaculture.²

With respect to the impacts of fishing on the environment, I wish to draw your attention to the work of FAO with the International Maritime Organization (IMO) in revision of MARPOL Annex V and its guidelines, especially those related to marine pollution in general and the specific issues of impacts associated with abandoned, lost or otherwise discarded fishing gear on the environment.

I would also like to highlight recent FAO work undertaken on the Ecosystem Approach to Fisheries (EAF), in particular the development of a toolbox of suitable methods as a proactive mechanism to assist countries, fishery agencies and the various stakeholder groups to implement the EAF. This “toolbox” is a first attempt at such a guide and will present a large number of tested tools that are already available. In addition to the development of a toolbox, in 2009 FAO with the help of an international expert group reviewed indicators for application of EAF. The report is being finalised and covers ecological, socio-economic and governance indicators for EAF. A workbook on the use of indicators for fisheries management is also underway.

I would also like to advise the meeting that the traditional timing of the COFI has been changed and that the next session will be held from 31 January to 4 February 2011. The meeting of the Regional Fishery Body Secretariats Network will take place immediately after COFI.

In the highly internationalized fisheries arena, it is now almost impossible for FAO to work on global, regional or even national fisheries issues without strong cooperation and collaboration with RFBs. Therefore, I would like to reaffirm FAO's commitment to work with all RFBs, to encourage their members to strengthen their activities and to implement fully and speedily decisions made by these organizations.

NAFO's proactive approach to protection of vulnerable marine ecosystems and initiation of the reform process at an early stage in order to strengthen its function and performance is highly appreciated. The FAO hopes that NAFO will continue playing a significant role in regional action to secure sustainable and more responsible fisheries management.

I would like to thank the NAFO Secretariat again for the invitation to observe this important meeting and I assure you that I will follow the discussions over the coming week with much interest. I wish you a very fruitful and productive meeting.

¹ <http://www.climatefish.org>

² <http://www.energyfish.nmfs.noaa.gov/>

Annex 16. Agenda

I. Opening Procedure

1. Opening by the Chair, Terje Lobach (Norway)
2. Appointment of Rapporteur
3. Adoption of Agenda
4. Admission of Observers
5. Publicity
6. Guidance to STACFAD necessary for them to complete their work (Monday)

II. Supervision and Coordination of the Organizational, Administrative and other Internal Affairs

7. Review of Membership of the General Council and Fisheries Commission
8. Status of ratification process resulting from the adoption of the amended Convention
9. Status of the NAFO Headquarters Agreement
10. Report of the Performance Assessment Working Group, April 2010 (GC Doc. 10/1)
11. Administrative Report

III. Coordination of External Affairs

12. Report of Executive Secretary on external meetings
13. International Relations

IV. Finance

14. Report of STACFAD at the Annual Meeting
15. Adoption of the Budget and STACFAD recommendations for 2011

V. Closing Procedure

16. Election of Vice-Chair
17. Time and Place of Next Annual Meeting
18. Other Business
19. Press Release
20. Adjournment

Annex 17. 2010 Annual Meeting Press Release

NAFO Takes Stock Further Progress made on International Fishery Management

FOR IMMEDIATE RELEASE: Halifax, NS, Canada, 24 September 2010

At this week's meeting of NAFO – the Northwest Atlantic Fisheries Organization - a range of conservation and management measures were adopted for fish stocks in international waters and straddling national fishing limits based on the precautionary approach. With a commitment to apply an ecosystem approach to fisheries management, NAFO agreed to further refine its provisions to protect vulnerable marine ecosystems from significant adverse impacts of bottom fisheries, which included the extended closure of 6 seamounts in international waters. To take stock of the effectiveness of NAFO as a regional fisheries management organization, an expert panel will work together over the next year to produce a performance assessment of the work of NAFO.

The meeting agreed on management measures for 20 fish stocks in or straddling the NAFO Regulatory Area (NRA) in 2011. Following the reopening of Flemish Cap cod (Div. 3M) and Grand Bank redfish (Div. 3LN) last year and, based on new scientific advice, total allowable catch (TACs) for these stocks were increased. Fisheries for a number of other stocks remain closed. Based on the latest scientific advice on the continued very low level of the shrimp stock on the Flemish Cap, it was agreed that fisheries for shrimp in this area should not be permitted in 2011.

NAFO has agreed upon a progressive strategy to manage Greenland halibut in its Regulatory Area, developed by a working group comprising fishery managers and scientists. The new management strategy provides for the annual adjustment of the TAC according to defined rules and will be implemented for four years.

Over the next year NAFO will begin to develop Conservation Plans and Stock Rebuilding Strategies for protected and recovering fish stocks such as Cod Div. 3NO and American plaice Div. 3LNO. This will be a collaborative effort between fishery managers and scientists.

NAFO continues to develop its enforcement measures by implementing an improved system for recording daily catches of all species in the NRA. This allows for simplified reporting requirements and enhanced monitoring capability and will be incorporated in the Vessel Monitoring System (VMS).

NAFO continues to improve its management and conservation regime to fulfil its commitment to prevent significant adverse impacts on vulnerable marine ecosystems, as called for by UN General Assembly (UNGA) by, among other things, agreeing on a map of existing fishing areas.

Furthermore NAFO has agreed to extend the closure of 6 seamounts for the next 4 years; the implementation of impact assessments of bottom fishing; and application of a more comprehensive data collection protocol for coral and sponge species.

In 2011 NAFO will undergo a Performance Review by a panel of experts. The Panel will consist of external reviewers and experts from Contracting Parties. The Panel will assess the performance of NAFO against the objectives set out in the NAFO Convention and other relevant international instruments addressing the conservation and management of marine living resources.

To date the ratification of the amended NAFO Convention has been completed by two Contracting Parties. The internal processes continue and an update will be given during the next Annual Meeting.

Some results from a new joint multidisciplinary scientific survey (NEREIDA) that was successfully conducted by NAFO Contracting Parties to examine fishing resources and vulnerable marine ecosystems within the NRA were presented.

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Additional highlights of the meeting can be found in the attached backgrounder.

For more information contact:

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2010 Annual Meeting Press Release

24 September 2010

Backgrounder

NAFO is an international intergovernmental fisheries science and management body that manages the fishery in the international portion of the Northwest Atlantic. The 32nd Annual Meeting was held in the World Trade and Convention Centre, Halifax, NS, Canada and was attended by 180 delegates from all 12 Contracting Parties - Canada, Cuba, Denmark (in respect of Faroe Islands and Greenland), European Union, France (in respect of St. Pierre et Miquelon), Iceland, Japan, Republic of Korea, Norway, Russian Federation, Ukraine and United States of America. The three bodies of NAFO, General Council (chaired by Terje Lobach, Norway), Fisheries Commission (chaired by Kate Sanderson, Denmark (in respect of Faroe Islands and Greenland) and Scientific Council (chaired by Ricardo Alpoim, EU-Portugal) and their subsidiary bodies met over the course of week to deliberate on management measures and scientific assessment regarding the international fisheries of the Northwest Atlantic. The scientific advice was presented. The meeting was also attended by observers from the Food and Agriculture Organization (FAO), the Northeast Atlantic Fisheries Commission (NEAFC), North Atlantic Marine Mammal Commission (NAMMCO), the World Wildlife Fund (WWF), the Ecology Action Centre (EAC), the International Coalition of Fisheries Associations (ICFA) and the Sierra Club of Canada (SCC).

The Fisheries Commission agreed on management measures for the 20 fish stocks managed by NAFO. The scientific advice was elaborated at meetings held in October of 2009 and June of 2010. Scientific Council fully assessed the status of eleven stocks and monitored the status of other fish stocks. The overall picture is one of cautious optimism for the finfish.

NAFO has agreed upon a progressive strategy to manage Greenland halibut in its Regulatory Area. A special working group comprised of fisheries managers and scientists was established in 2009 to address the uncertainty of assessments of the Greenland halibut stock in NAFO Subarea 2 and Divisions 3KLMNO. The new management strategy allows for the adjustment of the TAC on an annual basis based on harvest control rules and is to be implemented for four years, followed by a review by Fisheries Commission and Scientific Council.

A new working group of fishery managers and scientists will be established with a mandate to develop Conservation Plans and Stock Rebuilding Strategies for important resources within the NAFO Convention Area, including cod in Div. 3NO and American plaice in Div. 3LNO.

Recognizing the value in protecting its Vulnerable Marine Ecosystems (VME), NAFO continues to improve its management and conservation regime to fulfil its commitment to prevent significant adverse impacts on VMEs, as called for by UN General Assembly resolution 61/105. NAFO adopted a map of existing fishing areas that will identify new fishing areas. NAFO agreed:

- to extend the closure of six seamounts for an additional four years to protect the vulnerable marine ecosystems which live in these areas from impact from bottom fishing gears;
- to implement rigorous impact assessments of bottom fishing occurring outside of the NAFO fishing footprint, or if new scientific information comes to light on the existence of VMEs, or if significant changes occur in fishing conduct or technology; and
- to implement a more comprehensive data collection protocol for coral and sponge species encountered in exploratory and existing fishing areas.

Full-colour pictorial identification guides of deep-sea corals and sponges have been developed to assist in the recognition of these species.

In 2009 and 2010 the “NAFO Potential Vulnerable Marine Ecosystem-Impacts of Deep-sea Fisheries” (NEREIDA) programme conducted new multidisciplinary research surveys on vulnerable ecosystems and the effects of fishing activities. The survey was funded by EU-Spain, Canada, EU-United Kingdom and the Russian Federation. Specific objectives included to identify organisms that constitute Vulnerable Marine Ecosystems (VME), describe ecology of deep-sea habitats studying distinct features in the area and to develop a GIS database. Deep-sea Remotely Operated Vehicles (ROVs) took video footage of both pristine coral areas and areas where corals had been impacted by bottom contact gears.

The Fisheries Commission conducts the annual compliance review and noted the continuing trend of increased compliance. Amendments to the NAFO Conservation and Enforcement Measures were reviewed and revisions were made that strengthen protection of fish stocks. Increased TACs were decided for Flemish Cap cod (Div. 3M), Grand Bank redfish (Div. 3LN) and Greenland halibut in Subarea 2 + Div. 3KLMNO. TACs for other regulated species will be maintained. The biomass of shrimp in Div. 3M (Flemish Cap) continues to be a concern and so it was agreed that that a fishery on this stock will not be permitted. Fisheries for a number of other stocks continue to be closed.

A Performance Review will be conducted during 2011. A Review Panel consisting of experts from the International Council for the Exploration of the Sea (ICES), Food and Agriculture Organization (FAO) and the United Nations Division of Ocean Affairs and Law of the Sea (UNDOALOS) and from Contracting Parties, Canada, Denmark (in respect of Faroe Islands and Greenland), European Union and the Russian Federation, will assess the performance of NAFO against the objectives set out in the NAFO Convention and other relevant international instruments addressing the conservation and management of marine living resources. This is similar to assessments conducted by some other RFMOs and has been called for by UN General Assembly.

The 33rd Annual Meeting will be held in Halifax, NS, Canada.

Meetings

Prior to the Annual Meeting, the following NAFO meetings were held: (1) Scientific Council for shrimp assessment (21-19 October 2009); (2) FC WG on Greenland Halibut Management Strategy Evaluation (WGMSE) (28-29 January); (3) SC Study Group on Rebuilding Strategies for Greenland Halibut (1-5 February); (4) GC Performance Assessment Working Group (PAWG) (26-28 April); (5) STACFAD Working Group (29-10 April) (6) Scientific Council (March-April by correspondence); (7) WGMSE (2-4 May); (8) FC WG of Fishery Managers and Scientists on VMEs (WGFMS) (5-7 May); (9) STACTIC (18-20 May) (10) Scientific Council (3-16 June); (11) WGMSE (16-17 September).

The table of NAFO TACs and quotas agreed at the 32nd Annual Meeting is attached.

**Annex I.A.
Annual Quota Table**

QUOTA TABLE. Total allowable catches (TACs) and quotas (metric tons) for 2011 of particular stocks in Subareas 1-4 of the NAFO Convention Area. The values listed include quantities to be taken both inside and outside the 200-mile fishing zone, where applicable.

Species Division/Contracting Party	Cod			Redfish				American plaice		Yellowtail 3LNO		
	3L	3M	% of 3M Cod TAC	3NO	3LN	% of 3LN Redfish TAC	3M	3O	Sub-Area 2 and Div. 1F+3K		3LNO	3M
Canada		80	0.80	0	2556	42.60	500	6000	385 ^{2,4}	0	0	16575 ⁵
Cuba		370	3.70	-	588	9.80	1750		385 ^{2,4}	-	-	-
Denmark (Faroe Islands and Greenland)		2235	22.35	-	-		69 ¹⁹		9627 ^{2,3}	-	-	-
European Union		5703 ²⁵	57.03	0 ¹¹	1094 ²⁶	18.23	7813 ¹²	7000	9627 ^{2,3}	0	0 ¹¹	-
France (St. Pierre et Miquelon)		-		-	-		69 ¹⁹		2503 ^{2,15}	-	-	340 ⁵
Iceland		-		-	-		-		9627 ^{2,3}	-	-	-
Japan		-		-	-		400	150	385 ^{2,4}	-	-	-
Korea		-		-	-		69 ¹⁹	100	385 ^{2,4}	-	-	-
Norway		925	9.25	-	-		-		9627 ^{2,3}	-	-	-
Russia		647	6.47	0	1726	28.77	9137	6500	9627 ^{2,3}	-	0	-
Ukraine								150	385 ^{2,4}			
United States of America		-		-	-		69 ¹⁹		385 ^{2,4}	-	-	-
Others		40	0.40	0	35	0.60	124	100	-	0	0	85 ⁵
TOTAL ALLOWABLE CATCH	*9	10000 ²³	100.0	*9,20	6000 ^{16,24}	100.0	10000 ⁸	20000	12516 ^{10,17}	*21	*9	17000 ^{21,22}

Species	Witch		White hake	Capelin	Skates	Greenland halibut	Squid (Illex) ¹	Shrimp	
	3L	3NO						3L	3NO
Division/Contracting Party	3L	3NO	3NO	3NO	3LNO	3LMNO	Sub-areas 3+4	3L	3NO
Canada		0	1765	0	2000	1910	N.S. ⁶	15991	
Cuba		-		0		-	510	214	
Denmark (Faroe Islands and Greenland)		-		-		221	-	214	
European Union		0 ¹¹	3529	0 ¹¹	7556	7466 ¹⁸	N.S. ⁶ 611 ¹³	1069 ¹⁴	
France (St. Pierre et Miquelon)		-		-		208	453	214	
Iceland		-		-		-	-	214	
Japan		-		0		1305	510	214	
Korea		-		-		-	453	214	
Norway		-		0		-	-	214	
Russia		0	353	0	2000	1624	749	214	
Ukraine						-		214	
United States of America		-		-		-	453	214	
Others		0	353	-	444	0 ⁷	794	0	
TOTAL ALLOWABLE CATCH	^{*9,20}	^{*9}	6000	^{*16,9}	12000	12734	34000 ²⁰	19200 ²⁷	^{*9}

* Ban on fishing in force.

- Any quota listed for squid may be increased by a transfer from any "coastal state" as defined in Article 1, paragraph 3 of the NAFO Convention, provided that the TAC for squid is not exceeded. Transfers made to Contracting Parties conducting fisheries for squid in the Regulatory Area shall be reported to the Executive Secretary, and the report shall be made as promptly as possible.
- The Executive Secretary shall notify without delay all Contracting Parties the dates on which accumulated reported catch taken by vessels of Contracting Parties estimated equal to 50% and then 100% of that allocation.
- Quota to be shared by vessels from Denmark (Greenland and Faroe Islands), European Union, Iceland, Norway and Russia. Catches in the NAFO Convention Area shall be deducted from the quotas allocated in the NEAFC Convention Area.
- Quota to be shared by vessels from Canada, Cuba, France (St. Pierre et Miquelon), Japan, Korea, Ukraine and USA.
- Contracting Parties shall inform the Executive Secretary before 01 December 2010 of the measures to be taken to ensure that total catches do not exceed the levels indicated.
- The allocation to these Contracting Parties are as yet undetermined, although their sum shall not exceed the difference between the total of allocations to other Contracting Parties and the TAC (= 29,458 tons).

7. In 2005, the previous 935 t "Others" quota was assigned to three Contracting Parties. When the TAC exceeds 30,000 t the next 1,300 t beyond 30,000 will be allocated to an Others quota which can be accessed by those who do not hold Greenland halibut allocation. In deciding the relevant contributions of Contracting Parties to the 1,300 t Others quota, the Fisheries Commission will take into account the fact that some Contracting Parties received a benefit from the 935 t quota which was reassigned in 2005.
 8. Not more than 5000 tons may be fished before 01 July 2011. The Executive Secretary shall notify without delay all Contracting Parties of the date on which, for this stock, accumulated reported catch taken by vessels of the Contracting Parties is estimated to equal 50% and then 100% of the TAC.
 9. The provisions of Article 12, paragraph 1.b) of the Conservation and Enforcement Measures shall apply.
 10. In the case of the NEAFC decision which modifies the level of TAC in 2011 as compared to 2010, these figures shall be accordingly adjusted by NAFO and formalized through a mail vote.
 11. Including fishing entitlements of Estonia, Latvia, and Lithuania following their accession to the European Union and in accordance with sharing arrangements of the former USSR quota adopted by the Fisheries Commission at its Annual Meeting in 2003 (FC Working Paper 03/7).
 12. Including allocations of 1571 tonnes each for Estonia, Latvia and Lithuania out of a sharing of 20,000 tonnes, following their accession to the European Union.
 13. Allocations of 128 tonnes each for Estonia, Latvia and Lithuania as well as 227 tonnes for Poland out of a TAC of 34,000 tonnes, following their accession to the European Union.
 14. Including allocations of 214 tonnes each for Estonia, Latvia, Lithuania and Poland out of a TAC of 19,200 tonnes, following their accession to the European Union
 15. Allocation of 2,234 tonnes for Lithuania and 269 tonnes to Latvia following their accession to the European Union.
 16. Applicable to 2011 and 2012.
 17. The quota shares in footnotes 4 and 15 can only be fished in the NAFO Regulatory Area. If an increase in the overall TAC as defined in footnote 10 leads to an increase in these shares, the first 500 tonnes of that increase shall be added to the quota share referred to in footnote 4.
 18. Including an allocation of 418 tonnes for Estonia, Latvia, and Lithuania following their accession to the European Union.
 19. Notwithstanding the provisions of footnote 8 and without prejudice to future agreements on allocations, these quotas may be fished in their entirety by these Contracting Parties.
 20. Applicable until at least 2013.
 21. In lieu of Article 12.1 (a) and (b) of the CEM, the following by-catch provisions for American plaice only in the 3LNO yellowtail fishery shall apply: Contracting Parties fishing for yellowtail flounder allocated under the NAFO allocation table will be restricted to an overall Am. plaice by-catch harvest limit equal to 13% of their total yellowtail fishery as calculated in accordance with Article 12.1 (c). For 2010, the by-catch percentage will increase to 15% unless a Scientific Council projection indicates that this rate is likely to undermine stock recovery or cause an unreasonable delay in reaching B_{lim} , in which case the increase may be subject to a reassessment by the Fisheries Commission.
 22. Following the NAFO annual meeting and prior to January 1 of the succeeding year, at the request of the USA, Canada will transfer 1000 tonnes of its 3LNO yellowtail quota to the USA.
 23. The allocation key of this stock is based on the 1998 Quota Table. In 1999, a moratorium on cod in Division 3M was declared.
 24. The allocation key of this stock is based on the 1997 Quota Table. In 1998, a moratorium on redfish in Division 3LN was declared.
 25. Including fishing entitlements of 111 tons each for Estonia, Latvia, and Lithuania in accordance with sharing arrangements of the former USSR quota adopted by the Fisheries Commission at its Annual Meeting in 2003 (FC Working Paper 03/7) and allocation of 209 tons for Poland following their accession to the European Union.
 26. Including fishing entitlements of 297 tonnes each for Estonia, Latvia, and Lithuania in accordance with sharing arrangements of the former USSR quota adopted by the Fisheries Commission at its Annual Meeting in 2003 (FC Working Paper 03/7) following their accession to the European Union.
- For 2012, the TAC will be reduced to 17,000 tonnes. This TAC will be reviewed on available Scientific Council advice on this stock.

Annex I.B
Effort Allocation Scheme for Shrimp Fishery in the
NAFO Regulatory Area Div. 3M, 2011

CONTRACTING PARTY	NUMBER OF FISHING DAYS ¹	NUMBER OF VESSELS ¹
Canada	0	0
Cuba	0	0
Denmark		
Faroe Islands	0	0
Greenland	0	0
European Union	0	0
France (in respect of St Pierre et Miquelon)	0	0
Iceland	N/A	N/A
Japan	0	0
Korea	0	0
Norway	0	0
Russia	0	N/A
Ukraine	0	0
USA	0	0

¹When the scientific advice estimates that the stock shows signs of recovery, the fishery shall be re-opened in accordance with the effort allocation key in place for this fishery at the time of the closure.

PART II

Report of the Standing Committee on Finance and Administration (STACFAD)

**32nd Annual Meeting, 20-24 September 2010
Halifax, Nova Scotia, Canada**

1. Opening by the Chair

The first session of STACFAD was opened by the Chair, Bob Steinbock (Canada) on 20 September 2010. The Chair welcomed delegates and members of the NAFO Secretariat to the meeting and thanked the Secretariat for the advance preparations for this meeting in Halifax. He noted that there would be a few extraordinary items that the Committee would be dealing with during the week.

Present were delegates from Canada, European Union, Denmark (in respect of Faroe Islands and Greenland), Norway, the Russian Federation, and the United States of America and members of the Secretariat (Annex 1).

2. Appointment of Rapporteur

Stan Goodick (NAFO Secretariat) was appointed Rapporteur.

3. Adoption of Agenda

The Executive Secretary noted that a number of staffing issues have transpired since the provisional agenda was circulated and requested the addition of a new agenda item to cover personnel matters and a proposed revision to the staff rules. The provisional agenda with the above noted addition was adopted (Annex 2).

4. Auditors' Report for 2009

The auditing firm of Deloitte and Touche LLP, Chartered Accountants performed the audit of the financial statements of the Organization for the fiscal year ended December 31, 2009. The financial statements were circulated to the Heads of Delegation of the General Council in April 2010 and to STACFAD delegates in advance of the Annual Meeting. The financial statements included the auditors' report, the statements of financial position, operations, accumulated surplus, cash flows and the notes to the financial statements.

The Senior Finance and Staff Administrator for NAFO presented the Auditors' Report and Financial Statements of the Northwest Atlantic Fisheries Organization for the year ended 31 December 2009. It was noted that the total expenditures incurred for the fiscal period ending 2009 amounted to \$1,463,273, which was \$154,727 below the approved budget of \$1,618,000. It was also noted that outstanding contributions from Contracting Parties on December 31, 2009 was \$66,928.

The balance in the accumulated surplus account at year end amounted to \$675,350. At last year's Annual Meeting, General Council approved maintaining the level in the accumulated surplus account for 2010 at \$325,000 of which \$200,000 would be sufficient to finance operations during the first three months of 2010, and of which \$125,000 would be available for use in emergency situations. The remaining \$350,350 (\$675,350 - \$325,000) would be used to reduce annual contributions for 2010.

It was noted that the 2008 valuation of the pension plan for the employees of the Organization showed that the plan had a significant deficit of \$975,000. To fulfill Canadian regulations, NAFO is required to make annual supplementary payments of \$100,800 per year for 15 years, or until the plan is fully funded. The first of these payments was made in 2009. The valuation of the pension plan, which is scheduled every 3 years, will next take place on January 1, 2011.

The Auditors' Report noted that the Organization: (1) has not recorded the pension plan assets, liabilities and unfunded deficit, (2) has a policy not to capitalize its capital assets, and (3) has not recorded a liability for separation entitlements, as approved at the annual meeting in September 2007. This liability would be fully funded by the end of 2011. The audit determined the financial affairs of the Organization had been conducted in accordance with the Financial Regulations and budgetary provisions of NAFO and presented a fair and accurate accounting of the financial affairs of the Organization.

STACFAD recommends that the 2009 Auditors' Report be adopted.

The Organization's Financial Regulation, Rule 7.1, states that the length of time a firm carrying out the NAFO audit shall serve is limited to a maximum of three years. The audit of the 2010 financial records will be the third year for Deloitte and Touche LLP, Chartered Accountants having served as auditors of the Organization.

The Secretariat will begin in the summer of 2011 the process of contacting firms and requesting proposals to be considered to carry out the audit of NAFO's records for the 2011, 2012 and 2013 fiscal periods. The proposals will be presented to STACFAD at the next annual meeting.

5. Administrative and Activity Report by Secretariat

Under this item, the Executive Secretary highlighted NAFO administrative matters and activities. Of particular note was the development by the Secretariat of a new STATLANT data extraction tool, a new search feature for the Journal of the Northwest Atlantic Fishery Science (JNAFS) website and the digitization of historic NAFO documents for placement on the web. The complete report is available in GC Doc. 10/3-Revised.

The Secretariat once again expressed the importance of receiving accurate and timely catch reports and urged Contracting Parties to ensure compliance with the NAFO requirement.

6. Financial Statements for 2010

The Senior Finance and Staff Administrator presented the Financial Statements for the fiscal year ending 31 December 2010.

Budgetary Expenses

The approved operating budget for 2010 was set at \$1,782,000. It was noted in the financial statements that expenditures for the year are projected to be \$1,787,000, over the approved budget by \$5,000. Variances from the approved budget are as follows:

Salaries and benefits for the Secretariat staff members are projected to be \$30,000 below its approved budget. This is attributed to the position of Deputy Executive Secretary remaining vacant and the proposed overlap for the transition to a new publications manager was not required.

Four working group meetings held in Halifax during 2010 contributed to the inter-sessional other meetings budget exceeding its approved budget for the year by \$11,000. The inter-sessional scientific meetings budget was under budget by \$23,000 due to the cancellation of a proposed assessment workshop and the limited use of the ad hoc funds.

The Professional Services item includes expenses for audit, consulting, insurance, legal fees, professional development and training. The legal fees are associated with a claim made against the Organization regarding the ongoing wrongful dismissal suit.

Recruitment and relocation expenses are projected to be \$11,000 over budget for the year as there was no provision in the 2010 budget for relocation expenses relating to the unexpected resignation of the Scientific Council Coordinator.

All remaining 2010 operating expenses are anticipated to be on or near budget for the year.

Assessed Contributions

The 2010 operating budget was set at \$1,782,000. The prior years' accumulated surplus balance had \$350,350 deemed to be in excess of the needs of the Organization which was allocated to the operating budget. As a result, annual contributions issued to Contracting Parties for the 2010 fiscal year were \$1,431,650.

Balance Sheet

The Organization's cash position at December 31, 2010 is estimated to be \$492,365, which is sufficient to finance appropriations in early 2011 pending the receipt of annual payments by Contracting Parties in the spring of 2011.

Three Contracting Parties have outstanding contributions for 2010 totalling \$104,000; Cuba - \$36,918, Korea - \$31,291 and Ukraine - \$35,791. Cuba and Ukraine have communicated that payment would be forthcoming. The Committee recommended that these three Contracting Parties be urged to make their respective payments promptly.

7. Review of Accumulated Surplus and Contingency Funds

According to the financial regulations of the Organization, STACFAD and General Council shall review the amount available in the accumulated surplus account during each annual meeting. The accumulated surplus account shall be set at a level sufficient to temporarily finance operations during the first three months of the year plus an amount up to a maximum of 10% of the annual budget for the current financial year to be used for unforeseen and extraordinary expenses to the good conduct of the business of the Organization.

The Secretariat noted the accumulated surplus account at December 31, 2010 is estimated to be \$535,000.

Given a number of significant one time items included in the 2011 budget estimate, the Committee expressed concerns about the need to minimize the increases in contributions by Contracting Parties to the extent possible. In line with these concerns, **STACFAD recommends that the amount maintained in the accumulated surplus account be set at \$285,000 of which \$200,000 would be sufficient to finance operations during the first three months of 2011, and of which \$85,000 would be available for use in emergency situations.** This represents a decrease in the amount available for use in emergency situations in 2011 by \$40,000. The Committee noted its intent to increase the level of this fund if the budgetary situation allows.

8. Report of the STACFAD Working Group, April 2010

In view of the process towards entry into force of the amendments to the NAFO Convention and the resulting merger of General Council and Fisheries Commission, a STACFAD Working Group was established to amend the current Rules of Procedure and to address other elements of an administrative nature related to the entry into force of the amended Convention.

The Chair of the STACFAD presented the report of the STACFAD Working Group held in April 2010 which included recommended revisions to the Rules of Procedure, Rules of Procedure for Observers, Financial Regulations and Staff Rules.

One delegate expressed concern concerning the minimum time requirement for circulating proposals to amend the NAFO Conservation and Enforcement Measures (NCEM) in the suggested new provision in Rule 4.5 of the Rules of Procedure. Instead of the thirty day advance notice, the delegate proposed 14 days. It was agreed that this concern could be revisited in the future in advance of the entry into force of the amended Convention. No concerns were expressed on any other aspects of the STACFAD W.G. Report.

STACFAD recommends that the Report of the STACFAD Working Group, April 2010 be adopted noting that the issue of the submission deadline for proposals for the NCEM stated in Rule 4.5 of the Rules of Procedure could be revisited.

9. Personnel Matters and Proposed Revision to Staff Rules

In line with the Staff Rules, the Staff Representative, George Campanis, was invited to join the Committee for discussions under this item.

The Executive Secretary informed the Committee of some recent staffing issues:

- The Scientific Council Coordinator, Dr. Anthony Thompson, announced that he will be resigning from his position in December 2010. As Dr. Thompson was recruited internationally and relocated from Sweden to take on his current position, he is entitled to certain relocation expenses involving the return to his home country. These costs will be incurred during the 2010 fiscal year.

The process of recruiting a new SC Coordinator will be addressed as quickly as possible, and it is expected that a replacement could be in the post by March 2011. The recruitment procedures and timetable, vacancy announcement and job description were provided to the Committee for information purposes. The same information had also been provided to the Scientific Council Executive Committee for its comments. Costs associated with the recruitment and relocation of the new Scientific Council Coordinator have been included in the 2011 budget estimate.

- The Office Manager, Lisa Pelzmann, is expected to give birth in early 2011 and will be entitled to maternity/parental leave for most of 2011 as provided for in NAFO Staff Rule 6.13. Although some duties of the office manager may be shared by other staff members during her absence, it will be necessary to hire a temporary replacement during her leave of absence. An additional amount of \$10,000 has been included in the 2011 budget estimate.

The Executive Secretary informed the Committee of two staff members who are eligible to progress to the next stage of their respective salary classification in accordance with the NAFO Staff Classification System.

The Executive Secretary proposed a change to the NAFO Staff Rules regarding the term appointment of a Deputy Executive Secretary to allow for the Senior Finance and Staff Administrator to be eligible for this appointment.

STACFAD recommends amending (changes underlined and in italics) Staff Rule 5.3 as follows: The Executive Secretary may appoint a Coordinator or the Senior Finance and Staff Administrator to be the Deputy Executive Secretary for the term of one or two years (renewable). This appointment will be compensated with 10% of the Coordinator's or the Senior Finance and Staff Administrator's annual salary.

10. Budget Estimate for 2011

The Secretariat presented the 2011 budget estimate (GC Working Paper 10/1, Rev. 2) to the Committee highlighting the following items:

<i>Approved Budget 2010</i>	<i>Preliminary Budget Forecast 2011</i>	<i>Budget Estimate 2011</i>
\$1,782,000	\$1,735,000	\$1,886,000

The 2011 budget estimate of \$1,886,000 represents an increase of \$151,000 (8.7%) from the 2011 preliminary budget forecast and an increase of \$104,000 (5.8%) from the 2010 approved budget.

Although the variances will be discussed in detail below, there are three major reasons which have been attributed to the increase in the 2011 budget estimate.

1. A provision for a special item in the amount of \$75,000 to cover the expenses for a performance assessment review process (to cover the external review panel members' fees and travel, printing, etc.) which is under consideration by General Council.

2. Costs associated with hosting NAFO's Annual Meeting in Halifax as well as additional support and meetings of the Scientific Council have increased the NAFO meetings budget item by \$21,000.
3. The other meetings and travel has increased by \$15,000 to cover the Secretariat's representation at a number of international meetings.

<i>Personal Services:</i>	Budget 2010	\$1,290,000	Budget 2011	\$1,280,000
			Decrease (0.8%)	\$10,000

The salaries and remuneration for the members of the Secretariat are in line with the classifications and the salary levels of the public sector of the host country (Canada). Salary increases for 2011 are estimated to be 1.5%. Personnel changes for 2011 include the hiring of a new Scientific Council Coordinator and a term replacement for the Office Manager.

Superannuation and Annuities include the annual supplementary payment of \$100,800 towards the pension fund deficit.

<i>Additional Help:</i>	Budget 2010	\$20,000	Budget 2011	\$20,000
			Increase (0%)	\$0

The additional help budget is for the continued digitization of historical documents and other assistance as required.

<i>NAFO Meetings:</i>	Budget 2010	\$146,000	Budget 2011	\$167,000
			Increase (14.38%)	\$21,000

The NAFO meetings budget item includes logistical expenses to host a meeting in the headquarters area, invited expert travel costs, travel expenses by the Secretariat to attend NAFO meetings, etc. Increases to the sessional meetings budget include expected higher costs associated with hosting the 2011 Annual Meeting in the Halifax area.

The inter-sessional scientific meetings budget increased by \$10,000 and includes co-sponsorship of an ICES/NAFO Symposium, attendance at a workshop on reproductive potential, provision for an ad hoc fund to cover unforeseen expenses by SC including responding to requests for advice from the Fisheries Commission, and Secretariat support to Scientific Council inter-sessional meetings and working groups.

<i>Other Meetings and Travel:</i>	Budget 2010	\$35,000	Budget 2011	\$50,000
			Increase (42.9%)	\$15,000

The other meetings and travel budget allows the Secretariat to host a meeting in the headquarters area or to participate at various international meetings.

The Committee expressed concerns regarding the considerable increases to the *NAFO Meetings* and the *Other Meetings and Travel* items and a modification was made.

<i>Performance Review</i>	Budget 2010	\$0	Budget 2011	\$75,000
			Increase (100%)	\$75,000

There is a provision for a special item in the amount of \$75,000 to cover expenses for the performance assessment review process (external review panel members' fees and travel, printing, etc.) under consideration by the Organization. Although the budget item includes provision for up to two meetings to be held at the Secretariat, the review panel is encouraged to undertake as much of its work as possible by use of tele- and/or web conferencing and other electronic means (i.e. Sharepoint).

<i>Recruitment and Relocation:</i>	Budget 2010	\$51,000	Budget 2011	\$52,000
			Increase (0.2)	\$1,000

The 2010 recruitment and relocation budget included relocation and installation expenses of the incoming Executive Secretary. The 2011 recruitment and relocation budget is for the hiring of the new Scientific Council Coordinator.

STACFAD recommends that the budget for 2011 of \$1,886,000 (Annex 3) be adopted.

A preliminary calculation of billing for the 2011 financial year is provided in Annex 4. The preliminary calculation of billing is based on the budget estimate of \$1,886,000 and shall be reduced by any amount determined by the General Council to be in excess of the needs of the accumulated surplus account.

The accumulated surplus account at December 31, 2010 is estimated to be \$535,000 and the recommended minimum balance in the accumulated surplus account for operations and emergency use for the 2011 fiscal year is \$285,000. This allows for \$250,000 (\$535,000-\$285,000) to be applied towards the 2011 billing.

The funds required to meet the 2011 operational budget and to be funded by contributions from Contracting Parties is estimated to be \$1,636,000 (\$1,886,000 - \$250,000).

11. Budget Forecast for 2012 and 2013

STACFAD reviewed the preliminary budget forecast for 2012 (\$1,824,000) and 2013 (\$1,835,000) (Annex 5) and approved the forecast in principle. It was noted that the budget for 2012 will be reviewed in detail at the next Annual Meeting.

12. Adoption of 2011 Staff Committee Appointees

The Secretariat nominated the following people to serve as members of the Staff Committee for September 2010-September 2011: Bill Brodie, Deirdre Warner-Kramer and Bob Steinbock.

STACFAD recommends that General Council appoint the three nominees.

13. Time and Place of 2011 – 2013 Annual Meetings

As previously agreed, the dates of the 2011 and 2012 Annual Meetings (to be held in Halifax, N.S., Canada, unless an invitation to host is extended by a Contracting Party and accepted by the Organization), are as follows:

2011:

Scientific Council	-	19 – 23 September
General Council	-	19 – 23 September
Fisheries Commission	-	19 – 23 September

2012:

Scientific Council	-	17 – 21 September
General Council	-	17 – 21 September
Fisheries Commission	-	17 – 21 September

STACFAD recommends that the dates of the 2013 Annual Meeting (to be held in Halifax, N.S., Canada, unless an invitation to host is extended by a Contracting Party and accepted by the Organization) are as follows:

Scientific Council	-	[16 – 20] or [23 – 27] September
General Council	-	[16 – 20] or [23 – 27] September
Fisheries Commission	-	[16 – 20] or [23 – 27] September

For budgetary planning purposes, STACFAD urges that any invitations by a Contracting Party to host an Annual Meeting be issued as early as possible.

14. Election of Chair and Vice-Chair

Deirdre Warner-Kramer (USA) was elected Chair and Olga Sedkyh (Russian Federation) was elected Vice-Chair. Delegates expressed their gratitude to the outgoing Chair (Bob Steinbock, Canada) for his fine leadership over the past three years.

15. Other issues including any questions referred from the General Council during the current Annual Meeting

The Secretariat provided an update on the wrongful dismissal suit.

16. Adjournment

The final session of the STACFAD meeting adjourned on 22 September 2010.

Annex 1. List of Participants

Name	Contracting Party
Bob Steinbock Jamie Singh	Canada
Rasmus Fuglholt Elin Mortensen	Denmark (in respect of Faroe Islands and Greenland)
Fred Kingston	European Union
Akiko Onodera	Japan
Richard Pedersen	Norway
Olga Sedykh	Russian Federation
Deirdre Warner-Kramer	United States of America
Vladimir Shibanov Stan Goodick Bev McLoon	NAFO Secretariat

Annex 2. Agenda

1. Opening by the Chair, Bob Steinbock (Canada)
2. Appointment of Rapporteur
3. Adoption of Agenda
4. Auditors' Report for 2009
5. Administrative and Activity Report by Secretariat
6. Financial Statements for 2010
7. Review of Accumulated Surplus and Contingency Funds
8. Report of the STACFAD Working Group, April 2010 (GC Doc. 10/2)
9. Personnel Matters and Proposed Revision to Staff Rules
10. Budget Estimate for 2011
11. Budget Forecast for 2012 and 2013
12. Adoption of 2011 Staff Committee Appointees
13. Time and Place of 2011 - 2013 Annual Meetings
14. Election of Chair and Vice-Chair
15. Other issues
16. Adjournment

Annex 3. Budget Estimate for 2011
(Canadian Dollars)

	Approved Budget 2010	Projected Expenditures 2010	Preliminary Budget Forecast 2011	Budget Estimate 2011
1. Personal Services				
a) Salaries	\$902,000	\$877,000	\$923,000	\$904,000
b) Superannuation and Annuities	191,000	191,000	192,000	196,000
c) Medical and Insurance Plans	96,000	92,000	95,000	91,000
d) Employee Benefits	101,000	100,000	96,000	89,000
Subtotal Personal Services	1,290,000	1,260,000	1,306,000	1,280,000
2. Additional Help	20,000	20,000	20,000	20,000
3. Communications	26,000	26,000	27,000	27,000
4. Computer Services	28,000	28,000	29,000	28,000
5. Equipment	35,000	35,000	36,000	36,000
6. Fishery Monitoring	48,000	48,000	48,000	48,000
7. Hospitality Allowance	3,000	3,000	3,000	3,000
8. Materials and Supplies	33,000	33,000	33,000	33,000
9. NAFO Meetings				
a) Sessional	91,000	94,000	86,000	102,000
b) Inter-sessional Scientific	30,000	7,000	30,000	40,000
c) Inter-sessional Other	25,000	36,000	25,000	25,000
Subtotal NAFO Meetings	146,000	137,000	141,000	167,000
10. Other Meetings and Travel	35,000	35,000	35,000	50,000
11. Performance Review	0	0	0	75,000
12. Professional Services	51,000	84,000	41,000	51,000
13. Publications	16,000	16,000	16,000	16,000
14. Recruitment and Relocation	51,000	62,000	0	52,000
	\$1,782,000	\$1,787,000	\$1,735,000	\$1,886,000

Notes on Budget Estimate 2011
(Canadian Dollars)

Item 1(a)	Salaries Salaries budget estimate for 2011		\$904,000
Item 1(b)	Superannuation and Annuities Employer's pension plan which includes employer's contributions, administration costs, and actuarial fees. Also includes a payment towards the unfunded liability as the latest actuarial valuation of the pension plan showed the plan to be in a deficit position.		\$196,000
Item 1(c)	Group Medical and Insurance Plans Employer's portion of Canada Pension Plan, Employment Insurance, Group Life Insurance, Long Term Disability Insurance and Medical Coverage.		\$91,000
Item 1(d)	Employee Benefits Employee benefits as per the NAFO Staff Rules including overtime, repatriation grant, termination benefits, vacation pay, and travel to home country for internationally recruited members of the Secretariat. Termination Benefits Liability	\$50,000 39,000	\$89,000
Item 2	Additional Support Digitization of historical documents, translation of NAFO Fisheries Information (e.g. Observer Reports), interns and other assistance as required.		\$20,000
Item 3	Communications Phone, fax and internet services Postage Courier/Mail service	\$14,000 10,000 3,000	\$27,000
Item 4	Computer Services Computer hardware, software, supplies and support.		\$28,000
Item 5	Equipment Leases (print department printer, photocopier and postage meter) Purchases Maintenance	\$24,000 8,000 4,000	\$36,000
Item 6	Fishery Monitoring Vessel Monitoring System (VMS) annual license and maintenance fee Lloyd's Register of vessels	\$45,000 3,000	\$48,000
Item 9(a)	NAFO Sessional Meetings Annual Meeting, September 2011, Halifax, Canada SC Meeting, June 2011, Dartmouth, Canada SC Meeting, October 2011, Norway		\$102,000
Item 9(b)	NAFO Inter-sessional Scientific Meetings Provision for inter-sessional meetings, co-organizer and co-sponsor of the ICES/NAFO Symposium on the Variability of the North Atlantic and its Marine Ecosystems during 2000-2009, Workshop on Reproductive Potential, and a general provision for unforeseen expenses necessarily incurred by SC required for the provision of answering requests for advice from FC.		\$40,000

Item 9(c)	NAFO Inter-sessional Other General provision.	\$25,000
Item 10	Other Meetings and Travel International Meetings regularly attended by the NAFO Secretariat: <ol style="list-style-type: none"> 1. Aquatic Sciences and Fisheries Abstracts (ASFA) 2. Co-ordinating Working Party on Fishery Statistics (CWP) 3. Fisheries Resources Monitoring Systems (FIRMS) 4. International Fisheries Commissions Pension Society (IFCPS) 5. NEAFC Advisory Group for Data Communication (AGDC) 6. Regional Fishery Body Secretariats Network (RSN) 7. Secretariats of the North Atlantic Regional Fisheries Management Organizations (NARFMO) 8. Sirius IT Annual vTrack User Group Meeting 9. United Nations Fish Stock Agreement (UNFSA) Other Meetings	\$50,000
Item 11	Performance Review Costs associated with the performance review of the Organization.	\$75,000
Item 12	Professional Services Professional Services (audit, consulting, legal fees, and insurance) Professional Development and Training Public Relations	\$51,000 \$35,000 11,000 5,000
Item 13	Publications Production costs of NAFO publications which may include the following: Conservation and Enforcement Measures, Convention, Inspection Forms, Journal of Northwest Atlantic Fishery Science, Meeting Proceedings, Rules of Procedure, Scientific Council Reports, etc	\$16,000

**Annex 4. Preliminary calculation of billing for Contracting Parties
against the proposed estimate of \$1,886,000 for the 2011
financial year (based on 12 Contracting Parties to NAFO)**

(Canadian Dollars)

Budget Estimate	\$1,886,000
Deduct: Amount from Accumulated Surplus Account (pending approval from General Council)	<u>250,000</u>
Funds required to meet 2011 Administrative Budget	<u>\$1,636,000</u>

60% of funds required =	\$981,600
30% of funds required =	\$490,800
10% of funds required =	\$163,600

Contracting Parties	% of Total Catch in the Convention Area			2011 Preliminary Billing
	Nominal Catches for 2008	10%	30%	
Canada (1)	478,377	52.93%	\$92,249.21	\$519,560.88
Cuba (2)	500	0.06%	-	41,488.96
Denmark (in respect of Faroe Islands and Greenland) (3)	196,480	21.74%	37,888.79	292,188.63
European Union (1)	43,745	4.85%	-	88,507.60
France (in respect of St. Pierre et Miquelon)	3,639	0.40%	701.74	3,926.40
Iceland	-	-	40,900.00	40,900.00
Japan	1,926	0.21%	-	42,961.36
Republic of Korea	-	-	40,900.00	40,900.00
Norway (1)	2,483	0.27%	-	43,550.32
Russian Federation	6,461	0.71%	-	6,969.36
Ukraine (2)	276	0.03%	-	41,194.48
United States of America (1)	169,885	18.80%	32,760.26	184,540.80
Funds required to meet 1 January - 31 December 2011 Administrative Budget	903,772	100.00%	\$163,600.00	<u>\$981,600.00</u>
				<u>\$1,636,000.00</u>

(1) Based on 2008 provisional catch reports.

(2) Based on provisional catch reports received from chartering arrangements.

(3) Faroe Islands = 4,325 metric tons
Greenland = 192,155 metric tons

2010 Billing for comparison purposes		2010 Annual Assessment
Nominal Catches for 2007	% of Total Catch in the Convention Area	
550,923	57.31%	\$615,127.47
1,381	0.14%	36,993.84
193,653	20.15%	239,476.05
40,110	4.18%	71,697.03
4,021	0.42%	40,034.35
-	-	35,791.25
1,969	0.20%	37,509.23
-	-	35,791.25
3,653	0.38%	39,055.41
8,101	0.84%	43,006.77
-	-	35,791.25
157,477	16.38%	201,376.10
961,288	100.00%	<u>\$1,431,650.00</u>

Approved Budget 2010	\$1,782,000
Deduct: Accumulated Surplus	<u>350,350</u>
Funds required 2010 Budget	<u>\$1,431,650</u>

Annex 5. Preliminary Budget Forecast for 2012 and 2013

(Canadian Dollars)

	Budget Forecast	Budget Forecast
1. Personal Services		
a) Salaries	\$923,000	\$947,000
b) Superannuation and Annuities	245,000	247,000
c) Medical and Insurance Plans	102,000	107,000
d) Employee Benefits	81,000	56,000
Subtotal Personal Services	1,351,000	1,357,000
2. Additional Help	20,000	20,000
3. Communications	27,000	28,000
4. Computer Services	29,000	30,000
5. Equipment	36,000	37,000
6. Fishery Monitoring	33,000	33,000
7. Hospitality Allowance	3,000	3,000
8. Materials and Supplies	34,000	34,000
9. NAFO Meetings		
a) Sessional	103,000	105,000
b) Inter-sessional Scientific	40,000	40,000
c) Inter-sessional Other	30,000	30,000
Subtotal NAFO Meetings	173,000	175,000
10. Other Meetings and Travel	50,000	50,000
11. Professional Services	51,000	51,000
12. Publications	17,000	17,000
	\$1,824,000	\$1,835,000

SECTION III
(pages 117 to 230)

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(STACTIC), 32nd Annual Meeting
20-24 September 2010
Halifax, Nova Scotia, Canada**

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PART I**Report of the Fisheries Commission**

(FC Doc. 10/29)

32nd Annual Meeting, 20-24 September 2010**Halifax, Nova Scotia, Canada****I. Opening Procedure** (*Agenda items 1-6*)**1. Opening by the Chair, Kate Sanderson (Denmark in respect of the Faroe Islands and Greenland)**

The meeting was opened by the Chair, Kate Sanderson (Denmark in respect of the Faroe Islands and Greenland), at 1400 hrs on Monday, September 20, 2010. Representatives from the following Contracting Parties were in attendance: Canada, Cuba, Denmark (in respect of the Faroe Islands and Greenland), the European Union (EU), France (in respect of St. Pierre et Miquelon), Iceland, Japan, Republic of Korea, Norway, Russian Federation, Ukraine, and the United States of America (USA) (Annex 1).

With regards to attendance by observers, FAO was present, CCAMLR was represented by the EU, NEAFC was represented by Denmark (in respect of the Faroe Islands and Greenland), and NAMMCO was represented by Iceland.

The presence of the following NGOs which had been granted observer status was also acknowledged: the Ecology Action Centre (EAC), the International Coalition of Fisheries Association (ICFA), the Sierra Club of Canada (SCC) and World Wildlife Fund (WWF).

2. Appointment of Rapporteur

Ricardo Federizon, Fisheries Commission Coordinator (NAFO Secretariat), was appointed. The summary of decisions and actions taken by the Fisheries Commission is presented in Annex 2.

3. Adoption of Agenda

Sub-items 10.11 "American plaice in Divisions 3LNO", 10.12 "Northern shortfin squid in Subareas 3 + 4" and 15.2 "Conservation and Management of Sharks" were inserted (Annex 3).

4. Election of Vice-Chair

Sylvie Lapointe (Canada) was elected Vice-Chair.

5. Review of Commission Membership

The review of the Commission membership was conducted at the General Council session. It was noted that the membership of the Fisheries Commission is currently twelve (12). All Contracting Parties have voting rights in 2010.

6. Guidance to STACTIC necessary for them to complete their work

The Chair of the Standing Committee on International Control (STACTIC), Mads Trolle Nedergaard (Denmark, in respect of the Faroe Islands and Greenland) presented the results of STACTIC May 2010 intersessional meeting (FC Doc 10/6). He reported on the progress of the NAFO Conservation and Enforcement Measures Editorial Review Drafting Group, brought forward for clarification the issue of whether it should be permitted to charter fishing possibilities from shared quotas, and outlined the pending proposals which would be further discussed in this meeting.

In response to a request made by the United States, STACTIC was instructed to look into the compliance of the Contracting Parties with Article 17 of the NAFO Conservation and Enforcement Measures (NCEM) concerning the management and conservation of sharks. It was noted that it has been five years now since these management measures came into force.

The recommendations from the intersessional meeting would be forwarded to the Fisheries Commission together with the recommendations from this Annual Meeting (see item 15).

II. Scientific Advice (Agenda items 7-8)

7. Presentation of scientific advice by the Chair of the Scientific Council

7.1 Scientific advice on fish stocks

The Scientific Council (SC) Chair, Ricardo Alpoim (EU), presented a summary of scientific advice to the Fisheries Commission. He urged the Fisheries Commission to consult the relevant SCS documents for the detailed comments of the SC when considering management and conservation measures of the fish stocks. Details of the scientific advice for fish stocks are contained in SCS Doc 10/18 from the June 2010 Scientific Council meeting.

Updated advice for 2011 on shrimp, as well as responses to some other outstanding requests were finalized by the SC after the commencement of the Fisheries Commission meeting and made available to the meeting as addenda to FC Working Paper 10/1.

The following stocks were fully assessed. Below is the summary of the scientific advice and recommendations for 2011:

- **Shrimp in Division 3M.** The 2009-2010 survey biomass index indicates the stock is around the Blim 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.
- **Shrimp in Divisions 3LNO.** 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 levels of 24 000 t and above 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.

- **Greenland halibut in Subarea 2 + Divisions 3KLMNO.** SC noted that all year-classes which will recruit to the exploitable biomass in the short-term are weak. Projections at the F0.1 level indicate about 10% growth in exploitable biomass over 2010-2014. Therefore, SC recommends that fishing mortality in 2011 be no higher than the F0.1 level (median catch of 14 600 t in 2011).
- **American plaice in Divisions 3LNO.** At F = 0 spawning stock biomass is estimated to increase and there is a 50% probability that SSB will surpass Blim by 2012. Under Fcurrent and F0.1 the population is estimated to grow more slowly and there is a less than 50% probability that SSB will reach Blim by 2015. There should be no directed fishing on American plaice in Divs. 3LNO in 2011. Bycatches of American plaice should be kept to the lowest possible level and restricted to unavoidable bycatch in fisheries directing for other species.

- **Cod in Division 3M.** Considering the relatively low number of mature individuals currently in the stock, SC advises that a TAC lower than 10 000 t (approximate catch at F0.1), appears not to be damaging the SSB that is currently well above Blim.

The following stocks were fully assessed including elaboration of scientific advice for 2011 and 2012:

- **Redfish in Divisions 3LN.** SC recommends that an appropriate TAC for 2011-2012 could be around 1/6 of Fmsy corresponding to a catch level of 6 000 t.
- **Thorny skate in Divisions 3LNO.** To promote recovery of thorny skate, SC recommends that catches in 2011 and 2012 should not exceed 5 000 t (the average catch during the past three years) in NAFO Divs. 3LNO.

The following stocks were fully assessed including elaboration of scientific advice for 2011, 2012, and 2013:

- **Cod in Divisions 3NO.** There should be no directed fishing for cod in Div. 3N and Div. 3O in 2011-2013. Bycatches of cod should be kept to the lowest possible level and restricted to unavoidable bycatch in fisheries directed for other species.
- **Redfish in Division 3O.** The SC noted there is insufficient information on which to base predictions of annual yield potential for this resource. SC is unable to advise on an appropriate TAC for 2011, 2012, and 2013.
- **Witch flounder in Divisions 2J + 3KL.** No directed fishing on witch flounder is recommended in the years 2011 to 2013 in Divs. 2J, 3K and 3L to allow for stock rebuilding. Bycatches of witch flounder in fisheries targeting other species should be kept at the lowest possible level.
- **Northern shortfin squid in Subareas 3+4.** SC advises that the TAC for 2011 to 2013 be set between 19 000 and 34 000 t.

On the following stocks, multi-year scientific advice was provided. The Scientific Council reviewed the status of these stocks at the June 2010 meeting, and found no significant basis to alter the advice. Accordingly, the Scientific Council reiterates the previous advice as follows:

- **American plaice in Division 3M.** SC recommended that there should be no directed fishery on this stock in 2009, 2010 and 2011. Bycatch should be kept at the lowest possible level.
- **Yellowtail flounder in Divisions 3LNO.** SC recommended any TAC option up to 85% Fmsy for 2010 and 2011. SC noted that the yellowtail flounder fishery takes cod and American plaice as bycatch. Hence, in establishing the TAC for yellowtail flounder, the impacts on Divs. 3NO cod and Divs. 3LNO American plaice of any increase in yellowtail flounder TAC should be considered.
- **Witch flounder in Divisions 3NO.** No directed fishing on this stock in 2009, 2010 and 2011 to allow for stock rebuilding. Bycatches in fisheries targeting other species should be kept at the lowest possible level.
- **White hake in Divisions 3NO.** Catches in Divs. 3NO for 2010 and 2011 should not exceed the 2006-2008 average annual catch level of 850 t. Catches in Subdivision 3Ps for 2010 and 2011 should not exceed the 2006-2008 average annual catch level of 1 050 t.
- **Capelin in Divisions 3NO.** SC recommended no directed fishery in 2010-2011.

The SC Chair also presented advice on *Sebastes mentella* (**oceanic redfish**) which was formulated by SC of its own accord: In June 2010, SC reviewed the ICES 2010 Advice to NEAFC for 2011 and supported the conclusion and advice. The SC recognizes that the catches in the NAFO area will be taken from the shallow pelagic stock, for which ICES advises no directed fishery.

On the following topics, the SC Chair referred to the specific sections of the SCS Doc 10/18 regarding the SC response to the Special Request for Management Advice:

- **The Precautionary Approach** (Page 33 of SCS Doc 10/18)

- **Evaluation of Rebuilding and Recovery Plans** (Pages 33-34 of SCS Doc 10/18)
- **Measures to Reduce Bycatch** (Page 34 of SCS Doc 10/18)

On the topic of **Mesh Size in 3M Redfish Fishery**, the SC 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 Division 3M redfish stock.

7.2 Vulnerable Marine Ecosystems (VMEs) and other ecosystem considerations

- **On fishing plans and initial assessments for evaluating Significant Adverse Impacts (SAIs) on VMEs.** The SC Chair referred to the specific sections of the SCS Doc 10/18 regarding the SC response to the Special Request for Management Advice (pages. 34 – 36 of the SCS Doc 10/18).
- **On closed seamounts.** SC concludes that the available information supports the designation of some seamounts referred to in Article 15 of the NCEM as VMEs (pages 34-38 of SCS Doc 10/18).

7.3 Other issues (as determined by Scientific Council Chair)

There was no other issue presented.

7.4 Feedback to the Scientific Council regarding its work during this Meeting

Questions and enquiries for further clarification arose in response to the Scientific Council Chair's presentation, to which the Scientific Council prepared responses during the meeting. The questions from the Fisheries Commission and the responses from the Scientific Council are compiled in Annex 4. The questions concerned the designation of the six closed seamounts as VMEs vis-à-vis the FAO International Guidelines for the Management of Deep-Sea Fisheries in the High Seas, and exploitation rates in other shrimp fisheries.

8. Formulation of Request to the Scientific Council for Scientific Advice on the Management of Fish Stocks in 2012 and on other matters

The Fisheries Commission **adopted** FC WP 10/19 (Revision 2) containing its request to the Scientific Council for scientific advice on management in 2012 and beyond of certain stocks in Subareas 2, 3, and 4 and on other matters (Annex 5).

III. Conservation of Fish Stocks in the Regulatory Area (Agenda items 9-10)

The Quota Table for 2011 and the Effort Allocation Scheme for the Shrimp Fishery in NAFO Division 3M can be found in Annex 6 of this Report. Allocation schemes on the following stocks are the same as in 2010.

9. Management and Technical Measures for Fish Stocks in the Regulatory Area, 2011

9.1 Cod in Division 3M

It was **agreed** to set the Total Allowable Catch (TAC) at 10 000 t. FC WP 10/20 concerning bycatch requirements on re-opened fisheries was **adopted** (Annex 7).

9.2 Redfish in Division 3M

It was **agreed** to set the TAC at 10 000 t, the same level as in 2010.

9.3 Shrimp in Division 3M

It was **decided** that fisheries for shrimp in this area shall not be permitted in 2011.

A footnote was inserted in Annex 1B of the NCEM: When the scientific advice estimates that the stock shows sign of recovery, the fishery shall be re-opened in accordance with the effort allocation key in place for this fishery at the time of the closure.

Iceland expressed that notwithstanding the closure of the fishery in 2011, it maintains its position against the effort allocation scheme applied to this stock.

Japan expressed that it is in favour of retaining the current management measures for 2011 because shrimp in division 3M could not decline considering that the re-opened cod fishery in division 3M would decrease the predation pressure on the shrimp.

Denmark (in respect of the Faroe Islands and Greenland) reserved its position on this decision, noting that although they were willing to support a considerable decrease in fishing days, closing the fisheries for 3M shrimp completely was considered too drastic a decision given that the fishery was at an all time low, the cod quota in 3M was increasing, and data from the fishery was useful in the development of scientific advice.

10. Management and Technical Measures for Fish Stocks Straddling National Fishing Limits, 2011

10.1 Cod in Divisions 3NO

It was **agreed** that there shall be no directed fishery in 2011, 2012 and 2013. The bycatch provisions of Article 12, § 1.b) of the NCEM shall apply.

FC WP 10/14 Revised was **adopted**, creating a new Working Group of Fishery Managers and Scientists on Conservation Plans and Rebuilding Strategies (Annex 8). One of its terms of reference is to conduct a comprehensive review of the existing 3NO Cod Conservation Plan and Re-building Strategy.

10.2 Redfish in Divisions 3LN

It was **agreed** to set the TAC at 6 000 t applicable in 2011 and 2012. FC WP 10/20 concerning bycatch requirements on re-opened fisheries was **adopted** (Annex 7).

10.3 Redfish in Division 3O

It was **agreed** to set the TAC at 20 000 t, the same level as in 2010.

10.4 Pelagic *Sebastes mentella* (oceanic redfish) in the NAFO Convention Area

It was **decided** that the management measures applied to this stock in 2010 shall continue in 2011.

There were different views among Contracting Parties as to how existing management measures for this stock should best be adapted with respect to the latest scientific advice and in the light of the fact that the relevant Coastal States and NEAFC are endeavouring to develop appropriate management measures for oceanic redfish.

Norway referred to the Scientific Council's recognition of the ICES advice for 2011 for oceanic pelagic redfish and in particular to the recommendation relating to shallow pelagic redfish. Norway recalled that ICES had advised that no directed fishery should be conducted on this stock, and that bycatches in non-directed fisheries should be kept as low as possible since the stock is at a very low state. Norway expressed the view that management in the NAFO Regulatory Area should reflect this advice.

The Russian Federation tabled a statement (FC WP 10/16) reiterating its views regarding the need for further scientific research to ensure scientific consensus on the stock structure of pelagic *Sebastes mentella* in the Irminger Sea and adjacent waters, including the NAFO Convention Area.

10.5 Yellowtail flounder in Divisions 3LNO

It was **agreed** to set the TAC at 17 000 t, the same level as in 2010.

10.6 Witch Flounder in Division 3L

It was **agreed** that there shall be no directed fishery in 2011, 2012 and 2013. The bycatch provisions of Article 12, § 1.b) of the NCEM shall apply.

10.7 White hake in Divisions 3NO

It was **agreed** to set the TAC at 6 000 t, the same level as in 2010.

10.8 Thorny skate in Divisions 3LNO

It was **decided** to set the TAC at 12 000 t, the same level as in 2010. The TAC will be reviewed at the next meeting.

Following consultations with the United States, the EU tabled a proposal aimed at limiting the catch of this stock in line with scientific advice, and Canada shared similar concerns. However, given that no agreement could be reached amongst NAFO Contracting Parties on this issue, the EU, Canada and the United States committed to continue efforts to ensure that catches do not exceed the scientific advice, to develop measures to achieve this goal at the next Annual Meeting, and to request the NAFO Scientific Council to advance and deepen the assessment of this stock.

10.9 Greenland halibut in Subarea 2 and Divisions 3KLMNO

The TAC for 2011 was set at 17 185 t (12 734 t in Divisions 3LMNO) following the recommendation of the FC Working Group on Greenland Halibut Management Strategy Evaluation (WGMSE).

10.9.1 Reports of the FC Working Group on Greenland Halibut Management Strategy Evaluation

The Co-Chair of the WGMSE Sylvie Lapointe (Canada) presented the recommendations of the working group which met in January in Brussels and in May and September in Halifax (FC WP 10/7 Revision 2, Annex 9). The recommendations concern Management Strategy Evaluation approach in establishing the TAC. The Fisheries Commission **adopted** the recommendations, and specifically **agreed** on *Management Strategy 2* with a starting TAC input value of 17 500 t in the Harvest Control Rule, which resulted in the TAC of 17 185 t for 2011.

The Fisheries Commission commended the working group and expressed its thanks for the hard work and accomplishments it made on the highly technical subject of Management Strategy Evaluation.

10.10 Shrimp in Divisions 3LNO

It was **agreed** to set the TAC at 19 200 t. Fishing is confined to Division 3L. The allocation scheme of 2010 would be continued in 2011. The reservation of Denmark (in respect of the Faroe Islands and Greenland) to the division of shares, which it does not recognize as an appropriate allocation, was noted.

A footnote in Annex IA of the NCEM (Quota Table) was inserted: For 2012, the TAC will be reduced to 17 000 t. This TAC will be reviewed based on the available Scientific Council advice on this stock.

10.11 American plaice in Divisions 3LNO

The Fisheries Commission **agreed** on an interim Conservation Plan and Rebuilding Strategy for this stock (FC WP 10/13 Revised, Annex 10).

FC WP 10/14 Revised was **adopted**, creating a new Working Group of Fishery Managers and Scientists on Conservation Plans and Rebuilding Strategies (Annex 8). One of its terms of reference is to conduct a comprehensive review of the interim 3LNO American plaice Conservation Plan and Re-building Strategy.

10.12 Northern shortfin squid in Subareas 3 + 4

It was **agreed** to continue existing measures until at least 2013, with a TAC of 34 000 t.

IV. Ecosystem Considerations (Agenda items 11 -13)

During deliberations on ecosystem considerations, reference was made to the side-event during the meeting which featured a joint presentation by Canada and Spain on research results of the ongoing "NAFO Potential Vulnerable Marine Ecosystem-Impacts of Deep-sea Fisheries" (NEREIDA) programme. The NEREIDA conducts multidisciplinary research surveys on vulnerable ecosystems and the effects of fishing activities. The survey is funded by EU-Spain, Canada, EU-United Kingdom and the Russian Federation. Specific objectives include identifying organisms that constitute Vulnerable Marine Ecosystems (VMEs), describing ecology of deep-sea habitats studying distinct features in the area and developing a Geographic Information Systems (GIS) database. Deep-sea Remotely Operated Vehicles (ROVs) took video footage of both pristine coral areas and areas where corals had been impacted by bottom contact gears.

The Contracting Parties expressed their appreciation of the significance of this programme in NAFO's response to the UNGA Resolution 61/105. Scientists and personnel involved in the programme were applauded for their work.

Under this agenda item, the European Union proposed a resolution concerning the promotion of scientific research on climate change and its potential effects on NAFO fishery resources. While the proposed text garnered general support in principle, some Contracting Parties indicated that, given its late submission during the meeting, more time was required to reflect on the specific aims and appropriate wording of such a proposal. It was agreed to return to the matter at the next annual meeting.

11. Review of seamounts closure

It was **agreed** to roll over for four years the existing measures on seamounts as stipulated in Article 15 of the NAFO Conservation and Enforcement Measures (NCEM). This means that the six identified seamounts will continue to be closed to all bottom fishing activities until December 31, 2014.

The Fisheries Commission **instructed** the Working Group of Fishery Managers and Scientists on Vulnerable Marine Ecosystems to review Article 15 § 5-8 in conjunction with the review and update of Chapter Ibis of the NCEM.

12. Report of the Ad Hoc Working Group of Fishery Managers and Scientists on VMEs (WGFMS)

The Fisheries Commission noted the report of the Ad Hoc WGFMS which met in May 2010 (FC Doc 10/4).

12.1 Recommendations from the May 2010 Meeting

Bill Brodie (Canada), Chair of the Ad Hoc Working Group, presented the recommendations from the May 2010 meeting for adoption or consideration (FC WP 10/2, Revised, Annex 11):

- a) revised Exploratory Fishery Data Collection Form
- b) revised Article 5bis of the NCEM on Interim Encounter Provision
- c) map of existing fishing areas in the NAFO Regulatory area
- d) updated Chapter Ibis of the NCEM
- e) revised Article 4bis on Assessment of Bottom Fishing

The Fisheries Commission **adopted** Recommendations a) – d) and **considered** Recommendation e).

Regarding Recommendation a), the revised Exploratory Fishery Data Collection Form would be intended for use during exploratory fishery in accordance with Article 5bis § 2(b) of the NCEM. The form captures all the information required as stipulated in the template Data Collection Plan described in Annex XXV of the NCEM.

Regarding Recommendation b), the amendment of Article 5bis enhances the reporting requirements on Interim Encounter Provisions in existing fishing areas and new fishing areas.

Regarding Recommendation c), the map of existing fishing areas (footprint) is to be used and interpreted according to Article 2bis of the NCEM.

Regarding Recommendation d), the update is a “housekeeping” task to remove or update out-dated provisions in Chapter Ibis. The update did not include substantial changes in the Chapter.

Regarding Recommendation e), the Fisheries Commission considered the issues identified by the working group concerning the requirements for the assessment of bottom fishing as provided in Article 4bis. A proposal by the United States to amend the Article (FC WP 10/8 Revision 2, Annex 12) was brought forward and **adopted** by the Fisheries Commission. The amended article elaborates what the assessment should address.

Denmark (in respect of the Faroe Islands and Greenland) urged that in the further refinement of assessment procedures, attention should be given to ensuring that their implementation is practical, both for the relevant national authorities and for the industry.

In adopting the proposals, the Fisheries Commission commended the working group and expressed its thanks for the hard work and accomplishments. It also expressed its appreciation and thanks to the Secretariat which undertook the complex task of preparing the composite footprint map based on the submissions from the Contracting Parties.

12.2 Future of the Ad Hoc WGFMS

The Fisheries Commission **agreed** that the working group should continue. In adopting FC WP 10/10 Revised (Annex 13), the “ad hoc” nature of the working group was removed and new terms of reference were defined.

13. Multi-species interactions

13.1 Sea turtle – fisheries interactions

At the 2006 Annual Meeting, the Fisheries Commission adopted “Resolution to Reduce Sea Turtle Mortality in NAFO Fishing Operations”. A progress report was submitted to FAO in December 2008 on NAFO's implementation of the Resolution.

The Secretariat presented a summary of the submissions of the Contracting Parties on their progress on the implementation since the last report (FC WP 10/6 Revised and Addendum). It was noted that either the fleets of the Contracting Parties did not encounter sea turtles in their fishing operations over the last two years, or the Contracting Parties did not have any new significant information to report. It was decided to send a progress report to FAO only when new significant information becomes available. The Contracting Parties were urged to update the Secretariat on this matter.

13.2 Marine mammal – fisheries interactions

Denmark (in respect of the Faroe Islands and Greenland) referred to the report of the NAFO observer to the NAMMCO 19th meeting (GC WP 10/2) and in particular drew attention to the on-going work through the NAMMCO Scientific Committee to develop ecosystem models which can better describe the interactions between marine mammals and fish as a basis for improved management of all relevant marine resources. This work is likely to represent a major step forward in this field on a global scale. It will run over 2-3 years to progress work towards using ecosystem-based management of marine resources, including marine mammals, in the North Atlantic region. Four different models will be applied in two geographical regions: the Barents Sea and the waters around Iceland.

It was agreed that this item will be retained on the agenda for future meetings.

V. Conservation and Enforcement Measures (Agenda items 14 -15)

14. Review of Chartering Arrangements

A report on chartering arrangements was presented by the NAFO Secretariat (FC WP 10/3). There were five charter arrangements made during 2009 and three arrangements during January-September 2010. The Secretariat noted full compliance with all the chartering requirements stipulated in Article 19 of the NCEM.

15. Reports of STACTIC (from May 2010 intersessional meeting and current Annual Meeting)

The May 2010 intersessional meeting report was presented under item 6. The STACTIC Chair presented the results of the STACTIC Report (see Part II of this Report). As instructed, STACTIC also evaluated Contracting Parties' compliance with Article 17 concerning shark management.

15.1 Charter of fishing possibilities from quota allocations shared by other Contracting Parties

On the clarification sought by STACTIC (see item 6), the Fisheries Commission confirmed that chartering of fishing possibilities from quota allocations shared by other Contracting Parties should not be allowed.

15.2 Conservation and Management of Sharks

STACTIC advised that there were no identified compliance issues related to the provisions of NAFO CEM Article 17 on sharks and that it would reflect further on potential reporting improvements with the view to enhancing the provisions of Article 17.

15.3 Recommendations

The following recommendations from the May 2010 intersessional meeting and this Meeting were forwarded to the Fisheries Commission:

- a) Duration of Inspection (STACTIC 09/20, Annex 14)

- b) Inspection Party Composition (STACTIC WP 09/21 Revised 2, Annex 15)
- c) Chartering Arrangements (STACTIC WP 10/8 Revision 2, Annex 16)
- d) Daily Communication of Catches (STACTIC WP 10/9 Revision 5, Annex 17)
- e) Notification Requirements (STACTIC WP 10/10, Annex 18)
- f) Report on Infringements – Article 42 (STACTIC WP 10/11 Revised 2, Annex 19)
- g) Report on Infringements – Template (STACTIC WP 10/19 Revised, Annex 20)
- h) PSC 3 Form (STACTIC WP 10/23, Annex 21)
- i) Shrimp Strengthening Bag (STACTIC WP 10/24 Revised, Annex 22)
- j) Delisting Procedure for IUU Vessels (STACTIC WP 10/36 Revised, Annex 23)
- k) Product Labelling (STACTIC WP 10/37, Annex 24)

The Fisheries Commission **adopted** all recommendations. In addition, the Fisheries Commission **accepted** the Annual Compliance Review 2010 (STACTIC WP 10/26, Annex 25).

VI. Closing Procedure (*Agenda items 16 - 18*)

16. Time and Place of the Next Meeting

This decision was deferred to the General Council.

17. Other Business

The Fisheries Commission expressed serious concerns about the delay in the provision of updated advice on shrimp from the Scientific Council. The updated advice was provided in the afternoon on the second day of the meeting, resulting in inadequate time for Contracting Parties to consult their respective governments and stakeholders. While acknowledging that current schedules of SC and FC meetings and the timing of shrimp research surveys contributed to the delay, the Fisheries Commission strongly urged the Scientific Council to endeavour to make the updated advice available at the latest one week prior to the start of the Annual Meeting.

18. Adjournment

The meeting was adjourned at 1530 hrs on Friday, 24 September 2010.

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**Annex 2. Record of Decisions and Actions by the Fisheries Commission
(Annual Meeting 2010)**

Substantive Issues (Agenda item):	Decision/Action:
4. Election of Vice-Chair	Elected Sylvie Lapointe (Canada) as Vice-Chair.
7. Scientific Advice	Noted Scientific Council Chair's presentation of the scientific advice.
8. Formulation of Request to the Scientific Council for Scientific Advice on the Management of Fish Stocks in 2012	Adopted FC WP 10/19 (Revision 2).
9 Management and Technical Measures for Fish Stocks in the Regulatory Area, 2010	(see 2011 Quota Table)
9.1 Cod in Division 3M	TAC was set at 10 000 t. Adopted FC WP 10/20 concerning bycatch requirements.
9.2 Redfish in Division 3M	TAC was set at 10 000 t, same level as in 2010.
9.3 Shrimp in Division 3M	Decided that fisheries for shrimp in this area should not be permitted in 2011. Inserted footnote in Annex 1B of the NCEM: When the scientific advice estimates that the stock shows sign of recovery, the fishery shall be re-opened in accordance with the effort allocation key in place for this fishery at the time of the closure.
10. Management of Technical Measures for Fish Stocks Straddling National Fishing Limits, 2010	(see 2011 Quota Table)
10.1 Cod in Div. 3NO	No directed fishery. Applicable until 2013. Created a new Working Group (FC WP 10/14 Revised), one of its term of reference is to conduct a comprehensive review of the existing 3NO Cod Conservation Plan and Re-Building Strategy.
10.2 Redfish in Div. 3LN	TAC was set at 6 000 applicable for 2011 and 2012. Adopted FC WP 10/20 concerning bycatch requirements.
10.3 Redfish in Divisions 3O	TAC was set at 20 000 t, same level as in 2010.
10.4 Pelagic <i>Sebastes mentella</i> (oceanic redfish) in the NAFO Convention Area	Decided that management measures applied to this stock in 2010 shall continue in 2011.
10.5 Yellowtail flounder in Div. 3LNO	TAC was set at 17 000 t, same level as in 2010.
10.6 Witch flounder in Div. 3L	No directed fishery. Applicable until 2013.
10.7 White hake in Divisions 3NO	TAC was set at 6 000 t, same level as in 2010.

10.8 Thorny skate in Divisions 3LNO	TAC was set at 12 000 t, same level as in 2010. Agreed to review the TAC at the next meeting.
10.9 Greenland halibut in Subarea 2 and Divisions 3KLMNO	TAC was set at 17 185 t (12 734 t in Div 3LMNO) following the recommendation of the WGMSE.
10.9.1 Reports of the FC Working Group on Greenland Halibut Management Strategy Evaluation	Adopted FC WP 10/7 Revision 2 concerning the WGMSE recommendations on Management Evaluation Strategy approach in establishing TAC, specifically agreed on <i>Management Strategy 2</i> with a starting TAC input value of 17 500 t in the Harvest Control Rule which resulted to the TAC of 17 185 t for 2011.
10.10 Shrimp in Divisions 3LNO	TAC was set at 19 200 t. Fishing is confined to Div 3L. Allocation scheme is maintained. The reservation of Denmark (in respect of the Faroe Islands and Greenland) on the allocation scheme was noted. Inserted footnote in Annex 1A of the NCEM: For 2012, the TAC will be reduced to 17 000 t. This TAC will be reviewed based on available Scientific Council advice on this stock.
10.11 American plaice in Div. 3LNO	Adopted FC WP 10/13 Revised concerning an interim Conservation Plan and Rebuilding Strategy for this stock. Created a new Working Group (FC WP 10/14 Revised), one of its term of reference is to conduct a comprehensive review of the interim 3LNO American plaice Conservation Plan and Re-Building Strategy.
10.12 Squid (<i>Illex</i>) in Subareas 3 and 4	TAC was set at 34 000 t. Applicable until 2013.
11. Review of Seamounts	Agreed to rollover until 2014 the existing measures on seamounts as stipulated in Article 15 of the NCEM. Instructed the WGFMS to review Article 15 in conjunction with the review and update of Chapter Ibis of the NCEM.
12. Report of the Ad Hoc Working Group of Fishery Managers and Scientists on VMEs	Noted FC Doc 10/4, the report of the ad Hoc WGFMS from its May 2010 meeting.
12. 1 Recommendations from the May 2010 Meeting	Adopted FC WP 10/2, Revised Annex 1 concerning the revised Exploratory Fishery Data Collection Form as Annex XXV.III of the NCEM. Adopted FC WP 10/2 Revised, Annex 2 concerning the revision of Article 5bis of the NCEM. Adopted FC WP 10/2 Revised, Annex 3 concerning footprint map. Adopted FC WP 10/2 Revised, Annex 4 concerning the editorial update of Chapter Ibis of the NCEM. Adopted FC WP 10/8 Revision 2 concerning revision of Article 4bis of the NCEM on assessment of bottom fishing.
12. 2 Future of the Ad Hoc WGFMS	Adopted FC WP 10/10 Revised concerning the removal of the “ad hoc” nature and the new terms of reference of the working group.
15. Reports of STACTIC (from May 2010 intersessional meeting and current Annual Meeting	Noted the STACTIC Reports on its 2010 Intersessional Meeting (FC Doc. 10/6) and this meeting (Part II of this Report).

<p>15.1 Chartering of fishing possibilities from quota allocations shared by other CPs.</p>	<p>Confirmed that chartering of fishing possibilities from quota allocations shared by other CPs is not allowed.</p>
<p>15.3 Recommendations</p>	<p>Adopted STACTIC WP 09/20 concerning duration of inspections.</p> <p>Adopted STACTIC WP 09/21 Revision 2 concerning inspection party composition.</p> <p>Adopted STACTIC WP 10/8 Revision 2 concerning chartering arrangements.</p> <p>Adopted STACTIC WP 10/9 Revision 5 concerning requirements on daily communication of catches.</p> <p>Adopted STACTIC WP 10/10 concerning notification requirements in the Joint Inspection and Surveillance Scheme.</p> <p>Adopted STACTIC WP 10/11 Revision 2 concerning report on infringements.</p> <p>Adopted STACTIC WP 10/19 Revised concerning template for “Report on Infringement”.</p> <p>Adopted STACTIC WP 10/23 concerning the revised PSC 3 form used in port inspections.</p> <p>Adopted STACTIC WP 10/24 Revised concerning shrimp strengthening bags.</p> <p>Adopted STACTIC WP 10/36 Revised concerning delisting procedure for IUU vessels.</p> <p>Adopted STACTIC WP 10/37 concerning product labeling and recoding of catch.</p> <p>Accepted STACTIC WP 10/26 concerning the Annual Compliance Review.</p>

Annex 3. Agenda

I. Opening Procedure

1. Opening by the Chair, Kate Sanderson (Denmark in respect of the Faroe Islands and Greenland)
2. Appointment of Rapporteur
3. Adoption of Agenda
4. Election of Vice-Chair
5. Review of Commission Membership
6. Guidance to STACTIC necessary for them to complete their work

II. Scientific Advice

7. Presentation of scientific advice by the Chair of the Scientific Council
 - 7.1 Scientific advice on fish stocks
 - 7.2 Vulnerable Marine Ecosystems (VMEs) and other ecosystem consideration
 - 7.3 Other issues (as determined by the Chair of the Scientific Council)
 - 7.4 Feedback to the Scientific Council regarding its work during this Meeting
8. Formulation of Request to the Scientific Council for Scientific Advice on the Management of Fish Stocks in 2012 and on other matters

III. Conservation of Fish Stocks in the Regulatory Area

9. Management and Technical Measures for Fish Stocks in the Regulatory Area, 2011
 - 9.1 Cod in Division 3M
 - 9.2 Redfish in Division 3M
 - 9.3 Shrimp in Division 3M
10. Management and Technical Measures for Fish Stocks Straddling National Fishing Limits, 2011
 - 10.1 Cod in Divisions 3NO
 - 10.2 Redfish in Divisions 3LN
 - 10.3 Redfish in Division 3O
 - 10.4 Pelagic *Sebastes mentella* (oceanic redfish) in the NAFO Convention Area
 - 10.5 Yellowtail flounder in Divisions 3LNO
 - 10.6 Witch flounder in Division 3L
 - 10.7 White hake in Divisions 3NO
 - 10.8 Thorny skate in Divisions 3LNO
 - 10.9 Greenland halibut in Subarea 2 and Divisions 3KLMNO
 - 10.9.1 Reports of the FC Working Group on Greenland Halibut Management Strategy Evaluation
 - 10.10 Shrimp in Divisions 3LNO
 - 10.11 American plaice in Divisions 3LNO
 - 10.12 Northern shortfin squid in Subareas 3+4

IV. Ecosystem Considerations

11. Review of seamounts closure
12. Report of the Ad Hoc Working Group of Fishery Managers and Scientists on VMEs (WGFMS)
 - 12.1 Recommendations from the May 2010 meeting
 - 12.2 Future of the Ad Hoc WGFMS
13. Multi-species interactions
 - 13.1 Sea turtle – fisheries interactions
 - 13.2 Marine mammal – fisheries interactions

V. Conservation and Enforcement Measures

14. Review of Chartering Arrangements
15. Reports of STACTIC (from May 2010 intersessional meeting and current Annual Meeting)
 - 15.1 Chartering of fishing possibilities from quota allocations shared by other Contracting Parties
 - 15.2. Conservation and Management of Sharks
 - 15.3 Recommendations

VI. Closing Procedure

16. Time and Place of Next Meeting
17. Other Business
18. Adjournment

Annex 4. Scientific Council Responses to Questions from the Fisheries Commission (FC Working Paper 10/9)

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

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 SC used these guidelines in determining that the 6 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.

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

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).

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

The 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.*
- iii. *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 relatively 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 (uniqueness 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.

4. *What are the deep-sea species in question?*

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).

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

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.

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

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 benthic-pelagic species and seamount benthos, where benthic-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).

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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 known how the different surveys scale to absolute biomass. Eg. 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 relate 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)

**Annex 5. Fisheries Commission's Request for Scientific Advice on Management in 2012
and Beyond of Certain Stocks in Subareas 2, 3 and 4 and Other Matters**

(FC Working Paper 10/19, Revision 2 **now** FC Doc. 10/9, Revised)

1. The Fisheries Commission with the concurrence of the Coastal State as regards to the stocks below which occur within its jurisdiction ("Fisheries Commission") requests that the Scientific Council provide advice in advance of the 2011 Annual Meeting, for the management of Northern shrimp in Div. 3M, 3LNO in 2012.

Noting that Scientific Council will meet in October of 2010 for 2012 TAC advice, Fisheries Commission requests the Scientific Council to update its advice on shrimp stocks in 2011 for 2012 TAC.

Fisheries Commission further requests that SC provide advice in accordance to Annex 1.

2. Fisheries Commission requests that the Scientific Council provide advice for the management of the fish stocks below according to the following assessment frequency (unless Fisheries Commission requests additional assessments):

Two year basis

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

To continue this schedule of assessments, the Scientific Council is requested to conduct the assessment of these stocks as follows:

In 2011, advice should be provided for 2012 and 2013 for American plaice in Div. 3LNO, yellowtail flounder in Div. 3LNO, redfish in Div. 3M, white hake in Div. 3NO and capelin in Div. 3NO and for 2012, 2013 and 2014 American plaice in Div. 3M and witch flounder in Div. 3NO.

In 2011, advice should be provided for 2012 for 3M cod.

Fisheries Commission requests that SC provide advice in accordance to Annex 1.

The Fisheries Commission also requests the Scientific Council to continue to monitor the status of all these stocks annually and, should a significant change be observed in stock status (e.g. from surveys) or in bycatches in other fisheries, provide updated advice as appropriate.

3. With respect to Northern shrimp (*Pandalus borealis*) in Div. 3LNO, noting the NAFO Framework for Precautionary Approach and recognizing the desire to demonstrate NAFO's commitment to applying the precautionary approach, Fisheries Commission requests the Scientific Council to :
 - a) identify F_{msy}
 - b) identify B_{msy}
 - c) provide advice on the appropriate selection of an upper reference point for biomass (e.g. B_{buf})
4. The Scientific Council is requested to provide updated information on the proportion of the 3LNO shrimp stock that occurs in 3NO.
5. With respect to 3M shrimp, the Scientific Council estimated in 2009 a proxy for B_{lim} as 85% decline from the maximum observed index levels, this is 2600 t of female biomass. In 2009 the Scientific Council estimated biomass to be below B_{lim} and recommended fishing mortality to be set as close to zero as possible.

In 2009 estimated catches reached 5000 t. The Fisheries Commission decided on a 50% effort reduction in 2010 and provisional estimated catches up to September 2010 reached 1000 t. In its 2010 advice, the Scientific Council estimated biomass to be above B_{lim} , but reiterated its previous advice to set fishing mortality as close to zero as possible. The Fisheries Commission requests the Scientific Council to evaluate if the current level of catches is compatible with stock recovery, given that improvements in biomass levels were observed through current level of catches.

6. The Fisheries Commission adopted in 2010 an MSE approach for Greenland halibut stock in Subarea 2 + Division 3KLMNO (FC Working Paper 10/7). This approach considers a survey based harvest control rule (HCR) to set a TAC for this stock on an annual basis for the next four year period. The Fisheries Commission requests the Scientific Council to:
 - a) annually monitor and update the survey slope and to compute the TAC according to HCR adopted by the Fisheries Commission according to Annex 1 of FC Working Paper 10/7.
 - b) provide guidance on what constitutes “exceptional circumstances”.
 - c) provide advice on whether or not the “exceptional circumstances” provision should be applied.
7. Fisheries Commission requests the Scientific Council to identify F_{msy} , identify B_{msy} and provide advice on the appropriate selection of an upper reference point for biomass (e.g. B_{buf}) for 3LNO American Plaice, 3NO cod and 3LN redfish.
8. Fisheries Commission requests the Scientific Council to review the stock recruit relationship for 3NO cod and the historical productivity regime used in setting the B_{lim} value of 60 000t.
9. Noting that distribution and historical catches of capelin have also occurred in 3L, the Scientific Council is requested to provide the Fisheries Commission with available information on the occurrence and distribution of capelin in 3L and to advise on further research requirements.
10. Fisheries Commission requests the Scientific Council to examine the consequences resulting from a decrease in mesh size in the mid-water trawl fishery for redfish in Div. 3LN to 90mm or lower.
11. Blue whiting (*Micromesistius poutassou*) is a widely distributed species, which can be found in the open ocean as a semi-pelagic species and in shallower waters close to the bottom. Blue whiting is largely fished in the North Eastern-Atlantic by pelagic trawls. The North East Atlantic Fisheries Commission (NEAFC) defined a minimum mesh size of 35mm when fishing for blue whiting with pelagic trawls in its regulatory area. Interest is increasing for developing fishing opportunities on this stock in the NAFO Regulatory Area, specifically in the boundary with the NEAFC RA, Division 1F, sub area 2 and Division 3K.

The Fisheries Commission requests the Scientific Council to give advice on the following measures to be adopted for the blue whiting:

- a) Change in the classification of blue whiting in the species table (Annex II of NAFO CEM), from classification as a groundfish species to a pelagic species, consistent with the NEAFC classification.
 - b) In line with conservation and management measures in force in the NEAFC Regulatory Area, adoption of a minimum mesh size for pelagic and semi-pelagic trawls which would include in paragraph 1 of Article 13 – Gear Requirements the following:
 - g) 35 mm for blue whiting in the fishery using pelagic trawls in Subarea 2 and Divisions 1F, 3K and 3M.
12. Catches of thorny skate in Div. 3LNO averaged 18 000 t between 1985 and 1991 and declined to 7 500 t in 1992-1995. Since 2000, estimated catches averaged 9 000 t. No analytical assessment has been performed and the current advice is based on the decline of the survey indices, which have been stable at low levels since 1996. However, relative fishing mortality has been relatively constant at around 17% between 1998 and 2004 and declined to 5% from 2005. Scientific Council has recommended that catches in 2011 and 2012 should not exceed the last three years average catch (approximately 5 000 t). The Fisheries Commission requests the Scientific Council to clarify the reason behind using the last three years period as the basis for the advice and to provide alternative options. In its examination, the Scientific Council should also take into account the relative

stability of all survey indices since 1996 and furthermore consider the information that relative fishing mortality has declined to low levels.

13. Mindful of the NEREIDA mission, the international scientific effort led by Spain to survey the seafloor in the NAFO Regulatory Area,

Recognizing that the Coral and Sponge Protection Zones closed to bottom fishing activities for the protection of vulnerable marine ecosystems as defined in Chapter 1 Article 16 Paragraph 3 is in place until December 31, 2011,

Mindful of the call for review of the above measures based on advice from the Scientific Council,

Fisheries Commission requests that Scientific Council review any new scientific information on the areas defined in Chapter 1 Article 16 Paragraph 3 which may support or refute the designation of these areas as vulnerable marine ecosystems. In the event that new information is not available at the time of the Fisheries Commission meeting in September 2011, prepare an overview of the type of information that will be available and the timeline for completion.

14. Noting the response from the Scientific Council in June 2010 regarding simulation modeling in a GIS framework: "To apply this model to the NRA, an agreed upon set of gear descriptions and tow duration/lengths for each fishing fleet segment would need to be created. Further estimation of retention efficiencies of the different commercial gears and indirect effects of fishing will be needed to model effects of serious adverse impacts."

The Fisheries Commission requests that the Scientific Council: 1) acquire the requisite data and apply the model to the extent possible to the NRA, and 2) consider whether the SASI model used by the US New England Fisheries Council should be incorporated into the aforementioned GIS framework as a means of integrating significant adverse impacts into the approach.

15. Recognizing the initiatives on vulnerable marine ecosystems (VME) through the work of the WGFMS, and with a view to completing and updating fishery impact assessments, the Scientific Council is requested to provide the Fisheries Commission at its next annual meeting in 2011: 1) guidance on the timing and frequency of fishing plans/assessments for the purpose of evaluating significant adverse impacts on VMEs; 2) a framework for developing gear/substrate impact assessments to facilitate reporting amongst the Contracting Parties.

Annex1 – Additional guidance in regards to questions 1 and 2.

Mindful of the desire to move to a risk-based approach in the management of fish stocks, Fisheries Commission requests the Scientific Council to provide a range of management options as well as a risk analysis for each option as outlined in the provisions below, rather than a single TAC recommendation.

1. The Fisheries Commission request the Scientific Council to consider the following in assessing and projecting future stock levels for those stocks listed above. These evaluations should provide the information necessary for the Fisheries Commission to consider the balance between risks and yield levels, in determining its management of these stocks:
 - a) The preferred tool for the presentation of a synthetic view of the past dynamics of an exploited stock and its future development is a stock assessment model, whether age-based or age-aggregated.
 - b) For those stocks subject to analytical-type assessments, the status of the stocks should be reviewed and catch options evaluated in terms of their implications for fishable stock size in both the short and long term. As general reference points, the implications of fishing at $F_{0.1}$ and F_{2010} in 2012 and subsequent years should be evaluated. The present stock size and spawning stock size should be described in relation to those observed historically and those expected in the longer term under this range of options.
 - c) For those stocks subject to general production-type assessments, the time series of data should be updated, the status of the stock should be reviewed and catch options evaluated in the way described above to the extent possible. In this case, the level of fishing effort or fishing mortality (F) required to take two-thirds MSY catch in the long term should be calculated.
 - d) For those resources for which only general biological and/or catch data are available, few standard criteria exist on which to base advice. The stock status should be evaluated in the context of management requirements for long-term sustainability and the advice provided should be consistent with the precautionary approach.
 - e) Spawning stock biomass levels considered necessary for maintenance of sustained recruitment should be recommended for each stock, defined in relation to both long-term productivity regimes, and current productivity regimes to the extent these may differ. In those cases where present spawning stock size is a matter of scientific concern in relation to the continuing reproductive potential of the stock, options should be offered that specifically respond to such concerns.
 - f) Information should be provided on stock size, spawning stock sizes, recruitment prospects, fishing mortality, catch rates and catches implied by these management strategies for the short and the long term in the following format:
 - I. For stocks for which analytical-type assessments are possible, graphs should be provided of all of the following for the longest time-period possible:
 - historical yield and fishing mortality;
 - spawning stock biomass and recruitment levels;
 - catch options for the year 2012 and subsequent years over a range of fishing mortality rates (for as many years as the data allow)
 - (F) at least from $F_{0.1}$ to F_{max} ;
 - spawning stock biomass corresponding to each catch option;
 - yield-per-recruit and spawning stock per recruit values for a range of fishing mortalities.
 - II. For stocks for which advice is based on general production models, the relevant graph of production as a function of fishing mortality rate or fishing effort should be provided. Age aggregated assessments should also provide graphs of all of the following for the longest time period possible:
 - exploitable biomass (both absolute and relative to B_{MSY})
 - yield/biomass ratio as a proxy for fishing mortality (both absolute and relative to F_{MSY})
 - estimates of recruitment from surveys, if available.

- III. Where analytical methods are not attempted, the following graphs should be presented, for one or several surveys, for the longest time-period possible:
- time trends of survey abundance estimates, over:
 - an age or size range chosen to represent the spawning population
 - an age or size-range chosen to represent the exploited population
 - recruitment proxy or index for an age or size-range chosen to represent the recruiting population.
 - fishing mortality proxy, such as the ratio of reported commercial catches to a measure of the exploited population.

For age-structured assessments, yield-per-recruit graphs and associated estimates of yield-per-recruit based reference points should be provided. In particular, the three reference points, actual F , $F_{0.1}$ and F_{max} should be shown.

2. Noting the Precautionary Approach Framework as endorsed by Fisheries Commission, the Fisheries Commission requests that the Scientific Council provide the following information for the 2011 Annual Meeting of the Fisheries Commission for all stocks under its responsibility requiring advice for 2012:
 - a) the limit and precautionary reference points as described in Annex II of the UN Fisheries Agreement indicating areas of uncertainty (for those stocks for which precautionary reference points cannot be determined directly, proxies should be provided);
 - b) the stock biomass and fishing mortality trajectory over time overlaid on a plot of the PA Framework (for those stocks where biomass and/or fishing mortality cannot be determined directly, proxies should be used);
 - c) information regarding the current Zone the stock is within as well as proposals regarding possible harvest strategies which would move the resource to (or maintain it in) the Safe Zone, including medium term considerations and associated risk or probabilities which will assist the Commission in developing the management strategies described in paragraphs 4 and 5 of Annex II in the Agreement.

3. The following elements should be taken into account by the Scientific Council when considering the Precautionary Approach Framework:
 - a) References to “risk” and to “risk analyses” should refer to estimated probabilities of stock population parameters falling outside biological reference points.
 - b) Where reference points are proposed by the Scientific Council as indicators of biological risk, they should be accompanied by a description of the nature of the risk associated with crossing the reference point such as recruitment overfishing, impaired recruitment, etc.
 - c) When a buffer reference point is identified in the absence of a risk evaluation in order to maintain a low probability that a stock, measured to be at the buffer reference point, may actually be at or beyond the limit reference point, the Scientific Council should explain the assumptions made about the uncertainty with which the stock is measured.
 - d) Wherever possible, short and medium term consequences should be identified for various exploitation rates (including no fishing) in terms of yield, stability in yield from year to year, and the risk or probability of maintaining the stock within, or moving it to, the Safe Zone. Whenever possible, this information should be cast in terms of risk assessments relating fishing mortality rates to the trends in biomass (or spawning biomass), the risks of stock collapse and recruitment overfishing, as well as the risks of growth overfishing, and the consequences in terms of both short and long term yields.
 - e) When providing risk estimates, it is very important that the time horizon be clearly spelled out. By way of consequence, risks should be expressed in timeframes of 5, 10 and 15 years (or more), or in terms of other appropriate year ranges depending on stock specific dynamics. Furthermore, in order to provide the Fisheries Commission with the information necessary to consider the balance between risks and yield levels, each harvesting strategy or risk scenario should include, for the selected year ranges, the risks and yields associated with various harvesting options in relation to B_{lim} .

Annex 6. Quota Table 2011 and Effort Allocation Scheme 2011

QUOTA TABLE. Total allowable catches (TACs) and quotas (metric tons) for 2011 of particular stocks in Subareas 1-4 of the NAFO Convention Area. The values listed include quantities to be taken both inside and outside the 200-mile fishing zone, where applicable.

Species Division/Contracting Party	Cod			Redfish			American plaice		Yellowtail 3LNO	
	3L	3M	% of 3M Cod TAC	3NO	3LN	% of 3LN Redfish TAC	3M	3LNO		
Canada		80	0.80	0	2556	42.60	500	6000	0	16575 ⁵
Cuba		370	3.70	-	588	9.80	1750		-	-
Denmark (Faroe Islands and Greenland)		2235	22.35	-	-		69 ¹⁹		-	-
European Union		5703 ²⁵	57.03	0 ¹¹	1094 ²⁶	18.23	7813 ¹²	7000	0	0 ¹¹
France (St. Pierre et Miquelon)		-	-	-	-		69 ¹⁹		-	340 ⁵
Iceland		-	-	-	-		-		-	-
Japan		-	-	-	-		400	150	-	-
Korea		-	-	-	-		69 ¹⁹	100	-	-
Norway		925	9.25	-	-		-		-	-
Russian Federation		647	6.47	0	1726	28.77	9137	6500	-	0
Ukraine								150		
United States of America		-	-	-	-		69 ¹⁹		-	-
Others		40	0.40	0	35	0.60	124	100	0	85 ⁵
TOTAL ALLOWABLE CATCH	^{*9}	10000 ²³	100.0	^{*9,20}	6000 ^{16,24}	100.0	10000 ⁸	20000	^{*21}	17000 ^{21,22}

Species	Witch		White hake	Capelin	Skates	Greenland halibut	Squid (Illex) ¹		Shrimp	
	3L	3NO					3LNO	3L	3NO	
Canada		0	1765	0	2000	1910	N.S. ⁶	15991		
Cuba		-		0		-	510	214		
Denmark (Faroe Islands and Greenland)		-		-		221	-	214		
European Union		0 ¹¹	3529	0 ¹¹	7556	7466 ¹⁸	N.S. ⁶ 611 ¹³	1069 ¹⁴		
France (St. Pierre et Miquelon)		-		-		208	453	214		
Iceland		-		-		-	-	214		
Japan		-		0		1305	510	214		
Korea		-		-		-	453	214		
Norway		-		0		-	-	214		
Russian Federation		0	353	0	2000	1624	749	214		
Ukraine						-		214		
United States of America		-		-		-	453	214		
Others		0	353	-	444	0 ^{16,9}	794	0		
TOTAL ALLOWABLE CATCH	^{*9,20}	^{*9}	6000	^{*16,9}	12000	12734	34000 ²⁰	19200 ²⁷	0	^{*9}

* Ban on fishing in force.

- Any quota listed for squid may be increased by a transfer from any "coastal state" as defined in Article 1, paragraph 3 of the NAFO Convention, provided that the TAC for squid is not exceeded. Transfers made to Contracting Parties conducting fisheries for squid in the Regulatory Area shall be reported to the Executive Secretary, and the report shall be made as promptly as possible.
- The Executive Secretary shall notify without delay all Contracting Parties the dates on which accumulated reported catch taken by vessels of Contracting Parties estimated equal to 50% and then 100% of that allocation.
- Quota to be shared by vessels from Denmark (Greenland and Faroe Islands), European Union, Iceland, Norway and Russia. Catches in the NAFO Convention Area shall be deducted from the quotas allocated in the NEAFC Convention Area.
- Quota to be shared by vessels from Canada, Cuba, France (St. Pierre et Miquelon), Japan, Korea, Ukraine and USA.
- Contracting Parties shall inform the Executive Secretary before 01 December 2010 of the measures to be taken to ensure that total catches do not exceed the levels indicated.
- The allocation to these Contracting Parties are as yet undetermined, although their sum shall not exceed the difference between the total of allocations to other Contracting Parties and the TAC (= 29,458 tons).

7. In 2005, the previous 935 t "Others" quota was assigned to three Contracting Parties. When the TAC exceeds 30,000 t the next 1,300 t beyond 30,000 will be allocated to an Others quota which can be accessed by those who do not hold Greenland halibut allocation. In deciding the relevant contributions of Contracting Parties to the 1,300 t Others quota, the Fisheries Commission will take into account the fact that some Contracting Parties received a benefit from the 935 t quota which was reassigned in 2005. Not more than 5000 tons may be fished before 01 July 2011. The Executive Secretary shall notify without delay all Contracting Parties of the date on which, for this stock, accumulated reported catch taken by vessels of the Contracting Parties is estimated to equal 50% and then 100% of the TAC.
9. The provisions of Article 12, paragraph 1.b) of the Conservation and Enforcement Measures shall apply.
10. In the case of the NEAFC decision which modifies the level of TAC in 2011 as compared to 2010, these figures shall be accordingly adjusted by NAFO and formalized through a mail vote.
11. Including fishing entitlements of Estonia, Latvia, and Lithuania following their accession to the European Union and in accordance with sharing arrangements of the former USSR quota adopted by the Fisheries Commission at its Annual Meeting in 2003 (FC Working Paper 03/7).
12. Including allocations of 1571 tonnes each for Estonia, Latvia and Lithuania out of a sharing of 20,000 tonnes, following their accession to the European Union.
13. Allocations of 128 tonnes each for Estonia, Latvia and Lithuania as well as 227 tonnes for Poland out of a TAC of 34,000 tonnes, following their accession to the European Union.
14. Including allocations of 214 tonnes each for Estonia, Latvia, Lithuania and Poland out of a TAC of 19,200 tonnes, following their accession to the European Union.
15. Allocation of 2,234 tonnes for Lithuania and 269 tonnes to Latvia following their accession to the European Union.
16. Applicable to 2011 and 2012.
17. The quota shares in footnotes 4 and 15 can only be fished in the NAFO Regulatory Area. If an increase in the overall TAC as defined in footnote 10 leads to an increase in these shares, the first 500 tonnes of that increase shall be added to the quota share referred to in footnote 4.
18. Including an allocation of 418 tonnes for Estonia, Latvia, and Lithuania following their accession to the European Union.
19. Notwithstanding the provisions of footnote 8 and without prejudice to future agreements on allocations, these quotas may be fished in their entirety by these Contracting Parties.
20. Applicable until at least 2013.
21. In lieu of Article 12.1 (a) and (b) of the CEM, the following by-catch provisions for American plaice only in the 3LNO yellowtail fishery shall apply: Contracting Parties fishing for yellowtail flounder allocated under the NAFO allocation table will be restricted to an overall Am. plaice by-catch harvest limit equal to 13% of their total yellowtail fishery as calculated in accordance with Article 12.1 (c). For 2010, the by-catch percentage will increase to 15% unless a Scientific Council projection indicates that this rate is likely to undermine stock recovery or cause an unreasonable delay in reaching B_{lim} , in which case the increase may be subject to a reassessment by the Fisheries Commission.
22. Following the NAFO annual meeting and prior to January 1 of the succeeding year, at the request of the USA, Canada will transfer 1000 tonnes of its 3LNO yellowtail quota to the USA.
23. The allocation key of this stock is based on the 1998 Quota Table. In 1999, a moratorium on cod in Division 3M was declared.
24. The allocation key of this stock is based on the 1997 Quota Table. In 1998, a moratorium on redfish in Division 3LN was declared.
25. Including fishing entitlements of 111 tons each for Estonia, Latvia, and Lithuania in accordance with sharing arrangements of the former USSR quota adopted by the Fisheries Commission at its Annual Meeting in 2003 (FC Working Paper 03/7) and allocation of 380 tons for Poland following their accession to the European Union.
26. Including fishing entitlements of 297 tonnes each for Estonia, Latvia, and Lithuania in accordance with sharing arrangements of the former USSR quota adopted by the Fisheries Commission at its Annual Meeting in 2003 (FC Working Paper 03/7) following their accession to the European Union.
27. For 2012, the TAC will be reduced to 17,000 tonnes. This TAC will be reviewed based on available Scientific Council advice on this stock.

Annex I.B
Effort Allocation Scheme for Shrimp Fishery in the
NAFO Regulatory Area Div. 3M, 2011

CONTRACTING PARTY	NUMBER OF FISHING DAYS ¹	NUMBER OF VESSELS ¹
Canada	0	0
Cuba	0	0
Denmark		
Faroe Islands	0	0
Greenland	0	0
European Union	0	0
France (in respect of St Pierre et Miquelon)	0	0
Iceland	N/A	N/A
Japan	0	0
Korea	0	0
Norway	0	0
Russia	0	N/A
Ukraine	0	0
USA	0	0

¹ When the scientific advice estimates that the stock shows signs of recovery, the fishery shall be re-opened in accordance with the effort allocation key in place for this fishery at the time of the closure.

Annex 7. By-catch Requirements – NAFO CEM – Article 12
(FC WP 10/20 **now** FC Doc. 10/10)

Article 12(1)(d) introduces a new way to manage the COD 3M and RED 3 LN fisheries, by inviting CP which have been granted a quota to decide on a date, in advance of the exhaustion of the quota, from which the species can no longer be fished under a directed fishery. After this date the species may only be retained on board as a by-catch, within the limits laid down, up to the completion of the quota.

By merging by-catch and directed fishery provisions for CP fishing for their entitled quota, Article 12(1)(d) creates confusion by introducing a system which is hardly workable in practice, with no added value from the normal quota take up procedure. It also favours discards of both species.

Proposed Amendment

Article 3 – Article

2. Each Contracting Party to which a quota has been allocated shall close its fishery in the Regulatory Area for the stocks listed in Annex I.A on the date on which the accumulated reported catch, the estimated unreported catch, the estimated quantity to be taken before the closure of the fishery and the likely by-catches during the period to which the quota applies, equal 100 percent of the quota allocated to that Contracting Party.. Such Contracting Party shall promptly notify the Executive Secretary of the date on which that Party will close its fishery for the stocks concerned. The Executive Secretary shall promptly inform all other Contracting Parties of such notification. **Each Contracting Party shall ensure that, after the closure, no more fish of that species is retained on board its vessels, unless otherwise authorized by the measures.**

Article 12 - By-Catch Requirements

Delete sub-article 1 (d)

Annex 8. Conservation Plan and Rebuilding Strategy Working Group
(FC Working Paper 10/14, Revised now FC Doc. 10/11)

Noting that international agreements such as the United Nations Fish Stocks Agreement (UNFSA) and the FAO Code of Conduct for Responsible Fisheries call for the rebuilding of depleted stocks through application of the precautionary approach;

Further noting that many Contracting Parties have domestic legislation or policies which require the identification of limit reference points and recovery targets;

Recalling that the 3LNO American Plaice stock and 3NO Cod stock have been under long term moratoria;

Further recalling that in 2007 NAFO adopted a Conservation Plan and Rebuilding Strategy for 3NO Cod that identified a limit reference point of 60,000t;

Recognizing that the moratoria have created significant hardships for all Contracting Parties;

Desiring continued recovery and growth of these stocks to ensure their long term sustainability and to promote associated economic opportunities;

Noting that Scientific Council has reported that the Spawning Stock Biomass (SSB) for 3LNO American Plaice and 3NO Cod have been increasing since the moratoria and that these stocks are expected to further approach and possibly exceed B_{lim} in the short or medium term;

Mindful of the desire to allow further recovery and growth of these stocks;

Noting that it is necessary to implement a monitoring programme to ensure that these stocks are achieving rebuilding objectives in future years;

It is proposed that the Fisheries Commission:

1. Establish a Working Group of Fishery Managers and Scientists with the following Terms of Reference:

Terms of Reference

*Working Group of Fishery Managers and Scientists on
Conservation Plans and Rebuilding Strategies*

Structure

Establish a Working Group of Fishery Managers and Scientists, which reports to Fisheries Commission, consults with Scientific Council, and provides recommendations to Fisheries Commission.

The Working Group shall be comprised of fishery managers and scientists from Contracting Parties supported by advisors, as required, up to a maximum of three participants per Contracting Party. The Chair/Vice-chair shall be selected from participating fishery managers and scientists with both a fishery manager and a scientist represented in the two positions.

Consideration shall be given by the Fisheries Commission in 2011 to the continuation or dissolution of the working group.

Objective

1. Comprehensive review of the interim 3LNO Am. plaice and the existing 3NO Cod Conservation Plans and Re-Building Strategies.
2. Consider risk management approaches in the review, update and future development of Conservation Plans and Rebuilding Strategies.

This work should be presented to Fisheries Commission for consideration at the 2011 Annual General Meeting and possible implementation in January 2012.

Specific Duties

The working group should review and update conservation plans and rebuilding strategies in respect of:

- a) Limit reference points, as provided by Scientific Council, and recovery target(s);
- b) Buffer reference points, developed in the context of precautionary approach framework and in support of robust rebuilding plans;
- c) Timelines or time frames that can reasonably be expected to achieve established targets;
- d) Conditions at which a directed fishery might occur;
- e) Harvest control rules which incorporate target, limit and buffer reference points, as well as, rebuilding timelines or timeframes; and
- f) An implementation strategy which promotes stability in response to natural resource fluctuations that may be expected to occur over the life of the rebuilding plan.

Possible Principles/Elements

In the conduct of its work, the working group may consider the following principles and elements in the development of Conservation Plans and Rebuilding Strategies:

- a) When the stock has recovered beyond Blim, initial TAC levels should be set at conservative levels to allow for continued recovery and growth;
- b) Bycatch should be kept to the lowest possible level and restricted to unavoidable bycatch in fisheries directing for other species when SSB is below Blim;
- c) Interim target(s) for further growth in the stock prior to re-opening;
- d) Long-term rebuilding target (e.g. Bmsy) and associated timelines and/or timeframes;
- e) Harvest strategy, consistent with the Precautionary Approach, which ensure Spawning Stock Biomass remains above Blim;

- f) Monitoring and review process for each rebuilding plan to enable Fisheries Commission to assess and revise plans as necessary to ensure rebuilding plan targets are achieved.

The working group may also consider refining these principles/ elements outlined above.

Meetings

The Working Group shall hold its first meeting in advance of the 2011 Meeting of Scientific Council to allow for additional requests for advice.

The Working Group shall communicate regularly through teleconferences and electronically, as required.

A second meeting may be held at the discretion of the Chair.

**Annex 9. Working Group on Greenland Halibut Management Strategy Evaluation (WGMSE)
Recommendations to Fisheries Commission**

(FC Working Paper 10/7, Revision 2 **now** FC Doc. 10/12)

Recognizing that Contracting Parties agreed in 2003 to implement a fifteen-year rebuilding programme for the Greenland halibut stock in Subarea 2 + Divisions 3KLMNO,

Acknowledging the continued uncertainty of the 2009 assessment for the Greenland halibut stock in Subarea 2 + Divisions 3KLMNO,

Desirous to move forward with a risk management approach for this stock,

Desirous to achieve the objectives of the rebuilding programme,

Recalling that at the 2009 annual meeting of NAFO, the Fisheries Commission established a Working Group to develop a Management Strategy Evaluation (MSE) framework to help inform management of **Greenland halibut in Subarea 2 + Divisions 3KLMNO (FC Doc 09/18)**,

Consistent with its terms of reference, the Working Group considered alternative management strategies with their harvest control rules, selected appropriate performance indicators, defined acceptable levels of risk, and projected/evaluated outputs of the risk management framework utilizing a range of assessment models,

Noting that the Fisheries Commission will consider the report from this Working Group including any recommendations contained therein as the basis for a risk management based decision on the TAC level for 2011 and beyond,

The following recommendations will be forwarded to the Fisheries Commission.

1. Management Strategy Evaluation (MSE)

The Fisheries Commission shall implement an MSE approach for Greenland halibut stock in Subarea 2 + Divisions 3KLMNO.

2. Management Strategy (Harvest Control Rule)

A simple model-free management strategy shall be adopted consistent with NAFO SCR 09/37. The harvest control rule (HCR) will adjust the total allowable catch (TAC) from year (y) to year (y+1), according to:

$$TAC_{y+1} = TAC_y (1 + \lambda \times \text{slope})$$

where :

slope = measure of the recent trend in survey biomass. The TAC is subject to constraints on a percentage change from one year to the next.

Two management strategies were put forward for consideration by Fisheries Commission based on the HCR identified above:

	Management Strategy 1	Management Strategy 2
Starting TAC Control Parameter	16, 000 t	17, 500 t
λ if slope is negative	1.25	2.00
λ if slope is positive	1.00	1.00
Constraint on the rule-generated TAC change	$\pm 10\%$	$\pm 5\%$

Full details of the application of the management strategies are provided in Annex 1.

Results of these applications are provided in Annex 2.

3. Implementation

The management strategy shall be implemented initially for 4 years. It shall be annually monitored by the Scientific Council to ensure that the data being input into the management strategy is consistent with the MSE process. If exceptional circumstances arise, this shall provide a scientific justification for over-riding the TAC provided by the HCR

Guidelines on how to address exceptional circumstances for adoption by Fisheries Commission in 2011 shall be developed intersessionally by WGMSE with the advice of the Scientific Council.

The Fisheries Commission shall review the progress of this management strategy in four (4) years with advice from Scientific Council.

The FC shall consider undertaking a revision of the Greenland halibut rebuilding programme to reflect the implementation of the Management Strategy.

The WGMSE will remain in place at least until 2011 to allow for further refinement of the MSE following initial implementation.

Annex 1. Application of the management strategies

The management strategy to calculate the TAC for year $y+1$ is defined by the following formulae:

$$TAC_{y+1}^* = Z_y (1 + \lambda_y slope_y)$$

$$\text{where } Z_y = \begin{cases} Z & y = 2010 \\ TAC_y^* & y \geq 2011 \end{cases}$$

$$\lambda_y = \begin{cases} \lambda_u & slope_y > 0 \\ \lambda_d & slope_y \leq 0 \end{cases}$$

and where

$$\text{if } TAC_{y+1} - TAC_y > TAC_y (1 + x\%) \quad \text{then } TAC_{y+1} = TAC_y (1 + x\%)$$

$$\text{if } TAC_{y+1} - TAC_y < TAC_y (1 - y\%) \quad \text{then } TAC_{y+1} = TAC_y (1 - y\%)$$

where Z , λ_u , λ_d , x and y are control parameters to be selected.

For the MP selected the values of the control parameters are:

Z	16 000 t	or	17 500 t
λ_u	1.00	or	1.00
λ_d	1.25	or	2.00
x	0.10	or	0.05
y	0.10	or	0.05

The quantity $slope_y$ is calculated as follows:

For each survey, linearly regress $\ln I_y^i$ vs year y' for $y' = y - 5$ to $y' = y - 1$, to yield a regression slope value $slope_y^i$, an average of the slopes is taken to provide a composite value:

$$slope_y = \left(slope_y^{CanFall} + slope_y^{CanSpring} + slope_y^{EU(0-1400m)} \right) / 3$$

where I_y is the survey biomass result in terms of mean weight per tow of fish for all ages.

Annex 2. Performance statistics (medians) for two Management Strategies as averaged over the SCAA- and the XSA- conditioned operating models

	SCAA average		XSA average	
	MS 1 (mp01)	MS 2 (mp14 (+- 5%))	MS 1 (mp01)	MS 2 (mp14 (+- 5%))
C ₂₀₁₁₋₂₀₁₅	13374	15766	14800	16400
C ₂₀₁₆₋₂₀₂₀	13566	15827	19600	19100
C ₂₀₁₁₋₂₀₃₀	14335	16195	23100	21400
B ₂₀₁₁₋₂₀₁₅	91530	89361	69446	66588
B ₂₀₁₆₋₂₀₂₀	107715	103211	131854	128102
B ₂₀₁₁₋₂₀₃₀	117766	113381	127975	127612
B ₂₀₁₁₋₂₀₁₅ /B ₂₀₁₁	1.05	1.03	1.04	1.02
B ₂₀₁₆₋₂₀₂₀ /B ₂₀₁₁	1.26	1.20	1.98	1.98
B ₂₀₁₁₋₂₀₃₀ /B ₂₀₁₁	1.36	1.31	1.93	1.97

Annex 10. Interim 3LNO American Plaice Conservation Plan and Rebuilding Strategy
(FC Working Paper 10/13, Revised **now** FC Doc. 10/13)

1. The objective of this Conservation Plan and Rebuilding Strategy is to achieve and to maintain the 3LNO Am. plaice SSB at or above Bmsy. It may reasonably be expected that Blim will be reached within the period 2011-2017.
2. The following reference points apply:
 - (a) Limit reference point for spawning stock biomass (Blim) - 50,000t
 - (b) On an interim basis and in the absence of risk analysis, Bbuf - 100,000t
 - (c) Limit reference point for fishing mortality (Flim which is \leq Fmsy) - 0.4
 - (d) Target reference point for spawning stock biomass Bmsy - 175,000t
3. A directed fishery should only occur when SSB is above Blim and with a TAC set at a fishing mortality rate of < 0.15 that provides for an SSB trajectory for the subsequent 3-year period to remain positive.
4. Subject to paragraph 3, harvest control rules follow:
 - (a) When SSB is below Blim (50,000t), no directed fishing and by-catch should be restricted to unavoidable by-catch in fisheries directing for other species
 - (b) When SSB is between Blim and Bbuf (50,000 – 100,000t), TAC levels should be set at a level to allow for continued recovery and growth with low probability of declining below Blim, with F not to exceed < 0.15 .
 - (c) When SSB is above Bbuf (100,000t), TAC levels should be set to allow for continued growth, subject to natural fluctuations that may be expected to occur, with F not to exceed 0.2 (F0.1)
 - (d) When SSB is above Bmsy (175,000t), TAC levels may be set at $F < \frac{3}{4} F_{msy}$
5. To provide stability, TACs should be set at levels that achieve an agreed positive SSB trajectory over the subsequent 3 year period, consistent with the objective outlined in Paragraph 1.
 - (a) Annual TAC's should promote positive change or mitigate declines in SSB when it is below Bmsy.
 - (b) If the SSB is above Bbuf, TAC should utilize a risk neutral (50% or better probability) approach to projections and utilize a more risk adverse approach to decline if the SSB is below the Bbuf.

This interim plan will be reviewed and updated by the Working Group of Fishery Managers and Scientists on Conservation Plans and Rebuilding Strategies.

**Annex 11. Recommendations from the ad hoc Working Group of
Fishery Managers and Scientists (WGFMS) to the Fisheries Commission**
(FC Working Paper 10/2, Revised now FC Doc. 10/27)

Following the Terms of Reference outlined in FC Doc 09/19, the WGFMS met in Halifax in May 2010 (FC Doc 10/4) and agreed on the following recommendations:

1) Data Collection in Exploratory and Existing Fishing Areas

The WGFMS recommends to the Fisheries Commission the **adoption** of the revised Exploratory Fishery Data Collection Form as Annex XXV.III of the NAFO Conservation and Enforcement Measures (Annex 1).

The WGFMS recommends to the Fisheries Commission the **adoption** of the proposal to revise Article 5bis paragraph 1b first indent and Article 5bis paragraph 2b first indent concerning data collection requirements in existing and new fishing areas. The proposed revisions are contained in FCWGFMS WP 10/5, Rev. 3 and presented in Annex 2.

2) Fishing Footprint

The WGFMS recommends to the Fisheries Commission the **adoption** of the footprint as described in Annex 3. The footprint is to be used and interpreted in conjunction with Article 2bis of the NAFO Conservation and Enforcement Measures (NCEM).

3) Chapter Ibis update

The WGFMS recommends to the Fisheries Commission the **adoption** of the proposed editorial changes in Chapter Ibis of the NCEM. The proposed changes are detailed in FCWGFMS 10/4 Rev. 1 and presented in Annex 4.

4) Review of Fishery Assessment Guidelines (Article 4bis of the NCEM)

The WGFMS recommends to the Fisheries Commission the **consideration** of the issues raised in FCWGFMS WP 10/2 Rev. 2 and presented in Annex 5. The issues relate to Article 4bis of the NCEM.

Article 4bis concerns the assessment of bottom fishing. There is currently no guiding document to inform Contracting Parties as to what needs to be included in the assessment. Annex 5 clarifies the assessment process and what should be addressed in an assessment.

Annex 1. Exploratory Data Collection Form

Exploratory Fishery Data Collection Form

A. Fishing Trip Information

Flag state		Vessel Name		Call sign		Date of encounter (ddmmyy)	
------------	--	-------------	--	-----------	--	----------------------------	--

B. Gear and Fishing Information (use separate form for each gear).

Fishing Gear (e.g. trawl, gill net, hook and line, etc)		Gear Details:	Gear type (e.g. bottom trawl, set gill net, etc.)	
			Gear size (groundrope length, panel length, etc.)	
			Other details (cod end mesh size, # of hooks, etc.)	

		hr	min		degrees	minutes	meters
Tow or Set Start:	GMT Time:			Latitude	N		Depth
				Longitude	W		
Tow or Set End:	GMT Time:			Latitude	N		Depth
				Longitude	W		

C. Catch Information *Don't leave blank. Indicate zero catch if necessary.

Live Corals total weight in the haul (kg)*		Live Sponges total weight in the haul (kg)*	
--	--	---	--

Organisms identified to the lowest taxonomic unit as possible** Include fish and invertebrates	Biological Samples taken?		Biological samples of Vulnerable Indicator Species taken?		Total Weight (kg) in catch	Weight is estimate or actual? Tick one.	
	yes	no	yes	no		Act.	Est.

D. Comments

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**Refer to Annex I of the FAO International Guidelines for the Management of Deep-Sea Fisheries in the High Seas. Also, use NAFO Coral and Sponge Identification Guides as appropriate.

**Annex 2. Data Collection Requirements in Existing and New fishing Areas
(FCWGFMS WP 10/5, Rev. 3)**

Article 5bis. Para 1b, First indent:

- The vessel master shall report the incident to the flag state, which without delay shall forward the information to the Executive Secretary, including the position that is provided by the vessel, either the end point of the tow or set or another position that is closest to the exact encounter location, the VME indicator species encountered, and the quantity (kg) of VME indicator species encountered. Contracting Parties may if they so wish require their vessels to also report the incident directly to the Executive Secretary. The Executive Secretary shall archive the information and report it to all Contracting Parties. The Contracting Parties shall immediately alert all fishing vessels flying their flag.

Article 5bis, Para 2b, first indent:

- The vessel master shall report the incident without delay to its flag state, which shall forward the information to the Executive Secretary, including the position that is provided by the vessel, either the end point of the tow or set or another position that is closest to the exact encounter location, the VME indicator species encountered, and the quantity (kg) of VME indicator species encountered. Contracting Parties may if they so wish require their vessels to also report the incident directly to the Executive Secretary. The Executive Secretary shall archive the information and without delay transmit it to all Contracting Parties. The Contracting Parties shall issue an immediate alert to all vessels flying their flag.

Annex 3. Footprint map (extraction of Figure 4b and Table 2 from FC WP 09/01 Rev).

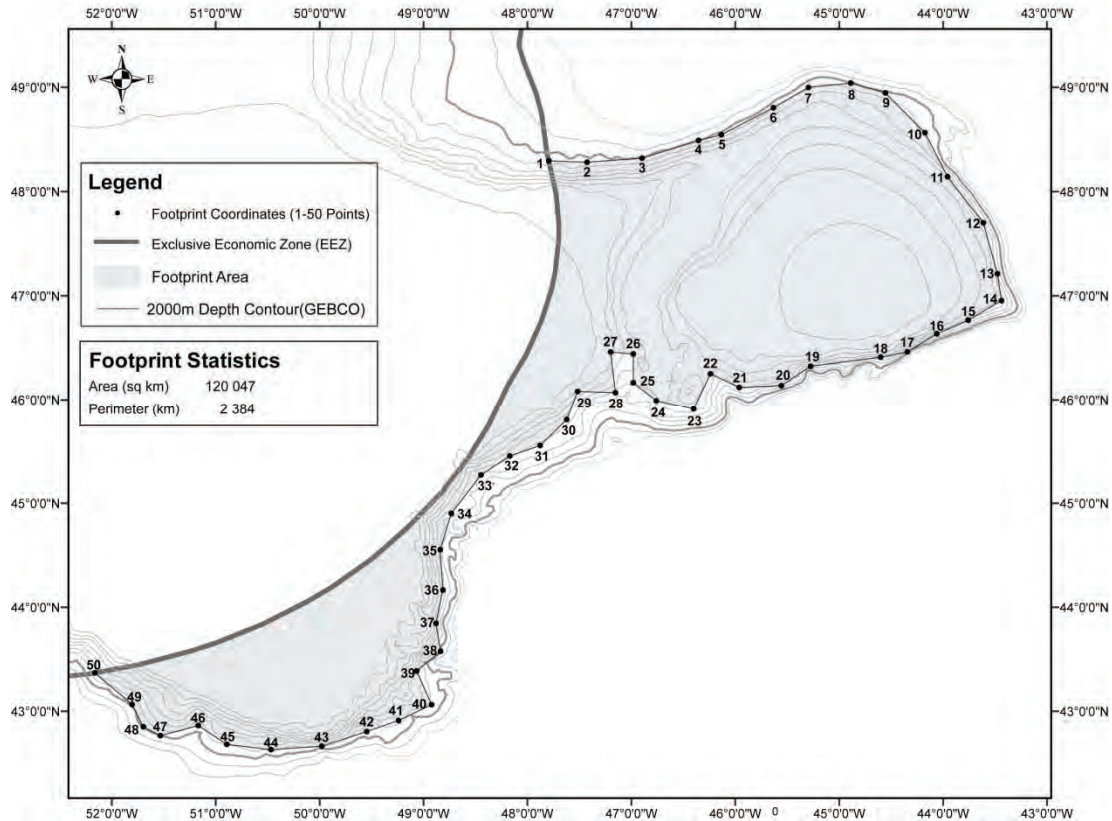


Figure1: NAFO Regulatory Area footprint map (shaded) (Figure 4b of FC WP 09/01 Rev).

Point No.	Latitude	Longitude
1	48°17'39"N	EEZ boundary ¹
2	48°16'51"N	47°25'37"W
3	48°19'15"N	46°53'48"W
4	48°29'21"N	46°21'17"W
5	48°32'43"N	46°08'04"W
6	48°48'10"N	45°37'59"W
7	48°59'54"N	45°17'46"W
8	49°02'20"N	44°53'17"W
9	48°56'46"N	44°33'18"W
10	48°33'53"N	44°10'25"W
11	48°08'29"N	43°57'28"W
12	47°42'00"N	43°36'44"W
13	47°12'44"N	43°28'36"W
14	46°57'14"N	43°26'15"W
15	46°46'02"N	43°45'27"W
16	46°38'10"N	44°03'37"W
17	46°27'43"N	44°20'38"W
18	46°24'41"N	44°36'01"W
19	46°19'28"N	45°16'34"W
20	46°08'16"N	45°33'27"W
21	46°07'13"N	45°57'44"W
22	46°15'06"N	46°14'21"W
23	45°54'33"N	46°24'03"W
24	45°59'36"N	46°45'33"W
25	46°09'58"N	46°58'53"W

Point No.	Latitude	Longitude
26	46°26'32"N	46°58'53"W
27	46°27'40"N	47°12'01"W
28	46°04'15"N	47°09'10"W
29	46°04'53"N	47°31'01"W
30	45°48'17"N	47°37'16"W
31	45°33'14"N	47°52'41"W
32	45°27'14"N	48°10'15"W
33	45°16'17"N	48°26'50"W
34	44°54'01"N	48°43'58"W
35	44°33'10"N	48°50'25"W
36	44°09'57"N	48°48'49"W
37	43°50'44"N	48°52'49"W
38	43°34'34"N	48°50'12"W
39	43°23'13"N	49°03'57"W
40	43°03'48"N	48°55'23"W
41	42°54'42"N	49°14'26"W
42	42°48'18"N	49°32'51"W
43	42°39'49"N	49°58'46"W
44	42°37'54"N	50°28'04"W
45	42°40'57"N	50°53'36"W
46	42°51'48"N	51°10'09"W
47	42°45'59"N	51°31'58"W
48	42°51'06"N	51°41'50"W
49	43°03'56"N	51°48'21"W
50	43°22'12"N	EEZ boundary ²

¹ approximately 47°47'45"W ² approximately 52°09'46"W

Table 1: Boundary points delineating the eastern side of the footprint in the NRA. The Canadian EEZ boundary delineates the western side of the footprint map (Table 2 of FC WP 09/01 Rev).

**Annex 4. Review and update of Chapter Ibis of the NAFO CEM
(FCWGFMS WP 10/4, Rev. 1)**

**Review and update of Chapter Ibis of the NAFO CEM
(Proposal by the USA and the EU)**

Changes proposed without taking into consideration the work carried out by STACTIC in relation to revision of the NAFO CEM control provisions.

Track changes: House cleaning, with reference to point 3 in the proposal adopted by FC at the annual meeting in 2009, Doc. 09/19

Highlighted in yellow: Text to be updated only in the event that the FC adopts the fishing footprint at the NAFO annual meeting 2010

**Chapter Ibis
BOTTOM FISHERIES IN THE NAFO
REGULATORY AREA**

Article Ibis – Purpose and definitions

1. The purpose of this chapter is to ensure the implementation by NAFO of effective measures to prevent significant adverse impacts of bottom fishing activities on vulnerable marine ecosystems known to occur or likely to occur in the Regulatory Area based on the best available scientific information. For the purposes of this Chapter, NAFO will take into account the guidance provided by the FAO in the framework of the Code of Conduct for Responsible Fisheries and any other internationally agreed standards, as appropriate.
2. The term ‘bottom fishing activities’ means bottom fishing activities where the fishing gear is likely to contact the seafloor during the normal course of fishing operations.
3. The term "existing bottom fishing areas" initially means areas where VMS data and/or other available geo-reference data indicating bottom fishing activities have been conducted at least in two years within a reference period of 1987 to 2007. This shall be revised regularly in accordance with Article 2bis-4.
4. The term "new bottom fishing areas" means all other areas within the Regulatory Area which are not defined as existing bottom fishing areas, including waters deeper than 2000 metres.
5. The term “vulnerable marine ecosystems” has the same meaning and characteristics as those contained in paragraphs 42 and 43 of the FAO International Guidelines for the Management of Deep-Sea Fisheries in the High Seas.
6. The term “significant adverse impacts” has the same meaning and characteristics as those described in paragraphs 17-20 of the FAO International Guidelines for the Management of Deep-Sea Fisheries in the High Seas.

Article 2bis - ~~Identification Map~~ of existing bottom fishing areas (footprint)

- ~~1. In 2008, NAFO shall proceed to map existing bottom fishing areas within the Regulatory Area for bottom fishing activities. Mapping of trawling activity shall be given priority.~~
- ~~2. Contracting Parties with vessels involved in bottom fishing activities in the period of 1987-2007 shall, for the purpose of paragraph 1, submit during 2008 comprehensive maps of existing fishing areas to the Executive Secretary. Maps shall be based on VMS data and/or other available geo-reference data and expressed in as precise spatial and temporal resolution as possible. Contracting Parties may, in the future, consider the possibility of refining these maps on the basis of haul by haul information, if available.~~
- ~~3. The Executive Secretary shall compile maps submitted by Contracting Parties pursuant to paragraph 2. The Executive Secretary shall on that basis, as well as on any data available to it, produce a comprehensive map of existing fishing areas. The Executive Secretary shall forward this map to the Scientific Council for review and comment at its meeting in September 2008 and thereafter to the Fisheries Commission.~~

The comprehensive map of existing bottom fishing areas referred to in paragraph 3 produced by the Executive Secretary (reference to ANNEX), based on information submitted by Contracting Parties, shall be revised

regularly to incorporate any new relevant information. Contracting Parties may, in the future, consider the possibility of refining the comprehensive map on the basis of haul by haul information, if available. (existing text from paragraph 2)

Article 3bis - Bottom fishing activities in new fishing areas

1. ~~From 1 January 2009, a~~All bottom fishing activities in new fishing areas or with bottom gear not previously used in the area concerned, shall be considered as exploratory fisheries and shall be conducted in accordance with ~~an~~the exploratory fisheries protocol set out in Part IV of Annex XXV to be adopted by the Fisheries Commission in 2008.
2. The exploratory bottom fishing shall be subject to the assessment procedure set forth in Article 4bis, with the understanding that particular care will be taken in the evaluation of risks of the significant adverse impact on vulnerable marine ecosystems, in line with the precautionary approach.
3. Contracting Parties shall communicate the exploratory fisheries protocol referred to in paragraph 1 to the Executive Secretary for forwarding to the Scientific Council for review and to all Contracting Parties for information, together with the information or preliminary impact assessment referred to in Article 4bis, paragraph ~~23~~ (i), below.
4. Contracting Parties shall provide promptly a report of the results of such activities to the Executive Secretary for circulation to the Scientific Council and all Contracting Parties.
5. Prior to commencing new bottom fishing activities based upon the results of exploratory fisheries conducted in the prior two years, the Fisheries Commission shall review the assessments undertaken in accordance with Article 4bis below and the results of the fishing protocols implemented by the participating fleets, and shall:
 - i. establish conservation and management measures to prevent significant adverse impacts on vulnerable marine ecosystems from individual fishing activities and to ensure the long-term sustainability of deep sea fish stocks, or
 - ii. not authorize these fishing activities to proceed.
6. Contracting Parties shall ensure that vessels flying their flag conducting exploratory fisheries are equipped with a satellite monitoring device and have an observer on board.

Article 4bis - Assessment of bottom fishing

1. The Scientific Council, with the co-operation of Contracting Parties, shall identify, on the basis of best available scientific information, vulnerable marine ecosystems in the Regulatory Area and map sites where these vulnerable marine ecosystem are known to occur or likely to occur and provide such data and information to the Executive Secretary for circulation to all Contracting Parties.
- ~~2. Proposed bottom fishing activities in the Regulatory Area for 2009 shall be subject to assessment by the Scientific Council in 2008, based on the best available scientific information, to determine if such activities, taking account of the history of bottom fishing in the areas proposed, would have significant adverse impacts on vulnerable marine ecosystems.~~
- ~~23.~~ Thereafter, aAssessments for proposed bottom fishing activities in the Regulatory Area shall follow the procedures below:
 - i. Each Contracting Party proposing to participate in bottom fishing shall submit to the Executive Secretary information and an initial assessment, where possible, of the known and anticipated impacts of its bottom fishing activities on vulnerable marine ecosystems, in advance of the next meeting of the Scientific Council. These submissions shall also include the mitigation measures proposed by the Contracting Party to prevent such impacts. The Executive Secretary shall promptly forward these submissions to the Scientific Council and the Fisheries Commission.
 - ii. The submission of such information shall be carried out in accordance with guidance developed by the Scientific Council, or, in the absence of such guidance, to the best of the Contracting Party's ability.

iii. The Scientific Council shall undertake an assessment, according to procedures and standards it develops, and provide advice to the Fisheries Commission as to whether the proposed bottom fishing activity would have significant adverse impacts on vulnerable marine ecosystems and, if so, whether mitigation measures would prevent such impacts. The Scientific Council may use in its assessment additional information available to it, including information from other fisheries in the region or similar fisheries elsewhere.

| 34. The *ad hoc* Working Group of managers and scientists on VMEs, the terms of reference of which are attached, shall examine the advice of the Scientific Council and shall make recommendations to the Fisheries Commission in accordance with its mandate.

| 45. The Fisheries Commission shall, taking account of advice and recommendations provided by the Scientific Council and the *ad hoc* Working Group of scientists and managers, concerning bottom fishing activities, including data and information arising from reports pursuant to Article 5bis adopt conservation and management measures to prevent significant adverse impacts on vulnerable marine ecosystems, that may include:

- (a) allowing, prohibiting or restricting bottom fishing activities;
- (b) requiring specific mitigation measures for bottom fishing activities;
- (c) allowing, prohibiting or restricting bottom fishing with certain gear types, or changes in gear design and/or deployment; and/or
- (d) any other relevant requirements or restrictions to prevent significant adverse impacts to vulnerable marine ecosystems.

| 56. Fisheries Commission will periodically ask Scientific Council and the *ad hoc* working group of managers and scientists on vulnerable marine ecosystems to provide advice to Fisheries Commission on the timing and requirement for assessment of a previously assessed bottom fishery.

Article 5bis – Interim Encounter Provision

Definition of an Encounter – is an encounter, above threshold levels as set out in paragraph 3, with indicator species of coral identified as antipatharians, gorgonians, cerianthid anemone fields, lophelia, and sea pen fields or other VME elements. Any encounter with a VME indicator species or merely detecting the presence of an element itself is not sufficient to identify a VME. That identification should be made on a case-by-case basis through assessment by relevant bodies.

Contracting Parties shall require that vessels flying their flag and conducting bottom fishing activities within the Regulatory Area abide by the following rules, where, in the course of fishing operations, evidence of vulnerable marine ecosystems is encountered:

1) Existing fishing areas

- a) Vessels shall quantify catch of VME indicator species, i.e. coral and sponge.
- b) if the quantity of VME elements or indicator species caught in a fishing operation (such as trawl tow or set of a gillnet or longline) is beyond the threshold defined in paragraph 3 below, the following shall apply:
 - The vessel master shall report the incident to the flag state, which without delay shall forward the information to the Executive Secretary. Contracting Parties may if they so wish require their vessels to also report the incident directly to the Executive Secretary. The Executive Secretary shall archive the information and report it to all Contracting Parties. The Contracting Parties shall immediately alert all fishing vessels flying their flag.
 - The vessel master shall cease fishing and move away at least 2 nautical miles from the endpoint of the tow/set in the direction least likely to result in further encounters. The captain shall use his best judgment based on all available sources of information.

- The Executive Secretary shall make an annual report on single and multiple encounters in discrete areas within existing fishing areas to the Scientific Council. The Scientific Council shall evaluate and, on a case-by-case basis the information and provide advice to the Fisheries Commission on whether a VME exists. The advice shall be based on annually updated assessments of the accumulated information on encounters and the Scientific Council's advice on the need for action, using FAO guidelines as a basis. The Fisheries Commission shall consider the advice in accordance with Article 4bis, paragraph 45.
- 2) Unfished areas that are defined as 'New fishing areas'
- a) Vessels shall quantify catch of VME indicator species, i.e. coral and sponge. Observers deployed shall identify corals, sponges and other organisms to the lowest possible taxonomical level. The sampling protocol found in Annex XXV shall be used (templates).
 - b) If the quantity of VME element or indicator species caught in a fishing operation (such as trawl tow or set of a gillnet or longline) is beyond the threshold defined in paragraph 3 below, the following shall apply:
 - The vessel master shall report the incident without delay to its flag state, which shall forward the information to the Executive Secretary. Contracting Parties may if they so wish require their vessels to also report the incident directly to the Executive Secretary. The Executive Secretary shall archive the information and without delay transmit it to all Contracting Parties. The Contracting Parties shall issue an immediate alert to all vessels flying their flag.
 - The Executive Secretary shall at the same time request Contracting Parties to implement a temporary closure of a two mile radius around the reporting position. The reporting position is that provided by the vessel, either the endpoint of the tow/set or another position that the evidence suggests is closest to the exact encounter location.
 - The Scientific Council at its next meeting shall examine the temporary closure. If the Scientific Council advises that the area consists of a vulnerable marine ecosystem the Executive Secretary shall request Contracting Parties to maintain the temporary closure until such time that the Fisheries Commission has acted upon the advice from the Scientific Council in accordance with Article 4bis, paragraph 45 in Chapter Ibis. If the Scientific Council does not conclude that the proposed area is a VME, the Executive Secretary shall inform Contracting Parties which may re-open the area to their vessels.
 - The vessel shall cease fishing and move away at least 2 nautical miles from the endpoint of the tow/set in the direction least likely to result in further encounters. The captain shall use his best judgment based on all available sources of information.
 - The Executive Secretary shall make an annual report on archived reports from encounters in *new fishing areas* to the Scientific Council. This report shall also include reports from the exploratory fishing activities that were conducted in the last year. The Scientific Council shall evaluate the information and provide advice to the Fisheries Commission on the appropriateness of temporary closures and other measures. The advice should be based on annually updated assessments of the accumulated information on encounters as well as other scientific information. The Scientific Council's advice should reflect provisions outlined in the FAO guidelines. The Fisheries Commission shall consider the advice in accordance with Article 4bis, paragraph 45.
- 3) For both existing and new fishing areas, an encounter with primary VME indicator species is defined as a catch per set (e.g. trawl tow, longline set, or gillnet set) of more than 60 kg of live coral and/or 800 kg of live sponge. These thresholds are set on a provisional basis and may be adjusted as experience is gained in the application of this measure.

Article 6bis - Review

The provisions of this chapter shall be reviewed by the Fisheries Commission at its Annual Meeting in 2011. The Commission shall biannually thereafter examine the effectiveness of these provisions in protecting vulnerable marine ecosystems from significant adverse impacts.

ATTACHMENT:**Terms of Reference****Ad Hoc Working Group of Fishery Managers and Scientists on Vulnerable Marine Ecosystems****Structure:**

~~An ad hoc Working Group of Fishery Managers and Scientists on Vulnerable Marine Ecosystems is established in 2008 which reports to the Fisheries Commission, consults with Scientific Council, and provides recommendations to Fisheries Commission.~~

~~The Working Group shall be comprised of fishery managers and scientists from Contracting Parties supported by advisors, as required, up to a maximum of three participants per Contracting Party. The Chair/Vice chair shall be selected from participating fishery managers and scientists with both a fishery manager and a scientist represented in the two positions.~~

~~Consideration shall be given by the Fisheries Commission in 2010 to the continuation or dissolution of the working group.~~

Objective:

~~The main objective of the Working Group is to make recommendations to Fisheries Commission on the effective implementation of measures to prevent significant adverse impacts on vulnerable marine ecosystems.~~

Specific Duties:

~~The Working Group shall:~~

~~In examining the advice of Scientific Council to Fisheries Commission, evaluate risk and make recommendations on mitigation strategies and measures to avoid significant adverse impacts on vulnerable marine ecosystems, drawing on relevant international information[†].~~

~~Develop operational procedures in 2008 in relation to encounters of vulnerable marine ecosystems to prevent significant adverse impacts.~~

~~Review and finalize the attached Exploratory Fishery Protocol for new fishing areas including the development of templates for elements of the protocol for adoption by the Fisheries Commission in 2008.~~

Meetings:

~~The Working Group will meet at least once annually between the Meeting of Scientific Council and the Annual Meeting of NAFO and shall communicate regularly through teleconferences and electronically, as required.~~

[†]Including but not limited to the pending FAO International Guidelines for the Management of Deep Sea Fisheries in the High Seas

Annex XXV (contd)

IV. Exploratory Protocol for New Fishing Areas

The Exploratory Fishery Protocol for New Fishing Areas shall ~~include~~ consist of:

- A harvesting plan which outlines target species, dates and areas. Area and effort restrictions should be considered to ensure fisheries occur on a gradual basis in a limited geographical area.
- A mitigation plan including measures to prevent significant adverse impact to vulnerable marine ecosystems that may be encountered during the fishery.
- A catch monitoring plan that includes recording/reporting of all species caught, 100% satellite tracking and 100% observer coverage. The recording/reporting of catch should be sufficiently detailed to conduct an assessment of activity, if required.
- A data collection plan to facilitate the identification of vulnerable marine ecosystems/species in area fished.

Exploratory fisheries shall not commence until this information has been provided to the Executive Secretary and forwarded to all Contracting Parties and the Scientific Council for information.

**Annex 5. Requirements for bottom fishing assessment
(FCWGFMS WP 10/2, Rev. 2)**

Proposal for Amendment of Article 4bis of Chapter Ibis
(Proposed by the United States)

Proposal

Article 4bis, paragraph 3.i. would read as follows:

3i. If proposed bottom fishing has not been covered by a previous assessment, or if there are significant changes to the fishery, or in light of new scientific information, the Contracting Party proposing to participate in bottom fishing shall submit to the Executive Secretary information and a preliminary assessment of the known and anticipated impacts of its bottom fishing activities on vulnerable marine ecosystems no less than two weeks in advance of the opening of the annual meeting in June of the Scientific Council. Assessments should address the elements as set forth in Annex XXVbis. The Executive Secretary shall promptly forward these submissions to the Scientific Council and the Fisheries Commission.

Annex XXVbis Assessment of Bottom Fishing Activities

Assessments should address, *inter alia*:

1. Type(s) of fishing conducted or contemplated, including vessels and gear types, fishing areas, target and potential bycatch species, fishing effort levels and duration of fishing (harvesting plan);
2. Best available scientific and technical information on the current state of fishery resources and baseline information on the ecosystems, habitats and communities in the fishing area, against which future changes are to be compared;
3. Identification, description and mapping of VMEs known or likely to occur in the fishing area;
4. Identification, description and evaluation of the occurrence, scale and duration of likely impacts, including cumulative impacts of activities covered by the assessment on VMEs;
5. Data and methods used to identify, describe and assess the impacts of the activity, the identification of gaps in knowledge, and an evaluation of uncertainties in the information presented in the assessment;
6. Risk assessment of likely impacts by the fishing operations to determine which impacts on VMEs are likely to be significant adverse impacts; and

The proposed mitigation and management measures to be used to prevent significant adverse impacts on VMEs, and the measures to be used to monitor effects of the fishing operations.

**Annex 12. Amendment of Article 4bis of Chapter Ibis –
Assessment of Bottom Fishing**
(FC Working Paper 10/8, Revision 2 now FC Doc. 10/14)

Proposal

Article 4bis, paragraph 3.i. would read as follows:

3i. If proposed bottom fishing is outside of the footprint identified by the Fisheries Commission, or if there are significant changes to the conduct or technology of existing bottom fisheries, or new scientific information indicating a VME in a given area, the Contracting Party proposing to participate in bottom fishing shall submit to the Executive Secretary information and a preliminary assessment of the known and anticipated impacts of its bottom fishing activities on vulnerable marine ecosystems no less than two weeks in advance of the opening of the annual meeting in June of the Scientific Council. Assessments should address the elements as set forth in Annex XXVbis. The Executive Secretary shall promptly forward these submissions to the Scientific Council and the Fisheries Commission.

Annex XXVbis Assessment of Bottom Fishing Activities

Assessments should address, *inter alia*:

1. Type(s) of fishing conducted or contemplated, including vessels and gear types, fishing areas, target and potential bycatch species, fishing effort levels and duration of fishing (harvesting plan);
2. Best available scientific and technical information on the current state of fishery resources and baseline information on the ecosystems, habitats and communities in the fishing area, against which future changes are to be compared;
3. Identification, description and mapping of VMEs known or likely to occur in the fishing area;
4. Identification, description and evaluation of the occurrence, scale and duration of likely impacts, including cumulative impacts of activities covered by the assessment on VMEs;
5. Data and methods used to identify, describe and assess the impacts of the activity, the identification of gaps in knowledge, and an evaluation of uncertainties in the information presented in the assessment;
6. Risk assessment of likely impacts by the fishing operations to determine which impacts on VMEs are likely to be significant adverse impacts; and
7. The proposed mitigation and management measures to be used to prevent significant adverse impacts on VMEs, and the measures to be used to monitor effects of the fishing operations.

**Annex 13. Terms of Reference – Working Group of Fishery Managers
and Scientists on Vulnerable Marine Ecosystems**
(FC Working Paper 10/10, Revised **now** FC Doc. 10/15)

Structure:

Working Group of Fishery Managers and Scientists on Vulnerable Marine Ecosystems reports to the Fisheries Commission, considers the advice of Scientific Council, and provides recommendations to Fisheries Commission.

The Working Group shall be comprised of fishery managers and scientists from Contracting Parties supported by advisors, as required, up to a maximum of three participants per Contracting Party. The Chair/Vice-chair shall be selected from participating fishery managers and scientists with both a fishery manager and a scientist represented in the two positions.

Objective:

The main objective of the Working Group is to make recommendations to the Fisheries Commission on the effective implementation of measures to prevent significant adverse impacts on vulnerable marine ecosystems.

Specific Duties:

In responding to requests for advice and recommendations from the Fisheries Commission, the Working Group shall:

Consider the advice of Scientific Council to Fisheries Commission; evaluate associated risks; and make recommendations on mitigation strategies and measures to avoid significant adverse impacts on vulnerable marine ecosystems, drawing on relevant international guidance¹.

Review area closures, fisheries impact assessments and other measures outlined in the NAFO Conservation and Enforcement Measures (NCEMs) with specific timelines.

Update the text in Chapter I bis of the NCEMs as necessary.

Meetings:

The Working Group will meet as required by the Fisheries Commission. Whenever possible, meetings of the Working Group should occur between the annual June meeting of Scientific Council and the NAFO annual meeting, and shall communicate regularly through teleconferences and electronically, as required.

¹ Including but not limited to the FAO International Guidelines for the Management of Deep-Sea Fisheries in the High Seas

Annex 14. Duration of Inspections
(STACTIC Working Paper 09/20 now FC Doc. 10/16)

The Conservation and Enforcement Measures, Chapter IV Joint Inspection and Surveillance Article 33 9 - Inspection Procedure currently states that the duration of an inspection shall not exceed (3) hours. Operational experiences have demonstrated that the (3) hour requirement can restrict inspectors in the time needed to complete a thorough and detailed inspection. Furthermore, in the context of joint patrols it would be desirable to allow for additional time to facilitate interpretational discussions and coordination necessary to facilitate consensus on inspection results/outcomes.

In addition to the elements described above, the movement to a (4) hour inspection duration would also serve to harmonize with the NEAFC *Scheme for Control and Enforcement* (Article 18.5) which states:

“The duration of an inspection shall not exceed 4 hours, or until the net is hauled in and the net and catch are inspected, whichever is longer.”

Possible Amendment

Chapter IV – Joint Inspection and Surveillance, Article 33 9, Inspection Procedures as follows:

9. The duration of an inspection shall not exceed ~~three~~ **four** hours, or until the net is hauled in and the net and catch are inspected, whichever is longer. This time limitation shall not apply in the case of an infringement.

Annex 15. Inspection Party Composition – Article 33(4)
(STACTIC Working Paper 10/21, Revision 2 now FC Doc. 10/17)

The current NAFO Conservation and Enforcement Measures (NCEM's), Article 33, explicitly calls for an inspection party to consist of “*at a maximum two inspectors*”, with the possibility of a third member if it is an inspection trainee and only where vessel conditions permit.

Given that the measures already allow for the possibility of a three member inspection party and that allowing the third member, previously only an inspection trainee, to be a regular inspector would provide additional flexibility to those Contracting Parties that conduct inspections under the NCEMs, it would seem appropriate, especially in the context of tight inspection duration timeframes, to sanction the use of an additional inspector were warranted.

Furthermore, recent joint inspections, conducted with the USCG, also lend further credence to allow for an additional inspector to facilitate this type of joint activity and not force Contracting Parties with inspection vessels in the NRA to rotate between its own inspectors and that of a guest Contracting Party, but rather to allow a fully effective and multinational inspection party.

It should also be noted that the NEAFC *Scheme of Control and Enforcement*, Article 18.6, places no actual limit on the number of inspection party members, rather only limits the number of inspectors from each NEAFC Contracting Party, when inspecting the vessel of another Contracting Party.

Possible Amendment

Proposal – Amend Chapter IV – *Joint Inspection and Surveillance Scheme, Article 33, Inspection Procedure.*

Replace the current text of Article 33(4) with the following:

4. An inspection party shall consist of at maximum four inspectors. An inspection trainee may accompany the inspection party for training purposes only, however the inspection trainee counts against the inspection party maximum of four. In such circumstances, the inspection party shall, upon arrival on board, identify the trainee to the master of the fishing vessel. This trainee shall simply observe the inspection operation conducted by the authorized inspectors and shall in no way interfere with the activities of the fishing vessel.

Annex 16. Chartering Arrangements

(STACTIC Working Paper 10/8, Revision 2 **now** FC Doc. 10/18)

It is noted that when a vessel engaged in a chartering arrangement is boarded at sea, inspectors do not know the information notified to the Secretariat regarding the chartering arrangement.

It is requested to adopt a provision allowing the inspectors at sea to be provided with the information related to the chartering arrangement when boarding a chartered vessel.

Possible amendment

Add the following sentence at the end of Article 19 (9):

The flag State of the chartered vessel shall provide a copy of the documentation referred to in this paragraph to the chartered vessel, to be carried on board.

Annex 17. Daily Communication of Catches
NAFO CEM Article 27 + Annex X and Annex XXII
(STACTIC Working Paper 10/9, Revision 5 **now** FC Doc. 10/19)

It is noted that a lack of clarity in some technical issues related to the communication of catches under Article 27 create confusion and do not allow an automated process of data for quota up-take and control. These are:

- the "CAT" reference, which is currently used for 3 different type of communication: weekly; daily and for the cross of boundary 3L (for PRA)
- the aggregation of the catch per species inside of a stock area in the weekly CAT message
- the option to choose the period for communicating aggregated catch reports
- the lack of specific field to declare catch under chartering

It is requested

- to use the CAT reference only for the daily catch reporting by Division and for all species
- to abandon the use of weekly catch report
- to give a specific code (COB) for the cross boundary 3L/3M messages for shrimp fishery
- to clarify the requirements defining each data element of the message
- to specify that the CAT message reports only the catch of the day before, per species and per Division
- to specify that the COE, COX and COB messages provide cumulative figures only per species, for control/inspection purposes
- to identify the catch under chartering
- to adapt Annex X and XXII for clarity

Possible amendments

1. Replace Article 27 §1 under c) and d) by the following text

c) Catch report. This report shall be on a daily basis and shall include catch of all species of the day preceding the report, including nil catch returns. The report shall be sent each day before 12.00 hours UTC of the day after fishing. This message is identified as CAT.

d) Catch prior to entry to and exit from 3L. This reports shall be made by vessels that fish shrimp in Division 3L and shall be sent one hour prior to crossing the boundary of Division 3L in entry and in exit. It shall include the requirements in Annex X point 3. This report shall be identified as COB;

2. Replace Article 27 point 3 second paragraph by the following text

The sequence of messages ~~under Article 26 and this article~~ shall be as follows:

Report	Code	Remarks Requirements for the field
Catch on Entry	COE	6 hours in advance of the vessels entry into the RA
Entry	ENT	The first position report from a vessel detected to be inside the RA
Position	POS	Position report every hour
Catch	CAT	Reporting of catches; in a daily basis, for all species by Division
Cross Boundary	COB	Reporting of catches; prior to crossing the boundary to 3L as appropriate
Transshipment	TRA	Report on quantities to be on-loaded (receiving vessel) or off-loaded (donor vessel), for each transshipment
Catch on Exit	COX	6 hours in advance of the vessels departure from the RA
Exit	EXI	The first position report from a vessel detected to be outside the RA
Port of Landing	POR	Report (receiving vessel) on catch onboard to be landed, for each landing after transshipment

3. Modify Annex X in accordance with the following provisions

a) Point 1: Replace the specified remarks by the following

1) “Catch on ENTRY” Report

Data Element	Field Code	Mandatory/Optional	Requirements for the field
On board	OB	M	Total round weight of fish by species on board upon entry into the Regulatory Area in kilograms rounded to the nearest 100 kilograms. Allow for several pairs of fields, consisting of species (FAO 3 alpha codes) + live weight in kilograms (until 9 digits), with each field separated by a space, e.g. //OB/speciesspaceweightspacspeciespaceweightspacspeciespaceweightspace//
Directed species	DS	M	Main target species in the Regulatory area. Allow several species to be entered with the value separated by spaces, e.g. //DS/speciesspacespeciespacespecies//

b) Point 4: Replace the specified remarks by the following

Renumber current point 4 as new point 5

4 5) “Catch on EXIT” Report

Data Element	Field Code	Mandatory/Optional	Requirements for the field
Catch	CA	M	Activity detail; Catch retained onboard by species and by Division since last CAT report in kilograms rounded to the nearest 100 kilograms. Allow for several pairs of fields, consisting of species (FAO 3 alpha codes) + live weight in kilograms (until 9 digits), with each field separated by a space, e.g. //CA/speciesspaceweightspacspecieswspaceeightspacspeciespaceweightspace//
Species Live weight	OB	M	Activity detail; Total round weight of fish by species on board upon exit from the Regulatory Area in kilograms rounded to the nearest 100 kilograms Allow for several pairs of fields, consisting of species (FAO 3 alpha codes) + live weight in kilograms (until 9 digits), with each field separated by a space, e.g. //OB/speciesspaceweightspacspeciespaceweightspacspeciespaceweightspace//
Days fished	DF	O	Activity detail; number of fishing days in the Regulatory Area

c) Point 2: Replace table by the following table

Add new footnotes 3 and 4 under the table

2) “Catch report”

Data Element	Field Code	Mandatory/Optional	Requirements for the field
Start record	SR	M	System detail; indicates start of record
Address	AD	M	Message detail; destination, “XNW” for NAFO
From	FR	M	Message detail; Address of the transmitting party (ISO-3)
Sequence Number	SQ	M	Message detail; serial number in current year
Type of Message	TM	M	Message detail; message type, “CAT” as Daily Catch report

Radio call sign	RC	M	Vessel registration detail; international radio call sign of the vessel
Trip Number	TN	O	Activity detail; fishing trip serial number in current year
Vessel Name	NA	O	Vessel registration detail; name of the vessel
Contracting Party Internal Reference Number	IR	O	Vessel registration detail; unique Contracting Party vessel number as ISO-3 flag state code followed by number
External Registration Number	XR	O	Vessel registration detail; the side number of the vessel
Relevant Area	RA	M	Activity detail; NAFO Division
Latitude	LA	M	Activity detail; position at time of transmission
Longitude	LO	M	Activity detail; position at time of transmission
Catch	CA	M	Activity detail; Catch retained onboard by species and by Division since last CAT report in kilograms rounded to the nearest 100 kilograms. Allow for several pairs of fields, consisting of species (FAO 3 alpha codes) + live weight in kilograms (until 9 digits), with each field separated by a space, e.g. //CA/speciesspaceweightspacspeciespaceweightspacspeciespaceweightspace//
Species Live weight			
Chartering Flag	CH	M ³	Flag of Chartering Contracting Party to which the catch must be allocated
Days Fished	DF	M	Activity detail; number of fishing days in the Regulatory Area since last CAT report, as appropriate ⁴
Date	DA	M	Message detail; date of transmission
Time	TI	M	Message detail; time of transmission
End of record	ER	M	System detail; indicates end of record

³ Mandatory if fishing activity under chartering agreement

⁴ By default, the normal reporting period should be 1 day

d) Point 3: Insert the following table as new point 3

3) “Catch on crossing Boundary” 3L report (for PRA)

Data Element	Field Code	Mandatory/Optional	Requirements for the field
Start record	SR	M	System detail; indicates start of record
Address	AD	M	Message detail; destination, “XNW” for NAFO
From	FR	M	Message detail; Address of the transmitting party (ISO-3)
Sequence Number	SQ	M	Message detail; serial number in current year
Type of Message	TM	M	Message detail; message type, “COB” for Cross Boundary Catch report
Radio call sign	RC	M	Vessel registration detail; international radio call sign of the vessel
Trip Number	TN	O	Activity detail; fishing trip serial number in current year
Vessel Name	NA	O	Vessel registration detail; name of the vessel
Contracting Party Internal Reference Number	IR	O	Vessel registration detail; unique Contracting Party vessel number as ISO-3 flag state code followed by number
External Registration Number	XR	O	Vessel registration detail; the side number of the vessel
Relevant Area	RA	M	Activity detail; NAFO Division entering from
Latitude	LA	M	Activity detail; position at time of transmission
Longitude	LO	M	Activity detail; position at time of transmission

Catch	CA	M	Activity detail; Catch retained onboard by species and by Division since last CAT report in kilograms rounded to the nearest 100 kilograms. Allow for several pairs of fields, consisting of species (FAO 3 alpha codes) + live weight in kilograms (until 9 digits), with each field separated by a space, e.g. //CA/speciesspaceweightspacespeciesspaceweightspacespeciesspaceweightspace//
Species Live weight			
Area of entry	AE	M	Activity detail; NAFO Division entering into
Catch	OB	M	Activity detail; Cumulative catch retained on board by species in kilograms rounded to the nearest 100 kilograms. since commencement of fishing in the Regulatory Area. Allow for several pairs of fields, consisting of species FAO 3 alpha codes) + live weight in kilograms (until 9 digits), with each field separated by a space, e.g. //OB/speciesspaceweightspacespeciesspaceweightspacespeciesspaceweightspace//
species live weight			
Days Fished	DF	O	Activity detail; number of fishing days in the Regulatory Area
Date	DA	M	Message detail; date of transmission
Time	TI	M	Message detail; time of transmission
End of record	ER	M	System detail; indicates end of record

- e) Renumber current point 3 as new point 4
Replace the specified line by the following

3 4) "Transshipment" Report

Data Element	Field Code	Mandatory/Optional	Requirements for the field
Quantity on-loaded or off-loaded	KG	M	Quantity by species in the Regulatory Area on-loaded or off-loaded in kilograms rounded to the nearest 100 kilograms. Allow for several pairs of fields, consisting of species (FAO 3 alpha codes) + live weight in kilograms (until 9 digits), with each field separated by a space, e.g. //KG/speciesspaceweightspacespeciesspaceweightspacespeciesspaceweightspace//
Species Live weight			

- f) Point 5: Replace the specified lines by the following
Renumber point 5 as new point 6

5 6) "Port of landing" Report

Data Element	Field Code	Mandatory/Optional	Requirements for the field
Quantity to be landed	KG	M	Activity detail; Quantity by species in kilograms rounded to the nearest 100 kilograms, to be landed in a port: Allow for several pairs of fields, consisting of species +9 weight (FAO 3 alpha codes) + live weight in kilograms (until 9 digits), with each field separated by a space, e.g. //KG/speciesspaceweightspacespeciesspaceweightspacespeciesspaceweightspace//
Species Live weight			

Quantity on board	OB	M	Activity detail; Quantity by species in kilograms rounded to the nearest 100 kilograms on-board. Allow for several pairs of fields, consisting of species (FAO 3 alpha codes) + live weight in kilograms (until 9 digits), with each field separated by a space, e.g. //OB/speciesspaceweightspacspeciesspaceweightspacspeciesspaceweightspace//
Species Live weight			

4. **Insert the following line in Annex XXII point C in category "Activity details"**

Category	Data Element	Field code	Type	Contents	Definitions
Activity Details	Chartering Flag Catches	CH	Char*3	ISO-3166	Flag of Chartering Contracting Party

Annex 18. Notification Requirements – NAFO CEM Article 30
(STACTIC Working Paper 10/10 now FC Doc. 10/20)

Article 30 requests CP to notify by 1 November the inspectors, inspection means and inspection plans related to their sea inspection programme.

Postponing by 1 month such notification would allow CP to better prepare the provisional plans for the inspection activities in the RA.

The availability of such information would be easier if posted on the secure part of the NAFO website.

It is requested to postpone the deadline from 1 November to 1 December and to invite the Secretariat to post the information on the secure part of the NAFO website.

Possible amendment

1. Replace 1 November by 1 December in paragraphs 1 and 3 of Article 30
2. Insert new paragraph 4 in Article 30:

4. The Executive Secretary shall post the information received from the CP on the secure part of the NAFO website.

Annex 19. Report on Infringements – NAFO CEM Article 42
(STACTIC Working Paper 10/11, Revision 2 now FC Doc. 10/21)

Article 42(1) states that CP shall report twice a year on infringements detected on their vessels and the relative follow-up, and on significant differences in the recording of catches from logbooks and the inspector's estimation. No standardized reporting process is proposed.

The rationale for such a biannual reporting is not clear.

It is requested

- to deliver a report once a year (on 1 March), instead of twice
- to standardize the reporting process (unique e-format)

The Executive Secretary shall establish the form of the report for the electronic notification by Contracting Parties.

Possible amendment

Modify paragraph 1 in Article 42 in accordance with the following text

1. Contracting Parties shall report to the Executive Secretary by 1 March each year:
 - a) the action taken during the previous year concerning infringements notified to it by a Contracting Party. The infringements shall continue to be listed on each subsequent report until the action is concluded under the laws of the Flag State; and
 - b) differences that they consider significant between records of catches in the logbooks of vessels of the Contracting Party and inspectors' estimates of catches on board the vessels.

Annex 20. Report on Infringement Form
 (STACTIC Working Paper 10/19, Revised now FC Doc. 10/22)

Form to be used for the electronic notification by Contracting Parties in complying with NCEM Article 42.

Northwest Atlantic Fisheries Organization Report on Infringements – CEM Chapter IV, Article 42											
Contracting Party											
Period											
Date of Report											
Case Reference #											
Reported Infringement			First Sea Inspection			Second Sea Inspection (if applicable)			Port Inspection (if applicable)		
Flag State	Fishing Vessel (Name, Call Sign)	Type (Details)	Date	by CP	Division	Date	by CP	Division	Date	Port Name	Port State
Apparent Infringement		NCEM Provision									
		Documentation									
Disposition / Follow-up actions			Action or Status	Comments/Observations							
			Action or Status								
			Action or Status								
			Action or Status								

Annex 21. Report on Port State Control Inspection (PSC 3) – NCEM Annex XIII
(STACTIC Working Paper 10/23 now FC Doc. 10/23)

A. INSPECTION REFERENCE					
Landing	Yes	No	Transhipment	Yes	No
Port State			Port of landing or transhipment		
Vessel name	Flag State		IMO Number ¹	International Radio call sign	
Landing/transhipment started		Date	Time		
Landing/transhipment ended		Date	Time		
B. INSPECTION DETAILS					
Name of Donor Vessel ²	IMO Number ¹		Radio Call sign	Flag State	
B1. CATCH RECORDED IN THE LOGBOOK					
Species ³	Area of catch		Declared live weight kg	Conversion Factor Used	

¹ Fishing vessels not assigned an IMO number shall provide their external registration number

² In case where a vessel has engaged in transhipment operations . A separate form shall be used for each donor vessel

³ FAO Species Codes – **NEAFC Annex V NAFO Annex II**

E. INFRINGEMENTS AND FOLLOW-UP			
E1. NAFO			
E.1A Sea Inspection			
Infringements resulting from Inspections inside NAFO RA			
Inspection Party	Date of Inspection	Division	NAFO CEM infringement legal reference
E1B Port Inspection results			
(a) – Confirmation of Infringements found at sea inspection			
NAFO CEM Infringement legal reference		National Infringement Legal Reference	
(b) – Infringements found at sea inspection and not possible to be confirmed during the Port Inspection			
Comments:			
(c) - Additional infringements found during the Port Inspection			
NAFO CEM Infringement legal reference		National Infringement Legal Reference	
E2. NEAFC INFRINGEMENT NOTED			
Article:	NEAFC provision(s) violated and summary of pertinent facts		
Observations:			
Inspectors Name	Inspectors Signature	Date and Place	
F:DISTRIBUTION			
Copy to flag state	Copy to NEAFC Secretary	Copy to NAFO Executive Secretary	

Annex 22. Shrimp Strengthening Bags
(STACTIC Working Paper 10/24, Revised ~~now~~ FC Doc. 10/24)

At present, the NAFO Conservation and Enforcement Measures (NAFO/FC Doc. 10/1), Chapter I, Article 13 (6) states that: “vessels shall not use any means or device which would obstruct the meshes or diminish the size of the meshes”. Irrespective of this provision vessels may still attach authorized topside chafers, described in Annex XV, to the upper side of the codend in such a manner that they will not obstruct the meshes of the codend inclusive of any lengthener(s).

Historically, vessels fishing shrimp have used an outer “strengthening bag” over the topside of the codend to provide support to the codend. While the wording within the current NCEMs does not allow for this type of attachment, vessels continue to use them.

It is Canada’s view it is acceptable for shrimp vessels to use strengthening bags. Accordingly, provisions should be inserted into the NCEMs to address the manner in which the strengthening bag must be attached to the trawl.

Possible Amendment

Use of shrimp strengthening bags in the NRA: effective January 1, 2011.

In order to ensure the proper attachment of shrimp strengthening bags currently in use in the NRA, Canada would suggest that parameters be documented in the NCEM to ensure that the attachments do not diminish the size of meshes in the codend, obstruct the mesh or sorting grids or grates.

Annex XV

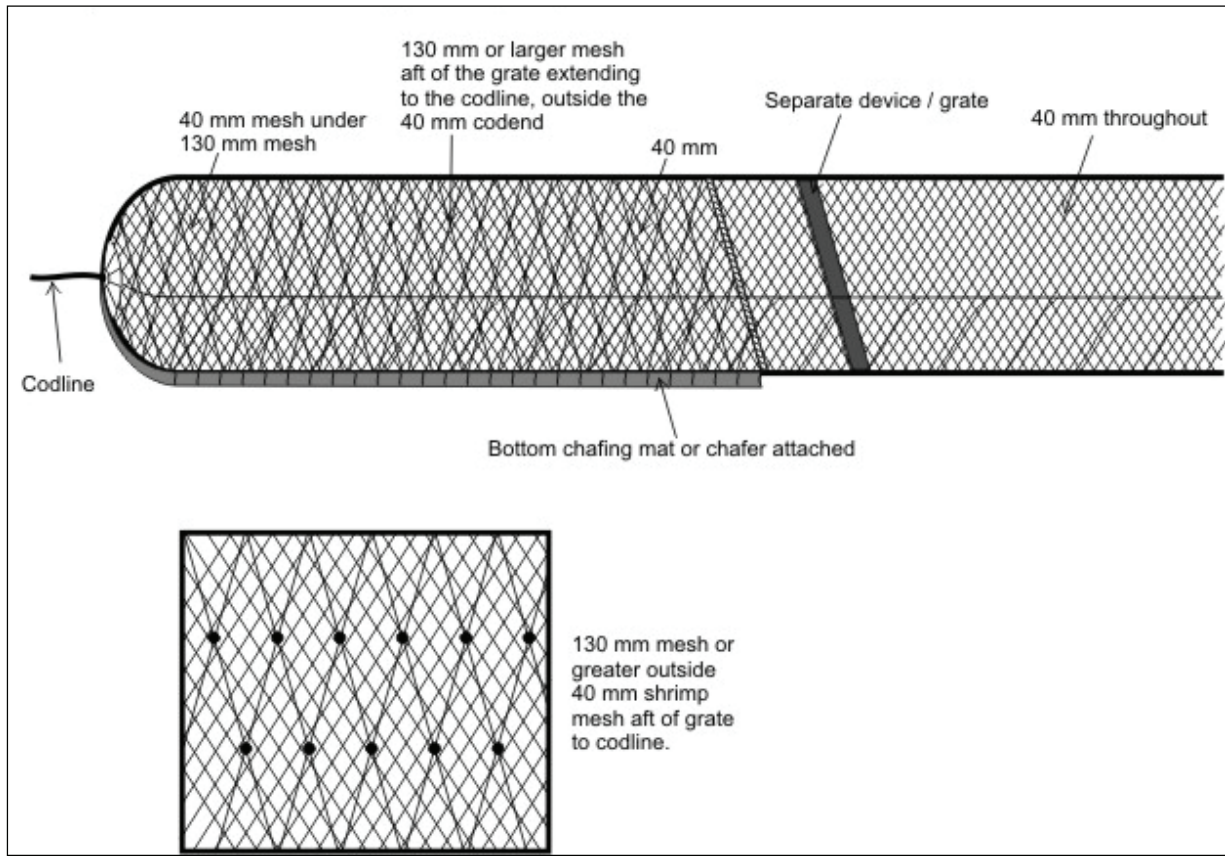
Add the following to Annex XV in reference to vessels fishing for shrimp in the NRA.

3. Shrimp Trawl – Codend Strengthening Bag (Figure 1), for vessels directing for shrimp in the NRA

A strengthening bag is defined as an outer covering of netting that can be used on a shrimp trawl to protect and provide strength to the codend of the shrimp trawl.

- (a) Vessels shall not use a strengthening bag of which the mesh size is less than 130 millimeters.
- (b) The strengthening bag shall not extend forward of the sorting grids or grates or obstruct the sorting grids or grates in any way.
- (c) A strengthening bag shall not be attached in any way that restricts the authorized mesh or obstructs the mesh opening.
- (d) Vessels shall not use a strengthening bag with any other top-side chafers simultaneously.

Figure 1 Shrimp Trawl Codend Strengthening Bag (side view)



Annex 23. Delisting Procedure for IUU Vessels
(STACTIC Working Paper 10/36, Revised **now** FC Doc. 10/25)

The NAFO procedures to remove a vessel from the NAFO listings related to vessels engaged in IUU fishing activities does not provide exhaustive criteria on which STACTIC should base its decision to delist the vessel concerned.

Considering the similarity between both IUU listings, it is requested to align the delisting criteria in NAFO with the relevant criteria for NEAFC. This would in particular allow Contracting Parties to recommend the removal of an IUU listed vessel without the intervention of the flag State.

Possible amendment

Insert the following text in Article 57 paragraph 3 after d)

- e) **the vessel has sunk, been scrapped, or permanently reassigned for purposes other than for fishing activities.**

STACTIC may also recommend that the vessel be removed from the Provisional List or the IUU List if a Contracting Party provides satisfactory evidence that the conditions under e) have been met.

**Annex 24. Minimum Standards for Product Labelling under Article 23 and
Labelling shall accurately reflect Logbook Records under Article 24**

(STACTIC Working Paper 10/37, Revised now FC Doc. 10/26)

Background

There are currently no minimum standards for product labelling in the NCEM. The lack of a standard has resulted in labels having information that is not legible. Also labels have fallen off the packaging or the original date of capture label has been covered with an additional label.

To ensure that product can be inspected properly it is recommended that minimum standards on product labelling be introduced to the NCEM.

The mislabeling of catch limits the ability for NAFO inspectors to reconcile catch in the hold with what is recorded by the Master. The mislabeling of catch has also resulted in catch being mis-recorded, particularly in the case of the 3L/3M Shrimp fisheries where the date of capture is required. For greater clarity of the measures, and given the direct correlation with mis-recording, it is recommended that the labeling of product shall be accurately recorded in the daily production and fishing logbooks. It should also be recognized that the inaccurate labelling of product should be considered a serious infringement of the measures.

Proposed Amendments

Amend Article 23 by adding the following text.

Labels shall be securely affixed, stamped or written on packaging and be of a size that can be clearly read by inspectors in the normal course of their duties. Labels shall be clearly marked in ink on a contrasting background. Each package shall not contain more than one product category. In the case of shrimps harvested in Divisions 3L and 3M and Greenland halibut harvested in Subarea 2 and Divisions 3KLMNO each package shall only contain one stock area. In the case of shrimps each package shall only contain one date of capture.

Amend Article 24.2 by adding the following text.

Catches and Product labelled in accordance with Article 23 shall be accurately recorded in the daily production logbook and the daily fishing logbook.

**Annex 25. Annual Compliance Review 2010
(Compliance Report for Calendar Year 2009)
(STACTIC Working Paper 10/26 now FC Doc. 10/28)**

1. Introduction

In 2004, NAFO introduced its first compliance review (FC Doc. 04/13). This review uses information from diverse NAFO monitoring, control and surveillance activities to determine how well the international fisheries complied with the annually updated NAFO Conservation and Enforcement Measures (NCEM). The review also assesses the performance of NAFO Contracting Parties with regard to their reporting obligations.

The format of the compliance review is being continuously developed by the Standing Committee on International Control (STACTIC). The current 2010 NAFO compliance review compares information for the years 2004 to 2009 from the following sources: a) Vessel Monitoring System (VMS), b) Observer Reports, c) Port Inspection Reports, d) At-sea Inspection Reports and e) Reports on Dispositions of Apparent Infringements. More detailed data compilation tables were compiled by the NAFO Secretariat and circulated to the Contracting Parties in June 2010.

2. Fishing Activities (effort) in the NAFO Regulatory Area

In the years covered by this review, overall fishing activity in the NAFO Regulatory Area (NRA) has continually diminished, with the exception of the groundfish fishery in 2009. In 2004, there were 134 active vessels operating in the NRA. However, by 2009 the number of active vessels decreased to 51, representing a 62-percent decrease (Figure 1). This number increased slightly in 2009 to 62 active vessels, but that is due to an increase in the number of vessels participating in both the groundfish and shrimp fisheries. Conversely, for the pelagic redfish fishery, the number of vessels has dropped by almost 98 percent; from 48 in 2004 to only 1 in 2009.

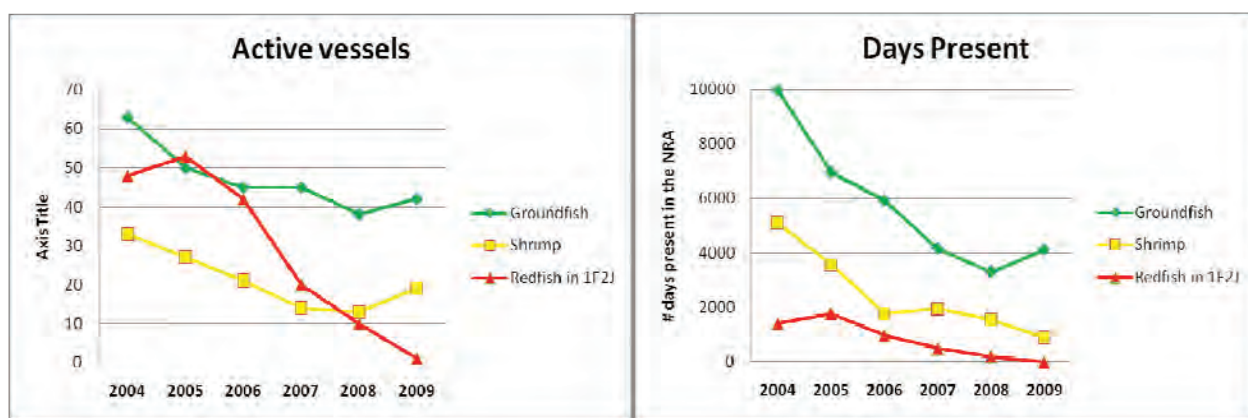


Figure 1. Number of vessels and vessel days in the NAFO Regulatory Area by fishery type

The fishing effort is measured in vessel-days per year in the NRA. Vessel-days are determined by the position reports transmitted by the vessels through their respective Fisheries Monitoring Centers via the vessel's VMS. Although the number of vessels decreased by 61 percent from 2004 to 2009, total fishing effort diminished by 70 percent; from 16,480 days to 5,016 days (Figure 1, Table 5). Although total fishing effort declined slightly between 2008 and 2009, effort in the groundfish fishery increased.

NAFO identifies three main different fishery types; the groundfish, shrimp and pelagic redfish fisheries (Sub-Areas 1F2J). Currently, over three-quarters of the fishing effort can be attributed to the groundfish fishery (82 percent), whereas the pelagic redfish fishery accounts for less than 1 percent of current fishing effort. It should be noted that the number of vessel days in the NRA for the pelagic redfish fishery declined by 99.7 percent, from 1,414 days in 2004 to 5 days in 2009, as compared to a 83 percent decline in the shrimp fishery and a 59 percent decline in the groundfish fishery during the same time period.

3. Compliance by Fishing Vessels

To ensure that vessels fishing in the NRA adhere to the NCEMs, NAFO monitors, surveys and controls the fishery. In this context NAFO conducts joint at-sea inspections by NAFO-certified inspectors as well as inspections in NAFO member ports. Through the random at-sea and obligatory port inspections, NAFO is able to uncover infringements of the NAFO regulations and collect evidence for the following prosecution within the legal system of each NAFO flag state. Prior to 2009, port state Contracting Parties were required to conduct port inspections on all vessels landing or transshipping fish species from the NRA. Under the recently implemented Port State Control measures, port state Contracting Parties are only required to carry out inspections on vessels from other Contracting Parties at a rate of 15 percent a year. However, the compulsory inspection of all vessels is still in force for landings of NAFO species under a recovery plan.

Although the total number of at-sea inspections decreased from 401 inspections in 2004 to 234 inspections in 2009, the frequency rate of at-sea inspections in relation to the effort (number of inspections per vessel-days per year) actually increased from 2.4 percent in 2004 to 4.7 percent in 2009, (Figure 2, Table 5). It should be noted, however, that the total at-sea inspection rate has remained fairly stable since 2006, ranging from 4.2 to 4.8 percent. At-sea inspection rates have generally increased in all three fisheries since 2004. However, in 2009, the inspection rate for the groundfish fishery dropped by 0.6 percent, and there were no at-sea inspections in the pelagic redfish fishery, likely because there was only 1 active vessel in this fishery with only 5 days present in the NRA. Conversely, the inspection rate for the shrimp fishery increased between 2008 and 2009 by 0.5 percent.

Inspections in port have also declined dramatically, from a 228 in 2004 to 94 in 2009, representing a 59 percent decline over the time period (Table 5). Although the number of port inspections increased slightly between 2007 and 2008 (6 percent), it declined by 29 percent between 2008 and 2009. This appears to be due to reductions in fishing effort in both the shrimp and pelagic redfish fisheries since the number of port inspections for the groundfish fishery actually increased slightly from 2008 to 2009 (4 percent) commensurate with of the slight increase in fishing effort in this fishery between these two years.

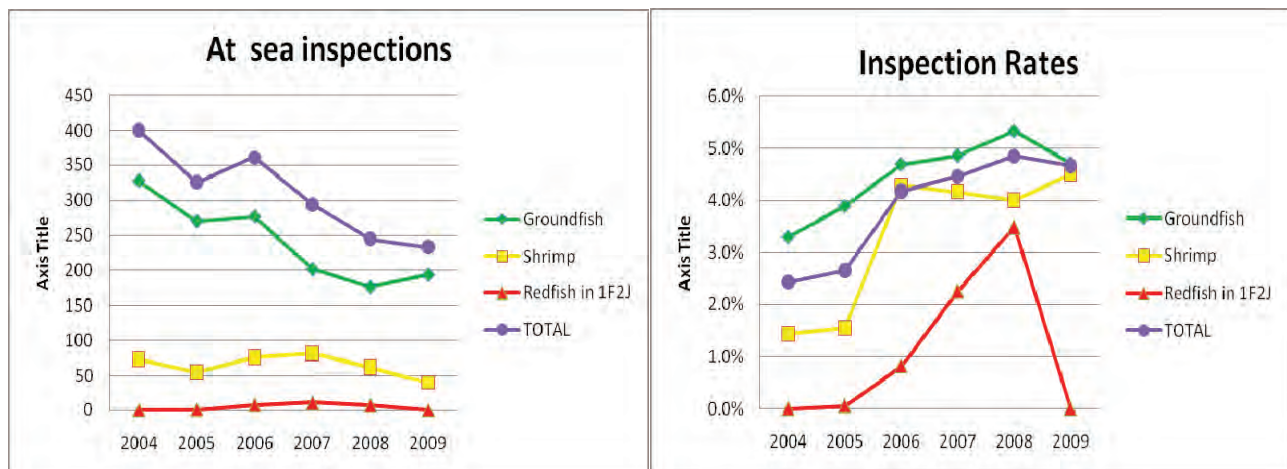


Figure 2. Number of At-Sea Inspections and Inspection rates (number of at-sea inspection/vessel-days) in the NAFO Regulatory Area by fishery type

NAFO inspectors cite a vessel if they have reason to suspect that the vessel breached one or more NAFO regulations. During the review period, at-sea inspectors issued a minimum of 5 citations in 2008, and a maximum of 20 citations in 2005¹ (Table 5). The annual citation rate (the number of citations issued in relation to the number of inspections conducted) for at-sea inspections declined between 2005 and 2008, but increased in 2009 (Figure 3). In contrast, the citation rate for port inspections more than tripled between 2004 and 2007, but declined dramatically in 2008 and 2009, with 2009 being the lowest in the time series at 1.1 percent.

¹Inspections for the sole purpose of confirming a previous citation were not counted.

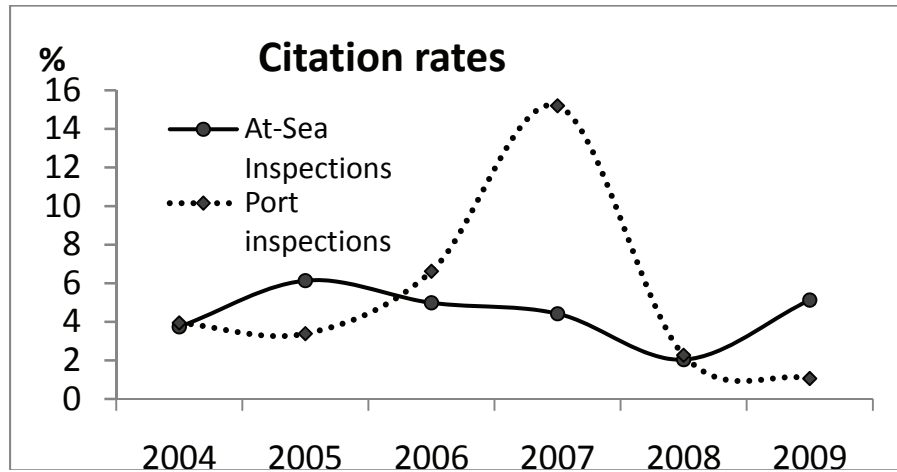


Figure 3. *Percentage of inspections that resulted in a citation at sea and in port*

Each citation issued by NAFO inspectors can list one or more infringement. NAFO recognizes 10 serious infringements (NCEM Article 37.1). NAFO inspectors also detect other infringements that are not classified as serious, such as missing stowage plans or product labels. The number of infringements that have been issued at-sea or in port during the review period is presented in Figure 4. Although the total number of infringements increased slightly from 30 in 2004 to 42 in 2007, it declined by 76 percent between 2007 and 2008. In contrast, there was a 90 percent increase in 2009 in comparison to 2008. This increase in infringements is likely the result of increased effort in the groundfish fishery in 2009, as discussed further below.

The frequency of infringements by type is presented in Figure 5. More detail on these infringements for the years 2004 through 2009 is provided in Table 5. The most frequent infringement is inaccurate recording of catches, a serious offence that was particularly pronounced in 2006 and 2007 (27 and 43 percent of total infringements, respectively). However, the actual number of infringements of this type declined dramatically between 2007 and 2008, from 16 to 2 infringements (Table 5), with a slight increase to 3 infringements in 2009.

The percentage of infringements by fisheries type is displayed in Figure 6 for 2006 through 2009. However, detailed infringement information for 2004 through 2009 is provided in Table 5. More than half of all infringements come from groundfish vessels, and up until 2008, groundfish vessels accounted for at least half of all serious infringements. In 2008, groundfish vessels accounted for 100 percent of serious infringements, although there were only 3 issued. The high level of infringements, including serious infringements, in the ground fish fishery can be attributed to the fact that groundfish fishery effort constitutes more than half of the total fishing effort in the NRA in terms of vessel-days. It should be noted that the number of serious infringements from groundfish vessels decreased dramatically in 2008 with a commensurate decline in fishing effort. However, fishing effort and number of infringements increased for the groundfish fishery in 2009. It should be further noted that all infringements detected by port inspectors during the review period involved groundfish vessels.

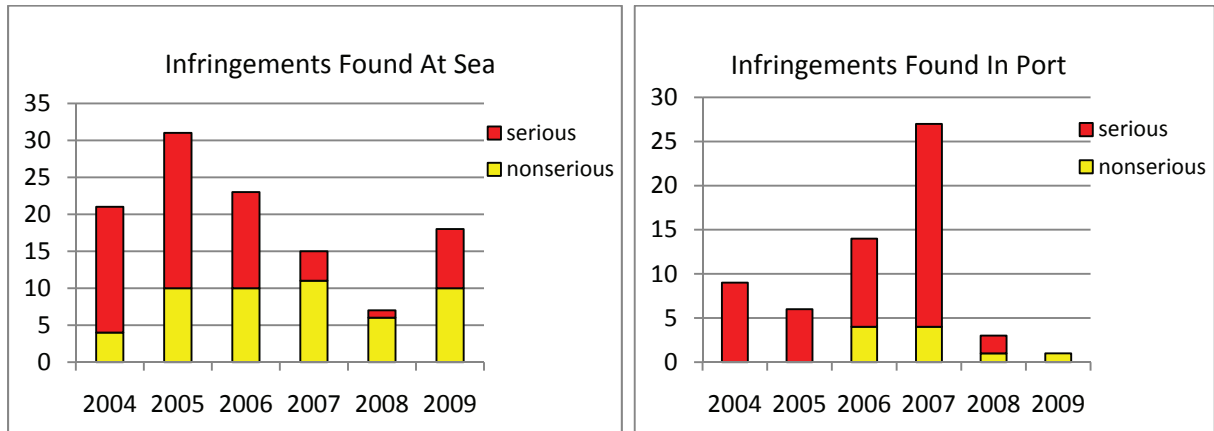


Figure 4. Number of Apparent Infringements detected by NAFO at-sea and port inspectors for 2004-2009

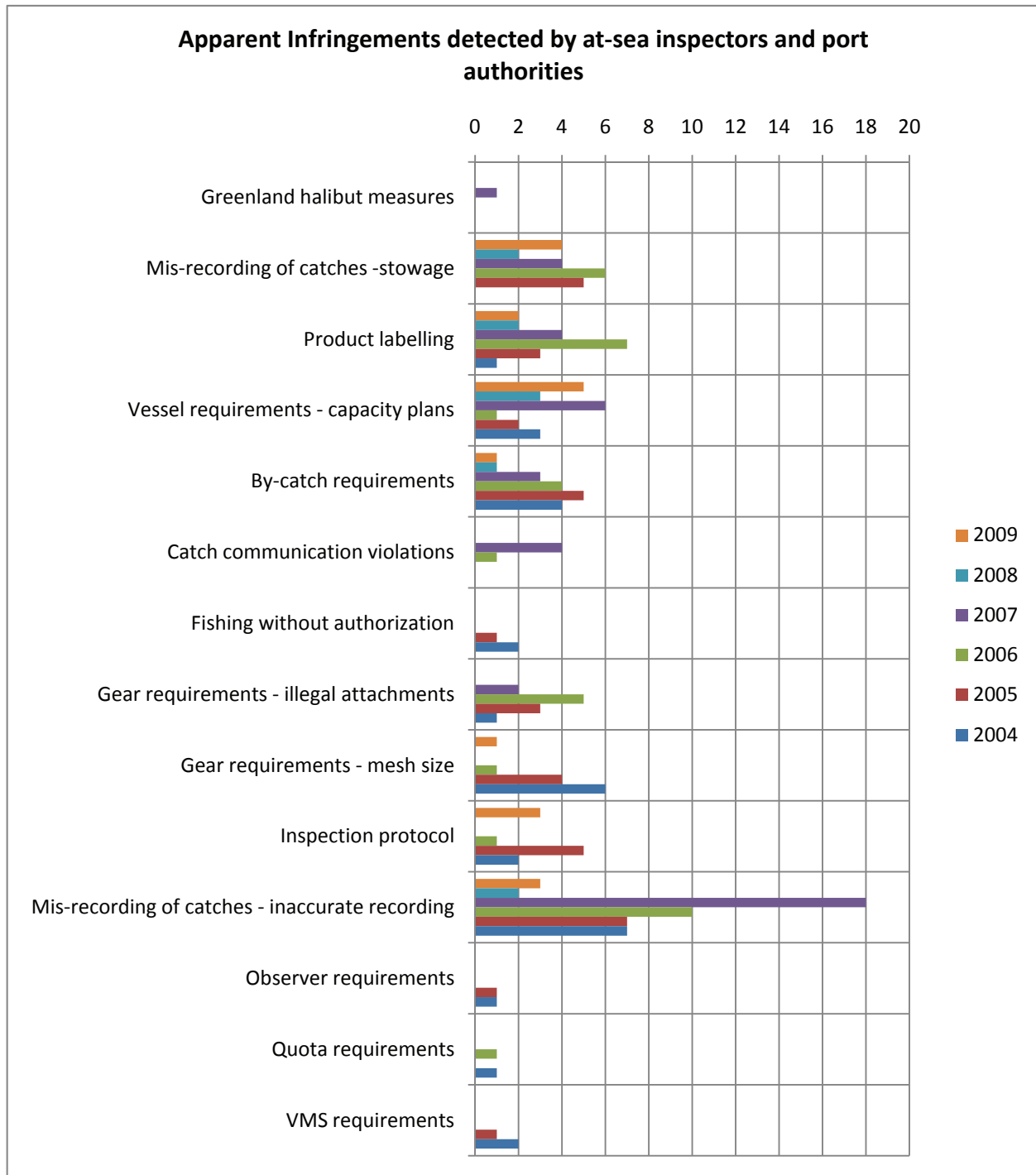


Figure 5. Apparent Infringements detected by NAFO at-sea and port inspectors

**Please note that the first 4 are non-serious infringements and the remaining 10 are serious infringements.*

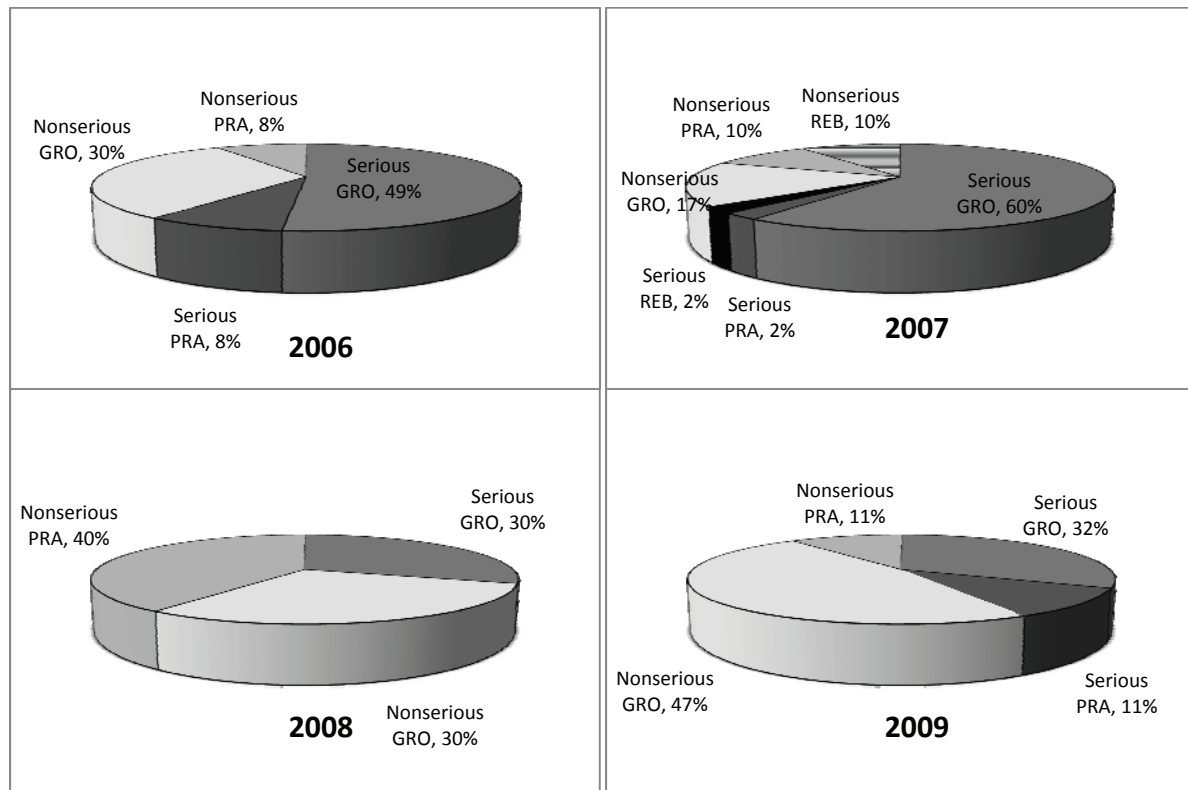


Figure 6. Percentages of serious (dark areas) and non-serious (light areas) infringements (by fishery type) detected by at-sea and port inspectors for 2006-2009

4. Reporting obligations by fishing vessels and NAFO Contracting Parties

Monitoring the NAFO fisheries includes submission of reports on catch and effort by vessels from different sources: VMS reports such as Catch-on-Entry (COE) and Catch-on-Exit (COX) are submitted by the fishing vessels through their respective Fisheries Monitoring Centers; port inspection reports by the port authorities; and observer reports² by the flag state members. These reports from different sources allow a comparative analysis of catches, should ideally cover 100 percent of the fishing trips, and should account for all the days the fishing vessels are present in the NRA. Figure 7 shows the relative coverage of fishing trips from the reports received; deviations from 100 percent are caused by missing reports.³ Since 2005, catch reports received by NAFO VMS have become the most complete source on catch-by-vessel information. The submission of port inspection and observer reports improved in 2008, but declined in 2009.

Submission of observer reports decreased in 2006 and 2007, increased in 2008, but declined again in 2009. The drop in observer reporting rate in 2006 and 2007 is not due to a decline in the actual number of observer reports received by NAFO resulting from implementation of the electronic reporting scheme, which allows vessels to reduce their observer coverage by 25 percent in if they submit daily electronic catch reports. Rather, the reporting compliance of vessels participating in that scheme has been accounted for in Figure 7 and Table 1 (i.e., if daily catch reports are 4 times the number of observer reports, the vessel is considered compliant). However, factors relating to

² Vessels fishing in the NRA are required to have 100% observer coverage, i.e. presence of an independent observer on board at all times. Since 2007, Contracting Parties can alternatively opt for a daily electronic catch reporting scheme (see CEM, Chapter VII) which allows them to reduce the observer coverage on their vessels by up to 25%.

³ The percentage coverage for VMS catch reports (COE-COX) shown in Figure 7 was calculated from the number of days as indicated in each report and the total effort (vessel-days) as validated from the VMS position reports. Port reports included transshipments at sea (particularly important for the pelagic redfish fishery).

implementation of this electronic reporting scheme may have impacted observer compliance rates during these two years. The electronic reporting scheme was originally a pilot project in 2006, and was fully implemented in 2007. In 2007, only two Contracting Parties participated in this scheme (Norway, the Faroe Islands), but Estonia became the third to participate in 2008 and 2009 (see STACTIC WP 10/22).

Similar to the observer reports, the submission of port inspection reports also decreased in 2009. This is likely due to the implementation of NAFO's Port State Control Scheme in 2009. As noted above, under this scheme port state Contracting Parties are only required to carry out inspections on vessels from other Contracting Parties at a rate of 15 percent a year, with the exception of vessels fishing for NAFO species under a recovery plan.

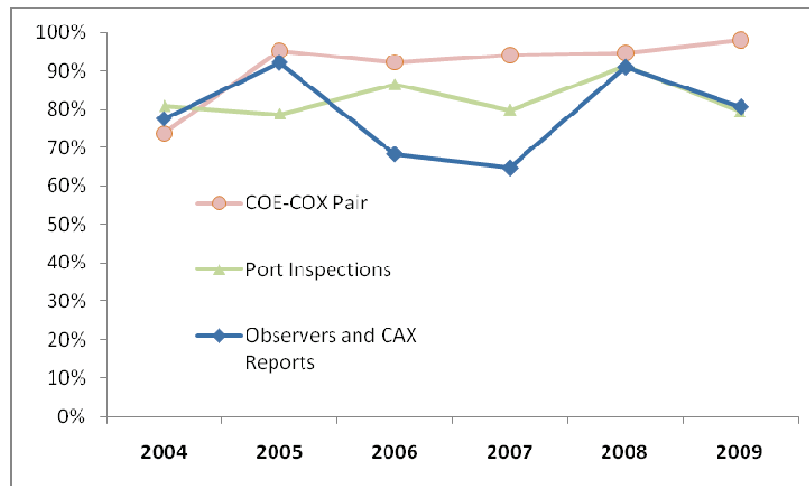


Figure 7. *Percentage coverage of fishing effort by VMS, Port Inspection and Observer Reports*

Another issue is the timeliness of reports submitted by Contracting Parties to the NAFO Secretariat. Articles 28 and 35 of the NCEMs require that observer reports and at-sea inspection reports be submitted within 30 days (of completion of assignment for observer reports). Under the Port State Control measures implemented in 2009, port state Contracting Parties are required to transmit the Port State Control inspection form (form PSC 3) to the Executive Secretary “without delay.” However, this provision was not in effect for 2008. Thus, the 30-day requirement in force for port inspection reports in 2008 is considered in this analysis. In comparison to port inspection and observer reports, at-sea inspection reports are submitted in a more timely fashion (Figure 8). However, the timeliness of the at-sea inspection reports has declined since 2005, from an on-time rate of 91 percent in 2005, to 62 percent in 2009. In fact, the timeliness of at-sea inspection reports has been fairly consistent since 2007, while the timeliness of observer and port inspection reports has increased, with dramatic improvement in 2009. It should be noted that timeliness of submission does not necessarily equate to a failure to submit the required reports.

During the course of the 2009 Annual NAFO Meeting, concerns were raised by Contracting Parties regarding the quality of the reports received. As such, the Secretariat was asked to provide a summary of their experience with these reports. This is as follows:

The lack of uniformity in format of the submitted observer reports may compromise the quality of the reports in general. However total catch information by species contained in the observer reports were compared to other sources (e.g., VMS hail reports and Port Inspection reports), where possible, and the comparison shows that there is a general agreement of the catch information among various sources.

Upon further discussion with the Secretariat it was noted that lack of uniformity with these reports is also an issue, making it time consuming to compile the annual compilation tables provided to Contracting Parties. It was also noted that corrections to individual reports must be handled on an individual basis, further complicating the

compilation of annual information to assess compliance. Finally, one of the Contracting Parties highlighted problems caused by “malformed” VMS reports, such as COE and COX reports. These “malformed” (or erroneous) reports cannot be processed, and, therefore, cannot be forwarded to the systems that provide information to patrol platforms on a real-time basis impacting monitoring and surveillance activities. As a result, the Secretariat proved a presentation at the 2010 STACTIC Intersessional Meeting to help explain the potential causes of “malformed” reports and how they are excluded from the data used to prepare the annual compliance review. Potential causes include technical issues at the Contracting Party level (e.g., duplicates, mis-typed hail reports, etc.) and lack of clarity regarding the hail reporting requirements in NCEMs (e.g., unnecessary reports, mis-directed reports, etc.).

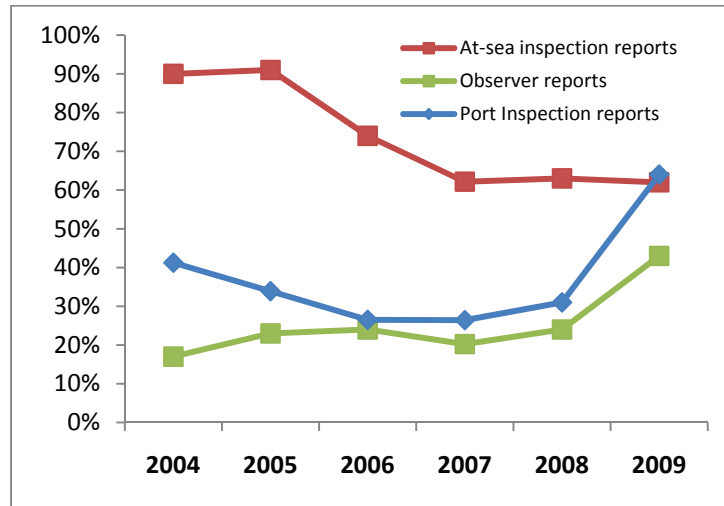


Figure 8. *Timeliness of submission of reports*

5. Follow-up to infringements

Flags states are obligated to follow-up with further investigations and legal prosecution when NAFO inspectors issue a citation against a Contracting Party vessel. The Secretariat receives information on the status of each case. The legal procedure can take longer than one year and it is, therefore, not expected that by 2009 (for example) all cases originating during the previous years could be resolved. This information is reflected in Figure 9 and also in Table 6.

In general, it appears that most cases are resolved within a 2-year time period. However, the number of cases with no follow-up information has remained relatively stable since 2006 despite a decline in the total number of citations issues.

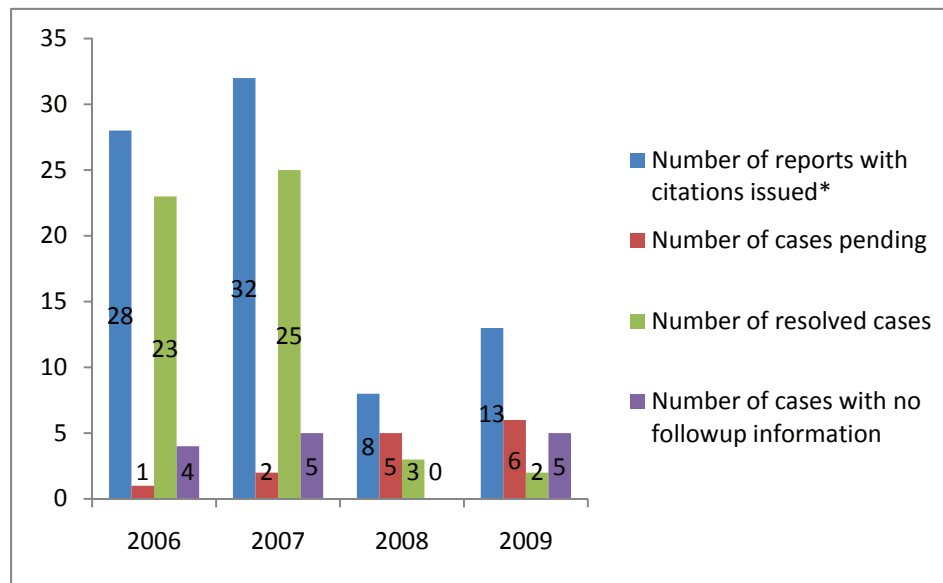


Figure 9. *Legal resolution of citations against vessels fishing in the NAFO Regulatory Area by year in which the citations were issued (as of July 2010). A citation is an inspection report (from at-sea or port inspectors) that lists one or more infringements. Inspections carried out for confirming a previous citation are not counted.*

6. Observed trends (period 2004 to 2009)

- The total fishing effort in the NAFO area continues to decline both in terms of number of vessels and fishing days in the NRA since 2004. There was an increase in the number of vessels participating in the groundfish and shrimp fisheries in 2009, but this increase was offset by a decline in the number of vessels participating in the redfish fishery. Further, the change in number of vessels participating in individual fisheries (61 in 2008 and 62 in 2009) in relation to the change in the total number of active vessels (60 in 2008 and 51 in 2009) indicates that more vessels participated in multiple fisheries in 2009 than in 2008. Although, there was a slight drop in total fishing effort in 2009 in comparison to 2008 (0.8 percent), there was a 25 percent increase in effort in the groundfish fishery. Conversely, total fishing effort declined substantially in both the shrimp and redfish fisheries (43 percent and 98 percent, respectively).
- The number of at-sea inspections has declined overall since 2004, despite a slight increase in 2006. This is likely due to the reduced number of active vessels fishing in the NRA. Overall, the rate of at-sea inspections per vessel fishing day has increased since 2004, from 2.4 percent in 2004 to 4.8 percent in 2008, with a slight decline to 4.7 percent in 2009. However, the at-sea inspection rate declined dramatically for the redfish fishery in 2009 (to 0 percent) since there was hardly any activity in this fishery. The at-sea inspection rate also declined by 11 percent for the groundfish fishery (from 5.3 to 4.7 percent), but increased by 13 percent (from 4.0 to 4.5 percent) for the shrimp fishery. This may indicate more compliance concerns involving the shrimp fishery in 2009 in comparison to the groundfish fishery.
- The number of citations resulting from at-sea inspections varied from 5 to 20 during the 5-year period. The at-sea citation rate decreased slightly since 2005, with an increase in 2009, but has remained generally stable over the time period.
- The number of citations resulting from port inspections increased to a peak of 19 between 2004 and 2007, but has declined dramatically since with only 1 citation in 2009.
- There was a 45 percent decline in port inspections from 2004 to 2007, but a slight increase in 2008 (6 percent), then a subsequent decline again in 2009 (29 percent). The number of vessels cited by port authorities per year

varied from a high of 16 in 2007 to a low of 1 in 2009. The number of apparent infringements issued ranged from 27 in 2007 to 1 in 2009, demonstrating a 96 percent decline since 2007.

- During the 6 year period, a total of 115 apparent infringements resulted from at-sea inspections and 60 from port inspections. The apparent infringement category “Mis-recording of Catches” (Both Stowage and Inaccurate recording related) accounted for 37 of the apparent infringements issued at sea (33 percent) and 32 in port (53 percent). These infringements were issued more frequently in relation to groundfish fisheries.
- The number of cases having no follow-up information from the Contracting Party has been relatively stable since 2006 despite an overall decline in the number of citations issued. Thus, lack of follow-up on apparent infringements remains a concern. For example, the percentage of citations with no follow-up relative to total citations issued was 14 percent in 2006 and 38 percent in 2009. The Contracting Party may be following up on the apparent infringement, but may not have reported the status back to the NAFO Secretariat.
- Timeliness of submission of port inspection and observer reports by Contracting Parties has greatly improved, but has remained steady for at-sea inspection reports.

7. Annexes (the “Report tables”)

Table 1. Submission of Fishing Reports*

Year	Days at the Regulatory Area (Effort)	Number of Days accounted by COE-COX pairs	Percentage of Effort accounted by COE-COX pairs	Number of Days accounted by Port Inspection and TRA reports	Percentage of Effort accounted by Port Inspection and TRA reports	Number of Days accounted by Observer and CAX reports	Percentage of Effort accounted by Observer and CAX reports
2004	16480	12156	74%	13327	81%	12779	78%
2005	12290	11706	95%	9679	79%	11326	92%
2006	8663	7991	92%	7488	86%	5921	68%
2007	6598	6210	94%	5269	80%	4276	65%
2008	5054	4785	95%	4613	91%	4596	91%
2009	5016	4920	98%	3981	79%	4047	81%

*COE = Catch on entry, COX = Catch on exit, TRA = transshipment, CAX = Daily catch report

Table 2. Timely submission of Port Inspection Reports

Year	2004	2005	2006	2007	2008	2009
Total Number of Port Inspection Reports received	228	177	151	125	133	94
Total Number of Port Inspection Reports received late	134	117	111	92	92	34
Percentage % of late Port Inspection Reports	59%	66%	74%	74%	69%	36%

NB: Timeliness based upon Article 45 in 2008 NECMs which stipulated the transmission of port inspection reports to the Secretariat within 30 days on which the landing was completed.

Port Inspection Reports are submitted by the CP of the Port Inspection Authority.

Table 3. Timely submission of At-Sea Inspection Reports

Year	2004	2005	2006	2007	2008	2009
Total Number of at-sea Inspections	401	326	361	296	263	324
Number of at-sea Inspections received late	40	30	95	112	96	124
Percentage % of late at-sea Inspection Reports	10%	9%	26%	38%	37%	38%

NB: Timely submission means transmission of the report with 30 days.

At-sea Inspection Reports are submitted by the CP with inspection presence at NAFO Regulatory Area.

Table 4. Timely submission of Observer Reports

Year	2004	2005	2006	2007	2008	2009
Total Number of Observers Reports	211	170	114	84	126	86
Number of Observers Reports received late	176	131	87	67	96	49
Percentage % of late Observers Reports	83%	77%	76%	80%	76%	57%

NB: Article 28 stipulates the transmission of the observer reports to the Secretariat within 30 days after the completion of the observer's assignment.

Observer Reports are submitted by the Flag State of the vessels.

Table 5-2004, part 1. Effort, at-sea inspections and AIs by fisheries type

Fisheries*	GRO	PRA	REB	Total
Number of vessels	63	33	48	134**
Days Present in NRA	9966	5100	1414	16480
Number of at-sea inspections	328	73	0	401
Number of at-sea inspection report containing citation of one or more AIs	13	2	0	15
Number of vessels cited with AIs at sea	10	2	0	12
AIs issued by category - from at-sea inspections***				
Greenland halibut measures	0	0	0	0
Mis-recording of catches -stowage	0	0	0	0
Product labeling	0	1	0	1
Vessel requirements - capacity plans	3	0	0	3
By-catch requirements	3	0	0	3
Catch communication violations	0	0	0	0
Fishing without authorization	0	1	0	1
Gear requirements - illegal attachments	1	0	0	1
Gear requirements - mesh size	5	0	0	5
Inspection protocol	2	0	0	2
Mis-recording of catches - inaccurate recording	1	0	0	1
Observer requirements	0	1	0	1
Quota requirements	1	0	0	1
VMS requirements	0	2	0	2
TOTAL	16	5	0	21

* GRO = groundfish primarily in Divs. 3KLMNO; PRA = shrimp fisheries in Divs. 3LM; REB = redfish in Divs. 1F2J

** Some vessels switched directed species within the year.

*** AIs from citation reports serving to confirm an incident are not counted. AI categories in bold are considered serious.

Table 5-2004, part 2. Effort, port inspections and AIs by fisheries type

FISHERIES*	GRO	PRA	REB	Total
Number of vessels	63	33	48	134**
Days Present in NRA	9966	5100	1414	16480
Number of port inspections	85	138	5	228
Number of port inspection report containing citation of one or more AIs	9	0	0	9
Number of vessels cited with AIs by port authorities	9	0	0	9
AIs issued by category - from port inspections***				
Greenland halibut measures	0	0	0	0
Mis-recording of catches -stowage	0	0	0	0
Product labeling	0	0	0	0
Vessel requirements - capacity plans	0	0	0	0
By-catch requirements	1	0	0	1
Catch communication violations	0	0	0	0
Fishing without authorization	1	0	0	1
Gear requirements - illegal attachments	0	0	0	0
Gear requirements - mesh size	1	0	0	1
Inspection protocol	0	0	0	0
Mis-recording of catches - inaccurate recording	6	0	0	6
Observer requirements	0	0	0	0
Quota requirements	0	0	0	0
VMS requirements	0	0	0	0
TOTAL	9	0	0	9

Table 5-2005, part 1. Effort, at-sea inspections and AIs by fisheries type

FISHERIES*	GRO	PRA	REB	Total
Number of vessels	50	27	53	116**
Days Present in NRA	6948	3558	1784	12290
Number of at-sea inspections	270	55	1	326
Number of at-sea inspection report containing citation of one or more AIs	16	4	0	20
Number of vessels cited with AIs at sea	14	3	0	17
AIs issued by category - from at-sea inspections***				
Greenland halibut measures	0	0	0	0
Mis-recording of catches -stowage	5	0	0	5
Product labeling	2	1	0	3
Vessel requirements - capacity plans	2	0	0	2
By-catch requirements	2	0	0	2
Catch communication violations	0	0	0	0
Fishing without authorization	0	1	0	1
Gear requirements - illegal attachments	2	1	0	3
Gear requirements - mesh size	3	0	0	3
Inspection protocol	3	1	0	4
Mis-recording of catches - inaccurate recording	5	1	0	6
Observer requirements	0	1	0	1
Quota requirements	0	0	0	0
VMS requirements	0	1	0	1
TOTAL	24	7	0	31

* GRO = groundfish primarily in Divs. 3KLMNO; PRA = shrimp fisheries in Divs. 3LM; REB = redfish in Divs. 1F2J

** Some vessels switched directed species within the year.

*** AIs from citation reports serving to confirm an incident are not counted. AI categories in bold are considered serious.

Table 5-2005, part 2. Effort, port inspections and AIs by fisheries type

FISHERIES*	GRO	PRA	REB	Total
Number of vessels	50	27	53	116**
Days Present in NRA	6948	3558	1784	12290
Number of port inspections	80	87	10	177
Number of port inspection report containing citation of one or more AIs	6	0	0	6
Number of vessels cited with AIs by port authorities	6	0	0	6
AIs issued by category - from port inspections***				
Greenland halibut measures	0	0	0	0
Mis-recording of catches -stowage	0	0	0	0
Product labeling	0	0	0	0
Vessel requirements - capacity plans	0	0	0	0
By-catch requirements	3	0	0	3
Catch communication violations	0	0	0	0
Fishing without authorization	0	0	0	0
Gear requirements - illegal attachments	0	0	0	0
Gear requirements - mesh size	1	0	0	1
Inspection protocol	1	0	0	1
Mis-recording of catches - inaccurate recording	1	0	0	1
Observer requirements	0	0	0	0
Quota requirements	0	0	0	0
VMS requirements	0	0	0	0
TOTAL	6	0	0	6

Table 5-2006, part 1. Effort, at-sea inspections and AIs by fisheries type

FISHERIES*	GRO	PRA	REB	Total
Number of vessels	45	21	42	92**
Days Present in NRA	5908	1776	979	8663
Number of at-sea inspections	277	76	8	361
Number of at-sea inspection report containing citation of one or more AIs	11	5	2	18
Number of vessels cited with AIs at sea	10	4	2	16
AIs issued by category - from at-sea inspections***				
Greenland halibut measures	0	0	0	0
Mis-recording of catches -stowage	5	1	0	6
Product labeling	1	2	0	3
Vessel requirements - capacity plans	1	0	0	1
By-catch requirements	2	0	0	2
Catch communication violations	0	0	0	0
Fishing without authorization	0	0	0	0
Gear requirements - illegal attachments	2	2	1	5
Gear requirements - mesh size	0	0	1	1
Inspection protocol	0	1	0	1
Mis-recording of catches - inaccurate recording	4	0	0	4
Observer requirements	0	0	0	0
Quota requirements	0	0	0	0
VMS requirements	0	0	0	0
TOTAL	15	6	2	23

* GRO = groundfish primarily in Divs. 3KLMNO; PRA = shrimp fisheries in Divs. 3LM; REB = redfish in Divs. 1F2J

** Some vessels switched directed species within the year.

*** AIs from citation reports serving to confirm an incident are not counted. AI categories in bold are considered serious.

Table 5-2006, part 2. Effort, port inspections and AIs by fisheries type

FISHERIES*	GRO	PRA	REB	Total
Number of vessels	45	21	42	92**
Days Present in NRA	5908	1776	979	8663
Number of port inspections	76	56	19	151
Number of port inspection report containing citation of one or more AIs	10	0	0	10
Number of vessels cited with AIs by port authorities	10	0	0	10
AIs issued by category - from port inspections***				
Greenland halibut measures	0	0	0	0
Mis-recording of catches -stowage	0	0	0	0
Product labeling	4	0	0	4
Vessel requirements - capacity plans	0	0	0	0
By-catch requirements	2	0	0	2
Catch communication violations	1	0	0	1
Fishing without authorization	0	0	0	0
Gear requirements - illegal attachments	0	0	0	0
Gear requirements - mesh size	0	0	0	0
Inspection protocol	0	0	0	0
Mis-recording of catches - inaccurate recording	6	0	0	6
Observer requirements	0	0	0	0
Quota requirements	1	0	0	1
VMS requirements	0	0	0	0
TOTAL	14	0	0	14

Table 5-2007, part 1. Effort, at-sea inspections and AIs by fisheries type

FISHERIES*	GRO	PRA	REB	Total
Number of vessels	45	14	20	76**
Days Present in NRA	4158	1948	488	6594
Number of at-sea inspections	202	81	11	294
Number of at-sea inspection report containing citation of one or more AIs	4	5	4	13
Number of vessels cited with AIs at sea	4	5	4	13
AIs issued by category - from at-sea inspections***				
Greenland halibut measures	0	0	0	0
Mis-recording of catches -stowage	3	1	0	4
Product labeling	0	1	0	1
Vessel requirements - capacity plans	0	2	4	6
By-catch requirements	0	0	0	0
Catch communication violations	0	0	0	0
Fishing without authorization	0	0	0	0
Gear requirements - illegal attachments	0	1	1	2
Gear requirements - mesh size	0	0	0	0
Inspection protocol	0	0	0	0
Mis-recording of catches - inaccurate recording	2	0	0	2
Observer requirements	0	0	0	0
Quota requirements	0	0	0	0
VMS requirements	0	0	0	0
TOTAL	5	5	5	15

* GRO = groundfish primarily in Divs. 3KLMNO; PRA = shrimp fisheries in Divs. 3LM; REB = redfish in Divs. 1F2J

** Some vessels switched directed species within the year.

*** AIs from citation reports serving to confirm an incident are not counted. AI categories in bold are considered serious.

Table 5-2007, part 2. Effort, port inspections and AIs by fisheries type

FISHERIES*	GRO	PRA	REB	Total
Number of vessels	45	14	20	76**
Days Present in NRA	4158	1948	488	6594
Number of port inspections	67	51	7	125
Number of port inspection report containing citation of one or more AIs	19	0	0	19
Number of vessels cited with AIs by port authorities	16	0	0	16
AIs issued by category - from port inspections***				
Greenland halibut measures	1	0	0	1
Mis-recording of catches -stowage	0	0	0	0
Product labeling	3	0	0	3
Vessel requirements - capacity plans	0	0	0	0
By-catch requirements	3	0	0	3
Catch communication violations	4	0	0	4
Fishing without authorization	0	0	0	0
Gear requirements - illegal attachments	0	0	0	0
Gear requirements - mesh size	0	0	0	0
Inspection protocol	0	0	0	0
Mis-recording of catches - inaccurate recording	16	0	0	16
Observer requirements	0	0	0	0
Quota requirements	0	0	0	0
VMS requirements	0	0	0	0
TOTAL	27	0	0	27

Table 5-2008, part 1. Effort, at-sea inspections and AIs by fisheries type

FISHERIES*	GRO	PRA	REB	Total
Number of vessels	38	13	10	60**
Days Present in NRA	3302	1551	201	5054
Number of at-sea inspections	176	62	7	245
Number of at-sea inspection report containing citation of one or more AIs	2	3	0	5
Number of vessels cited with AIs at sea	2	3	0	5
AIs issued by category - from at-sea inspections***				
Greenland halibut measures				0
Mis-recording of catches -stowage	1	1		2
Product labelling	1			1
Vessel requirements - capacity plans		3		3
By-catch requirements	1			1
Catch communication violations				0
Fishing without authorization				0
Gear requirements - illegal attachments				0
Gear requirements - mesh size				0
Inspection protocol				0
Mis-recording of catches - inaccurate recording				0
Observer requirements				0
Quota requirements				0
VMS requirements				0
TOTAL	3	4	0	7

* GRO = groundfish primarily in Divs. 3KLMNO; PRA = shrimp fisheries in Divs. 3LM; REB = redfish in Divs. 1F2J

** Some vessels switched directed species within the year.

*** AIs from citation reports serving to confirm an incident are not counted. AI categories in bold are considered serious.

Table 5-2008, part 2. Effort, port inspections and AIs by fisheries type

FISHERIES*	GRO	PRA	REB	Total
Number of vessels	38	13	10	60**
Days Present in NRA	3302	1551	201	5054
Number of port inspections	70	60	2	132
Number of port inspection report containing citation of one or more AIs	3	0	0	3
Number of vessels cited with AIs by port authorities	2			
AIs issued by category - from port inspections***				
Greenland halibut measures				0
Mis-recording of catches -stowage				0
Product labelling	1			1
Vessel requirements - capacity plans				0
By-catch requirements				0
Catch communication violations				0
Fishing without authorization				0
Gear requirements - illegal attachments				0
Gear requirements - mesh size				0
Inspection protocol				0
Mis-recording of catches - inaccurate recording	2			2
Observer requirements				0
Quota requirements				0
VMS requirements				0
TOTAL	3	0	0	3

Table 5-2009, part 1. Effort, at-sea inspections and AIs by fisheries type

FISHERIES*	GRO	PRA	REB	Total
Number of vessels	41	20	1	51**
Days Present in NRA	4122	889	5	5016
Number of at-sea inspections	194	40	0	234
Number of at-sea inspection report containing citation of one or more AIs	8	4	0	12
Number of vessels cited with AIs at sea	6	4	0	10
AIs issued by category - from at-sea inspections***				
Greenland halibut measures				0
Mis-recording of catches -stowage	4			4
Product labelling	1			1
Vessel requirements - capacity plans	3	2		5
By-catch requirements	1			1
Catch communication violations				0
Fishing without authorization				0
Gear requirements - illegal attachments				0
Gear requirements - mesh size	1			1
Inspection protocol	2	1		3
Mis-recording of catches - inaccurate recording	2	1		3
Observer requirements				0
Quota requirements				0
VMS requirements				0
TOTAL	14	4	0	18

* GRO = groundfish primarily in Divs. 3KLMNO; PRA = shrimp fisheries in Divs. 3LM; REB = redfish in Divs. 1F2J

** Some vessels switched directed species within the year.

*** AIs from citation reports serving to confirm an incident are not counted. AI categories in bold are considered serious.

Table 5-2009, part 2. Effort, port inspections and AIs by fisheries type

FISHERIES*	GRO	PRA	REB	Total
Number of vessels	41	20	1	51**
Days Present in NRA	4122	889	5	5016
Number of port inspections	73	21	0	94
Number of port inspection report containing citation of one or more AIs	1	0	0	1
Number of vessels cited with AIs by port authorities	1			
AIs issued by category - from port inspections***				
Greenland halibut measures				0
Mis-recording of catches -stowage				0
Product labelling	1			1
Vessel requirements - capacity plans				0
By-catch requirements				0
Catch communication violations				0
Fishing without authorization				0
Gear requirements - illegal attachments				0
Gear requirements - mesh size				0
Inspection protocol				0
Mis-recording of catches - inaccurate recording				0
Observer requirements				0
Quota requirements				0
VMS requirements				0
TOTAL	1	0	0	1

Table 6. Resolution of Apparent Infringement (AI) Cases (as of July 2010)

	2006	2007	2008	2009
Number of reports with citations issued*	28	32	8	13
Number of cases pending	1	2	5	6
Number of resolved cases	23	25	3	2
Number of cases with no followup information	4	5	0	5

* Number of at-sea and port inspection reports issuing serious and non-serious AIs.

A report may contain one or more AI.

Reports serving to confirm identical cases are not counted.

PART II

Report of the Standing Committee on International Control (STACTIC)

**32nd Annual Meeting
Halifax, Nova Scotia, Canada
September 20-24, 2010**

1. Opening of the Meeting (Chair: Mads Nedergaard, Denmark (in respect of the Faroe Island and Greenland))

The Chairman opened the meeting at 14:00 hrs at the World Trade and Convention Centre, Halifax, Canada and welcomed representatives of Canada, Denmark (in respect of the Faroe Islands and Greenland), Iceland, the European Union (EU), France (in respect of St. Pierre-et-Miquelon), Japan, Norway, Russia, the United States and the NAFO Secretariat to the STACTIC meeting.

No opening statements were made.

2. Appointment of Rapporteur

Brent Napier (Canada) was appointed Rapporteur.

3. Adoption of Agenda

The Chair introduced the agenda and noted that an item would be added under “Other matters” to address the instructions received from Fisheries Commission to reflect on possible changes to Article 17 – Conservation and Management of Sharks. He then opened the floor to further comments.

The Representative of Canada noted that, under agenda item 5 – Review and evaluation of NAFO Compliance objectives, that based on STACTIC WP 09/08 a standing section related to “Electronic/Satellite/Remote Monitoring” should be added as it was in previous agendas. The Chair noted the omission and added this item as agenda item 5 (d).

The Representative of Canada also noted his wish to have a second proposal (STACTIC WP 10/34) added under agenda item 9 b) as it related to product labeling. The Chair recognized the addition.

The representative of Denmark (in respect of the Faroe Islands and Greenland) signaled a desire to add an agenda item to accommodate a proposal concerning fishing for shrimp in NAFO Division 3L (Article 15.2.). The Chair acknowledged the request and indicated that this would be dealt with under “Other matters”.

The Chair remarked that STACTIC WP 10/33, related to the work of the Editorial Drafting Group (EDG), would be added under agenda item 8.

The Representative of the EU informed the Chair of the following new proposals and recommended agenda placement:

- STACTIC WP 10/9 (revised) Daily Communication of Catches under agenda item 9 h)
- STACTIC WP 10/29 Observer Scheme under agenda item 10
- STACTIC WP 10/30 Port State Control under agenda item 9
- STACTIC WP 10/31 At-sea Inspection Checklist under agenda item 5 b)
- STACTIC WP 10/32 Product Form Codes under agenda item 9

The Chair agreed to the EU’s proposed agenda amendments.

The Chair noted that the Icelandic proposal (STACTIC WP 10/21) regarding procedures to coordinate the weighing of landed catch would be discussed under agenda item 5a).

As a point of clarification, the Chair noted that an editorial error had been discovered and corrected in a proposal (STACTIC WP 09/21 revised 2) approved for submission to Fisheries Commission at the 2010 NAFO annual meeting.

The agenda, as amended, was adopted (Annex 1).

4. Compliance review 2009 including review of reports of apparent infringements

The Chair introduced the agenda item and requested that the representative of the Compliance Report Drafting Group (CRDG) make a presentation on the compilation of fisheries reports and the 2009 annual compliance review process (STACTIC WP 10/26).

The representative of the CRDG introduced the 2009 compliance review report and provided a brief explanation of the compilation process. She also sought STACTIC approval to explore a new approach to the compliance review process (outlined in STACTIC WP 10/38) that would be composed of two steps, the first being a more detailed discussion/report internal to STACTIC and the second a high level, executive summary that would be submitted to Fisheries Commission in the form of the Annual Compliance Report. The representative of Canada and the EU both supported the proposed approach.

The Chair thanked the CRDG for its work to date and directed it to continue working closely with the Secretariat to develop the new format in preparation for the 2011 NAFO intercessional meeting.

Prompted by comments from the CRDG, the Chair opened a discussion on practice of addressing the objectivity of inspections (STACTIC WP 10/18) independent from the compliance review report and the relevance of its current format given STACTIC's decision to abandon the objectivity of inspection formula at the 2009 NAFO Annual Meeting.

The representative of the EU noted that the NAFO CEM's currently contained provisions obliging the NAFO Secretariat to report on objectivity of inspections, however remarked that this concept was already covered within the existing compliance reporting process.

The representative of Canada supported the notion that the current compliance report included information pertaining to objectivity, and its placement within this report allowed for better correlation to the other elements of the compliance report.

The Chair noted that the issue of objectivity would hereafter be addressed within the compliance report.

Addressing the final issues under this agenda item the Chair introduced the outstanding working papers (STACTIC WP 10/1 revised, STACTIC WP 10/14 and FC Doc 10/8) and asked whether there were any updates/comments.

The representative of Iceland noted that, in one particular case, the final disposition of the apparent infringement did not seem to be commensurate with the magnitude of non-compliant behaviour and the corresponding enforcement effort required to address the issue.

The representative of the EU noted that it was the responsibility of each flag State Contracting Party to prosecute apparent infringements based on its domestic procedures, and further noted that vessels that exhibit this type of behaviour, and escape reasonable penalties, will be subject to closer scrutiny and monitoring.

The Chair noted that no other comments were made on this issue and the item was closed.

It was agreed that:

- *STACTIC would take a two phased approach to the compliance reporting process, as described in STACTIC WP 10/38.*
- *The NAFO Secretariat would assist the CRDG with ensuring the elements of the annual "Report on the Objectivity in the Realization and Distribution of Inspections Between the Contracting Parties" are incorporated within the compliance review process and that the objectivity formula previously utilized in relation to this report would be discarded.*
- *STACTIC WP 10/26 would be submitted to the Fisheries Commission for adoption.*

5. Review and evaluation of NAFO Compliance objectives

The Chair opened the agenda item and proceeded with each sub-item.

a) In-Port/Land based Monitoring

Port Inspection Checklist

The representative from the EU reiterated his statement from the May 2010 intersessional meeting that the purpose of the in-port checklist, presented as STACTIC WP 09/17, was to for use as a guide and was not intended to be compulsory. Thus, there is no redraft of this working paper as indicated in the report from the intersessional meeting. See item 5.b for further discussion on the issue of harmonizing the in-port and at-sea inspection process.

The representative of the United States noted that the elements in the checklist should be consistent with the elements provided for under similar FAO guidelines, the representative of the EU confirmed that the elements were fully consistent.

Procedures to Coordinate the Weighing of Landed Catch

The representative of Iceland presented STACTIC WP 10/21 touching on the key points of the working paper which provided an overview of the Icelandic system for weighing landed catch. The Chair thanked the representative of Iceland for the presentation and inquired as to how the minimum sample levels identified in the paper were determined. The representative of Iceland noted that research formed the basis for these thresholds.

The representative of the EU noted that a similar process was in place in the EU and remarked that this type of working paper was useful in further developing the concept of a more effective and reliable inspection scheme. The representative of Denmark (in respect of the Faroe Islands and Greenland) noted that other “best practices” type papers had been submitted by other representatives in the past and that it might be useful to make them more accessible. The Chair noted that the NAFO Secretariat maintains working papers, so it could track this information down as required. The representative of the EU supported this idea and suggested that a reference site could be created to make these papers more readily available. The Chair suggested that other representatives could provide information on relevant domestic practices, including those regarding procedures for weighing landed catch, to allow NAFO to draw from collective experiences and best practices, and possibly harmonize in the future.

Representatives were encouraged to provide information on relevant enforcement practices to allow STACTIC to benefit from the collective experiences. It was agreed that this issue could be revisited at subsequent meetings.

b) At-Sea Monitoring

At-sea inspection Checklist

The representative of the EU introduced STACTIC WP 10/31, a guidance document outlining a checklist for at-sea inspections. The representative of the EU explained that this was a non-compulsory checklist intended to act as a compliment to the port inspection checklist (STACTIC WP 09/17). He elaborated that in order to maximize the effectiveness of the NAFO inspection scheme, and in the interest of improving the cost/benefit ratio, representatives should reflect on how to work more strategically by focusing on the quality instead of the quantity of inspections.

The representative of Canada voiced support for the concept of minimum standards and guidelines for inspections, so long as the checklist was not overly prescriptive or limiting to the inspection process and still allowed the necessary degree of flexibility.

The Chair inquired as to whether this was based on domestic practices within the EU. The representative confirmed that the elements of the checklist were based on domestic practices.

The representative of Denmark (in respect of the Faroe Islands and Greenland) questioned whether this would form part of the inspection report. The representative of the EU indicated that this checklist was intended solely as guidance and it was not envisaged that it would form part of the inspection report.

It was agreed that this would remain an open item to allow STACTIC to reflect on Contracting Party experiences related to the utilization of the checklists.

Joint Patrols

To further discussions held during the 2010 STACTIC intersessional meeting, and in relation to STACTIC WP 09/15, which proposes procedures for joint inspections, the representative of Canada provided a brief summary of Canada's experiences with joint patrols in 2010. The following key points were enumerated:

- As of this meeting, four joint patrols were conducted (2 with the EU inspectors and 2 with inspectors from the United States) from 2 Canadian patrol vessels operating in the NRA in 2010;
- There were a total of 22 inspections conducted;
- Overall, the joint inspections worked well and were a positive experience;
- Given logistical issues future patrols should be identified in the December preceding the inspections;
- Medical (sea-going) and security clearances must be conducted and submitted well in advance of patrols;
- The ability to communicate effectively in the English language is essential for safety/planning purposes onboard Canadian vessels; and
- Inspectors should arrive sufficiently in advance of patrols to allow for comprehensive briefings and participation in patrol planning.

The representative of the EU thanked Canada for hosting community inspectors, citing that joint inspections provided an opportunity for Contracting Parties to participate in enforcement operations in the NRA when there were no National means available. He reiterated that more work was required on developing protocols/procedures to enhance further joint patrols and noted that the experiences garnered through this "pilot" would be beneficial in that regard.

The representative of Canada noted that those participating in the joint patrols should also be getting credit for having contributed to enforcement operations in the NRA. He also reminded representatives that those thinking of engaging in joint patrols must notify the Executive Secretary prior to deployment.

The representative of the United States also thanked Canada for providing a cost effective means of allowing greater participating in enforcement operations in the NRA and contributing to inspector capacity development. He agreed that joint patrol participants should be acknowledged for their contribution and relevant reports should be documented accordingly.

The representative of the EU noted that the concept of joint inspections should be expanded to include such things as port inspections. The representative of Canada supported this concept.

It was agreed that further reflection was required on the issue of joint inspection protocols and that this item should be revisited at subsequent meetings.

c) Aerial Surveillance

The Chair introduced this standing item on the STACTIC agenda to facilitate discussions related to aerial surveillance in the NRA. No working papers or were submitted under this item. However, the representative of Canada noted that Canada does operate an extensive aerial surveillance program in the NRA which accounts for approximately 295 patrols per year, some in a joint capacity with inspectors from other Contracting Parties. The representative of Canada further suggested that STACTIC should leave this agenda item open to allow for annual reporting of efforts in this regard.

It was agreed that this agenda item would remain open to allow representative to report on aerial surveillance activities and reflect on related issues.

d) Electronic/Satellite/Remote Monitoring

The Chair introduced this standing item on the STACTIC agenda to facilitate discussions related to electronic/satellite/remote monitoring in the NRA. No working papers or discussion items were submitted under this item. The representative of Canada noted that, in future, issues such as VMS and emerging electronic reporting provisions could be discussed under this agenda item.

Representatives agreed to reflect further on possible topics of interest under this agenda item.

6. Review of IUU pursuant to NAFO CEM Article 57.3

The Chair opened the agenda item and asked the NAFO Secretariat to introduce STACTIC WP 10/20. The NAFO Secretariat presented the working paper and indicated that there had been no changes to the IUU lists since the last formal review at the 2010 STACTIC intersessional.

The representative of the EU provided an update on two vessels on the NAFO-NEAFC IUU list, indicating that they were possible candidates for de-listing. The Chair noted that these vessels were placed on the list by NEAFC and accordingly, they should be de-listed by the same organization.

The representative of Norway noted that, while NAFO should have the ability to de-list vessels, it was STACTIC's responsibility to ensure that there was proper documentation supporting removals.

The representative of the EU presented STACTIC WP 10/36, this paper introduces procedural text from the NEAFC *Scheme for Control and Enforcement* outlining eligibility elements for a delisting procedure.

The representatives noted that NAFO should be harmonized with NEAFC on this issue and recognized the practical basis for adopting these provisions.

It was agreed to submit STACTIC WP 10/36 (revised) to the Fisheries Commission for adoption.

7. Joint Inspection and Surveillance Scheme

The Chair remarked that a discussion had taken place on the issue concerning the trend of increased inspection rates on fishing vessels, as tabled at Fisheries Commission during the 2009 NAFO annual meeting. He was not aware of any further developments and opened the floor to comments.

The representative of the EU remarked that if there were no outstanding issues or papers that this agenda item could be deferred to another meeting. The Chair agreed with this view.

The agenda item was closed.

8. Editorial Drafting Group of the NAFO CEM (EDG)

The Chair asked that the EDG provide a progress report on the NAFO CEM editorial drafting initiative and referenced the associated working papers (STACTIC WP 10/27, STACTIC WP 10/28 and STACTIC WP 10/33).

The representative of the EDG provide a brief synopsis of STACTIC WP 10/27, which provided a summary of the groups efforts to date and outlined the proposed next steps. She indicated that phase 1 of the work, addressing the more minor and editorial issues, was nearly complete and that phase 2 would focus on re-ordering the articles/provisions into logical groupings and beginning to address/identify the more substantial issues.

In conducting its editorial work the EDG again identified issues requiring STACTIC guidance. The EDG introduced STACTIC WP 10/28 and sought direction on how to proceed with the issues listed in the working paper. The Chair echoed the sentiments of many of the representatives cautioning the EDG to work through the editorial issues, leaving the substantive issues to STACTIC for resolution. Each issue was reviewed and those items identified as possible substantive questions may be presented to Fisheries Commission for guidance after further reflection by STACTIC at its next intersessional (Annex 2).

As a final part of the work completed by the EDG, STACTIC WP 10/33 was presented. This paper proposed a draft table of contents for the existing annexes to group them in a more logical and thematic (e.g. annexes related to gear grouped together) order.

The representative of the DFG supported the ordering but suggested that the grouping proposed under the "reporting" theme could be separated into obligations of the Master and obligations of the Contracting Party. The representative of the EDG noted that the table of contents would be modified accordingly.

The representative of Canada applauded the EDG for its efforts, however questioned, with phase 1 nearly completed, whether Fisheries Commission guidance should be sought on the more substantive phase 2 components. The Chair advised the EDG to continue its work and focus on completing phase 1 in advance of the 2011 STACTIC intersessional.

It was agreed that:

- *The EDG would continue its work in order to provide a final editorial overview for consideration at the 2011 STACTIC intersessional.*
- *As phase 2 of the editorial review, the EDG would commence work on making suggestions for new measures to be submitted to Fisheries Commission at the 2011 NAFO annual meeting.*
- *The Fisheries Commission would be provided with a progress report on this initiative, noting the need for another year given the magnitude of the task.*

9. Possible revisions of NAFO CEM

a) Duration of an inspection

The Chair introduced the agenda item and reminded representatives that this working paper (STACTIC WP 09/20) had been deferred from the 2010 STACTIC intersessional to allow for further reflection. The representative of Denmark (in respect of the Faroe Islands and Greenland) indicated that he had consulted with industry and it was felt that (3) hours was sufficient, (4) hours could start to become a burden. The representative of the EU indicated that provisions existed within the NAFO CEM's that allowed for stays beyond three hours (e.g. Article 33.10).

The representative of Canada reiterated that given the complexity of inspection under the NAFO inspection scheme the extra hour would be useful and again noted that NEAFC currently had a provision for (4) hour inspections. The representative of Russia supported the Canadian proposal. The representative of the United States also supported the proposal, citing the usefulness of the extra time, especially in the context of joint patrols. The representative of Norway confirmed that the NEAFC *Scheme for Control and Enforcement*, Article 18.5, allowed for (4) hour inspections. Given this, representatives agreed, in the interest of harmonization, to adopt (4) hour inspection in NAFO.

After further reflection it was agreed to forward STACTIC WP 09/20 to the Fisheries Commission for adoption.

b) Product Labelling

The Chair opened the agenda item and noted that there were two Canadian working papers under this item (STACTIC WP 10/25 and STACTIC WP 10/34). The representative of Canada introduced STACTIC WP 10/25 and explained that this paper was a re-write to expand on concepts first introduced in STACTIC WP 09/23. It was explained that the rationale for establishing label standards was to facilitate the inspections process and was deemed necessary in light of operational experiences.

The representative of Norway was surprised to hear that this level of detail was required to address the issue but supported the proposal. The representative of the EU agreed with that labels should be of adequate size and constitution to facilitate inspections, however felt other text may be more effective. The representative of France (in respect of St. Pierre-et-Miquelon) also indicated that the emphasis should be readability and not on size standards.

The representative of Canada introduced the second working paper under this agenda item, STACTIC WP 10/34. This proposal called for the inclusion of labelling violations as serious infringements given the linkage to mis-recording. The representative of the EU supported the principle but felt another approach might be more effective in achieving the desired result. The representative of the EU agreed to work with Canada on a revised paper that would address both issues.

Based on discussion and consultation, Canada presented STACTIC WP 10/37. This paper merged the concepts found in the two earlier proposals. The new document amends Article 23 to further emphasize the need for legible labelling and also amends Article 24.2 to create a linkage between labelled product and the catches recorded in the daily production/fishing logbook.

It was agreed that STACTIC WP 10/37 would be submitted to the Fisheries Commission for adoption.

c) Verification of Authorization to Fish

The Chair noted that there were two working papers under this agenda item and asked the representative of Iceland to present STACTIC WP 10/16. The representative of Iceland explained that the purpose of this paper was to introduce the concept of a virtual inspector's portal that would contain the most updated electronic version of

relevant information (e.g. vessel registration, authorization to fish, research plans). He noted that this initiative could be developed in stages and other relevant information could be made available through the portal as the project developed. The portal would be a secure password protected site that could be accessed from sea.

The representative of Denmark (in respect of the Faroe Islands and Greenland) supported the concept but indicated some issues would need to be resolved (e.g. vague wording in Article 20 Vessel Register). The representative of Canada also supported the concept noting that a one-stop shop for inspectors would be desirable but that there still remains much design and development work to implement this initiative. He also noted that connectivity for all users would need to be addressed and indicated that while awaiting development of the portal, STACTIC WP 09/24 could be supported in the interim. The representative of Norway indicated that it has dispensed with the paper process and it would be undesirable to return to this practice. The representative of Iceland supported this position and noted that connectivity at sea was no longer an issue.

The Chair thanked the representative of Iceland for the paper and inquired as to the potential cost implications. The NAFO Secretariat indicated that they would welcome the opportunity to develop such a portal but indicated that there would be systemic and resource implications with respect to implementing this concept. The representative of Iceland indicated that NEAFC had implemented a lesser, but similar system and wondered if those experiences could not be exploited. He further elaborated that this system could be implemented in stages given the complexity. The NAFO Secretariat indicated that they had consulted with NEAFC on its system and discovered it had taken several years to complete the work in its entirety. The representative of Canada suggested that it might be useful if the NAFO Secretariat developed a workplan with options and cost implications for presentation to STACTIC. The representative of the EU supported the Canadian suggestion. The Chair directed the NAFO Secretariat to reflect further on this issue and report back to STACTIC at the next meeting.

It was agreed that the NAFO Secretariat would develop a working paper to present at the 2011 STACTIC intersessional meeting.

d) Shrimp Strengthening Bags

The Chair introduced the agenda item and asked Canada to explain the revisions to this working paper that was originally presented at the 2009 annual meeting as STACTIC WP 09/25. The representative of Canada introduced STACTIC WP 10/24 and noted that the changes requested during the 2010 STACTIC intersessional had been incorporated. The representative of the EU supported the proposal, but noted that the term “sorting grid/grate” should be used instead of “separator grate” to be consistent with what is found in the NAFO CEM’s. The representative of Denmark (in respect of the Faroe Islands and Greenland) made some minor wording suggestions in the interest of clarity.

Canada presented a revised working paper that incorporated these editorial changes, and it was agreed to forward this working paper to the Fisheries Commission for adoption.

It was agreed that STACTIC WP 10/24 (Rev.) would be submitted to the Fisheries Commission for adoption.

e) Retrieval of the net

The Chair opened the agenda item and asked Canada to elaborate on STACTIC WP 09/26. The representative of Canada remarked, based on an intervention by Norway, he now recognized that this proposal would make the provision contained with the NAFO CEM’s inconsistent with what was in place within the NEAFC *Scheme for Control and Enforcement* and agreed to withdraw the proposal, especially in light of the adoption of STACTIC WP 09/20 which aimed to harmonize NAFO and NEAFC measures.

The working paper was withdrawn and this item was closed.

f) By-catch requirements

The Chair opened the agenda item and invited the EU to explain the rationale for STACTIC WP 10/7. The representative of the EU explained that the bycatch provision, Article 12.1 d), adopted at the 2009 annual meeting is inappropriate and added a level of complexity to an already complicated bycatch regime and was, in his estimation, impractical to implement. The representative of Russia supported this position.

The representative of Canada noted that this provision was only just adopted last year by the Fisheries Commission, specifically in relation to newly re-opened fisheries that had been under moratoria. He indicated that this provision was consistent with existing management provisions.

The representative of the EU argued that this provision mixed the concept of fishing under a quota and fishing under by-catch tolerances and required fisheries managers to invent a date to halt fishing to avoid quota overruns. The representative of Norway remarked that the adopted provision was logical and that it was the obligation of the Contracting Party to manage within its quota. Elaborating further the representative of Norway indicated that depending on the available quota, and prevailing circumstances, a Contracting Party would have to choose between allocating the full quota, allocating only a partial quota to allow for some by-catch in other fisheries and finally not allocating any quota to provide for high by-catch rates in other fisheries.

Several Contracting Parties expressed their apprehensions about exploring the removal of this newly introduced provision, noting the need to further consult with their respective delegations.

It was agreed that:

- ***The Chair would report to the Fisheries Commission that, while it was recognized that this was a fisheries management issue, some STACTIC representatives expressed concerns that the implementation of this provision was problematic and may add confusion in the management of the fisheries.***

g) Chartering arrangements

The Chair opened this agenda item and requested the representative of the EU present STACTIC WP 10/8 concerning requiring that documentation be retained on board the vessel concerning the chartering arrangement. It was explained that the purpose of this working paper was to facilitate the work of at-sea inspectors in the short-term. This topic was also discussed in concert with the broad level discussion on electronic reporting, and the desire to move towards a more electronic means of documentation (see STACTIC WP 10/16 presented by Iceland) in the mid-to longer term.

The representative of Canada noted that the short-term solution was to require that this information be retained on board, while the long-term solution would be to have it available to Contracting Parties electronically, in real-time. The NAFO Secretariat noted that this information was currently available on the NAFO website. The representative of Canada further noted that not all Contracting Parties may have electronic capabilities on board their inspection vessels, and it may be useful to have a document on board to facilitate inspection. The representative from the United States remarked that the charter vessel should at a minimum carry a copy of the consent letter referenced under NAFO CEM Article 19.7. The Secretariat clarified that there are two consent letters, one from the Chartering Contracting Party and one from the flag State Contracting Party. It was agreed that both consent letters should be carried on board the vessel. The representative of the EU agreed to revise STACTIC WP 10/8 in light of these comments. Following presentation of this revised working paper, there was general agreement that STACTIC WP 10/8 (Rev 2) be forwarded to the Fisheries Commission for adoption.

It was agreed that STACTIC WP 10/8 Rev.2 would be submitted to the Fisheries Commission for adoption.

h) Communication of Catches

The Chair opened the agenda item and noted there were a number of proposals pertaining to this issue. The representative of Iceland introduced STACTIC WP 10/17, a discussion paper that provided clarification on report types and proper sequencing of messages. The Chair thanked Iceland for the paper and noted that this document would provide good context for subsequent discussion on reporting.

The representative of the EU provided a detailed summary and rationale for the EU's proposal on daily communication of catch (STACTIC WP 10/9). Representatives all agreed on the merit of adopting daily reporting, in the interest of both simplifying reporting requirements and to provide enhanced monitoring capability. A comprehensive discussion ensued on the benefits and systemic issues related to the elements of the proposal. The representatives, particularly those of Iceland, the EU and Russia were able to successfully merge multiple concepts and resolve the various technical issues to arrive at a modified proposal that was acceptable to all parties.

The representative of Iceland explained that regardless of the frequency of catch reports, the catch reported under the CA data element is always the catch taken since the last communication of catches.

It was agreed that new codes would be submitted to the AGDC for verification via the NAFO Secretariat.

The Chair remarked that the extent and breadth of the discussions reflected the complexity and importance of the issue and was pleased that STACTIC was able to advance this working paper.

It was agreed to submit STACTIC WP 10/9 (Rev.5) the Fisheries Commission for adoption.

i) Report on Infringements

As requested at the 2010 STACTIC intersessional, the NAFO Secretariat produced a draft template for an electronic notification form (STACTIC WP 10/19) that would be used by Contracting Parties to report on infringements. While there was general support for the proposed template, the representative of the United States noted that the field entitled “Second Sea Inspection” should have additional text indicating “as applicable”. The representative of Canada also supported the form, but noted the use of the term “confirmation”, under the “Second Sea Inspection” and “Port Inspection” fields, and remarked that this was not appropriate given that no such process existed within the NCEM’s. It was suggested that this text be removed and no example be provided. The representative of the EU noted that this term was simply intended to reflect the follow-up that occurs to an infringement, but acknowledged that “confirmation” was not appropriate.

The NAFO Secretariat noted the comments and provided a revised working paper that addressed the identified issues.

It was agreed to submit STACTIC WP 10/19 (Rev.) to the Fisheries Commission for adoption.

j) COX message and CANCEL report

The Chair opened this agenda item and asked the representative of Russia to introduce STACTIC WP 10/15. The representative of Russia indicated that there were two parts to this proposal. The first part was intended to facilitate inspections by adding a field OB (onboard) to the COX report that represents that actual catch on board the vessel (to account for any catch that was acquired or offloaded via transshipment). The second part was conceived to provide a means for allowing the cancellation of erroneous catch reports through the implementation of a “cancel” report.

The representative from the EU noted that the essence of the first part of Russia’s proposal, related to COX messages, was addressed within the EU proposal STACTIC WP 10/9 (Rev. 5) and could be removed from this proposal. The representative of Russia agreed with this suggestion.

The representative from the EU then noted his support for the “cancel” report concept, but expressed his view that this message should not come from the vessel Master, but rather the FMC. The representative from Canada echoed this sentiment, explaining that while he understood the need for the cancel report, he also recognized that this provision could be negatively exploited by vessel Masters. Accordingly, the representative of Canada supported the EU’s recommendation that the “cancel” reports should only be submitted from a Contracting Parties FMC.

The representative of Russia agreed to modify their proposal to address the comments of Canada and the EU. This revised proposal was later presented as STACTIC WP 10/15 (Rev). While there was general agreement that this proposal should be adopted, on the advice of the representative of Iceland, it was suggested that Russia should first submit this to the Advisory Group on Data Communication (AGDC) to facilitate harmonization between the linked NAFO and NEAFC systems.

It was agreed that NAFO Secretariat would submit the revised proposal on “Cancel” messages to the AGDC to solicit its views on how best to adopt the proposal for use in both NAFO and NEAFC.

k) Port State Control (pre-notification of arrival in port)

The Chair opened the agenda item and asked the representative of the EU to introduce STACTIC WP 10/30, a proposal that would enable a vessel to provide portion “A” of PSC 1 or 2 at the latest (1) day in advance of the estimated time of arrival instead of the current (3) days. It was noted that the pre-notification of the estimated time of arrival is still to be submitted (3) days prior to landing or transshipment. The representative of the EU noted that when the fishing grounds are in close proximity to a designated port the quantity provided (3) days in advance is likely an estimate as the vessel will continue fishing prior to entry. This creates the need to send a second form to amend the original PSC form. The representative of Japan supported the proposal.

The representative of Iceland indicated that, under Article 46.2, a derogation already exists that allows a port State to identify a different pre-notification period. He also noted that pre-notification exists to provide the opportunity to verify the catch with the flag State. The representative of Canada agreed with the Icelandic intervention, noting in

practice that Canada has permitted shorter pre-notification periods. The representative of Canada also indicated that pre-notification was necessary to allow for proper inspection planning.

The representative of Norway indicated that a similar scenario exists in Norway, where Russian vessels are active in fishing grounds that are in close proximity to port. He noted that, as in NAFO, the NEAFC measures provide Contracting Parties with the necessary flexibility to address this issue bilaterally.

The representative of the EU noted that this derogation was not compulsory and forced the need to negotiate bilateral arrangements, which creates an unnecessary administrative burden. The representative of Iceland noted that NAFO and NEAFC currently employed harmonized port State control schemes and changes to this article would affect this balance. The representative of Russia agreed with the Icelandic and Norwegian views and noted that the current port state control schemes were working well in both organizations.

The Chair encouraged Contracting Parties to work collaboratively in establishing practical pre-notification periods within the purview of the established Port State Control Scheme. After further reflection the EU agreed to withdraw STACTIC WP 10/30 based on the comments of the other representatives.

It was agreed that STACTIC WP 10/30 would be withdrawn and the agenda item was closed.

1) Product Form Codes

The Chair opened the agenda item and asked the representative of the EU to introduce STACTIC WP 10/32, a proposal calling for an amendment to the existing product form codes in the NAFO CEM's Annex XX (c). The representative of the EU noted that the existing codes within Annex XX (c) were insufficient to cover some of the product forms currently utilized in the NRA. The representative of Denmark (in respect of the Faroe Islands and Greenland) inquired as to the origin of these codes. The representative of the EU indicated that these were taken from established FAO 3-alpha codes and added that others could be added from the FAO list if necessary. The Chair noted the potential need to make similar changes in NEAFC to ensure ongoing harmonization of these codes.

The representative of Canada indicated that he had no issues with expanding the number of codes but questioned the technical implication of moving from a single alpha code to a 3-alpha code. The representative of Norway agreed that there could be data issues and suggested that this matter be tabled at the next meeting of NEAFC's AGDC. The Chair supported Norway's suggestion given the possible implications in NAFO and NEAFC.

It was agreed that the NAFO Secretariat would forward this issue to the AGDC.

10. Observers Scheme - NCEM Chapter VII and Article 28

The Chair noted that there were two working papers under this agenda item and asked the NAFO Secretariat to provide an overview of STACTIC WP 10/22, the preliminary evaluation of the effectiveness of implementation of Chapter VII. The NAFO Secretariat outlined the approach taken in conducting this evaluation and solicited comments and questions from the representatives.

The representative of the EU suggested that this agenda item be structure to deal with three items:

1. Evaluation of NAFO CEM's Chapter VII;
2. Identification of items to submit to the attention of the AGDC.
3. Observer Program discussion; and

The Chair noted the EU's suggested approach and opened the floor to comments.

The representative of the EU thanked the NAFO Secretariat for this factual report and expressed the view that it was clearly demonstrated that Chapter VII is in need of a major revision. He expressed the view that this item should be discussed within the broader context of full electronic reporting system in the AGDC. He asked the Chair to request that the AGDC to initiate a discussion on the electronic reporting system at its next session.

In the context of STACTIC WP 10/22, the representative from Canada inquired as to why only 13 out of 25 fishing periods under this alternative Observer scheme were found to be compliant. The representative of Denmark (in respect of the Faroe Islands and Greenland) offered practical explanations for some of the missing reports from his vessels. The Secretariat explained that compliance determination under this evaluation was based on an examination of individual vessel compliance with reporting requirements across all trips by that Contracting Party. The

representative from the United States questioned whether this was an appropriate means of determining compliance with these provisions.

The representative of Iceland provided some background on the evolution of NAFO CEM's Chapter VII and noted that compliance was to be assessed by reviewing both the reporting requirements, and the content of messages when an Observer was onboard a vessel and when an Observer was not onboard. He remarked that compliance to these provisions was not an issue for the AGDC.

The Chair acknowledge the general sentiment within STACTIC that the provisions contained with NAFO CEM's Chapter VII were not overly functional or effective and that they would soon be rendered obsolete by advances in electronic reporting, such as daily reporting. On this note, the discussion concerning the evaluation of the alternative Observer scheme was concluded.

On the issue of potential items that could be brought to the attention of the AGDC, the representative of the EU sought agreement by representatives to initiate a discussion in the AGDC on the implementation of a broader electronic reporting system, in the medium term, to promote a more reliable and effective enforcement scheme.

The Chair then requested that the EU present STACTIC WP 10/29, a discussion paper that suggested extensive changes to the current Observer scheme. The representative of the EU outlined the philosophy behind the discussion paper, reiterating the EU's position that the current Observer scheme was costly and ineffective.

The representative of Canada noted that Observers are an internationally recognized enforcement tool and that Canada currently operates an extensive Observer program, both domestically and within the NRA, which is viewed as an effective component in Canada's enforcement scheme. He suggested that, given the sentiments expressed by the EU, a possible way forward could be the establishment of a working group comprised of enforcement, science and fisheries management experts. The representative of the United States supported the Canadian comments.

The representative of the EU suggested the Scientific Council should be questioned on the usefulness of the compliance Observer program to scientific initiatives. The Chair noted the suggested and it was agreed that Scientific Council would be approached on this issue.

It was agreed that:

- ***Further reflection was required on NAFO CEM's Chapter VII, including how other electronic reporting provisions could be explored to replace the current scheme.***
- ***Scientific Council would be consulted on usefulness of Observer reports to its various initiatives and what, if any, negative scientific impacts could come from reductions/elimination of a scientific observer program.***
- ***STACTIC would continue to reflect on the merit and effectiveness of the current Observer scheme.***
- ***The NAFO Secretariat would forward a request to the AGDC to initiate a discussion on the electronic reporting system at its next session.***

11. Other matters

a) Contingency plans in the case of force majeure

The Chair noted that, given the infrequency of this issue there was no urgency in addressing this issue, but remarked that it would be prudent to develop procedures at some point.

The representative of Iceland voiced concerns that, in the absence of clear procedures, issues may be advanced in the absence of interested Contracting Parties being present. He recommended postponing discussion on important items in these cases. The representative of the United States acknowledged these concerns, but noted that this would not be an issue if the meeting was cancelled or postponed, it would only be relevant in cases were a meeting was convened with less than the usual compliment of Contracting Parties.

The representative of Canada noted that another international organization, the IMCS Network, was recently faced with the same situation and elected to cancel the meeting. He noted that circumstances would often dictate the appropriate action.

The Chair instructed representatives to reflect further on the issue so that a way forward could be determined.

It was agreed that STACTIC would reflect further on the issue and revisit it at the 2011 STACTIC intersessional meeting.

b) Conservation and Management of Sharks (Article 17)

The Chair opened the discussions, presented the NAFO Secretariat's compilation of information related to sharks and encouraged representatives to provide views related to compliance with the shark conservation and management provisions.

The EU remarked that, based on available information, sharks did not appear to pose a compliance concern in the NRA and noted information from the full NAFO Convention area may be useful for the purposes of this exercise. He noted that, based on the discussions under this agenda item it was clear that the reporting rules were not sufficient and work should be undertaken to improve the provisions.

The representative of the United States questioned whether Contracting Parties were complying with the reporting provisions of Article 17. The NAFO Secretariat confirmed that reports were being received from Contracting Parties pursuant to Article 17, although few references to sharks had been noted.

The representative of Canada reported that Canadian NAFO inspectors had witnessed only limited shark activity in the NRA and that there were no compliance issues of concern. He noted that sharks were occasionally captured inadvertently as bycatch, however in Canada's experience they were being discarded.

The representative of Denmark (in respect of the Faroe Islands and Greenland) noted that the reporting provisions linked with Article 17 were less than ideal for capturing information pertaining to sharks as they generally called for information pertaining to catch "onboard", and most sharks in the NRA were being discarded. She also noted that the provisions contained within Article 17 should also be reviewed and updated, as appropriate, to reflect advances in shark management.

It was agreed that:

- *Fisheries Commission would be advised that there were no identified compliance issues related to the provisions of NAFO CEM's Article 17.*
- *Representatives would reflect further on potential reporting improvements with the view to enhancing the provisions of Article 17.*

c) Article 15 – Area and Time Restrictions

The representative of Denmark (in respect of the Faroe Islands and Greenland) presented STACTIC WP 10/35 and explained that its purpose was to align the coordinates provided under NAFO CEM's Article 15.2 with the spirit of the provision. The representative of Norway indicated that it could support the concept if it indeed brought harmony between the spirit of the provisions and the coordinates. The representative of Canada supported Norway's view but noted that the proposed (3) coordinates would need to be verified to ensure they were consistent with the text of the current measures and encouraged adding additional coordinates to better reflect the 200 meter contour.

It was agreed that:

- *Further consultation is required to ensure the spirit of NAFO CEM Article 15.2 was respected.*
- *Denmark (in respect of the Faroe Islands and Greenland) will submit a revised working paper at the 2011 STACTIC intersessional meeting.*

d) STACTIC Working Papers submitted for adoption

The following table contains a list of STACTIC Working Papers forwarded to the Fisheries Commission for adoption:

STACTIC W. P.	TITLE
09/20	Discussion Paper on "Duration of Inspections"
09/21 (Rev. 2)	Discussion Paper on "Inspection Party Composition: Article 33 (4)"
10/8 (Rev. 2)	Discussion paper on "Chartering Arrangements" - NAFO CEM - Article 19
10/9 (Rev. 5)	Discussion paper on "Daily Communication of Catches" - NAFO CEM Article 27 + Annex X + Annex XXII
10/10	Discussion Paper on "Notification Requirements" NCEM Article 30
10/11 (Rev. 2)	Discussion Paper on "Report on Infringements" NCEM Article 42
10/19 (Rev.)	Template for "Report on Infringement" Form
10/23	PSC 3 Report Form
10/24 (Rev.)	Discussion Paper on "Shrimp Strengthening Bags"
10/26	Annual Compliance Review 2010
10/36 (Rev.)	Discussion paper on "Delisting procedure for IUU vessels"- NAFO CEM Article 57
10/37	Minimum Standards for Product Labelling under Article 23 and Labelling shall Accurately reflect Logbook Records under Article 24

12. Election of Chair

Representatives acknowledged the excellent work of Mads Nedergaard (Denmark in respect of the Faroe Islands and Greenland), who has served as STACTIC Chair for two consecutive terms, and thanked him for his professionalism during his tenure.

Gene Martin (United States) was appointed Chair of STACTIC.

Stein-Åage Johnsen (Norway) was appointed as Vice-Chair.

13. Time and Place of Next Meeting

The Chair opened the agenda item and expressed a strong desire to take advantage of the cost savings and economies of having the STACTIC intersessional meeting take place in association with the NEAFC PECCOE and the AGDC meetings. The representative of Canada reiterated comments made during its opening statement in General Council that controlling costs for the NAFO Secretariat was important and Contracting Parties should keep this in mind when selecting a venue for the STACTIC intersessional meeting.

The representative of the EU also supported the view expressed by the Chair, however noted that should this proposal not be possible in 2011, Estonia was willing to host the next STACTIC intersessional, at a time and place to be determined. He also expressed a wish to continue conducting the meeting in the month of May to allow for adequate time in advance of the NAFO annual meeting.

The representative of Iceland agreed with the benefits to be derived from having the various meeting take place around the same time, in the same location. In the event that this was not possible however, he reiterated Iceland's view, expressed in STACTIC WP 9/16, that in the interest of cost savings and convenience, the STACTIC intersessional meeting should take place in either the NAFO facilitates in Dartmouth, or at a centrally located European venue.

It was agreed NEAFC would be engaged on this issue and that efforts would be made to conduct the STACTIC intersessional meeting in close coordination with the PECCOE and AGDC meetings. The default location will be at the NAFO Secretariat offices in Dartmouth, Canada.

14. Adoption of Report

The report was adopted by the representatives.

15. Adjournment

The meeting adjourned at 12:20 hrs on Thursday, September 23rd 2010.

Annex 1. Agenda

1. Opening by the Chair, Mads Nedergaard, Denmark (in respect of the Faroe Islands and Greenland)
2. Appointment of Rapporteur
3. Adoption of Agenda
4. Compliance review 2009 including review of reports of apparent infringements
5. Review and evaluation of NAFO Compliance objectives
 - In-Port/Land based Monitoring
 - At-Sea Monitoring
 - Aerial Surveillance
 - Electronic/Satellite/Remote Monitoring
6. Review of current IUU List pursuant to NAFO CEM Article 57.3
7. Joint Inspection and Surveillance Scheme
8. Editorial Drafting Group of the NAFO CEM (EDG)
9. Possible revisions of NAFO CEM
 - a) Duration of an inspection
 - b) Product Labelling
 - c) Verification of Authorization to Fish
 - d) Shrimp Strengthening Bags
 - e) Retrieval of the net
 - f) By-catch requirements
 - g) Chartering arrangements
 - h) Communication of Catches
 - i) Report on Infringements
 - j) COX message and CANCEL report
 - k) Port State Control (pre-notification of arrival in port)
 - l) Product Form Codes
10. Observers Scheme - NCEM Chapter VII and Article 28
11. Other matters
 - a) Contingency plans in the case of force majeure
 - b) Conservation and Management of Sharks
 - c) Article 15 – Area and Time Restrictions
 - d) STACTIC Working Papers submitted for adoption
12. Election of Chair
13. Time and Place of the next STACTIC Meeting
14. Adoption of Report
15. Adjournment

Annex 2. Outstanding Issues Presented by the EDG

The following determinations were made:

1. Under Article 14.1 (minimum fish size), should the 5 nautical mile move provision be changed to 10 nautical miles to be consistent with by-catch provisions?

Determination: Requires further reflection.

2. Does Article 14.3 (minimum fish size exemption since Canadian vessels required to land all catches) apply to any other CPs?

Determination: Requires further reflection.

3. Which protocol is being referred to under Article 15.8 (area and time restrictions)? The exploratory fishing protocol?

Determination: Requires guidance from Fisheries Commission/Scientific Council.

4. Which duties/responsibilities are transferred from chartering CP to flag state CP when a charter takes place (Article 19.5)?

Determination: Only those outlined in Article 19.5.

5. What is intent of including reference to bycatches in Article 19.11 (chartering arrangements), and to who's quota does such by-catch get counted against?

Determination: Contracting Party with the quota - as is the reporting practice. Representative of the EU questioned why chartering exists when quota transfer process in place – further reflection required.

6. Should chartering compliance report referenced in Article 19.13 be included in general compliance report generated by STACTIC?

Determination: Presented directly to Fisheries Commission as required, thus no need to incorporate into Compliance Report.

7. In Article 20.1, there is not clear definition for “operate.” For example, “...authorized to operate in the Regulatory Area...” Does this mean fishing, transiting, or both? EDG suggests that a definition be developed and incorporated into the definitions section of the CEMs.

Determination: Definition should be developed - requires further reflection.

8. A practical approach needs to be developed concerning “wet fish” under Article 23 (product labeling requirements)? Is it the will of STACTIC for the EDG to develop such an approach?

Determination: Canada agreed to draft a proposal on this issue.

9. The issue of whether all required documents should be available on board vessel to inspectors issue needs further consideration – taking into consideration Iceland is preparing a working paper on electronic methods of data exchange for the September 2010 STACTIC meeting.

Determination: Defer to Icelandic discussion paper on this issue.

SECTION IV
(pages 231 to 238)

**Report of the FC Working Group of Fishery Managers and Scientists on
Conservation Plans and Rebuilding Strategies (WGFMS-CPRS)
7 April 2011
(via WebEx)**

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Report of the FC Working Group of Fishery Managers and Scientists on Conservation Plans and Rebuilding Strategies (WGFMS-CPRS)

(FC Doc. 11/2)

7 April 2011 (via WebEx)

1. Opening

The Executive Secretary (Vladimir Shibanov) opened the inaugural meeting at 1410 GMT on Thursday 7 April 2011, and welcomed all participants. Canada, European Union, Norway, the Russian Federation, and the USA were represented. The Scientific Council (SC) Chair was also present (Annex 1).

2. Election of Chair and Vice-Chair

Jean-Claude Mahé (EU) and Morley Knight (Canada) were elected Chair and Vice-Chair, respectively. The newly-elected Chair presided the meeting for the subsequent agenda items.

3. Appointment of Rapporteur

The Fisheries Commission Coordinator (Ricardo Federizon) was appointed rapporteur.

4. Adoption of Agenda

The provisional agenda as previously circulated was adopted (Annex 2).

5. Review of the current SC advice relevant to CPRS and consideration of a formulation of additional FC request to SC

The SC Chair (Ricardo Alpoim, EU) presented the latest scientific advice on two fish stocks currently under the *Conservation Plans and Rebuilding Strategies* programme, 3LNO American plaice and 3NO cod (Annex 3). The advice was formulated by the SC during its June 2010 meeting and was already presented at the September 2010 Annual Meeting. He indicated that the detailed advice and comments are contained in the document SCS Doc 10/18 Rev.

The SC Chair indicated the SC is aware of time constraints imposed by the Rules of Procedure concerning Fisheries Commission (FC) Requests and SC responses. However, it is ready in its scheduled June 2011 Meeting in Germany to accommodate additional and relevant request for advice that may emanate from this WG Meeting. The results of the SC June 2011 Meeting would be finalized within few days after the adjournment, and thus this WG would have adequate time to consider and utilize the SC June 2011 Meeting results in time for the next WG meeting (see item 7 of this report).

The current FC Request for Scientific Advice (FC Doc 10/9 Rev) which was formulated at the 2010 Annual Meeting and which would be considered by SC at its June 2011 Meeting was reviewed. Noting that one of the specific duties of this WG as defined in the ToR is the review of reference points and Harvest Control Rules, which would be undertaken at the next WG meeting, it was clarified that F_{msy} and B_{msy} and a provision for advice on reference points would be addressed by item 7 of the FC Request. Likewise, Harvest Control Rule could be covered by Paragraph 2c of Annex I of the FC Request.

It was concluded the latest SC advice and comments on the two fish stock and forthcoming results of the SC June 2011 Meeting would be adequate for this WG to continue its work at the next meeting. Thus, no additional request to SC for advice is necessary.

6. Consideration of the agenda of the next meeting

The draft provisional agenda of the next meeting circulated in March 2011 (GFS/11-119) was reviewed. It was agreed that a new item "SC Chair presentation of scientific advice from the SC June 2011 meeting" be inserted (Annex 4). The *revised* draft provisional agenda would be dispatched to the Contracting Parties as soon as possible.

7. Confirmation of agreed date (26-28 June) and location of the next meeting

It was confirmed that the next meeting will be held in Halifax, Nova Scotia, Canada on 26 – 28 June 2011, as previously agreed by the Contracting Parties. The Secretariat was in the process of negotiations with an appropriate hotel as the venue. Hotel information and logistical details will be circulated as soon as possible.

8. Other business

It was pointed out that in the Terms of Reference document (FC Doc 10/11), a maximum of three participants per Contracting Party is allowed. It was agreed that there should be some flexibility on this rule, as it may be necessary for Contracting Parties to send more than three delegates, as advisers for example.

The SC Chair suggested that a *SharePoint* site be created in the NAFO Web site to facilitate coordination and sharing of documents among members of this WG. The Secretariat committed to implement the suggestion.

It was asked if there was a need for another WebEx meeting prior to the 26-28 June meeting. It was concluded that there would probably not be any other matter arising before the SC June meeting and that since there will only be one week delay between the end of the SC June meeting and the next WGFMS-CPRS, there was no need for an additional WebEx meeting.

9. Adjournment

The meeting was adjourned at 1530 GMT on Thursday, 7 April 2011.

Annex 1. List of Participants

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Annex 2. Agenda

1. Opening
2. Election of Chair and Vice-Chair
3. Appointment of Rapporteur
4. Adoption of Agenda
5. Review of current SC advice relevant to CPRS and consideration of a formulation of additional FC request to SC
6. Consideration of the agenda of the next meeting
7. Confirmation of agreed date (26-28 June) and location of the next meeting
8. Other business
9. Adjournment

Annex 3. Summary of Scientific Advice on 3LNO American plaice and 3NO Cod

Fish Stock	3LNO American plaice	3NO Cod
Biomass	Biomass and SSB are very low compared to historic levels. SSB declined to the lowest estimated level in 1994 and 1995. SSB has been increasing since then and is currently at 33, 000 t. B_{lim} for this stock is 50 000 t	The 2010 total biomass and spawning biomass remain low but are estimated to be at their highest levels since 1992.
State of the Stock	The stock remains low compared to historic levels and although SSB is increasing, it is estimated to be below B_{lim} . Scientific Council notes that SSB was projected in the last assessment to surpass B_{lim} in 2010. However, in this assessment recent estimates of SSB were revised downward as a result of relatively low survey indices in 2009, as well as slight revisions to input data from previous years. In addition, stock weights and maturities now appear to be reduced compared to values used in the projections in the last assessment.	Remains relatively low but has improved in recent years to levels just prior to the moratorium. Nevertheless, SSB is still well below B_{lim} .
Reference Points	An examination of the stock recruit scatter shows that good recruitment, with the possible exception of the 2003 year class, has rarely been observed in this stock at SSB below 50 000 t and this is currently the best estimate of B_{lim} . In 2009 STACFIS adopted an F_{lim} of 0.4 consistent with stock history and dynamics for this stock. The stock is currently below B_{lim} and current fishing mortality is below F_{lim} .	The current best estimate of B_{lim} is 60 000 t. SSB in 2010 is estimated to be 12 700 t which is 21% of B_{lim}
Short-term considerations	<p>Simulations were carried out to examine the trajectory of the stock under 3 scenarios of fishing mortality: $F = 0$, $F = F_{2009}$ (0.13), and $F_{0.1}$ (0.2) (show below). Simulations were limited to a 5-year period. Recruitment was resampled from three sections of the estimated stock recruit scatter, depending on SSB.</p> <p>At $F = 0$ spawning stock biomass is estimated to increase and there is a 50% probability that SSB will surpass B_{lim} by 2012. Under $F_{current}$ and $F_{0.1}$ the population is estimated to grow more slowly and there is a less than 50% probability that SSB will reach B_{lim} by 2015.</p>	Simulations were carried out to examine the trajectory of the stock under two scenarios of fishing mortality: $F=0$, $F=0.07$ (the average F on ages 4-6 from 2007-2009). Simulations were limited to a 3-year period. Given the SSB is still estimated to be well below B_{lim} , recruitment (at age 3) was only re-sampled from 1994-2009 as this represents a reasonable expectation of what has occurred under low productivity conditions. At $F = 0$ spawning stock biomass is estimated to increase and there is an 88% probability that SSB will remain under B_{lim} by 2013. At $F = 0.07$ the population is estimated to grow more slowly. If the fishing mortality in 2010-2012 remains at the average estimated in 2007-2009 then yield is estimated to increase over the 3-year time period.
Recommendations	There should be no directed fishing on American plaice in Div. 3LNO in 2011. Bycatches of American plaice should be kept to the lowest possible level and restricted to unavoidable bycatch in fisheries directing for other species.	There should be no directed fishing for cod in Div. 3N and Div. 3O in 2011-2013. Bycatches of cod should be kept to the lowest possible level and restricted to unavoidable bycatch in fisheries directed for other species

Annex 4. Draft Provisional Agenda of Next Meeting

**2nd Meeting of the
FC Working Group of Fishery Managers and Scientists
on Conservation Plans and Rebuilding Strategies (WGFMS-CPRS)**

**26-28 June 2011
Halifax, Canada**

Draft Provisional Agenda

1. Opening of the Meeting
2. Appointment of Rapporteur
3. Adoption of the Agenda
4. Matters arising from the WebEx meeting (April 2011)
5. SC Chair presentation of scientific advice from the SC June 2011 meeting
6. Review and update of the 3NO Cod Conservation Plan and Rebuilding Strategies (Article 9 of the NCEM)
7. Review and update of the 3LNO American Plaice Conservation Plan and Rebuilding Strategies (FC Doc 10/13)
8. Next Steps
9. Recommendations to be forwarded to the Fisheries Commission
10. Other Matters
11. Adoption of Report
12. Adjournment

SECTION V
(pages 239 to 268)

Report of the Standing Committee on International Control (STACTIC)
9-10 May 2011
London, UK

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Report of the Standing Committee on International Control (STACTIC)

(FC Doc. 11/3)

9-10 May 2011

London, UK

1. Opening by the Chair

The Chair (Gene Martin, USA) opened the 2011 NAFO STACTIC Intersessional Meeting at 09:00 hrs at the Northeast Atlantic Fisheries Commission (NEAFC) Headquarters in London, United Kingdom, and welcomed participating Contracting Parties to the 2011 STACTIC Intersessional Meeting. Contracting Parties present included Canada, Denmark (in respect of the Faroe Islands and Greenland) the European Union (EU), France (in respect of St. Pierre et Miquelon), Iceland, Norway, Russian Federation and the United States. (Annex 1)

Before commencing the Chair introduced the Secretary of NEAFC, Kjartan Hoydal, for a brief opening statement. Mr. Hoydal welcomed NAFO Contracting Parties and noted the important relationship between NEAFC and NAFO.

2. Appointment of Rapporteur

Brett Gilchrist (Canada) was appointed rapporteur.

3. Adoption of Agenda

The Chair noted that four issues were added to the Other Matters Agenda heading:

- *The HTTPs NAF Gateways at the NEAFC and NAFO Secretariats (discussion paper from Norway)* STACTIC WP 11/2
- *Structural Changes to NAFO's VMS (presented by Secretariat)* STACTIC WP 11/3
- *SC Requests for FC Definition of Certain Fishing Gears (presented by the Secretariat)* STACTIC WP 11/8
- *Assessments of NAFO's VMS Data Transmissions (2008-2010) (presented by the NAFO Secretariat)* STACTIC WP 11/9

The agenda, with the addition of the four issues under the Other Matters Agenda item, was adopted. (Annex 2)

4. Compilation of fisheries reports for compliance review (2004-2010), including review of Apparent Infringements

The Chair introduced the agenda item and noted that this is an ongoing process to improve the reporting process on compliance to the Fisheries Commission. The Chair then asked the representative of the Secretariat to present the preliminary compilation of fisheries reports and the 2010 annual compliance review process.

The Secretariat provided a presentation on compliance Profiles and Trends from the NAFO fisheries in 2010. (Annex 3)

The Presentation by the Secretariat highlighted a series of data gaps encountered during the compilation that included:

- Port Inspection reports and Port State Measures
 - Scope of PSM: applies when Flag State of Vessel and Port State are different. Issue: Even if FS and PS are the same, GHJ fishing requires 100% port inspection (Art. 7 of NCEM). *Issue: For redfish or shrimp vessels landing catches in home ports, are port inspection reports required?*
 - Start and End fishing dates in PSC 3 are not indicated. *Issue: reduces the utility as one source of cross-verification of fishing trips and catches.*

- Art. 16.10 – Port State CP shall carry inspections at least 15% of all landings. *Issue: Analysis needed to determine whether 100% coverage has become unnecessary?*
- Vessel Monitoring System (VMS)
 - COX – inconsistent catch reporting. Catch indicated as “catch-on-board”, or “catch-in-NRA”.
 - POS reports – VMS not turned off when going to Newfoundland port without intention of landing catch. Additional scrutiny required in order to exclude these days in the estimation “number of days on fishing ground”.
 - Error Alerts that are automatically generated by the VMS.

The Secretariat asked Contracting Parties to review the circulated Table 1 - Overview of NAFO 2010 Fishing Reports, and note anything that may be missing (see “Next Steps” in slide presentation – slide 22).

Following the presentation by the Representative of the Secretariat, the Chair opened the floor for comments. Contracting Parties raised a number of issues under this agenda item.

Comments on the Problems Identified in the Presentation

With regards to the Secretariats’ concerns about port inspection, multiple Contracting Parties noted that there is no requirement to send port inspection information on domestic fisheries other than GHJ and those under a recovery plan. The Secretariat noted that the challenge associated with data gaps is based on the lack of clear justification for the gap. Contracting Parties suggest the Secretariat identify in Table 1 the cases where the submission of a port inspection report is not requested. It was agreed the Secretariat would work with Contracting Parties to verify whether or not missing data associated with their vessels is required or not based on current CEMs.

The representative of the EU reiterated discussions about improving the connection between at sea and in port inspections, and the need to improve reliability and efficiency of the entire process. The EU noted that one option could be to drop the requirement for 100% inspection of GHJ landings in the context of a risk-based inspection process, which could be applied to increase overall efficiency.

Norway noted that the rules for Port Inspection are recently established, and should not be renegotiated at this time.

Canada and other Contracting Parties expressed support for Norway’s recommendation that this was not the time for renegotiation of Port Inspection rules, but added that to support the Secretariat Contracting Parties may want to clarify the details of its submissions to avoid any errors.

Respecting the Secretariat’s concern about VMS reporting, it was noted by multiple Contracting Parties that the inconsistencies in catch reporting will in part be addressed by the introduction of the daily CAT message.

With regards to the problems outlined by the Secretariat on POS reports, Contracting Parties noted that there must be some way of excluding location VMS data outside of the NRA. The US recommended geofencing as a possible option.

Canada noted that Canada requires VMS on fishing fleets in Canadian waters in addition to the collateral benefits VMS provides search and rescue purposes.

Iceland noted that the start and end of fishing trips for the purpose of properly identifying time at sea (i.e., for monitoring 3M shrimp effort) could be determined via the COE and COX messages.

Comments on the Overall Report

Canada noted that in connection with the slide on infringements, proper stowage plans are important for conducting at sea inspections, and need to be accurate at all times to facilitate inspections at sea.

DFG and other Contracting Parties noted concern with the number of error reports identified on slide 19, and noted that it is important for the Secretariat to follow up to ensure the CPs do not repeat the errors. The Secretariat

indicated that most of the errors are minor and based on the quantity of information received. The error rate was under 5%. The Secretariat also noted that they follow-up on all errors.

The EU and other Contracting Parties thanked the Secretariat for compiling the report. The EU and Canada also noted that during the 2010 Annual Meeting, STACTIC decided that what is to be presented to the FC on the compliance report would only include patterns and trends. The Secretariat would identify in STACTIC the specific issues before the final report is sent to the FC.

The EU, the US and others noted that in 2010 STACTIC agreed to include VME issues in the compliance report and other relevant issues as necessary (e.g. sharks). The EU also asked that empty columns in Table 1 should be removed and that a Chartering Arrangements column should be added.

Status of the Compliance Report Drafting Group

It was noted by multiple Contracting Parties that the work of the Compliance Report Drafting Group is complete. It was also agreed that there should be a standing working group to do a review of the Compliance Report as prepared by the Secretariat based on last year's example between the intersessional and the annual meeting. All Contracting Parties were invited to participate. US, EU and Canada volunteered to participate. This will be done by email correspondence.

It was agreed that:

- ***STACTIC will form an ad-hoc group to review a draft report prepared by the Secretariat based on last year's example and on the indicators identified by the Secretariat during its presentation, to present the basic trends of the fishing activities in NAFO, in preparation for the Annual Meeting. US, EU and Canada volunteered to participate. This will be done by email correspondence.***
- ***The Secretariat will prepare a VME report for STACTIC to review and possibly include in the Compliance Report at the Annual Meeting.***
- ***The columns in the table presented should be adjusted so that empty columns will not appear.***
- ***A column will also be added to address Chartering Arrangements and other issues as required.***

5. Review and evaluation of NAFO Compliance objectives

The Chair introduced the agenda item and noted that Iceland provided a presentation on agenda Item 5a in the past, and the EU has provided a paper under agenda item 5b. The Chair reminded Contracting Parties that these agenda items remain open based on previous meetings. The Chair then opened the floor for discussion.

It was noted by multiple Contracting Parties that the four categories identified under this agenda item should be standing agenda items but need to be discussed only as necessary, and should not automatically be included in each review and evaluation of NAFO compliance objectives.

Multiple Contracting Parties noted STACTIC's past support for the development of a web page with information on 'best practices' regarding compliance objectives, and asked the Secretariat for a status report of the web page. The Secretariat indicated that the web page has not been developed yet, but the process would be relatively simple. Multiple Contracting Parties expressed support for the page, but noted that it does not necessarily represent "best practices", but serves more as guidance for inspectors. The representative of Canada suggested titling the web page more generally, such as "Practices and Guidelines" but asked the Secretariat to think about it. Parties agreed that documents posted on this website do not need to be vetted through STACTIC.

The Chair noted that the title of this section of the agenda also does not reflect its intent, and recommended it be entitled "Review and Evaluation of NAFO Practices and Procedures" which the Parties agreed to.

Multiple Contracting Parties noted the value of the joint patrol opportunities offered by Canadian enforcement officials. Canada indicated that they have had several successful joint patrols over the past few years with multiple Contracting Parties. Canada also indicated that arranging joint patrols can be challenging, and that while Canada is receptive to further joint patrols at this time, advanced warning of any request would be helpful to facilitate logistical preparations.

It was agreed that:

- *This agenda item will be renamed “Review and Evaluation of NAFO Practices and Procedures” and will be a standing agenda item on STACTIC’s agenda to be discussed only as necessary.*
- *The Secretariat will develop a mock web page entitled “NAFO Practices and Procedures” and present it to STACTIC for review and comments during the 2011 NAFO Annual Meeting. Contracting Parties will forward any information they wish to have included on the web page directly to the Secretariat.*

6. Review of IUU List pursuant to NAFO CEM Article 57.3

The Chair provided a brief overview of the agenda item, and introduced a representative of the Secretariat to present STACTIC WP 11/6.

The Secretariat’s presentation stated that there has been no addition or deletion of IUU vessels by NAFO since the last review in September 2010. Two vessels have been deleted from the NEAFC list. In accordance with Article 57.8 of the NCEM, these vessels will be removed from the list by June 3, 2011, unless there is an objection raised by a NAFO Contracting Party.

The Chair opened the floor for discussion on this agenda item.

The EU noted that the listing and delisting procedures in place make it often unclear if a vessel still exists, despite being on the NAFO list.

Norway noted that there may be some confusion with the status of vessels on the list, but said that removing a vessel from a list should be based only on the criteria in Chapter VI of the CEM. Norway argued that the list continues to get smaller, and there is little risk associated with keeping a vessel on the list for an extended amount of time.

The Chair closed the item and said it would be revisited at the Annual Meeting if necessary. The Chair also encouraged Contracting Parties to look at ways to improve the IUU listing procedure and to raise them at our next meeting.

It was agreed that:

- *Contracting Parties will consider ways to improve the IUU listing procedure for consideration at future NAFO meetings.*
- *This item will be revisited at the NAFO Annual Meeting if necessary.*

7. Half-year review of the implementation of new NCEM measures

The Chair opened the agenda item and asked the Secretariat to provide a presentation of STACTIC WP 11/5 concerning the new requirements for daily catch communications (CAT) and catch prior to entry to and exit from Division 3L (COB).

The Secretariat found that there is a very satisfactory level of compliance in the submission of the CAT, with the exception of the month of January. This is in part due to the fact that it is a new requirement which fulfillment needs some time for familiarization. Another reason may be that some vessels commenced their fishing trips at the latter part of 2010, at which time the daily CAT requirement was not yet in force, and continued until January 2011. By February and thereafter, there was virtually 100% compliance.

The Secretariat indicated that compliance with COB requirement was not an issue because 3M was closed to shrimp fishing.

The Chair then opened the floor for questions.

Russian Federation noted that some species are not listed in the NAFO species list, and this creates the potential for data problems. Russian Federation called for all new species to be added to the NAFO species list when encountered.

The Secretariat took note of the comments from Russian Federation and indicated that there are many species covered in the FAO 3 Alpha species code list that can be added to the NAFO list. However, the Secretariat cannot add the entire FAO species list as it is too large. However, the Secretariat adds codes for any new species reported by a Contracting Party. An alternative is to add the MZZ code in the list of species, to be used for other species.

The Secretariat also noted that while the system identifies an error with a new species that is not in the database, no information is lost. The Secretariat also suggested that NAFO may want to add coral and sponges species to the list as well.

The EU outlined a series of issues regarding the new Catch communication system, for consideration at the Annual meeting. The comments were summarized in STACTIC Working Paper 11/13.

Iceland concurred with most of the issues raised by the EU, and called for a review of the new CEM measures to ensure they reflect decisions from the 2010 NAFO Annual Meeting.

Canada raised the possibility of adding discards to daily catch reporting requirements.

The Chair commended Contracting Parties for achieving near 100% compliance with the new reporting requirements. The report will reflect the efforts taken by Contracting Parties to implement these new measures and Contracting Parties should be commended for this.

It was agreed that:

- ***The document drafted by the EU, entitled Discussion Points on “Communication of catches (STACTIC WP 11/13)”, be deferred for consideration and discussion until the STACTIC session of the 2011 NAFO Annual Meeting.***
- ***STACTIC will also consider the recommendation by Canada that day-to-day discards also be added to the requirements for the communication of catch information.***

8. Inspectors Web Page

The Chair opened the agenda item, and asked a representative of the Secretariat to present STACTIC WP 11/7 which outlines a phased in approach to implementing an Inspectors Web Page as agreed to at the 2010 Annual Meeting.

The approach presented was based in part on consultation with NEAFC which has an Inspector’s Web site up and running. A representative of NEAFC provided STACTIC with a brief presentation on the NEAFC version of the Inspectors Web Page.

STACTIC WP 11/7 sets out the phases and draws comparisons between a NEAFC and NAFO page. The costs associated with each phase have not yet been determined but the Secretariat expects that such costs, at least for the first phase, will be available for review before the Annual Meeting. These funds would have to be identified and approved in the budget for 2012, in order for the first phase to go forward.

Contracting Parties all seemed to support the development of this tool, but noted the potential cost must be considered.

It was agreed that:

- *The Secretariat will circulate a cost estimate that will accompany the recommendation to the FC shortly after the May 2011 STACTIC Intersessional Meeting.*
- *STACTIC will recommend to the Fisheries Commission that the Secretariat develop an Inspectors Web Page using a phased implementation approach, based on the estimated costs.*

If necessary, STACTIC will forward the estimated costs to STACFAD for their consideration and recommendation.

9. Editorial Drafting Group of the NAFO CEM (EDG)

The Chair introduced the Agenda item, and called upon a representative of the EDG group to provide a presentation on the editorial guidance document developed by the Group and proposed timelines.

The EDG representative outlined the key elements and types of changes to be found in the guidance document. Types of revisions to the NAFO CEMs include proposed structural changes, basic edits, and revisions and restructuring to the Annexes.

The draft document prepared by the EDG should be ready for distribution to the participants by mid-June. Contracting Parties will be asked to provide comments within 30 days after distribution so that the EDG can have adequate time to incorporate the comments in order to have a final draft available for distribution to Contracting Parties on July 20th, 60 days prior to the 2011 NAFO Annual Meeting.

The EDG group noted that they will work with the Secretariat to explore options for submitting comments to the NAFO SharePoint website used by the EDG.

The representative of DFG and others thanked the EDG for their hard work.

Contracting Parties were supportive of the format of the guidance document presented by the Representative of the EDG and the proposed timelines for the project.

10. Possible revisions of the NAFO CEM

DFG Proposal to Amend Article 15.2 - STACTIC Working Paper 11/1

The Chair invited the representative of DFG to provide an overview of their proposal outlined in STACTIC WP 11/1.

Canada noted that, while it understood the intent of the proposal, the rationale for the establishment of the original coordinates in Article 15.2 was unclear and that it may have been intended as a buffer zone. The Secretariat provided an overview of the details surrounding the original adoption of Article 15.2. However this provided only limited insight into the decision process.

The representative of the EU noted that the provisions appeared to contain two separate elements (200m contour and the line drawn by coordinates). However, because the justification of the coordinates was not clear and the area over the 200 meters curve are very small, the deletion of the coordinates could be considered and replaced by the 200 meters curve, taking advantage of the existing VMS technology.

In light of the uncertainty surrounding this issue, and the fact that this provision originated in Fisheries Commission, the representative of Canada felt that additional time to reflect on the matter was required.

It was agreed that:

- ***A decision on this agenda item will be deferred to the next STACTIC session during the 2011 NAFO Annual Meeting to allow Contracting Parties to give further consideration to the issue and the proposal by DFG.***

US Proposal – Modification to Shark Bycatch Reporting and Finning Provisions – STACTIC WP 11/10:

Under this agenda item, the Chair called on a representative of the US Delegation to present its proposal (STACTIC WP 11/10).

Among the key issues raised by the representative of the US Delegation are apparent conflicting provisions of the CEMs that possibly provide a loophole for not identifying reporting shark catch if catch is less than 1 ton. (Article 27.1.f)

While recognizing the general intent of the US proposal, a number of Contracting Parties noted concern with some elements. It was noted by some Contracting Parties and the Chair that the U.S. proposal raises 2 separate questions - one concerning the mandatory reporting requirements of sharks, including skates, rays and chimeras, and another concerning the requirement to land sharks with fins intact.

Canada indicated that the proposed amendment to Article 17. 3 implied mandatory landing of all sharks, which is not required by NAFO. Canada suggested the language be modified as necessary. The U.S. clarified that the proposed amendment was not intended to require mandatory landing of sharks.

DFG noted problems with Article 27.1.f, as it is unclear if the limit of one ton of catch applies to a whole trip, haul by haul, etc. They also suggested requiring species specific reporting for everything 100 kg or greater, which is in-line with NEAFC and their domestic approach.

The EU indicated that the reporting of incidental catch of sensitive species under Article 17 should not be confused with the reporting of commercial catches under Article 27. The EU also underlined that the inclusion of skates, rays and chimeras which implies a modification of Article 17, which is now limited to sharks. The EU also argued that it is too early to come to an agreement on the requirement to land sharks with fins intact.

Iceland and other Contracting Parties also noted the limitations with the electronic reporting of sharks. The system is designed to consider weight. The CAT reports excludes discard. CAX includes discards. If shark catch is thrown overboard it is not reported electronically under the CAT report.

The U.S. agreed to revise its proposal for consideration at the Annual Meeting.

It was agreed that:

- ***This proposal will be reconsidered at the STACTIC session of the 2011 Annual Meeting based on a revised U.S. paper.***

Issues Raised by Canada

The Chair recognized Canada's interest in providing a brief overview of some emerging issues that may require future revisions to the CEMs, and invited a representative of Canada to provide a summary of the issues.

Canada provided a brief summary of the following 4 issues:

Labeling Provisions:

1) Canada noted that labeling has improved in recent years with the revisions to the CEMs. However, a recent trend of stowed boxes stacked upside down, concealing the labels, makes it difficult for inspectors to do their job effectively. The spirit and intent of the improved labeling provisions was to facilitate inspections both at sea and in port.

2) Canada noted that it would be useful to have the date and area of capture labeled on groundfish (similar to the provision for Shrimp product marking) given the current situation in the cod fishery whereby 3NO is under moratorium and 3M is now open.

Tows:

3) Canada noted that to effectively monitor by-catch provisions, particularly in respect to moving after exceeding by-catch limits in any 1 tow, it would be useful to have the logbooks reflect the tow information on a set by set basis.

4) Canada noted that there is currently no measure in the CEMs to prevent vessels from returning to the same area where they have recently exceeded bycatch limits (1 tow provision only but not time limitations).

It was agreed that:

- *Canada will continue to monitor the trends and prepare a working paper(s) if required for the 2011 NAFO Annual Meeting.*

11. Observers Scheme - NCEM Chapter VII and Article 28

The Chair opened this item and after some discussion, the EU presented STACTIC WP 10/29.

The representative from the EU outlined several issues that it considered examples of limitations of the current observer program as outlined in STACTIC WP 10/29, particularly that the observer information is not used by science or the inspection service. He expressed that NAFO has enough information to use a risk based approach to focus inspection activity. The EU argued that the need for observers on all vessels is obsolete. The EU proposed that STACTIC consider the overall concept of observers and redefine the task and requirements for observers. The EU noted that they tabled STACTIC WP 10/29 in September 2010, and that the item remains open for consideration.

Some Contracting Parties indicated that they can sympathize with the limitations expressed by the EU with the current EU observer program in the NRA. It was highlighted that effective observer programs are in place in domestic and international fisheries and that the principals of an observer program in NAFO, such as deterrence, remain important and that the performance of the observer scheme cannot be measured on the number of apparent infringement reported by observers. The same Contracting Parties, which included Canada, Norway and Iceland, noted that the observer program should not be eliminated simply because some parts do not work as effectively as they should. However there may be room for improvements to the current programs. Norway underlined that NAFO should also be receptive to new technology to replace observers, as long as the control regime is not weakened.

The Chair suggested that STACTIC consult with the SC regarding the usefulness, etc. of observer reports. The EU and others expressed concern that the FC request to the SC to consider negative scientific impacts from the reduction/elimination of the “scientific observer program” was misleading and confusing because there is not “scientific observer program,” only an observer program. Contracting Parties agreed to reword the request as indicated below to clarify the nature of the request to the SC.

It was agreed that:

- *The following request will be sent to the Chair of the Fisheries Commission for transmission to the Scientific Council:*

“STACTIC requests the SC to evaluate any negative scientific impacts resulting from the reduction/elimination of the scientific tasks specified under Article 28 of the NAFO CEM.” (STACTIC WP 11/12, Rev.)

- *This agenda item will be reconsidered at the STACTIC session of the 2011 NAFO Annual Meeting based on a revised paper.*

12. Contingency plans in the case of force majeure

The Chair noted that this agenda item is primarily related to what should be done about upcoming STACTIC meetings when unexpected events occur and interested Contracting Parties cannot attend.

Iceland noted that this is a potential challenge for all branches of NAFO, not just STACTIC.

Contracting Parties considered a number of options on how to proceed should such unexpected events affect attendance at future STACTIC meetings.

It was agreed that:

- ***Should unexpected events disrupt a STACTIC meeting, and as a result some or all Contracting Parties are unable to attend, the Chair and the Secretariat will continue to consider options on an ad-hoc basis that may include, but are not limited to:***
 - *Consideration of electronic meeting alternatives, e.g. video or teleconference meetings.*
 - *Allowing the meeting to proceed with recognition that some or all issues can be discussed, but no recommendation finalized until Contracting Parties not present during the meeting review and respond to the recommendations.*
 - *The meeting be rescheduled.*
 - *The meeting be held at an alternative location.*
- ***It was also agreed that Contracting Parties should notify the Secretariat of their intent to participate in a particular STACTIC meeting and any concerns regarding possible attendance so that they may be considered and included in any ad hoc decisions regarding the holding of such meeting.***

13. Items forwarded to Advisory Group for Data Communication (AGDC)

The Chair opened this agenda item by calling on the Secretariat to present a series of Working Papers. After the presentation the Chair opened the floor to discussion.

The EU noted that the AGDC report of its last meeting on 16 February 2011 mentioned the presentation to STACTIC, at this intersessional meeting, on electronic logbooks. Since such presentation was not done without clear explanation, the EU invited STACTIC to remind the AGDC group that NAFO needs to be fully integrated into the AGDC process, as stated in the reference terms of the AGDC. The EU recalled the request presented by STACTIC to the AGDC to establish in the short term a common system for the daily communication of catches through automated electronic reporting that benefits both organizations (NEAFC, NAFO) in the North Atlantic.

Contracting Parties pointed to the fact that NAFO did not participate in the February AGDC meeting. A representative from Iceland, who is also the Chairman of PECCOE, noted that the AGDC meeting in February highlighted the need for electronic log books. The representative from Iceland noted that he understood the implementation of electronic log books is not as imminent in NAFO, and thus not an immediate concern. If STACTIC wants a presentation of the AGDC report on electronic log books, it should make such a request.

The Secretariat said that they continue to play a role in the AGDC, including housing the web site and holding data and information.

Last year the EU proposed new product code forms (STACTIC WP 10/32). The same product code forms have been adopted by NEAFC.

The Contracting Parties discussed each of the agreed items below.

It was agreed that:

Daily Communication of Catches

- *The AGDC has endorsed the new data elements outlined in FC Doc. 19 Rev (CH-Chartering Flag) and AE (Area of Entry), and the Secretariat has implemented these elements.*

Cancel Message

- *This issue outlined in STACTIC WP 10/15 Rev is deferred to NEAFC and the AGDC to develop the Cancel message system, and once this has been completed, STACTIC will consider its adoption for NAFO.*

Product Code Forms

- *STACTIC will recommend to the Fisheries Commission the adoption of the 3-Alpha codes for product form as set forth in STACTIC WP 11/14 REV (Annex 4). This system does not include, at this time, any special codes for collective presentation of fish and fish parts.*

Observer scheme

- *STACTIC will defer a discussion on the Observer Scheme in the NAFO CEMs and the implementation of a broader electronic catch reporting system pending further discussion on the issue in AGDC.*

Other

- *It was noted that the STACTIC should remind AGDC that NAFO needs to be fully integrated into the AGDC process. STACTIC should be a more active participant in the AGDC to ensure better harmonization of Data Communication Standards and Reporting Systems.*

14. Other mattersProposal from Norway – HTTPS NAF Gateways at the NEAFC and NAFO Secretariat - STACTIC WP 11/2

For this agenda item, the Chair called on a representative from Norway to present STACTIC WP 11/2.

The representative from Norway noted there were unexpected challenges encountered when its security certificate expired. Based on these challenges, Norway's document for discussion outlines proposals to ensure NEAFC and NAFO standards reflect 'best practices'.

Norway's paper also calls on NAFO to switch from self-signed authorities to third-party authorities.

Contracting Parties, including Norway, Iceland and DFG, discussed the pros and cons of self-signed and third party authorities.

It was agreed that:

- *As NAFO has no authority over NEAFC, STACTIC cannot support Proposal 1 of STACTIC WP 11/2.*
- *STACTIC supports the NAFO related content in Proposal 2 of STACTIC WP 11/2. As such, the NAFO Secretariat will review their current procedures for data communication via HTTPS to ascertain if the systems are in accordance with common recognized standards and 'best practice' and to report to STACTIC during the 2011 NAFO Annual Meeting.*
- *Some technical comments from the AGDC would be sought regarding this matter.*

Presentation by the Secretariat - Structural Changes to NAFO's VMS - STACTIC WP 11/3

The Chair called on the Secretariat to provide an overview of STACTIC WP 11/3 to open this agenda item.

It was agreed that:

- ***Proposals by Contracting Parties that require changes to computer systems that in any way affect the obligations, duties and costs of other Contracting Parties should be brought to STACTIC. If they do not affect Contracting Party obligations, duties and costs of other Contracting Parties, the issue does not have to be raised with STACTIC.***

Presentation by the Secretariat – SC Requests FC for Definition of Certain Fishing Gears - STACTIC Working Paper 11/8

The Chair called on the Secretariat to present STACTIC Working Paper 11/8 to open this agenda item.

Following the presentation from the Secretariat, the EU noted that the request is based on a growing trend of blue whiting crossing the NEAFC/NAFO border. The problem is that blue whiting is considered by NAFO as a groundfish subject to a 130 mm mesh size, while on the NEAFC side it is classified as a pelagic species subject to a 35 mm mesh size.

Iceland and others asked if there is any evidence of blue whiting in the NAFO Convention Area. Canada noted that there was no indication that there was.

It was noted that STACTIC is being asked to define the fishing gear for purposes of responding to an FC request to consider the appropriate mesh size for a fishery that is deemed to be “semi-pelagic.” Contracting Parties did not think it was appropriate to define semi-pelagic gear for this purpose because there are already definitions that use the term mid-water trawls and there are ongoing efforts at FAO to further define mid-water trawl/pelagic gears. Contracting Parties felt that Working Paper 11/8 adequately reflects the extent to which STACTIC can respond to a request for definitions of semi-pelagic gear

It was agreed that:

- ***In response to the SC request for gear definition, STACTIC will forward WP 11/8 as it adequately reflects the extent to which STACTIC can provide guidance to the SC on pelagic gear definitions.***

STACTIC Working Paper 11/9

There was no substantive discussion on this agenda item.

It was agreed that:

- ***STACTIC WP 11/9 shall be forwarded to the AGDC to compliment the steps that have already been taken by NEAFC.***

Other Issues

A Contracting Party raised a concern that vessels of another Contracting Party fishing for cod in area 3M at the same time and in the same vicinity as one of its flag vessels appeared to be reporting significantly lower catch rates than its vessel. The Contracting Party of these other vessels indicated its willingness to investigate this concern, including issuing an invitation to the Contracting Party raising this concern to jointly inspect vessels that were fishing in 3M.

It was agreed that:

- ***Relevant Contracting Parties will cooperate and be transparent on apparent compliance issues such as this, including allowing the possibility of joint in port inspections (as per the joint inspection scheme).***

15. Time and Place of next meeting

The next STACTIC meeting will take place during the 2011 NAFO Annual Meeting being held 19-23 September in Halifax, Nova Scotia, Canada.

16. Adoption of Report

It was agreed that the first draft of the meeting report will be completed by end of day, May 10, 2011. The Draft will be circulated to Contracting Parties shortly afterwards, and Contracting Parties will be given 10 business days to provide feedback using the MS Word Track Changes tool on the draft report.

A final report will be circulated by the Secretariat once all Contracting Parties confirm support for the report.

17. Adjournment

The meeting was adjourned at 14:30 hrs on May 10, 2011.

Annex 1. List of Participants

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Annex 2. Agenda

1. Opening by the Chair
2. Appointment of Rapporteur
3. Adoption of Agenda
4. Compilation of fisheries report for compliance review (2004-2009), including review of Apparent Infringements
5. Review and evaluation of NAFO Compliance objectives
6. Review of IUU List pursuant to NAFO CEM Article 57.3
7. Half-year review of the implementation of the new NCEM measures
8. Inspectors Web Page
9. Editorial Drafting Group of the NAFO CEM (EDG)
10. Possible revisions of the NAFO CEM
11. Observers Scheme - NCEM Chapter VII and Article 28
12. Contingency plans in the case of force majeure
13. Items forwarded to Advisory Group for Data Communication (AGDC)
14. Other matters
 - The HTTPs NAF Gateways at the NEAFC and NAFO Secretariats
 - Structural Changes to NAFO's VMS
 - SC Requests for FC Definition of Certain Fishing Gears
 - Assessments of NAFO's VMS Data Transmissions (2008-2010)
15. Time and Place of next meeting
16. Adoption of Report
17. Adjournment

Annex 3. NAFO 2010 Fisheries Profile and Trends

**NAFO 2010 FISHERIES
PROFILE and TRENDS**

**(from the Compilation of NAFO Fishing
Reports for STACTIC Compliance Review)**

In this presentation . . .

- **The big Table 1**
- **Vital Statistics 2010 – Groundfish (GRO), Shrimp (PRA), and pelagic Redfish (REB)**
- **Trends 2004 – 2010**
 - **Effort – days-at-sea**
 - **Number of vessels**
 - **At-sea inspections**
 - **Inspection Rate**

What is Table 1?

- **Metadata – fishing reports received by the Secretariat**
 - **VMS Hails – COE, COX, ENT, EXI**
 - **Port Inspection Reports**
 - **Observer Reports**
 - **At-sea inspection Reports**

What is Table 1?

- **Presented on “fishing trip” basis**
- **Fishery type – GRO, PRA, REB -- identified**
- **Catch information from these reports**
- **Apparent Infringements issued**

How are “fishing trips” determined?

- Examination of the POS reports
- Start of trip defined by ENT (or COE)
- End of trip defined by EXI (or COX)

- When ENT/COE or EXI/COX reports are missing, the dates are cross-referenced with POS and with other reports, e.g. Port Inspection and Observers.




What Table 1 can offer?

- Identifies missing reports

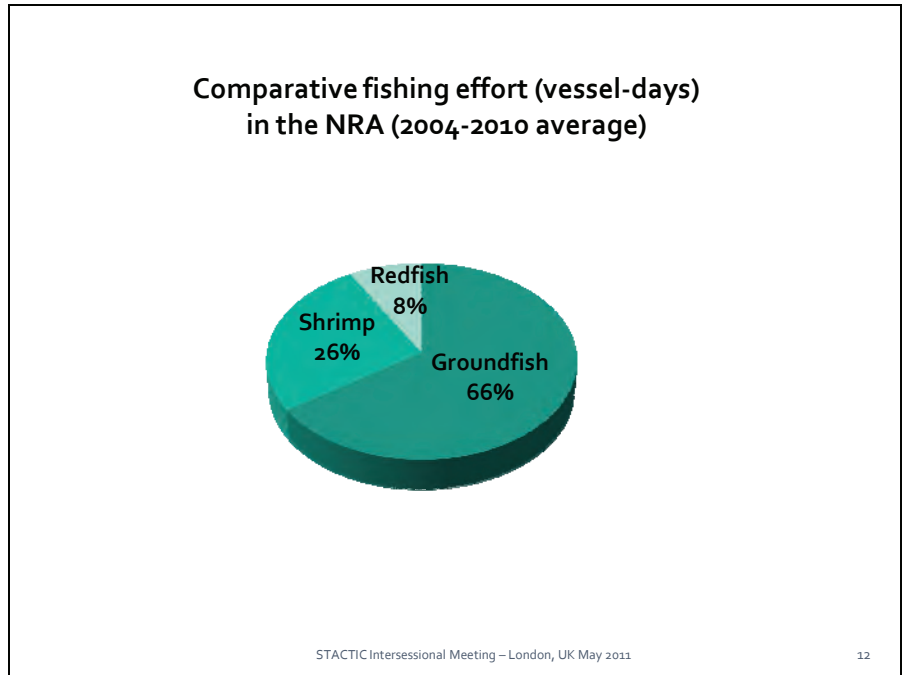
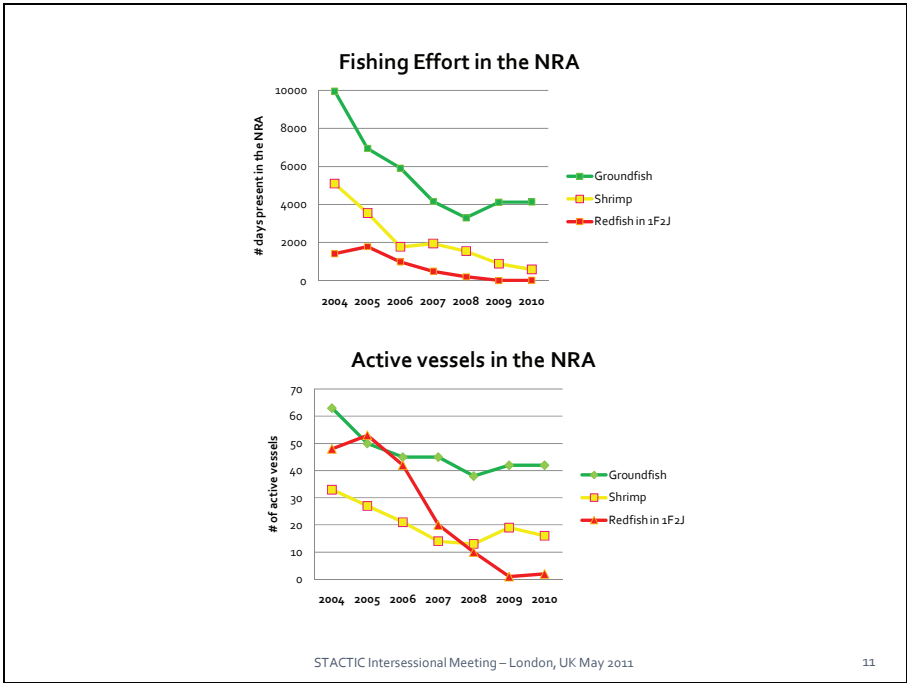
- Allows derivation of basic statistics – e.g. how many boats, how many days on fishing ground?

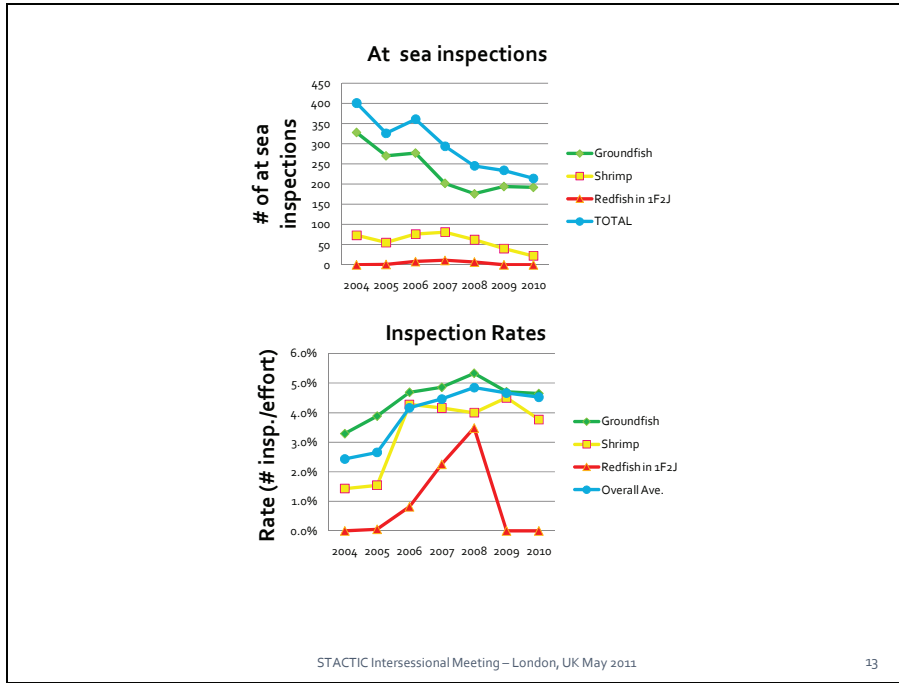
- Allows cross verification of catches as reported from various sources

2010 Fishing Effort Profile in NAFO Regulatory Area

	 Groundfish	 Shrimp	 Redfish	TOTAL
 Number of vessels	42	16	2	53
 Effort (Days present)	4131	584	14	4729

TRENDS 2004-2010





Apparent Infringements and disposition in 2010

AI#	CallSign	Div	Fisheries Type	Apparent Infringement	Article (2010 NCEM)	Disposition - Followup or update	STATUS as of April 2011
1	Vessel 1	3M	PRA	Mis-recording of catches - inaccurate recording	24.2	Case under investigation	Pending
2	Vessel 2	3L	GRO	Gear requirements - illegal attachment	13.6	Case under investigation	Pending
3	Vessel 3	3N	GRO	Gear requirements - mesh size	13.1	Convicted, fined and paid 1848,56 euros	Resolved
4	Vessel 4	3M	GRO	Mis-recording of catches - inaccurate recording	24.2	Case under investigation	Pending
5	Vessel 5	3O	GRO	Vessel requirements - capacity plans	18.5	Case under investigation	Pending
6	Vessel 6	3L	PRA	Vessel requirements - capacity plans	18.5	New certified capacity plan was provided and made available to inspectors at the time of landing in Canada	Resolved
7	Vessel 6	3L	PRA	Mis-recording of catches - stowage	24.6	A proper stowage plan was provided at the time of landing at the home port.	Resolved

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**Some Problems Encountered and Issues Identified during
Data Compilation:**

- **Port Inspection reports and Port State Measures**

- **Scope of PSM: applies when Flag State of Vessel and Port State are different. Issue: Even if FS and PS are the same, GHL fishing requires 100% port inspection (Art. 7 of NCEM). Redfish or shrimp vessels landing catches in home ports, Port Inspection reports required?**

**Some Problems Encountered and Issues Identified during
Data Compilation:**

- **Port Inspection reports and Port State Measures**

- **Start and End fishing dates in PSC 3 are not indicated. Issue: reduces the utility as one source of cross-verification of fishing trips and catches.**

**Some Problems Encountered and Issues Identified during
Data Compilation:**

- **Port Inspection reports and Port State Measures**

- **Art. 16.10 – port State CP shall carry inspections at least 15% of all landings. *Issue: Analysis to determine whether 100% coverage has become unnecessary?***

**Some Problems Encountered and Issues Identified during
Data Compilation:**

- **Vessel Monitoring System (VMS)**

- **COX – inconsistent catch reporting. Catch indicated as “catch-on-board”, or “catch-in-NRA”.**
- **POS reports – VMS not turned off when going to Newfoundland port without intention of landing catch. Additional scrutiny required in order to exclude these days in the estimation “number of days on fishing ground”.**

Issue: Error Alerts that are automatically generated by the VMS

NAKs by Message Types for all Flag States from 2008 -2010

NAK	101	102	104	150	250	251	303	304	350	
CAT	0	52	6	31	0	1	0	0	0	90
CAX	0	59	14	7	0	0	0	0	0	80
COE	0	48	158	11	0	1	0	0	0	218
COX	0	55	16	6	0	0	35	10	0	122
ENT	0	5	5	2	0	0	0	0	14	26
EXI	0	2	23	0	0	0	0	0	0	25
MAN	0	0	8	0	0	0	0	0	0	8
NOT	0	6	2	26	28	0	0	0	0	62
OBR	0	77	47	0	0	0	0	0	0	124
POR	0	3	8	0	0	0	0	0	0	11
POS	0	171	1681	243	0	0	0	0	87	2182

NAK-102 – Data value or size out of range

NAK-104 – Mandatory data missing

NAK-150 – Sequence Error

NEXT AIM: Compliance Tables to be forwarded to STACTIC on 20 June 2011 in accordance with FC Rules of Procedure 5.1.e.

NEXT STEPS (STACTIC WP 10/38):

- 1. CPs, particularly those with inspection presence shall present compliance issues/concerns at this meeting.**
- 2. STACTIC to discuss these issues at this meeting.**

NEXT STEPS (STACTIC WP 10/38):

- 3. At request of STACTIC, Secretariat compiles additional information forwarded 60 days before the Annual Meeting.**
- 4. Compliance Report Drafting Group presents information compiled by Secretariat at the STACTIC Annual Meeting.**
- 5. STACTIC to draft the Annual Compliance Review**

Annex 4. NAFO CEM – Annex XXc - Product Form Codes
(STACTIC Working Paper 11/14, Revised)

The list of product form codes in Annex XXc is not exhaustive enough to cover all the fish product forms on fishing vessels.

It is therefore requested to add additional codification in order to include all traditional product forms produced on board.

Possible amendment

Replace the actual Annex XX (c) with the table below.

Annex XX(c)
Product Form Presentation
3-Alpha Codes

3-Alpha	Presentation	Description
CBF	Cod butterfly (escalado)	HEA with skin on, spine on, tail on
CLA	Claws	Claws only
DWT	ICCAT code	Gilled, gutted, part of head off, fins off
FIL	Filleted	HEA + GUT + TLD + bones off Each fish originates two fillets
FIS	Filleted and skinned fillets	FIL+SKI Each fish originates two fillets not joined by any par
FSB	Filleted with skin and bones	Filleted with skin and bones on
FSP	Filleted skinned with pinbone	Filleted with skin removed and pinbone on
GHT	Gutted headed and tailed	GUH+TLD
GUG	Gutted and gilled	Guts and gills removed
GUH	Gutted and headed	Guts and head removed
GUL	Gutted liver in	GUT without removing liver parts
GUS	Gutted headed and skinned	GUH+SKI
GUT	Gutted	All guts removed
HEA	Headed	Heads off
HET	Headed and tailed	Heads and tails off
JAP	Japanese cut	Transversal cut removing all parts from head to belly
JAT	Tailed Japanese cut	Japanese cut with tail removed
LAP	Lappen	Double fillet, HEA, skin + tails + fins ON
LVR	Liver	Liver only
OTH	Other	Any other presentation
ROE	Roe (s)	Roe(s) only
SAD	Salted dry	Headed with skin on, spine on, tail on and salted dry
SAL	Salted wet light	CBF + salted
SGH	Salted, gutted and headed	GUH + salted
SGT	Salted gutted	GUT+salted
SKI	Skinned	Skin off
SUR	Surimi	Surimi
TAL	Tail	Tails only
TLD	Tailed	Tail off
TNG	Tongue	Tongue only
TUB	Tube only	Tube only (Squid)
WHL	Whole	No processing
WNG	Wings	Wings only

SECTION VI
(pages 269 to 289)

**Report of the FC Working Group of Fishery Managers and Scientists on
Conservation Plans and Rebuilding Strategies (WGFMS-CPRS)
26-28 June 2011
Halifax, Nova Scotia, Canada**

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**Report of the FC Working Group of Fishery Managers and Scientists on
Conservation Plans and Rebuilding Strategies (WGFMS-CPRS)**
(FC Doc. 11/4)

**26-28 June 2011
Halifax, Nova Scotia, Canada**

1. Opening

Following a welcome speech by the Executive Secretary (Vladimir Shibanov), the Chair Jean-Claude Mahé (EU) opened the meeting at 1010 hrs on Sunday, 26 June 2011. He welcomed the participants from Canada, European Union, Norway, the Russian Federation, and the USA, as well as the Scientific Council (SC) Chair (Annex 1).

2. Appointment of Rapporteur

The Fisheries Commission Coordinator (Ricardo Federizon) was appointed rapporteur.

3. Adoption of Agenda

The provisional agenda as previously circulated was adopted with minor adjustment in the order of agenda items. It was agreed that 3LNO American Plaice should be discussed ahead of 3NO Cod (Annex 2).

4. Matters arising from the WebEx meeting (April 2011)

No substantive matters arose. It was indicated that the relevant FC requests for SC advice, as reviewed during the WebEx meeting, were addressed by the Scientific Council.

5. SC Chair presentation of scientific advice from the SC June 2011 meeting

The SC Chair (Ricardo Alpoim, EU) presented the latest scientific advice on two fish stocks currently under the *Conservation Plans and Rebuilding Strategies* programme, 3LNO American plaice and 3NO cod (Annex 3). Regarding 3LNO American plaice, the advice was formulated by the SC at its June 2011 Meeting in Braunschweig, Germany. Regarding 3NO cod, a full assessment was conducted during its June 2010 Meeting. It was monitored in 2011 and the advice was re-iterated. Reference points in the Precautionary Approach Framework for both stocks were also estimated. The comprehensive scientific advice is documented in NAFO SCS Doc 11/16.

**6. Review and update of 3LNO American plaice Conservation Plan and
Rebuilding Strategy (FC Doc. 10/13)**

The stock 3LNO American plaice has been in moratorium since 1995. The interim 3LNO American plaice CPRS, adopted by the Fisheries Commission in 2010 and in force in 2011, was reviewed. The CPRS as contained in FC Doc 10/13 specifies an objective of attaining and maintaining the Spawning Stock Biomass (SSB) at or above Bmsy. Reference points in the framework of Precautionary Approach are identified; circumstance under which a directed fishery can occur (i.e. re-opening) is elaborated; harvest control rules (HCR) are formulated, and a strategy for stock stability is provided.

At the review, it was recognized that the objective needs to be amended to give more precision and consideration to long-term objective and interim milestone. It was also recognized that SC has provided new values in its advice to some of the reference points. The justification to re-open the fishery needs to be more rigorous. Concerning HCR which are based on the SC advice, a refinement and elaboration of risk tolerance is needed.

Concerns were raised on the high uncertainty and the lack of confidence intervals of the reference points. The WG agreed that the values of B_{isr} and B_{msy} should be further reviewed by the Scientific Council and the Fisheries Commission.

The interim CPRS was updated in consideration with the issues and concerns identified during the review. The updated CPRS has four sections: Objective(s), Reference Points, Re-opening to Directed Fishing, and Harvest

Control Rules. It was decided that the updated interim CPRS, as presented in Annex 4, will be forwarded to the Fisheries Commission with a recommendation for adoption (see item 9).

7. Review and update of 3NO Cod Conservation Plan and Rebuilding Strategy (Article 9 of the NCEM)

The stock 3NO Cod has been in moratorium since 1994. The 3NO Cod CPRS, adopted by the Fisheries Commission in 2007 and in force since 2008, was reviewed. The CPRS is embodied as Article 9 in the NAFO Conservation and Enforcement Measures (NCEM).

Concerns were raised on the high uncertainty and the lack of confidence intervals of the reference points. The WG agreed that the values of *B_{MSY}* and *B_{MSY}* should be further reviewed by the Scientific Council and the Fisheries Commission.

At the review, it was intended that CPRS would replace the current text of Article 9 in the NCEM. The updated CPRS follows the template and language of the 3LNO American plaice CPRS. It however does not cover the bycatch issues of Articles 9.3, 9.4, and 9.7, which were duly noted. The WG concluded that this CPRS was not the place to address bycatch issues, so NCEM Articles 9.3, 9.4, and 9.7 were highlighted for possible action by the Fisheries Commission.

The updated CPRS, in a format similar to that of 3LNO American plaice and as presented in Annex 5, will be forwarded to the Fisheries Commission with a recommendation for adoption (see item 9).

8. Next Steps

The WG will report to the Fisheries Commission the results of this meeting and present its recommendations at the 2011 Annual Meeting.

The WG will seek feedback and instructions from the Fisheries Commission concerning its future work. The CPRS template that was developed and applied to 3LNO American plaice and 3NO Cod can be applied to other stocks.

This WG will seek guidance from the Fisheries Commission on which other NAFO-managed fish stocks could be under a CPRS.

The WG will take into account the work of the Scientific Council particularly in the development and evaluation of HCR.

9. Recommendations to be forwarded to the Fisheries Commission

The Working Group agreed on the following recommendations:

Noting that international agreements such as the United Nations Fish Stocks Agreement (UNFSA) and the FAO Code of Conduct for Responsible Fisheries call for the rebuilding of depleted stocks through application of the precautionary approach;

Recalling the interim Conservation Plan and Rebuilding Strategy for 3LNO American plaice adopted by the Fisheries Commission in 2010;

Further Recalling that in 2007 NAFO adopted a Conservation Plan and Rebuilding Strategy for 3NO Cod that identified a limit reference point of 60,000t;

Desiring continued rebuilding and growth of these stocks to ensure their long-term sustainability and to promote associated economic opportunities; while noting rebuilt stocks may differ markedly from their status prior to depletion;

Recalling Scientific Council states that the available data for 3LNO American plaice and 3NO cod do not span the entire production curve, and that therefore large uncertainty in the estimated reference points can be expected;

Recognizing Scientific Council has advised that changes in population biology and in fishing practices can have a large impact on the estimated level of some reference points;

Noting that the Scientific Council has advised that the use of any reference points in a precautionary approach framework or rebuilding plan needs to be evaluated for any stock to which they are applied; and

Recognizing that further updates and development of the plans may be required to ensure that the long term objectives are met;

The Working Group recommends that:

1. The Fisheries Commission adopt the Interim 3LNO American Plaice Conservation and Rebuilding Plan (FCWG-CPRS Working Paper 11/3 Rev. 5) (Annex 4) and include it in the NCEM;

2. The Fisheries Commission adopt the Interim 3NO Cod Conservation Plan and Rebuilding Strategy (FCWG-CPRS Working Paper 11/4 Rev. 3) (Annex 5) to replace current Article 9 of the NCEMs, noting the outstanding bycatch issues related to Article 9.3, 9.4 and 9.7; and

3. The Fisheries Commission agree to an implementation, review and monitoring process:

To support the effective implementation and monitoring of the Conservation Plans and Rebuilding Strategies, it is recommended that:

- a) The working group remains in place through 2014 to allow for further update and development of the plans.
- b) The Conservation Plans and Rebuilding Strategies be assessed and revised as required, taking into account the analysis of the Scientific Council, to ensure that the objective(s) of the plans are being achieved. Initial reviews should take place no later than the 36th Annual Meeting (2014), and at regular intervals subsequently agreed to by Fisheries Commission.
- c) Scientific Council be requested to provide advice for these stocks in a manner consistent with any specific parameters within the Conservation Plans and Rebuilding Strategies.

10. Others Matters

Canada presented, for information purposes, its actions and programs concerning national CPRS of fish stocks in Atlantic Canada. They include, among others, the evaluation of recovery potential of cod and American plaice stocks, establishment of limit reference points for various stocks including 3Ps and 2J3KL cod, and long term projections done under various scenarios. The work was peer reviewed in Canada, and will guide the development of rebuilding plans for cod stocks.

A research project on recovery strategies for 3LNO American plaice and 3NO cod has also been funded in Canada, under the International Governance Strategy. IGS is a program within Fisheries and Oceans Canada that provides funding for Science projects focused on international fisheries, such as NAFO stocks and bluefin tuna. Project funding has been provided for 2011-2014, and the Principal Investigator is Dr. Peter Shelton, with collaboration from EU and Canadian scientists.

Recovery strategies investigated will take into account relevant PA reference points as well as performance statistics relevant to the fishery, such as average catch and variation in TAC. Several aspects of the work will require extensive discussion and collaboration with managers and industry advisors, and Scientific Council peer review of results is proposed.

11. Adoption of Report

The report was adopted prior to adjournment.

12. Adjournment

The Chair and Vice-Chair thanked the participants and the Secretariat. The meeting was adjourned at 1035 hrs on Tuesday, 28 June 2011.

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Annex 2. Agenda

1. Opening of the Meeting
2. Appointment of Rapporteur
3. Adoption of the Agenda
4. Matters arising from the WebEx meeting (April 2011)
5. SC Chair presentation of scientific advice from the SC June 2011 meeting
6. Review and update of the 3LNO American Plaice Conservation Plan and Rebuilding Strategies (FC Doc 10/13)
7. Review and update of the 3NO Cod Conservation Plan and Rebuilding Strategies (Article 9 of the NCEM)
8. Next Steps
9. Recommendations to be forwarded to the Fisheries Commission
10. Other Matters
11. Adoption of Report
12. Adjournment

Annex 3. Fisheries Commission Requests and Scientific Council Responses
(FCWG-CPRS Working Paper 11/2)

For information purposes and to help facilitate discussions within the Working Group, the Secretariat has put together this working paper presenting the summary of the latest response from the Scientific Council to the FC Request for scientific advice concerning rebuilding and recovery plans and on fish stocks 3LNO American plaice and 3NO cod.

Contents:

FC Request for Advice		Scientific Advice	
FC Request	Request Item and FC Reference Document	SC Advice Formulation	SC Reference Document
Evaluation of Rebuilding and Recovery Plans	Item 6 of FC Doc 09/17	Advice formulated at the September 2010 SC Meeting.	SC Reports 2010, pp. 240-241
In 2010, advice should be provided for 2011 and 2012 for Cod Div. 3NO	Item 2 of FC Doc 09/17	Advice formulated at the June 2010 SC Meeting	SC Reports 2010, pp. 28-30
		Monitoring of Cod in Div. 3NO, undertaken at the June 2011 SC Meeting: Scientific advice was reiterated.	SCS Doc 11/16, p.27*
In 2011, advice should be provided for 2012 and 2013 for American plaice in Div. 3LNO	Item 2 of FC Doc 10/9 Revised	Advice formulated at the June 2011 SC Meeting.	SCS Doc 11/16, pp. 10-11*
Fisheries Commission requests the Scientific Council to identify F_{msy} , identify B_{msy} and provide advice on the appropriate selection of an upper reference point for biomass (e.g. B_{buf}) for 3LNO American Plaice, 3NO cod and 3LN redfish	Item 7 of FC Doc 10/9 Revised	Advice formulated at the June 2011 SC Meeting.	SCS Doc 11/16, pp. 29-30*
Fisheries Commission requests the Scientific Council to review the stock recruit relationship for 3NO cod and the historical productivity regime used in setting the Blim value of 60 000t	Item 8 of FC Doc 10/9 Revised	Advice formulated at the June 2011 SC Meeting.	SCS Doc 11/16, p. 30*

*The SC June 2011 Meeting Report (SCS Doc 11/16) has been adopted by the Scientific Council. Pagination of the report may change due to formatting of the report document for publication.

Evaluation of Rebuilding and Recovery Plans

Fisheries Commission requested (Item 6 of FC Doc 09/17):

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 its 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.

Cod in Div. 3NO

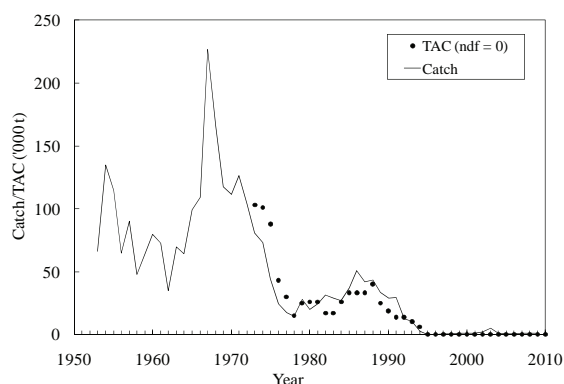
Background: This stock occupies the southern part of the Grand Bank of Newfoundland. Cod are found over the shallower parts of the bank in summer, particularly in the Southeast Shoal area (Div. 3N) and on the slopes of the bank in winter as cooling occurs.

Fishery and Catches: This stock has been under moratorium to directed fishing since February 1994. Since the moratorium catch increased from 170 t in 1995, peaked at about 4 800 t in 2003 then declined to 600 t in 2006. Since 2006 catches have increased steadily to 1 100 t in 2009.

Year	Catch ('000 t)		TAC ('000 t)	
	STACFIS	21A	Recommended	Agreed
2007	0.8	0.7	ndf	Ndf
2008	0.9	0.7 ¹	ndf	Ndf
2009	1.1	0.6 ¹	ndf	Ndf
2010			ndf	Ndf

¹ Provisional.

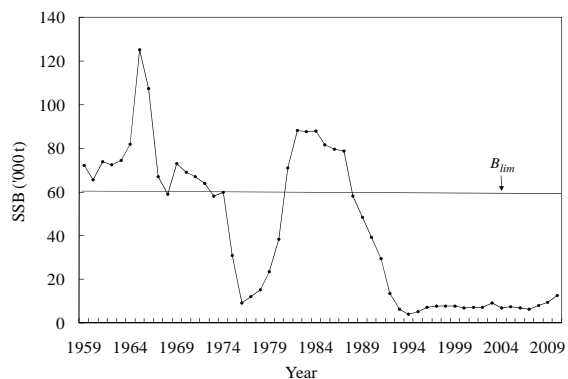
ndf No directed fishing.



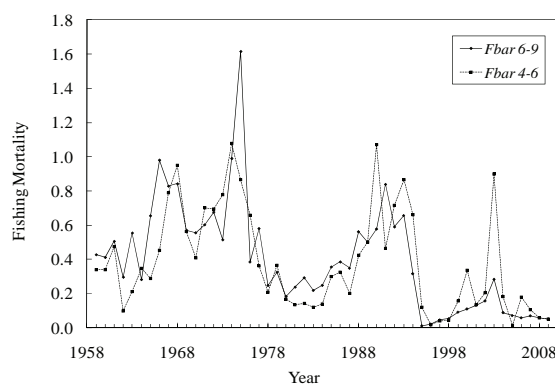
Data: Length and age composition were available from the 2007-2009 trawler fisheries to update catch at age. Canadian spring (1984-2009), autumn (1990-2009), and juvenile (1989-1994) surveys; and EU-Spain Div. 3NO May-June surveys provided abundance, biomass and size structure information.

Assessment: An analytical assessment was presented to estimate population numbers, biomass and SSB at 1 Jan in 2010.

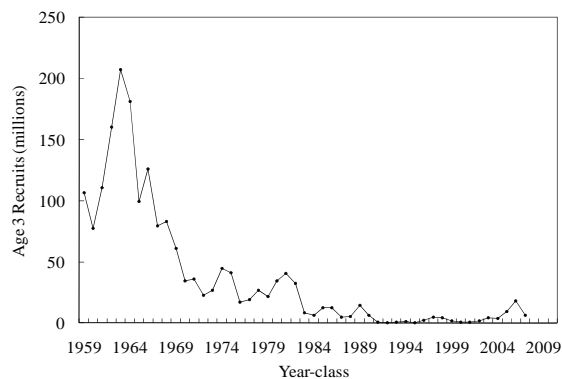
Biomass: The 2010 total biomass and spawning biomass remain low but are estimated to be at their highest levels since 1992.



Fishing Mortality: Has been declining since 2006. Estimates for ages 4-6 in 2008 and 2009 are less than 0.06 and are amongst the lowest estimated during the moratorium.

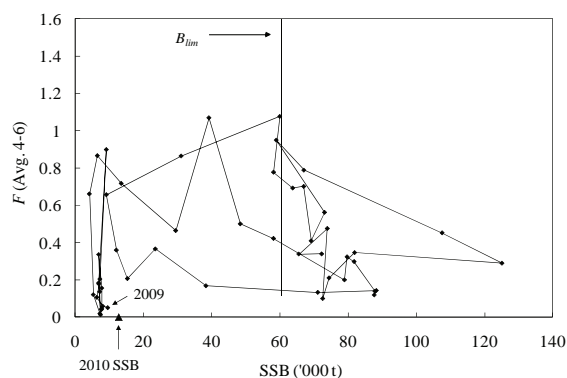


Recruitment: Remains low but has been improving in recent years with current estimates of the 2005-2007 year classes comparable to those from the mid- to late 1980s.



State of the Stock: Remains relatively low but has improved in recent years to levels just prior to the moratorium. Nevertheless, SSB is still well below B_{lim} .

Reference Points: The current best estimate of B_{lim} is 60 000 t. SSB in 2010 is estimated to be 12 700 t which is 21% of B_{lim} .



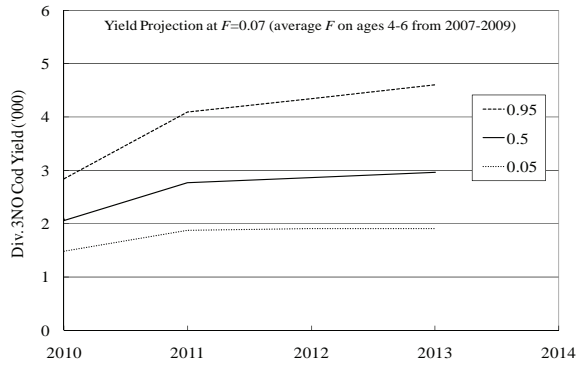
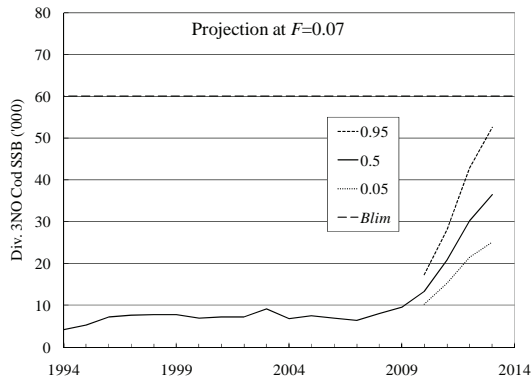
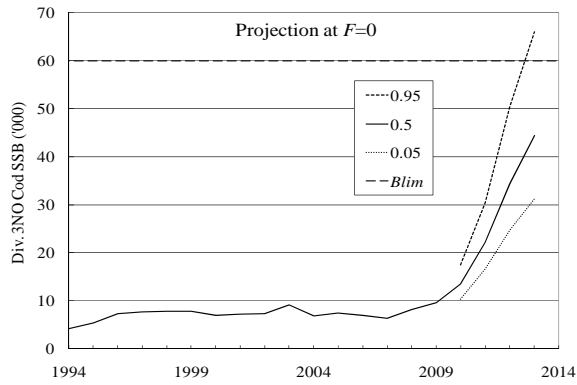
Short-term considerations: Simulations were carried out to examine the trajectory of the stock under two scenarios of fishing mortality: $F=0$, $F=0.07$ (the average F on ages 4-6 from 2007-2009). Simulations were limited to a 3-year period. Given the SSB is still estimated to be well below B_{lim} , recruitment (at age 3) was only re-sampled from 1994-2009 as this represents a reasonable expectation of what has occurred under low productivity conditions. At $F = 0$ spawning stock biomass is estimated to increase and there is an 88% probability that SSB will remain under B_{lim} by 2013. At $F = 0.07$ the population is estimated to grow more slowly. If the fishing mortality in 2010-2012 remains at the average estimated in 2007-2009 then yield is estimated to increase over the 3-year time period.

Stochastic Projection Results:

F=0 Percentile	Beginning of Year SSB			
	2010	2011	2012	2013
0.95	17456	30414	50423	66023
0.75	14963	25056	39827	51819
0.5	13498	22181	34369	44368
0.25	12150	19752	30157	38374
0.05	10283	16572	24722	31190

F=0.07 Percentile	Beginning of Year SSB			
	2010	2011	2012	2013
0.95	17358	27999	42894	52622
0.75	14853	23418	34660	42223
0.5	13388	20791	30294	36493
0.25	12028	18165	26116	31222
0.05	10261	15263	21474	25067

F=0.07 Percentile	Yield			
	2010	2011	2012	2013
0.95	2843	4092	4343	4602
0.75	2356	3237	3382	3567
0.5	2054	2765	2862	2957
0.25	1768	2351	2419	2461
0.05	1478	1877	1904	1909



Recommendation: There should be no directed fishing for cod in Div. 3N and Div. 3O in 2011-2013. Bycatches of cod should be kept to the lowest possible level and restricted to unavoidable bycatch in fisheries directed for other species.

Special Comments: The next assessment will be in 2013.

Sources of Information: SCR. Doc. 10/9, 42; SCS Doc. 10/5, 6, 7; 09/5, 09/12; 08/5, 6, 7.

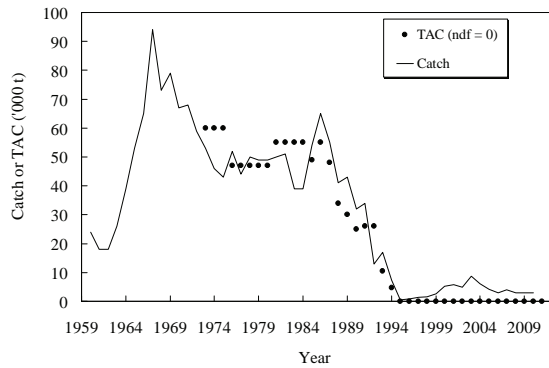
American plaice in Divisions 3LNO

Background: Historically, American plaice in Div. 3LNO has comprised the largest flatfish fishery in the Northwest Atlantic.

Fishery and Catches: In most years the majority of the catch has been taken by offshore otter trawlers. There was no directed fishing in 1994 and there has been a moratorium since 1995. Catches increased after the moratorium until 2003 after which they began to decline. Total catch in 2010 was 2 898 t, mainly taken in the Regulatory Area.

Year	Catch ('000 t)		TAC ('000 t)	
	STACFIS	21	Recommended	Agreed
2008	2.5	1.9	ndf	ndf
2009	3.0	1.8	ndf	ndf
2010	2.9	1.5	ndf	ndf
2011			ndf	ndf

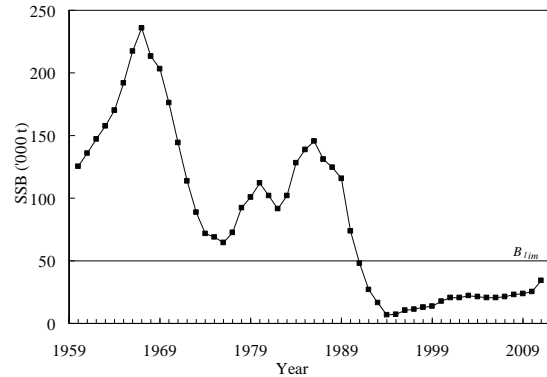
ndf No directed fishing.



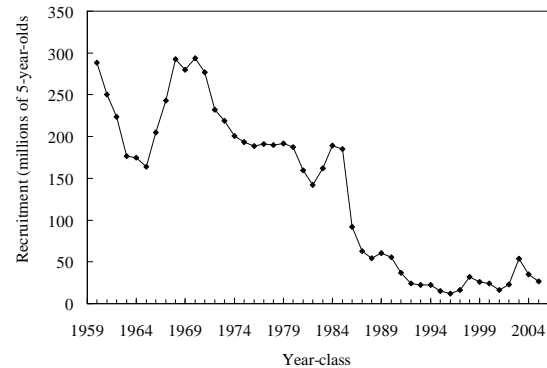
Data: Biomass and abundance data were available from: annual Canadian spring (1985-2010) and autumn (1990-2010) bottom trawl surveys; and EU-Spain surveys in the NAFO Regulatory Area of Div. 3NO (1995-2010). Age data from Canadian bycatch as well as length frequencies from EU-Portugal and EU-Spain bycatch were available for 2010.

Assessment: An analytical assessment using the ADAPTive framework tuned to the Canadian spring, Canadian autumn and the EU-Spain Div. 3NO survey was used. Natural mortality (*M*) was assumed to be 0.2 on all ages except from 1989-1996, where *M* was assumed to be 0.53 on all ages.

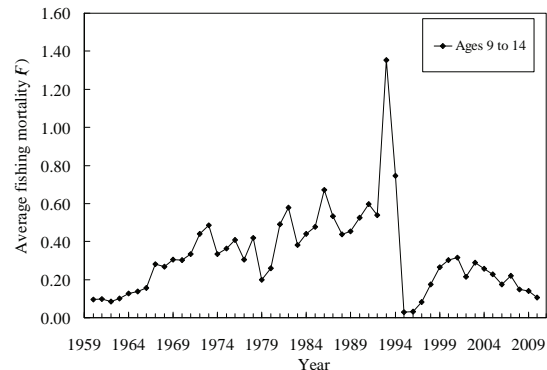
Biomass: Despite the increase in biomass since 1995, the biomass is very low compared to historic levels. SSB declined to the lowest estimated level in 1994 and 1995. SSB has been increasing since then and is currently at 34, 000 t. *B_{lim}* for this stock is 50 000 t.



Recruitment: Estimated recruitment at age 5 indicates that the 2003 year class is comparable to the 1987-1990 year classes but well below the long-term average.

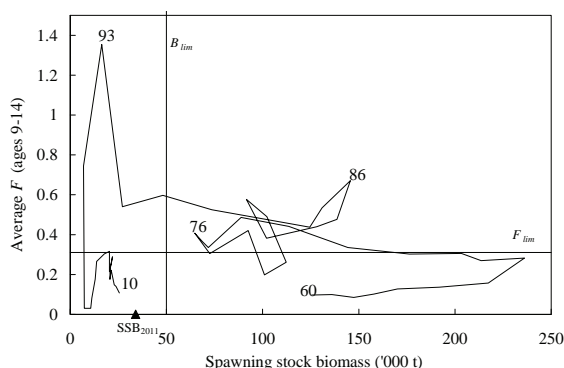
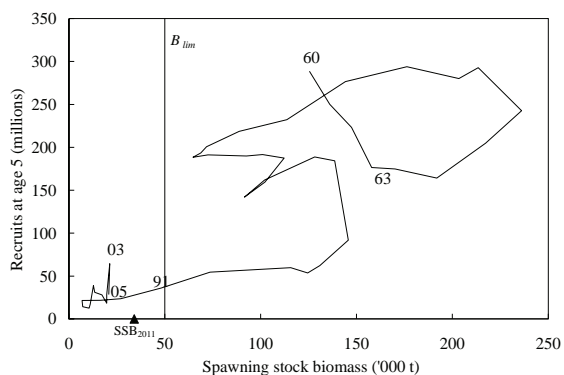


Fishing mortality: Fishing mortality on ages 9 to 14 has generally declined since 2001.



State of the Stock: The stock remains low compared to historic levels and, although SSB is increasing, it is still estimated to be below *B_{lim}*. Estimated recruitment at age 5 indicates that the 2003 year class is comparable to the 1987-1990 year classes but well below the long-term average.

Reference Points: An examination of the stock recruit scatter shows that good recruitment has rarely been observed in this stock at SSB below 50 000 tons and this is currently the best estimate of B_{lim} . In 2011 STACFIS adopted an F_{lim} of 0.31 for this stock based on F_{MSY} (see SC VII.1.d.i). The stock is currently below B_{lim} and current fishing mortality is below F_{lim} .



Short term considerations: Simulations were carried out to examine the trajectory of the stock under 3 scenarios of fishing mortality: $F = 0$, $F = F_{2010}$ (0.11), and $F_{0.1}$ (0.16). Simulations were limited to a 2-year period. Recruitment was resampled from three sections of the estimated stock recruit scatter, depending on SSB.

SSB is projected to have a 50% probability of reaching B_{lim} by the start of 2014 (i.e. end of 2013) when $F=0$. Although SSB is also projected to increase slowly with $F_{current}$ and $F_{0.1}$ the probability of reaching B_{lim} by the start of 2014 under these scenarios is less than 50%.

	F = 0		
	SSB ('000 t)		
	p5	p50	p95
2011	29	33	38
2012	36	41	47
2013	42	48	56
2014	46	53	64

	F ₂₀₁₀ = 0.11					
	SSB ('000 t)			Yield ('000 t)		
	p5	p50	p95	p5	p50	p95
2011	29	33	37	3.2	3.6	4.1
2012	33	37	43	3.7	4.1	4.7
2013	36	41	47	3.9	4.3	4.9
2014	37	42	49			

	F _{0.1} = 0.16					
	SSB ('000 t)			Yield ('000 t)		
	p5	p50	p95	p5	p50	p95
2011	29	33	37	4.5	5.1	5.8
2012	32	36	42	5.0	5.7	6.5
2013	33	38	44	5.1	5.7	6.5
2014	33	38	45			

Recommendation: There should be no directed fishing on American plaice in Div. 3LNO in 2012 and 2013. Bycatches of American plaice should be kept to the lowest possible level and restricted to unavoidable bycatch in fisheries directing for other species.

Special Comment: The next full assessment of this stock will be conducted in 2013.

Sources of Information: SCS Doc. 11/4, 5, 7, 11; SCR Doc. 11/5, 19, 32, 37, 39

d) Special Requests for Management Advice

i) Reference point for Div. 3LNO A. plaice, Div. 3NO Cod, Div. 3LN redfish (Item 7)

Fisheries Commission requests the Scientific Council to identify F_{msy} , identify B_{msy} and provide advice on the appropriate selection of an upper reference point for biomass (e.g. B_{buf}) for 3LNO American Plaice, 3NO cod and 3LN redfish.

Scientific Council responded:

Results of the last assessments of these stocks (2010) were used in the estimation of reference points. Div. 3LN redfish is assessed using a surplus production model (ASPIC) and the reference points for that stock are derived directly from the results of the ASPIC. For Div. 3NO cod and Div. 3LNO American plaice reference points were obtained through simulation by running the population to equilibrium with the dynamics determined by the spawner-recruit relationship, together with weights, maturity and partial recruitment vectors. Scientific Council notes that the available data for 3NO cod and 3LNO American plaice do not span the entire production curve and therefore large uncertainty in the estimated reference points can be expected.

	Div. 3LNO American plaice	Div. 3NO cod	Div. 3LN redfish
F_{msy}	0.31	0.30	0.13
B_{msy}	242 000 t SSB	248 000 t SSB	186 000 t

B_{buf} is a stock biomass level above B_{lim} that is required in the absence of analyses of the probability that current or projected biomass is below B_{lim} . All three of the stocks in the present request have analyses of the probability that biomass is below B_{lim} and a B_{buf} is not required. For these stocks an additional zone(s) between B_{lim} and B_{msy} in the NAFO Precautionary Approach Framework could be considered.

Changes in population biology and in fishing practices can have a large impact on the estimated level of some reference points. For example, for Div. 3LNO American plaice, although the estimate of F_{msy} of 0.31 is considered to be the most appropriate at this time, estimates of F_{msy} ranged from 0.21 to 0.47 depending on the period used to compute the input parameters. These reference points therefore need to be reevaluated on a regular basis, the frequency of which will be stock specific depending on how much change there is in biological parameters and fisheries selectivity over time.

The use of any of these reference points in a precautionary approach framework or rebuilding plan needs to be evaluated for any stock to which they are applied. There needs to be a harvest control rule (management strategy) which is mathematically explicit in order to allow formal testing. Any proposed management/rebuilding strategy should be subject to robustness testing to determine the merit of the proposed strategy. This should then be followed by full management strategy evaluation. All such analyses conducted for the Fisheries Commission should be thoroughly peer reviewed by Scientific Council.

ii) Stock recruit relationship and B_{lim} for Div. 3NO cod (Item 8)

Fisheries Commission requests the Scientific Council to review the stock recruit relationship for 3NO cod and the historical productivity regime used in setting the B_{lim} value of 60 000t.

Scientific Council responded:

The stock recruit data for Div. 3NO cod from the most recent assessment (2010) were examined. Six different stock recruit models were fit to these data. While no particular S-R approach is strongly supported by the data, the Loess smoother fitted to log recruitment provides a general description of the past response of recruitment to SSB and can be used as a basis for deriving reference points. This model gives an estimate of B_{lim} of about 60 000 t.

The Scientific Council will review in detail the biological reference points in the context of the PA framework when the SSB has reached half the current estimate of B_{lim} . In order to conduct this review a number of stock recruit pairs are required once the stock has reached and exceeded 30 000 t of SSB. The most recent estimate of SSB (from the 2010 assessment) for this stock is 12 700 t. In the most optimistic projection scenario ($F=0$) the stock will not be above 30 000 t of SSB until 2012. It will be 2015 before recruitment at age 3 produced by the 2012 SSB is observed.

There is no basis at this stage to suggest a B_{lim} lower than 60 000 t of SSB.

Annex 4. Interim 3LNO American Plaice Conservation Plan and Rebuilding Strategy (FCWG-CPRS Working Paper 11/3, Revision 5)

1. Objective(s):

- a) Long-term Objective: The long-term objective of this Conservation Plan and Rebuilding Strategy is to achieve and to maintain the 3LNO American plaice Spawning Stock Biomass (SSB) in the 'safe zone', as defined by the NAFO Precautionary Approach framework, and at or near Bmsy.
- b) Interim Milestone: As an interim milestone, increase the 3LNO American plaice Spawning Stock Biomass (SSB) to a level above the Limit Reference Point (Blim). It may reasonably be expected that Blim will not be reached until after 2014.

Reference Points:

- a) Limit reference point for spawning stock biomass (Blim) – 50,000t
- b) An intermediate stock reference point or security margin B_{isr}¹ – [100,000t]
- c) Limit reference point for fishing mortality (F_{lim} = F_{msy}) – 0.31
- d) B_{msy} – [242,000t]

Re-opening to Directed Fishing:

- a) A re-opening of a directed fishery should only occur when the estimated SSB, in the year projected for opening the fishery, has a very low² probability of actually being below Blim.
- b) An annual TAC should be established at a level which is projected to result in:
 - i. continued growth in SSB,
 - ii. low³ probability of SSB declining below Blim throughout the subsequent 3-year period, and
 - iii. fishing mortality < F_{0.1}

Harvest Control Rules:

Noting the desire for relative TAC stability, the projections referred to in items (a) through (d) below should consider the effect of maintaining the proposed annual TAC over 3 years. Further, in its application of the Harvest Control Rules, Fisheries Commission may, based on Scientific Council analysis, consider scenarios which either mitigate decline in SSB or limit increases in TACs as a means to balance stability and growth objectives.

- a) When SSB is below Blim:
 - i. no directed fishing, and
 - ii. by-catch should be restricted to unavoidable by-catch in fisheries directing for other species
- b) When SSB is between Blim and B_{isr}:
 - i. TACs should be set at a level(s) to allow for continued growth in SSB consistent with established rebuilding objective(s),
 - ii. TACs should result in a low probability of SSB declining below Blim throughout the subsequent 3-year period, and
 - iii. Biomass projections should apply a low risk tolerance
- c) When SSB is above B_{isr}:
 - i. TACs should be set at a level(s) to allow for growth in SSB consistent with the long term objective, and
 - ii. Biomass projections should apply a risk neutral approach (i.e. mean probabilities)
- d) When SSB is above B_{msy}:
 - i. TACs should be set at a level of F that has a low probability of exceeding F_{msy}, and
 - ii. Biomass projections should apply a risk neutral approach (i.e. mean probabilities)

¹ A 'buffer zone' (B_{buf}) is not required under the NAFO PA given the availability of risk analysis related to current and projected biomass values; however, SC has advised that an additional zone(s) between Blim and B_{msy} could be considered. An intermediate stock reference point (B_{isr}) is proposed to delineate this zone. The proposed value is equivalent to twice Blim.

² 'very low' means 10% or less

³ 'low' means 20% or less

Annex 5. Interim 3NO Cod Conservation Plan and Rebuilding Strategy
(FCWG-CPRS Working Paper 11/4, Revision 3)

1. Objective(s):

- a) Long-term Objective: The long-term objective of this Conservation Plan and Rebuilding Strategy is to achieve and to maintain the 3NO Cod Spawning Stock Biomass (SSB) in the 'safe zone', as defined by the NAFO Precautionary Approach framework, and at or near Bmsy.
- b) Interim Milestone: As an interim milestone, increase the 3NO Cod Spawning Stock Biomass (SSB) to a level above the Limit Reference Point (Blim). It may reasonably be expected that Blim will not be reached until after 2015.

2. Reference Points:

- a) Limit reference point for spawning stock biomass (Blim) – 60,000t¹
- b) An intermediate stock reference point or security margin Bmsr² – [120,000t]
- c) Limit reference point for fishing mortality (Flim = Fmsy) – 0.30
- d) Bmsy – [248,000t]

3. Re-opening to Directed Fishing:

- a) A re-opening of a directed fishery should only occur when the estimated SSB, in the year projected for opening the fishery, has a very low³ probability of actually being below Blim.
- b) An annual TAC should be established at a level which is projected to result in:
 - i. continued growth in SSB,
 - ii. low⁴ probability of SSB declining below Blim throughout the subsequent 3-year period, and
 - iii. fishing mortality < F0.1

4. Harvest Control Rules:

Noting the desire for relative TAC stability, the projections referred to in items (a) through (d) below should consider the effect of maintaining the proposed annual TAC over 3 years. Further, in its application of the Harvest Control Rules, Fisheries Commission may, based on Scientific Council analysis, consider scenarios which either mitigate decline in SSB or limit increases in TACs as a means to balance stability and growth objectives.

- a) When SSB is below Blim:
 - i. no directed fishing, and
 - ii. by-catch should be restricted to unavoidable by-catch in fisheries directing for other species

Before SSB increases above Blim, additional or alternative harvest control rules should be developed, following the Precautionary Approach, to ensure the long-term objective is met, such as:

- b) When SSB is between Blim and Bmsr:
 - i. TACs should be set at a level(s) to allow for continued growth in SSB consistent with established rebuilding objective(s),
 - ii. TACs should result in a low probability of SSB declining below Blim throughout the subsequent 3-year period, and
 - iii. Biomass projections should apply a low risk tolerance

¹ The Fisheries Commission shall request the Scientific Council to review in detail the limit reference point when the Spawning Stock Biomass has reached 30,000t.

² A 'buffer zone' (Bbuf) is not required under the NAFO PA given the availability of risk analysis related to current and projected biomass values; however, SC has advised that an additional zone(s) between Blim and Bmsy could be considered. An intermediate stock reference point (Bmsr) is proposed to delineate this zone. The proposed value is set at a level equivalent to twice Blim. Should the SC review of the limit reference point (Blim) result in a change to that value then the intermediate stock reference point (Bmsr) should also be re-evaluated.

³ 'very low' means 10% or less

⁴ 'low' means 20% or less

When SSB is above B_{isr} :

- iv. TACs should be set at a level(s) to allow for growth in SSB consistent with the long term objective, and
 - v. Biomass projections should apply a risk neutral approach (i.e. mean probabilities)
- c) When SSB is above B_{msy} :
- i. TACs should be set at a level of F that has a low probability of exceeding F_{msy} , and
 - ii. Biomass projections should apply a risk neutral approach (i.e. mean probabilities)

Ecosystem Considerations:

Considering the importance of capelin as a food source, consistent with the ecosystem approach, the moratorium on 3NO capelin will continue until at least December 31, 2015.

SECTION VII
(pages 291 to 315)

**Report of the FC Working Group of Fishery Managers and Scientists on
Vulnerable Marine Ecosystems (WGFMS-VME)
29-30 June 2011
Halifax, Nova Scotia, Canada**

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**Report of the FC Working Group of Fishery Managers and Scientists on
Vulnerable Marine Ecosystems (WGFMS-VME)
(FC Doc. 11/5)**

**29-30 June 2011
Halifax, Nova Scotia, Canada**

1. Opening of the Meeting

The Chair Bill Brodie (Canada) opened the meeting at 0935 hrs on Wednesday, 29 June 2011. He welcomed the participants from Canada, European Union (EU), Iceland, Japan, Norway, the Russian Federation, and the USA, as well as the Scientific Council (SC) Chair (Annex 1).

2. Appointment of Rapporteur

The Fisheries Commission Coordinator was appointed rapporteur.

3. Adoption of Agenda

The provisional agenda as previously circulated was adopted with insertion of three sub-items under Other Matters: a) NAFO's Implementation of the Ecosystem Approach, b) NERIEDA update, c) Procedural issues relating to the mandate of the working group, including utilization of SC advice (Annex 2).

**4. Review of the scientific advice of the Scientific Council to the Fisheries Commission;
evaluate associated risks**

The Working Group (WG) received a summary of the Scientific Council report of the June 2011 meeting, from the SC Chair (Annex 3). The presentation of the SC Chair focused on responses to three VME-related questions from the Fisheries Commission (FC) to SC (items 13 – 15 of FC Doc 10/9 Rev.). There was relevant information on the coral and sponge protection zones (notably closed area #5), on encounter thresholds for sponge, and frequency and timing of fishing plans/assessments.

The WG drew the attention of FC to these responses. No evaluation of associated risks was conducted as it was decided that the WG would seek further clarification and instructions from the FC regarding this matter.

**5. Review area closures, fisheries impact assessments and other measures outlined in the NAFO
Conservation and Enforcement Measures (NCEM) with specific timelines**

The WG agreed that the primary focus was those measures with specific timelines, and concentrated on those measures in its review. It was agreed that the effective closure period as well as the review date of seamount, coral, and sponge measures be harmonized. The WG recommended several extensions of closed area deadlines, and this is reflected in the updated text Chapter Ibis (see item 6).

Also, it was noted that the SC advice from June 2011 contained information on frequency and timing of fishing plans/assessments.

6. Update the text in Chapter Ibis of the NCEM as necessary

The review and update of Chapter Ibis generated some discussions, which focused mainly on removing outdated elements, clarifying the text, and reorganizing the articles.

Some changes were proposed in the text in order to bring clarity. In cases where there was no consensus, the text were square-bracketed with the intention of bringing these to the attention of the FC for clarification.

Annex 4 presents the proposed updated text of Chapter Ibis. The main features of the update are 1) moving Articles 15.5-15.10 (on seamounts closure) and Article 16 (on coral and sponge areas closure) and integrating them into Article 2bis, 2) harmonization of the closure and review dates of the protected areas and 3) consolidation of definitions related to VME (Article Ibis).

7. Recommendations to be forwarded to the Fisheries Commission

a) On mitigation strategies and measures to avoid significant adverse impacts on vulnerable marine ecosystems.

The WG recommends the extension of the existing coral and sponge closures until 2014 to synchronize with the seamount closure. This recommendation is reflected in the proposed update of Chapter Ibis of the NCEM.

b) Other recommendations

Update of Chapter Ibis of the NCEM

- The WG recommends to the FC the adoption of the proposed update of Chapter Ibis of the NCEM. The proposed update is contained in FCWG-VME WP 11/2 Rev.2, and is presented in Annex 4.

Issues arising from this meeting

- In relation to Article 1bis6 of the draft update concerning VME indicator species, the WG recommends to the FC to formulate a request to the Scientific Council to produce a detailed list of VME indicator species and possibly other VME elements.
- In relation to Article 2bis3 of the draft update, it is implied that exploratory fishery in the seamounts is allowed. The WG recommends that the FC clarify this measure and its application, with specific reference to Article 2bis, paragraph 2 (regarding 'fishable area'). The WG is of the view that there should be clear and consistent measures in the NCEM on exploratory fisheries vis-à-vis closed areas (seamounts, coral and sponge areas).
- In relation to Article 2bis8 of the draft update concerning the establishment of national coral and sponge monitoring programs, the WG recommends that FC clarify the intent of this measure.
- Concerning the role and task of the WG, the WG recommends to the FC to clarify whether this group should consider scientific advice before it is presented to the FC and make recommendations to the FC at the Annual Meeting.

8. Other Matters

a) NAFO's Implementation of the Ecosystem Approach

The Executive Secretary presented a summary of NAFO's decisions and actions in implementing the ecosystem approach. Measures on protection of sharks and turtles, as well as on bottom fisheries in the Regulatory Area (Chapter Ibis of NCEM) were outlined in line with the international instruments such as the 1995 Fish Stock Agreement, 2006 UNGA Resolution 61/105, and the 2007 NAFO Amended Convention.

The WG was reminded that many of the measures currently in place in Chapter Ibis were the result of recommendations from this WG. The WG was also informed that the Secretariat, in consultation with the Contracting Parties, reports regularly to the United Nations Division for Ocean Affairs and the Law of the Sea (UNDOALOS). The latest report was transmitted in May 2011.

b) Update on NEREIDA Project

Enrique de Cardenas (EU) made an update-presentation on the research survey project NEREIDA (NAFO Potential Vulnerable Marine Ecosystems: Impact of Deep-sea Fisheries) coordinated by EU-Spain in collaboration with other Contracting Parties. This project was first announced at the 2008 NAFO Annual Meeting. It was noted that regular updates were already provided at previous WG meetings. Also at the 2010 Annual Meeting, a side-event was organized for a joint presentation by Canada and Spain on the research results of the on-going project.

All planned research cruises under the project have been undertaken. Activities since the last update focus on further processing of specimens and samples and data analyses.

Commitment of financial support on the project by EU and Canada are secured until 2014.

c) Procedural issues relating to the utilization of SC advice

The WG had some discussion around timing and function of the WG. Some members felt that the WG should examine in detail the most recent SC advice and responses on VME-related material, and provide recommendations to FC on this content. Other members of the WG felt that the SC advice should go directly to FC, who could then task the WG with specific items as required. The opinion of the Chair of SC was that the SC advice should be delivered to FC for action, rather than to various WGs or other Standing Committees of NAFO. Related to this issue, the WG also discussed options for best timing of any future WG meetings, but did not come to any conclusions. A clarification on the process and timing would be sought from FC

9. Adoption of Report

This report was adopted through correspondence after the meeting.

10. Adjournment

The Chair thanked the participants and the Secretariat. The meeting was adjourned at 1605 hrs on Thursday, 30 June 2011.

Annex 1. List of Participants

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Annex 2. Agenda

1. Opening of the Meeting
2. Appointment of Rapporteur
3. Adoption of the Agenda
4. Review of the scientific advice of the Scientific Council to the Fisheries Commission; evaluate associated risks
5. Review area closures, fisheries impact assessments and other measures outlined in the NAFO Conservation and Enforcement Measure with specific timelines
6. Update the text in Chapter Ibis of the NCEM as necessary
7. Recommendations to be forwarded to the Fisheries Commission
 - a. On mitigation strategies and measures to avoid significant adverse impacts on vulnerable marine ecosystems
 - b. Other recommendations
8. Other Matters
 - a. NAFO's implementation of the Ecosystem Approach
 - b. Update on NEREIDA Project
 - c. Procedural issues relating to the utilization of SC advice
9. Adoption of Report
10. Adjournment

Annex 3. Fisheries Commission Requests and Scientific Council Responses
(FCWG-VME Working Paper 11/1)

For information purposes and to help facilitate discussions within the Working Group, the Secretariat has put together this working paper presenting the summary of the latest response from the Scientific Council to the FC Request for scientific advice on VMEs.

Contents:

FC Request for Advice		Scientific Advice	
FC Request	Request Item and FC Reference Document	SC Advice Formulation	SC Reference Document
Review any new scientific information on Coral and Sponge Protection Zone (Art. 16.3, 2011 NCEM)	Item 13, FC Doc 10/9 Rev.	Advice formulated at the June 2011 Meeting	SCS Doc. 11/16, p. 34-35*
Application of simulation modelling in a GIS framework	Item 14, FC Doc 10/9 Rev.	Advice formulated at the June 2011 Meeting	SCS Doc. 11/16, pp. 35-36*
Evaluating SAIs and Gear/Substrate impact assessments	Item 15, FC Doc 10/9 Rev.	Advice formulated at the June 2011 Meeting	SCS Doc. 11/16, pp. 37-38*

*The SC June 2011 Meeting Report (SCS Doc 11/16) has been adopted by the Scientific Council. Pagination of the report may change due to formatting of the the report document for publication.

FC Request (item 13 of FC Doc. 10/9 Rev.)

Mindful of the NEREIDA mission, the international scientific effort led by Spain to survey the seafloor in the NAFO Regulatory Area,

Recognizing that the Coral and Sponge Protection Zones closed to bottom fishing activities for the protection of vulnerable marine ecosystems as defined in Chapter 1 Article 16 Paragraph 3 is in place until December 31, 2011, Mindful of the call for review of the above measures based on advice from the Scientific Council,

Fisheries Commission requests that Scientific Council review any new scientific information on the areas defined in Chapter 1 Article 16 Paragraph 3 which may support or refute the designation of these areas as vulnerable marine ecosystems. In the event that new information is not available at the time of the Fisheries Commission meeting in September 2011, prepare an overview of the type of information that will be available and the timeline for completion.

SC Response (SCS Doc. 11/16, p. 34-35)

Sources of Information: SCS Doc. 08/10, 08/24, 09/06, 10/19, 10/24 and references therein.

Although a full review of all NEREIDA results is not yet available, SC have focused their efforts in the study and analysis of different streams of data from the Sackville Spur (Closed Area # 6). The goal was to provide, at minimum, a more comprehensive look of one of the close areas currently in place. These results can be considered as a first order approximation of what would be expected to find in other closed areas with similar characteristics. In addition to the focalized efforts on Sackville Spur, some data analyses for other areas like Flemish Cap south, Flemish Cap east (Closed Area # 4), and Flemish Cap northeast prong (Closed Area 5) were also pursued.

The battery of studies and analyses done for the Sackville Spur (Closed Area # 6) rendered some important results about the benthic communities in this area which support the designation of this area as a VME. It was found that both benthic organisms biomass as well as biodiversity are higher within the closed area, and that there were differences in the composition of the benthic community within and outside the closed area. Furthermore, the number of non-sponge benthic taxa is significantly and positively related to both depth and sponge density, supporting the notion that sponge grounds have an important structural role in defining these benthic systems.

In the Flemish Cap northeast prong (Closed Area # 5), the work done documented the existence of a gradient of benthic communities with depth, transitioning from coral dominated communities at ~2450m depth, to corals intermixed with sponges around 2000m, to sponge dominated grounds at 1500m, and to a diverse community of corals, sponges and other benthic taxa at ~1300m depth. This is probably the most interesting arrangement of corals and sponges communities documented so far in the NRA. It is worth noting that the lower boundary of the Closed Area # 5 does not reach sufficiently deep waters to protect the entire gradient of coral and sponges assemblages. Therefore it would be advisable to extend the lower boundary of this close area up to the 2500m contour.

Based upon the above findings, as well as prior studies, Scientific Council confirms that the original rationale and basis for identifying and establishing closed areas to protect significant concentrations of VME-defining corals and sponges was appropriate.

The processing of samples and analysis of the data collected during the NEREIDA project is still ongoing. A stream of results and studies are expected to become available over the next few years, but precise timelines for completion are dependent on the continuation of the funding and resources that had supported these research efforts until now. Many of these sources have already expired or are scheduled to finish in 2011. If current efforts aimed to secure additional funding are successful, a full analysis of NEREIDA data streams and collections is expected to be completed by 2014.

FC Request (item 14 of FC Doc. 10/9 Rev.)

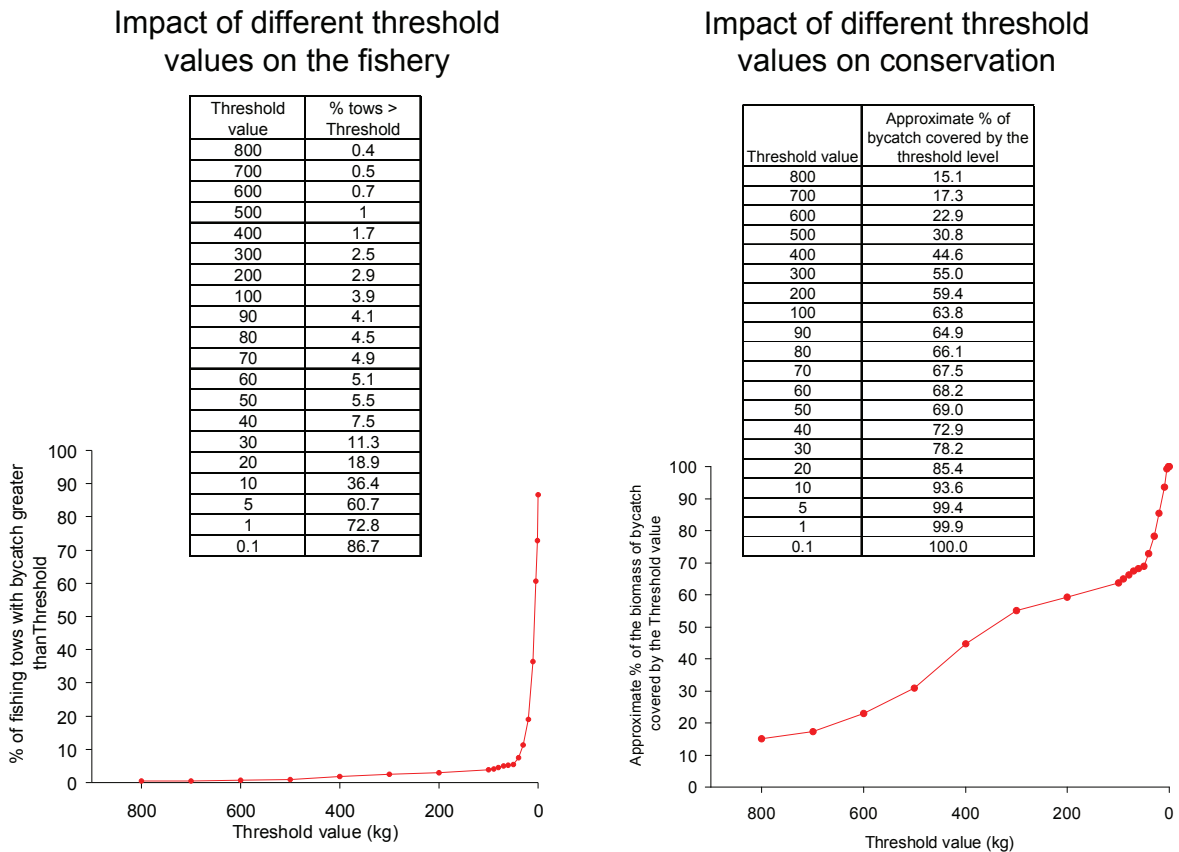
Noting the response from the Scientific Council in June 2010 regarding simulation modeling in a GIS framework: “To apply this model to the NRA, an agreed upon set of gear descriptions and tow duration/lengths for each fishing fleet segment would need to be created. Further estimation of retention efficiencies of the different commercial gears and indirect effects of fishing will be needed to model effects of serious adverse impacts.”

The Fisheries Commission requests that the Scientific Council: 1) acquire the requisite data and apply the model to the extent possible to the NRA, and 2) consider whether the SASI model used by the US New England Fisheries Council should be incorporated into the aforementioned GIS framework as a means of integrating significant adverse impacts into the approach.

SC Response (SCS Doc. 11/16, p. 35-36)

Significant efforts were made to enhance and improve the GIS framework, and to apply it to the NRA, outside the closed areas, for the evaluation of VME-defining species bycatch threshold levels for encounter protocols. These efforts included a complete and open sharing of raw data among scientists of different contracting parties, a full engagement and collaboration with the staff at the NAFO Secretariat for the generation of VMS effort maps, as well as gathering information from actual commercial tows to capture their characteristics as realistically as possible within the GIS framework.

The key results from this analysis can be summarized in the following figure:



At the present time, these results are relying on a simulation exercise intended to capture as much realism as possible. However, detailed and accurate reporting on bycatch of VME-defining species (sponges in this case) during commercial fishing operations is essential to validate the results from models like this, as well as to refine its accuracy and performance.

This GIS framework can generate outputs like the ones presented in the figures above, but it can also be used to provide estimations of biomass of sponge bycatch per effort, if selectivity values are available. The above analyses assume 100% catchability, but implementing other catchability values is possible.

The results obtained from the application of the GIS framework, indicate that the current encounter threshold for sponges bycatch is rarely met. If the intension of the threshold is to accomplish protection of sponges outside the closed areas this analysis therefore indicates that the threshold needs to be reduced. The above analysis can serve as a guide for this exercise. It is also considered very important to maximize efforts in the reporting of bycatch of corals and sponges, regardless of whether these bycatches hit or not the thresholds indicated in the encounter protocols.

Part 2: Consideration of the SASI model for its potential integration with the GIS framework, and its application to the NRA.

The Swept Area Seabed Impact model (SASI) addresses a different set of questions than the GIS framework, and hence, there is no particular benefit in merging both approaches into a single software application. SASI structure provides another tool to explore significant adverse impacts, but its current configuration/parameterization is not directly applicable to the NRA, however, the possibility of developing a SASI-like a tool for the NRA is expected to be explored further through the invitation extended to Brad Harris, a SASI expert from the University of Massachusetts, to join the Scientific Council Working Group of Ecosystem Approaches to Fisheries Management (WGEAFM).

FC Request (item 15 of FC Doc. 10/9 Rev.)

Recognizing the initiatives on vulnerable marine ecosystems (VME) through the work of the WGFMS, and with a view to completing and updating fishery impact assessments, the Scientific Council is requested to provide the Fisheries Commission at its next annual meeting in 2011: 1) guidance on the timing and frequency of fishing plans/assessments for the purpose of evaluating significant adverse impacts on VMEs; 2) a framework for developing gear/substrate impact assessments to facilitate reporting amongst the Contracting Parties

SC Response (SCS Doc. 11/16, p. 37-38)

Part 1: Guidance on timing and frequency of fishing plans/assessments

At the present time, no fishing plan/assessment has been submitted in the new format, so there is no actual procedural experience on which a more thorough guidance and feedback, not just on timing and frequency, but also on content can be provided. Nonetheless, some observations can be made that may be of utility.

On regards to timing, the current NCEM provisions (Article 4bis) indicates that an assessment should be submitted no less that two weeks prior to the beginning of the June meeting of Scientific Council (SC), with the intent that this council submits its conclusions and recommendations to Fisheries Commission which, together with the advice received by its Working Group of Fisheries Scientists and Managers, it would be expected to make decisions and recommendations pertaining to the assessment in the following September meeting; this assumes the intent of the proponents is to start fishing on Jan 1 of the following year. However, this timeline does may not allow for sufficient time for SC to prepare an adequate review of the submitted assessment. SC rules of procedure states that the SC Agenda for the June meeting must be finalized two months prior to the meeting; it would be important to respect this timeline in order to provide, a least in principle, a minimal amount of time for SC to review the submitted assessment.

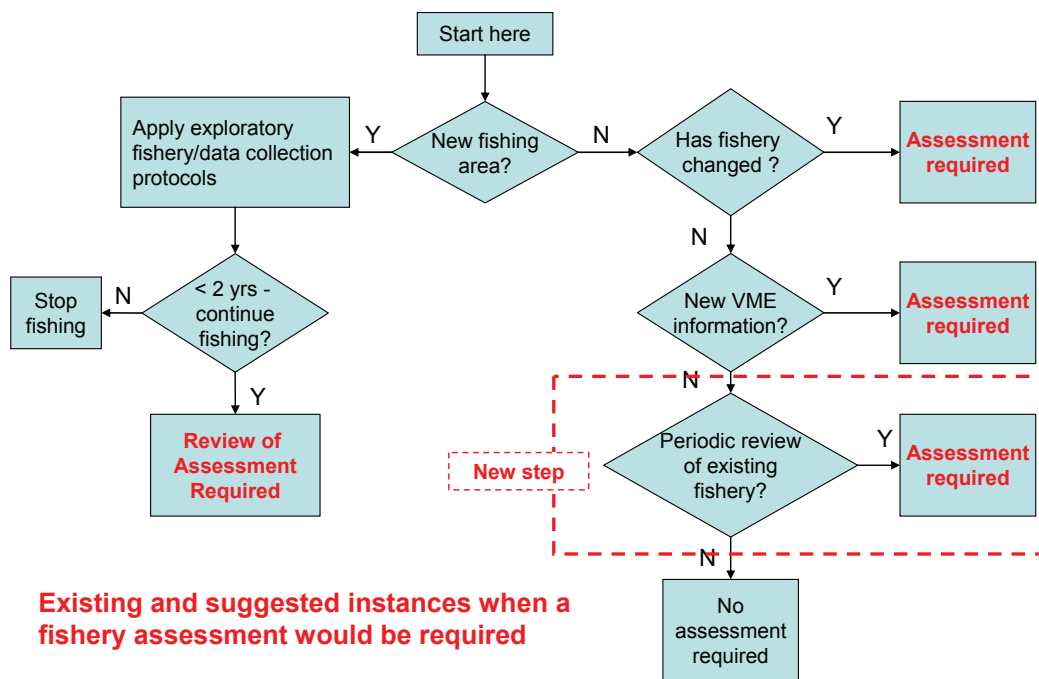
This timeline essentially implies that the submission of an assessment should take place approximately 8-9 months prior to the intended start of the fishery. However, the review of assessments by Scientific Council would most likely require input from STACFIS, which meets in June, but may also require input from the SC WGEAFM, which typically meets in December. Considering these circumstances, it would be advisable that fisheries assessments are

submitted one year prior to the FC meeting at which a decision on the assessment is expected to be made; assessment submission should be tabled at the FC and SC meeting during the September Annual Meeting of the year prior to the one where the decision should be made. This would allow SC to have enough time to circulate the assessment among all necessary groups with sufficient time for their reviews to be available at the SC June meeting prior to the FC meeting that would make a decision about the assessment.

With respect to frequency, current procedures do not establish any specific frequency for fisheries assessments. For example, in new fishing grounds, an assessment is triggered by the request of pursuing exploratory fishing, and another one is required two years later if the contracting parties request to continue fishing after the exploratory fishing phase. On existing fishing grounds, assessments are triggered by a) significant changes in the fishery, or b) new scientific information on VMEs in a particular area becomes available. On these grounds, it is worth noting that there should be an established process for reporting and reviewing possible VME encounters, and that SC needs data from fisheries to address questions on whether VME have been detected during fishing, and/or to evaluate if significant changes in the fishery have occurred. Current procedures allow FC to requests updates on previously assessed fisheries, but there is no provision whatsoever that requires a periodic assessment of an existing fishery within the fishery footprint.

Given the lack of experience, it is difficult to gauge how demanding the review process of fisheries plans/assessments may be, or how this additional workload may affect the ability of SC to continue delivering the advice required within currently expected timelines. Until some assessments are actually submitted and reviewed, their true impact on regular SC activities will remain unknown.

Nonetheless, after examining the regulations that currently defines the frequency of assessments, Scientific Council suggests that a structure similar to the one depicted in the flowchart below, may help developing a more consistent approach to the submission and reviews of fisheries plans/assessments. This flow chart includes assessments required under current regulations, but it also incorporates new instances when an assessment would be required (e.g. periodic review of existing fisheries). The frequency of these periodic reviews would be better determined once some experience on assessments is gained, but it would be expected them to be on a multiyear cycle.



Part 2: Guidance on framework for gear/substrate impact assessment to facilitate reporting amongst Contracting Parties

Scientific Council considered the development of an impact assessment framework, but could not provide a comprehensive approach at this time. SC noted that such frameworks exist in other RFMOs, and that further review of these frameworks and investigations into the particular requirements in the NAFO areas is needed. SC also noted that it would be useful for the continuing work on this matter if the request could be somewhat elaborated to give clearer directions on the work needed. Depending on the scope of such a framework SC also notes that this would require a considerable workload on SC members and that additional data from fishing activities will likely be required (e.g. an enhanced data collection protocol, fishery data on corals sponges, etc).

Annex 4. Draft Update of Chapter Ibis – Bottom Fisheries in the NAFO Regulatory Area (FCWG-VME Working Paper 11/2 Revision 3)

Article Ibis – Purpose and definitions

1. The purpose of this chapter is to ensure the implementation by NAFO of effective measures to prevent significant adverse impacts of bottom fishing activities on vulnerable marine ecosystems known to occur or likely to occur in the Regulatory Area based on the best available scientific information. For the purposes of this Chapter, NAFO will take into account the guidance provided by the FAO in the framework of the Code of Conduct for Responsible Fisheries and any other internationally agreed standards, as appropriate.
2. The term ‘bottom fishing activities’ means bottom fishing activities where the fishing gear is likely to contact the seafloor during the normal course of fishing operations.
3. The term "existing bottom fishing areas" means that portion of the Regulatory Area where bottom fishing has historically occurred and is defined by the coordinates shown in Table 1 and illustrated in Figure 3. ~~initially means areas where VMS data and/or other available geo-reference data indicating bottom fishing activities have been conducted at least in two years within a reference period of 1987 to 2007. This shall be revised regularly in accordance with Article 2bis.~~
4. The term "new bottom fishing areas" means all other areas within the Regulatory Area which are not defined as existing bottom fishing areas[, including waters deeper than 2000 metres].
5. The term “vulnerable marine ecosystems” means has the same meaning and characteristics as those contained in paragraphs 42 and 43 of the FAO International Guidelines for the Management of Deep-Sea Fisheries in the High Seas.
6. The term VME indicator species refers to species of coral identified as antipatharians, gorgonians, lophelia, and sea pen fields; cerianthid anemone fields; and sponges that constitute sponge grounds or aggregations, [and other VME elements].
- 7.6. The term "significant adverse impacts" has the same meaning and characteristics as those described in paragraphs 17-20 of the FAO International Guidelines for the Management of Deep Sea Fisheries in the High Seas.
8. The term “exploratory fisheries” means all bottom fishing activities outside of the existing bottom fishing area (footprint), or if there are significant changes to the conduct or technology of existing bottom fishing activities within the footprint.
9. The term “encounter” means catch of a VME indicator species above threshold levels as set out in Article 6bis, paragraph 3, with indicator species of coral identified as antipatharians, gorgonians, cerianthid anemone fields, lophelia, and sea pen fields or other VME elements. Any encounter with a VME indicator species or merely detecting the its presence of an element itself is not sufficient to identify a VME. That identification should be made on a case-by-case basis through assessment by relevant bodies.

Article 2bis Seamount, Coral, and Sponge Protection Zones

1. ~~5. As of January 1, 2007, and u~~ Until December 31, 2010 2014, no vessel shall engage in the following areas shall be closed to all bottom fishing activities in the areas. The closed areas are defined by connecting the following coordinates (in numerical order and back to coordinate 1).

Area	Coordinate 1	Coordinate 2	Coordinate 3	Coordinate 4
Fogo Seamounts 1	42°31'33"N 53°23'17"W	42°31'33"N 52°33'37"W	41°55'48"N 53°23'17"W	41°55'48"N 52°33'37"W
Fogo Seamounts 2	41°07'22"N 52°27'49"W	41°07'22"N 51°38'10"W	40°31'37"N 52°27'49"W	40°31'37"N 51°38'10"W
Orphan Knoll	50°00'30"N 45°00'30"W	51°00'30"N 45°00'30"W	51°00'30"N 47°00'30"W	50°00'30"N 47°00'30"W
Corner Seamounts	35°00'00"N 48°00'00"W	36°00'00"N 48°00'00"W	36°00'00"N 52°00'00"W	35°00'00"N 52°00'00"W
Newfoundland Seamounts	43°29'00"N 43°20'00"W	44°00'00"N 43°20'00"W	44°00'00"N 46°40'00"W	43°29'00"N 46°40'00"W
New England Seamounts	35°00'00"N 57°00'00"W	39°00'00"N 57°00'00"W	39°00'00"N 64°00'00"W	35°00'00"N 64°00'00"W

~~At the 2010 Annual Meeting, the Fisheries Commission agreed that the existing measures on seamounts be rolled over until December 31, 2014.~~

2. ~~6. At the 2007 Annual Meeting, t~~ The Fisheries Commission shall consider providing access to a small scale and restricted exploratory fishery, effective January 1, 2008, not to exceed 20% of the fishable area of each seamount. These

representative areas that may be fished on each seamount will be recommended by the Scientific Council based on existing survey and commercial data from these seamount areas. Scientific Council is requested to provide the Fisheries Commission, at the 2007 Annual Meeting, recommendations on: 1) areas that could be fished on each seamount and, 2) a protocol for the collection of the data required to assess these seamounts, with a view to future recommendations on management measures for these areas.

7. Contracting Parties shall provide the Executive Secretary, in advance of the June 2007 Scientific Council meeting, with all existing data from survey and commercial fisheries that have taken place in these seamount areas. The Executive Secretary will forward this information to the Scientific Council for its review in making the above noted recommendations to the Fisheries Commission.
3. ~~8.~~ A request to conduct exploratory bottom contact fishing, in the areas defined by paragraph 1 shall be in accordance with the Exploratory Protocol for New Fishing Areas (Annex XXV). ~~Vessels may only fish in the defined areas in accordance with the protocol established by the Scientific Council and adopted by the Fisheries Commission.~~ In addition to the protocol, vessels fishing in the areas defined in paragraph ~~1~~ 5, shall have a scientific observer onboard.
4. ~~9.~~ If vessels fishing in the areas defined in paragraph ~~1~~ 5 encounter ~~hard corals~~, a VME indicator species, as defined in paragraph 3 of Article 6bis of Chapter Ibis, interim encounter provisions as set out in paragraph 2 of Article 6bis of Chapter Ibis will apply. ~~notification of the location of the coral area is to be provided to the Executive Secretary which will implement an immediate temporary closure of that area to all Contracting Parties pending a Fisheries Commission decision at the next Annual Meeting.~~
10. The measures referred to in paragraphs ~~5-9~~ shall be reviewed in 2010 by the Fisheries Commission, based on the advice from the Scientific Council, and a decision shall be taken on future management measures which may include extending the application of these measures for an additional period or making the closure(s) permanent.
5. ~~1.~~ As of January 1, 2008, and ~~u~~ Until December 31, 2014, no vessel shall engage in bottom fishing activities in the following area in Division 30 shall be closed to all bottom fishing activities. The closed area is defined by connecting the following coordinates (as illustrated in Figure 1).

Point No.	Latitude	Longitude
1	42° 53' 00" N	51° 00' 00" W
2	42° 52' 04" N	51° 31' 44" W
3	43° 24' 13" N	51° 58' 12" W
4	43° 24' 20" N	51° 58' 18" W
5	43° 39' 38" N	52° 13' 10" W
6	43° 40' 59" N	52° 27' 52" W
7	43° 56' 19" N	52° 39' 48" W
8	44° 04' 53" N	52° 58' 12" W
9	44° 18' 38" N	53° 06' 00" W
10	44° 18' 36" N	53° 24' 07" W
11	44° 49' 59" N	54° 30' 00" W
12	44° 29' 55" N	54° 30' 00" W
13	43° 26' 59" N	52° 55' 59" W
14	42° 48' 00" N	51° 41' 06" W
15	42° 33' 02" N	51° 00' 00" W

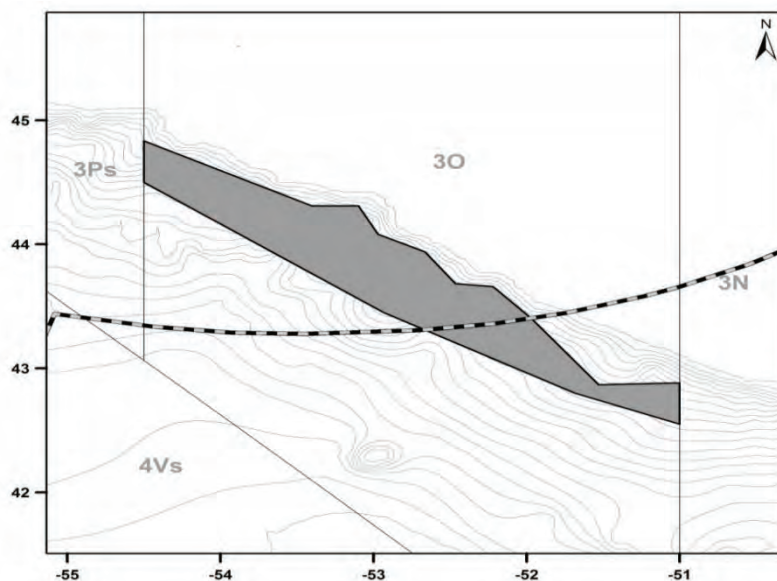


Figure 1. Polygon Delineating Area of 30 Coral Closure referred to in Article 2bis paragraph 5.

2. The measures referred to in Article 16 paragraph 1 shall be reviewed in 2012 by the Fisheries Commission, based on the advice from the Scientific Council, and a decision shall be taken on future management measures.
6. ~~3. As of January 1, 2010, and Until December 31, 2014, no vessel shall engage in~~ The following areas shall be closed on an interim basis (until December 31, 2012) to all bottom fishing activities. ~~The closed areas are in the areas~~ defined by connecting the following coordinates (as illustrated in Figure 2).

Area	Description	Point No.	Latitude	Longitude
1	Tail of the Bank	1.1	44° 02' 53.88" N	48° 49' 9.48" W
		1.2	44° 21' 31.32" N	48° 46' 48" W
		1.3	44° 21' 34.56" N	48° 50' 32.64" W
		1.4	44° 11' 48.12" N	48° 50' 32.64" W
		1.5	44° 02' 54.6" N	48° 52' 52.32" W
2	Flemish Pass/ Eastern Canyon	2.1	44° 50' 56.4" N	48° 43' 45.48" W
		2.2	46° 18' 54.72" N	46° 47' 51.72" W
		2.3	46° 25' 28.56" N	46° 47' 51.72" W
		2.4	46° 46' 32.16" N	46° 55' 14.52" W
		2.5	47° 03' 29.16" N	46° 40' 4.44" W
		2.6	47° 11' 47.04" N	46° 57' 38.16" W
		2.7	46° 40' 40.8" N	47° 03' 4.68" W
		2.8	46° 24' 24.12" N	46° 51' 23.04" W
		2.9	46° 07' 1.56" N	47° 30' 36.36" W
		2.10	45° 49' 6.24" N	47° 41' 17.88" W
		2.11	45° 19' 43.32" N	48° 29' 14.28" W
2.12	44° 53' 47.4" N	48° 49' 32.52" W		
3	Beothuk Knoll	3.1	45° 49' 10.2" N	46° 06' 2.52" W
		3.2	45° 59' 47.4" N	46° 06' 2.52" W
		3.3	45° 59' 47.4" N	46° 18' 8.28" W
		3.4	45° 49' 10.2" N	46° 18' 8.28" W
4	Eastern Flemish Cap	4.1	46° 48' 35.28" N	43° 20' 51.72" W
		4.2	47° 03' 58.68" N	43° 20' 51.72" W
		4.3	47° 03' 58.68" N	43° 34' 16.32" W
		4.4	46° 48' 35.28" N	43° 34' 16.32" W

5	Northeast Flemish Cap	5.1	47° 37' 42.24" N	43° 37' 29.64" W
		5.2	47° 58' 30.72" N	43° 44' 47.04" W
		5.3	48° 29' 52.44" N	44° 14' 42.72" W
		5.4	48° 27' 19.44" N	44° 21' 7.92" W
		5.5	47° 51' 14.4" N	43° 48' 35.64" W
		5.6	47° 35' 57.48" N	43° 43' 9.12" W
6	Sackville Spur	6.1	48° 18' 51.12" N	46° 37' 13.44" W
		6.2	48° 28' 51.24" N	46° 08' 33.72" W
		6.3	48° 49' 37.2" N	45° 27' 20.52" W
		6.4	48° 56' 30.12" N	45° 08' 59.99" W
		6.5	49° 00' 9.72" N	45° 12' 44.64" W
		6.6	48° 21' 12.24" N	46° 39' 11.16" W
7	Northern Flemish Cap	7.1	48° 20' 29.76" N	44° 54' 38.16" W
		7.2	48° 25' 2.28" N	44° 54' 38.16" W
		7.3	48° 25' 2.28" N	45° 17' 16.44" W
		7.4	48° 20' 29.76" N	45° 17' 16.44" W
8	Northern Flemish Cap	8.1	48° 35' 56.4" N	45° 05' 35.52" W
		8.2	48° 40' 9.84" N	45° 05' 35.52" W
		8.3	48° 40' 9.84" N	45° 11' 44.88" W
		8.4	48° 35' 56.4" N	45° 11' 44.88" W
9	Northern Flemish Cap	9.1	48° 34' 23.52" N	45° 26' 18.96" W
		9.2	48° 36' 55.08" N	45° 31' 15.96" W
		9.3	48° 30' 18.36" N	45° 39' 42.48" W
		9.4	48° 27' 30.6" N	45° 34' 40.44" W
10	Northwest Flemish Cap	10.1	47° 47' 17.16" N	46° 17' 27.96" W
		10.2	47° 58' 42.24" N	46° 06' 43.92" W
		10.3	48° 01' 6.6" N	46° 12' 3.96" W
		10.4	47° 49' 41.52" N	46° 22' 48" W
11	Northwest Flemish Cap	11.1	47° 25' 48" N	46° 21' 23.76" W
		11.2	47° 30' 1.44" N	46° 21' 23.76" W
		11.3	47° 30' 1.44" N	46° 27' 33.12" W
		11.4	47° 25' 48" N	46° 27' 33.12" W

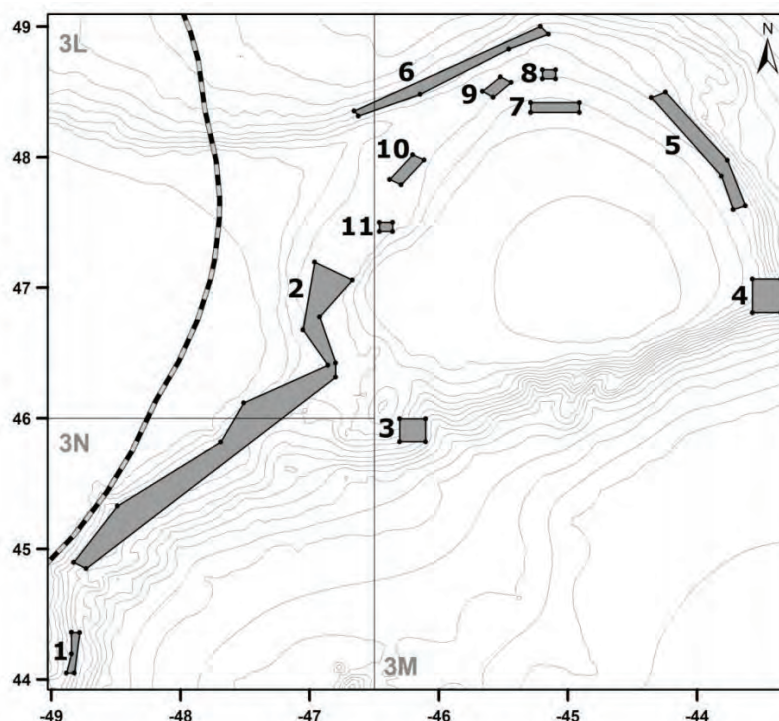


Figure 2. Polygons Delineating Areas of Higher Sponge and Coral Concentrations Referred to in Article 2bis paragraph 6.

7. ~~4.~~ The measures referred to in Article 2bis paragraph 6 shall be reviewed in 2014 by the Fisheries Commission, taking account of the advice from the Scientific Council and the Working Group of Fisheries Managers and Scientists, and a decision shall be taken on future management measures.

8. ~~5.~~ Contracting Parties shall establish/incorporate a coral and sponge monitoring program into government and/or industry research programs.

Article 32bis - Map of existing bottom fishing areas (footprint)

The comprehensive map of existing bottom fishing areas produced by the Executive Secretary (as delineated by the coordinates shown in Table 1 and illustrated in Figure 3) based on information submitted by Contracting Parties, shall be revised regularly to incorporate any new relevant information. Contracting Parties may, in the future, consider the possibility of refining the comprehensive map on the basis of haul by haul information, if available.

Table 1. Boundary points delineating the eastern side of the footprint in the NRA. The Canadian EEZ boundary delineates the western side of the footprint map (see Figure 3).

Point No.	Latitude	Longitude	Point No.	Latitude	Longitude
1	48°17'39"N	EEZ boundary ¹	26	46°26'32"N	46°58'53"W
2	48°16'51"N	47°25'37"W	27	46°27'40"N	47°12'01"W
3	48°19'15"N	46°53'48"W	28	46°04'15"N	47°09'10"W
4	48°29'21"N	46°21'17"W	29	46°04'53"N	47°31'01"W
5	48°32'43"N	46°08'04"W	30	45°48'17"N	47°37'16"W
6	48°48'10"N	45°37'59"W	31	45°33'14"N	47°52'41"W
7	48°59'54"N	45°17'46"W	32	45°27'14"N	48°10'15"W
8	49°02'20"N	44°53'17"W	33	45°16'17"N	48°26'50"W
9	48°56'46"N	44°33'18"W	34	44°54'01"N	48°43'58"W
10	48°33'53"N	44°10'25"W	35	44°33'10"N	48°50'25"W
11	48°08'29"N	43°57'28"W	36	44°09'57"N	48°48'49"W
12	47°42'00"N	43°36'44"W	37	43°50'44"N	48°52'49"W
13	47°12'44"N	43°28'36"W	38	43°34'34"N	48°50'12"W

14	46°57'14"N	43°26'15"W		39	43°23'13"N	49°03'57"W
15	46°46'02"N	43°45'27"W		40	43°03'48"N	48°55'23"W
16	46°38'10"N	44°03'37"W		41	42°54'42"N	49°14'26"W
17	46°27'43"N	44°20'38"W		42	42°48'18"N	49°32'51"W
18	46°24'41"N	44°36'01"W		43	42°39'49"N	49°58'46"W
19	46°19'28"N	45°16'34"W		44	42°37'54"N	50°28'04"W
20	46°08'16"N	45°33'27"W		45	42°40'57"N	50°53'36"W
21	46°07'13"N	45°57'44"W		46	42°51'48"N	51°10'09"W
22	46°15'06"N	46°14'21"W		47	42°45'59"N	51°31'58"W
23	45°54'33"N	46°24'03"W		48	42°51'06"N	51°41'50"W
24	45°59'36"N	46°45'33"W		49	43°03'56"N	51°48'21"W
25	46°09'58"N	46°58'53"W		50	43°22'12"N	EEZ bound ary ²

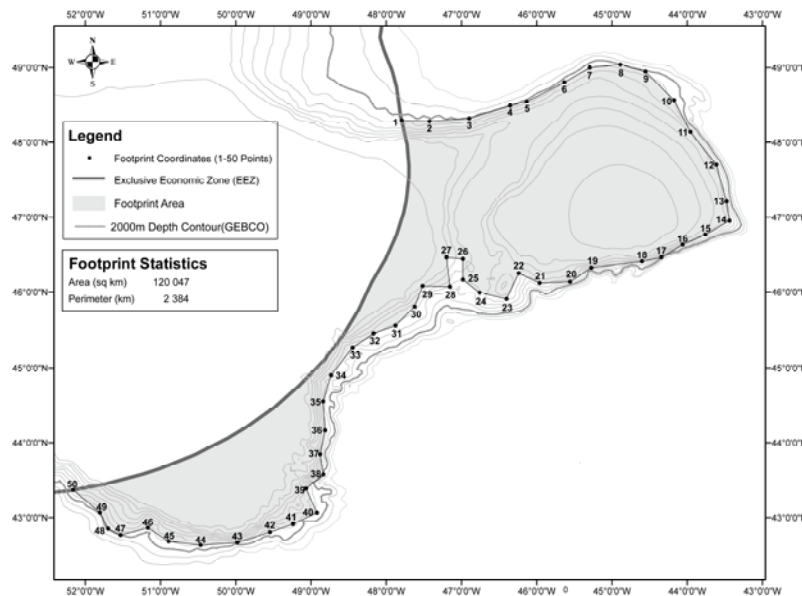
¹approximately 47°47'45"W²approximately 52°09'46"W

Figure 3. NAFO Regulatory Area footprint map (shaded).

Article 43bis - Bottom fishing activities in new fishing areas

1. ~~All bottom fishing activities in new fishing areas or with bottom gear not previously used in the area concerned, shall be considered as exploratory fisheries and shall be conducted in accordance with the exploratory fisheries protocol set out in Parts I-IV of Annex XXV.~~
- ~~2.3-~~ Contracting Parties shall communicate a 'Notice of Intent to Undertake Exploratory Fishing' (Annex XXV, Parts I and IV) ~~the exploratory fisheries protocol referred to in paragraph 1~~ to the Executive Secretary for forwarding to the Scientific Council for review and to all Contracting Parties for information, together with the ~~information or~~ preliminary impact assessment referred to in Article 5bis, paragraph 2 (i), below.
- ~~3.2-~~ The exploratory bottom fishing shall be subject to the assessment procedure set forth in Article 5bis, with the understanding that particular care will be taken in the evaluation of risks of the significant adverse impact on vulnerable marine ecosystems, in line with the precautionary approach.
- ~~4.5-~~ Prior to commencing new bottom fishing activities based upon the results of exploratory fisheries conducted in the prior two years, the Fisheries Commission shall review the assessments undertaken ~~in accordance with Article 5bis below~~ and the results of the fishing protocols implemented by the participating fleets, ~~and shall~~ and take decision in accordance with Article 5bis.

- ~~i. establish conservation and management measures to prevent significant adverse impacts on vulnerable marine ecosystems from individual fishing activities and to ensure the long term sustainability of deep sea fish stocks, or~~
- ~~ii. not authorize these fishing activities to proceed.~~

- ~~5.6. Contracting Parties shall ensure that vessels flying their flag conducting exploratory fisheries are equipped with a satellite monitoring device and have an a scientific observer on board.~~
- ~~6.4. Contracting Parties shall provide promptly an 'Exploratory Fishing Trip Report' report of the results of such activities to the Executive Secretary for circulation to the Scientific Council and all Contracting Parties.~~

Article 54bis - Assessment of bottom fishing

1. The Scientific Council, with the co-operation of Contracting Parties, shall identify, on the basis of best available scientific information, vulnerable marine ecosystems in the Regulatory Area and map sites where these vulnerable marine ecosystem are known to occur or likely to occur and provide such data and information to the Executive Secretary for circulation to all Contracting Parties.
2. Assessment for proposed bottom fishing activities in the Regulatory Area shall follow the procedures below:
 - i. If proposed bottom fishing activities is outside of the existing bottom fishing area (footprint) ~~identified by the Fisheries Commission~~, or if there are significant changes to the conduct or technology of existing bottom fisheries within the footprint, or new scientific information indicating a VME in a given area, the Contracting Party proposing to participate in bottom fishing shall submit to the Executive Secretary information and a preliminary assessment of the known and anticipated impacts of its bottom fishing activities on vulnerable marine ecosystems no less than two weeks in advance of the opening of the ~~annual meeting in June~~ meeting of the Scientific Council. Assessments should address the elements as set forth in Part V of Annex XXV. The Executive Secretary shall promptly forward these submissions to the Scientific Council and the Fisheries Commission.
 - ii. The submission of such information shall be carried out in accordance with guidance developed by the Scientific Council, or, in the absence of such guidance, to the best of the Contracting Party's ability.
 - iii. The Scientific Council shall undertake an assessment, according to procedures and standards it develops, and provide advice to the Fisheries Commission as to whether the proposed bottom fishing activity would have significant adverse impacts on vulnerable marine ecosystems and, if so, whether mitigation measures would prevent such impacts. The Scientific Council may use in its assessment additional information available to it, including information from other fisheries in the region or similar fisheries elsewhere.
3. The Working Group of Fishery Managers and Scientists on VMEs shall examine the advice of the Scientific Council and shall make recommendations to the Fisheries Commission in accordance with its mandate.
4. The Fisheries Commission shall, taking account of advice and recommendations provided by the Scientific Council and the ~~Working Group~~ of Fishery Managers and Scientists, concerning bottom fishing activities, including data and information arising from reports pursuant to Article 6bis adopt conservation and management measures to prevent significant adverse impacts on vulnerable marine ecosystems. ~~These that~~ may include:
 - ~~i. (a)~~ allowing, prohibiting or restricting bottom fishing activities;
 - ~~ii. (b)~~ requiring specific mitigation measures for bottom fishing activities;
 - ~~iii. (c)~~ allowing, prohibiting or restricting bottom fishing with certain gear types, or changes in gear design and/or deployment; and/or
 - ~~iv. (d)~~ any other relevant requirements or restrictions to prevent significant adverse impacts to vulnerable marine ecosystems.
5. Fisheries Commission will periodically ask Scientific Council and the Working Group of Fishery Managers and Scientists on VMEs ~~working group of managers and scientists on vulnerable marine ecosystems~~ to provide advice to Fisheries Commission on the timing and requirement for assessment of a previously assessed bottom fishery.

Article 65bis – Interim Encounter Provision

~~Definition of an Encounter — is an encounter, above threshold levels as set out in paragraph 3, with indicator species of coral identified as antipatharians, gorgonians, cerianthid anemone fields, lophelia, and sea pen fields or other VME elements. Any encounter with a VME indicator species or merely detecting the presence of an element itself is not sufficient to identify a VME. That identification should be made on a case-by-case basis through assessment by relevant bodies.~~

Contracting Parties shall require that vessels flying their flag and conducting bottom fishing activities within the Regulatory Area abide by the following rules, where, in the course of fishing operations, evidence of vulnerable marine ecosystems is encountered:

1. Existing fishing areas

~~i. a)~~ Vessels shall quantify catch of VME indicator species, ~~i.e. coral and sponge~~.

~~ii. b)~~ If the quantity of VME ~~elements or~~ indicator species caught in a fishing operation (such as trawl tow or set of a gillnet or longline) is beyond the threshold defined in paragraph 3 below, the following shall apply:

- The vessel master shall report the incident to the flag State Contracting Party, which without delay shall forward the information to the Executive Secretary, including the position that is provided by the vessel, either the end point of the tow or set or another position that is closest to the exact encounter location, the VME indicator species encountered, and the quantity (kg) of VME indicator species encountered. Contracting Parties may if they so wish require their vessels to also report the incident directly to the Executive Secretary. The Executive Secretary shall archive the information and report it to all Contracting Parties. The Contracting Parties shall immediately alert all fishing vessels flying their flag.
- The vessel master shall cease fishing and move away at least 2 nautical miles from the endpoint of the tow/set in the direction least likely to result in further encounters. The captain shall use his best judgment based on all available sources of information.
- The Executive Secretary shall make an annual report on single and multiple encounters in discrete areas within existing fishing areas to the Scientific Council. The Scientific Council shall evaluate and, on a case-by-case basis the information and provide advice to the Fisheries Commission on whether a VME exists. The advice shall be based on annually updated assessments of the accumulated information on encounters and the Scientific Council's advice on the need for action, using FAO guidelines as a basis. The Fisheries Commission shall consider the advice in accordance with Article 5bis, paragraph 4.

2. Unfished areas that are defined as 'New bottom fishing areas'

~~i. a)~~ Vessels shall quantify catch of VME indicator species, ~~i.e. coral and sponge~~. Observers deployed shall identify corals, sponges and other organisms to the lowest possible taxonomical level. The sampling protocol found in Annex XXV shall be used (templates).

~~ii. b)~~ If the quantity of VME ~~element or~~ indicator species caught in a fishing operation (such as trawl tow or set of a gillnet or longline) is beyond the threshold defined in paragraph 3 below, the following shall apply:

- The vessel master shall report the incident without delay to its flag state Contracting Party, which shall forward the information to the Executive Secretary, including the position that is provided by the vessel, either the end point of the tow or set or another position that is closest to the exact encounter location, the VME indicator species encountered, and the quantity (kg) of VME indicator species encountered. Contracting Parties may if they so wish require their vessels to also report the incident directly to the Executive Secretary. The Executive Secretary shall archive the information and without delay transmit it to all Contracting Parties. The Contracting Parties shall issue an immediate alert to all vessels flying their flag.
- The vessel shall cease fishing and move away at least 2 nautical miles from the endpoint of the tow/set in the direction least likely to result in further encounters. The captain shall use his best judgment based on all available sources of information.
- The Executive Secretary shall at the same time request Contracting Parties to implement a temporary closure of a two mile radius around the reporting position. The reporting position is that provided by the vessel, either the endpoint of the tow/set or another position that the evidence suggests is closest to the exact encounter location.
- The Executive Secretary shall make an annual report on single and multiple encounters in discrete areas within existing fishing areas to the Scientific Council This report should also include reports from the exploratory fishing activities conducted in the last year. The Scientific Council at its next meeting shall examine the temporary closure. If the Scientific Council advises that the area consists of a vulnerable marine ecosystem the Executive Secretary shall request Contracting Parties to maintain the temporary closure until such time that the Fisheries Commission has adopted conservation and management measures ~~acted upon the advice from the Scientific Council~~ in accordance with Article 5bis, paragraph 4 in Chapter Ibis. If the Scientific Council does not conclude that the proposed area is a VME, the Executive Secretary shall inform Contracting Parties which may re-open the area to their vessels.

~~The vessel shall cease fishing and move away at least 2 nautical miles from the endpoint of the tow/set in the direction least likely to result in further encounters. The captain shall use his best judgment based on all available sources of information.~~

- The Executive Secretary shall make an annual report on archived reports from encounters in *new fishing areas* to the Scientific Council. This report shall also include reports from the exploratory fishing activities that were conducted in the last year. The Scientific Council shall evaluate the information and provide advice to the Fisheries Commission on the appropriateness of temporary closures and other measures. The advice should be based on annually updated assessments of the accumulated information on encounters as well as other scientific information. The Scientific Council's advice should reflect provisions outlined in the FAO guidelines. The Fisheries Commission shall consider the advice in accordance with Article 5bis, paragraph 4.

3. For both existing and new fishing areas, an encounter with primary VME indicator species is defined as a catch per set (e.g. trawl tow, longline set, or gillnet set) of more than 60 kg of live coral and/or 800 kg of live sponge. These thresholds are set on a provisional basis and may be adjusted as experience is gained in the application of this measure.

Article 7bis - Review

The provisions of this chapter shall be reviewed by the Fisheries Commission at its Annual Meeting in 2014 ~~2014~~. ~~The Commission shall biannually thereafter examine the effectiveness of these provisions in protecting vulnerable marine ecosystems from significant adverse impacts.~~

[Annex I (to Chapter Ibis). Excerpts from the FAO International Guidelines for the Management of Deep-Sea Fisheries in the High Seas]

[Significant adverse impacts]

17. Significant adverse impacts are those that compromise ecosystem integrity (i.e. ecosystem structure or function) in a manner that: (i) impairs the ability of affected populations to replace themselves; (ii) degrades the long-term natural productivity of habitats; or (iii) causes, on more than a temporary basis, significant loss of species richness, habitat or community types. Impacts should be evaluated individually, in combination and cumulatively.

18. When determining the scale and significance of an impact, the following six factors should be considered:

- i. the intensity or severity of the impact at the specific site being affected;
- ii. the spatial extent of the impact relative to the availability of the habitat type affected;
- iii. the sensitivity/vulnerability of the ecosystem to the impact;
- iv. the ability of an ecosystem to recover from harm, and the rate of such recovery;
- v. the extent to which ecosystem functions may be altered by the impact; and
- vi. the timing and duration of the impact relative to the period in which a species needs the habitat during one or more of its life- history stages.

19. allow the particular ecosystem to recover over an acceptable time frame. Such time frames should be decided on a case-by-case basis and should be in the order of 5-20 years, taking into account the specific features of the populations and ecosystems.

20. In determining whether an impact is temporary, both the duration and the frequency at which an impact is repeated should be considered. If the interval between the expected disturbance of a habitat is shorter than the recovery time, the impact should be considered more than temporary. In circumstances of limited information, States and RFMO/As should apply the precautionary approach in their determinations regarding the nature and duration of impacts.

Identifying vulnerable marine ecosystems and assessing significant adverse impacts

42. A marine ecosystem should be classified as vulnerable based on the characteristics that it possesses. The following list of characteristics should be used as criteria in the identification of VMEs.

- 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:
- 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.
- iii. Fragility – an ecosystem that is highly susceptible to degradation by anthropogenic activities.
- 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:
- v. Structural complexity – an ecosystem that is characterized by complex physical structures created by significant concentrations of biotic and abiotic features. In these ecosystems, ecological processes are usually highly dependent on these structured systems. Further, such ecosystems often have high diversity, which is dependent on the structuring organisms.

Examples of potentially vulnerable species groups, communities and habitats, as well as features that potentially support them are contained in Annex 1A.

43. These criteria should be adapted and additional criteria should be developed as experience and knowledge accumulate, or to address particular local or regional needs.

Annex 1A (in reference to paragraph 42 of the FAO International Guidelines for the Management of Deep-Sea Fisheries in the High Seas). Examples of potentially vulnerable species groups, communities and habitats, as well as features that potentially support them

The following examples of species groups, communities, habitats and features often display characteristics consistent with possible VMEs. Merely detecting the presence of an element itself is not sufficient to identify a VME. That identification should be made on a case-by-case basis through application of relevant provisions of these Guidelines, particularly Sections 3.2 and 5.2.

Examples of species groups, communities and habitat forming species that are documented or considered sensitive and potentially vulnerable to DSFs in the high seas, and which may contribute to forming VMEs:

- i. certain coldwater corals and hydroids, e.g. reef builders and coral forest including: stony corals (Scleractinia), alcyonaceans and gorgonians (Octocorallia), black corals (Antipatharia) and hydrocorals (Stylasteridae);
- ii. some types of sponge dominated communities;
- iii. communities composed of dense emergent fauna where large sessile protozoans (xenophyophores) and invertebrates (e.g. hydroids and bryozoans) form an important structural component of habitat; and
- iv. seep and vent communities comprised of invertebrate and microbial species found nowhere else (i.e. endemic)

Examples of topographical, hydrophysical or geological features, including fragile geological structures, that potentially support the species groups or communities, referred to above:

- i. submerged edges and slopes (e.g. corals and sponges);
- ii. summits and flanks of seamounts, guyots, banks, knolls, and hills (e.g. corals, sponges, xenophyphores);
- iii. canyons and trenches (e.g. burrowed clay outcrops, corals);
- iv. hydrothermal vents (e.g. microbial communities and endemic invertebrates); and
- v. cold seeps (e.g. mud volcanoes for microbes, hard substrates for sessile invertebrates).]