

Northwest Atlantic Fisheries Organization



Report of the Ad Hoc Working Group of Fishery Managers and Scientists
on Vulnerable Marine Ecosystems (WGFMS)
19 – 20 March 2009
Vigo, Spain

NAFO
Dartmouth, N.S., Canada
2009

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Report of the NAFO Fisheries Commission Ad Hoc Working Group of Fishery Managers and Scientists on Vulnerable Marine Ecosystems (WGFMS)

19 -20 March 2009

Vigo, Spain

1. Opening

The Chair (Bill Brodie, Canada) opened the meeting at 9:10 a.m. on Thursday, March 19, 2009 and welcomed delegates to Centro Tecnológico del Mar - Fundación CETMAR in Vigo (Annex 1).

2. Appointment of Rapporteur

Ricardo Federizon (NAFO Secretariat) was appointed as the rapporteur.

3. Adoption of Agenda

New items were inserted to the provisional agenda previously circulated:

- 1) Presentation of EU-Spain on the international survey which it is coordinating in the NAFO Regulatory Area (NRA) (item 4), and,
- 2) Presentation of Canada on its domestic measures and programs to protect Vulnerable Marine Ecosystems (VMEs) within its EEZ (item 5).

Also, four specific items were included and inserted as sub-items under “Other Matters” (item 9):

- a) requirements to conduct assessment in compliance with Article 4bis.3,
- b) submission of a progress report by NAFO to the United Nations on NAFO actions to protect the VMEs,
- c) process and future steps of this Working Group, and
- d) Exploratory Fishery Data Collection form.

The recommendations to be forwarded to the Fisheries Commission (FC) are presented in a separate agenda item (item 8). The adopted agenda reflecting these additions is presented in Annex 2.

4. Presentation on the Study Project on the Bottom Vulnerable Marine Ecosystems in the NAFO Regulatory Area (NRA)

Enrique de Cardenas (EU-Spain) made the presentation of the research study project coordinated by EU-Spain in collaboration with other NAFO Contracting Parties. This project was first announced at the last NAFO Annual Meeting in September 2008. The main objectives of the project are 1) to map the potential VMEs which may occur in the NRA at depths less than 2000 m, 2) to study the distribution of the fishing effort in the NRA, and 3) to identify sensitive areas which may be closed to bottom fisheries. The first scientific cruise is planned for June 2009. Preliminary and final results are expected by 2010 and 2011, respectively. Participants of the project are scientists from Canada, USA, and the EU. The EU re-iterated the invitation to the scientists from other Contracting Parties to participate in this project. Details of the presentation are found in Annex 3.

Participants welcomed this presentation and considered that the research study no doubt will greatly enhance the knowledge on potential VMEs in the NRA.

5. Presentation on Canada's Actions to Protect Vulnerable Marine Ecosystems

Brett Gilchrist (Canada) made a presentation on Canada's actions in protecting the VME's within its EEZ. The presentation summarized the measures and actions which can be classified under fisheries management, ocean management, voluntary measures by the industry, and science projects and special initiatives. Through a “toolbox approach” the interaction between the categories of measures are identified. Details of the presentation are found in Annex 4.

Upon a question from one NAFO Contracting Party, Mr. Gilchrist specified that Canada used many tools to identify potential VMEs including through the use of threshold levels, but made that determination on a case by case basis.

Other NAFO Contracting Parties also welcomed the presentation by Canada and expressed a wish that Canada continue to report its endeavors to implement the UNGA Resolution to NAFO to ensure, to the extent possible, a coherent approach on the implementation of the UNGA Resolution throughout the NAFO Area.

6. Review of recent information on corals

a) Review of information regarding the identification/refinement of VMEs, and assessment of risk

In response to the FC request for advice during the 2008 Annual Meeting held in Vigo, specifically on the provision of scientific information on the concentration of corals in the NRA (item 9a of FC Doc. 08/19), the Scientific Council (SC) Working Group on the Ecosystem Approach to Fisheries Management (WGEAFM) had met by correspondence in early October. The results of the WGEAFM meeting are contained in document SCS Doc. 08/24, and the SC Response to the FC Request, based on this report and agreed upon during the October meeting of the SC, is contained in SCS Doc. 08/26.

The SC Chair (Don Power, Canada) presented the SC response. Three main coral taxa were evaluated: sea pens (Pennatulaceans), small gorgonians (*Acanella*), and large gorgonians (*Keratoisis*, *Acanthogorgia*, *Paragorgia*, etc.). The term “key location” was introduced to express the area in which a collection of significant coral concentrations was found. The key locations (Figures 2- 6 in pages 12-15 of SCS Doc 08/26) were for the most part nested within the candidate VMEs identified previously (Figure 3 in page 40 of SCS Doc. 08/19). The SC Chair clarified that the identification of the key locations in no way suggests an alteration of the map of the candidate VMEs. A 4 nm area buffer zone around the position of each of the significant coral concentrations was proposed. The 4nm-buffer zone was considered conservative and precautionary until detailed mapping of these areas and additional research on buffer areas becomes available.

The SC Chair also noted that:

- High resolution habitat mapping is required to identify these candidate VME boundaries with greater certainty (e.g. through camera surveys and ROV activities) and will also allow monitoring of health and recovery,
- Further research to quantify the level of Significant Adverse Impact (SAI) for these taxa is required. It is known that these taxa in the trawl path are subject to a very high mortality but it is not known what degree of habitat fragmentation can be tolerated before the population is unable to recover.

b) Provide recommendations to FC on any further mitigation measures

In formulating recommendations, deliberations were made on the following issues:

- Current practices of other countries and Regional Fisheries Management Organizations (RFMOs). It was acknowledged that NAFO would benefit by investigating current practices of other countries and RFMOs concerning VME protection (see item 5).
- Quantification of thresholds. It was recognized that the 100 kg of live corals, currently adopted as the threshold quantity, is on the high end. However, it was considered extremely difficult to determine the appropriate threshold level (see item 8).
- Buffer zones around high coral concentrations. Although SC recommended 4 nm, it was acknowledged that any distance would be arbitrary until confirmed by more scientific research (see items 4 and 6a).
- Specific mitigation measures. Recommended measures are considered as interim measures and these may be altered when the results of the international survey coordinated by Spain becomes available (see item 4). Also, some measures regarding coral concentrations might be interlinked with possible sponge fields. SC will gather and present the scientific information on sponge fields in June 2009. Thus, it was appropriate to defer such recommendations until the next meeting of this WG when the information on sponge fields becomes available (see item 9c).

The recommendations of WGFMS are presented in item 8.

7. Review of bottom fishing footprints

The Secretariat presented the document FCWGWP 09/2 Rev. on the identification of bottom fishing areas (Annex 5). This document was a compilation of the original submissions of the Contracting Parties and flag States. The presentation comprised three parts: 1) actual images/plot of the footprints submitted by CPs and flag States, 2) plot prepared by the Secretariat of the data points of coordinates, as submitted by the CPs and flag States, where the

vessels conducted bottom fishing, 3) plot based on the VMS data from 2003-2008 with an overlay of the plots of candidate VMEs.

Upon review of the document and discussion, the Secretariat was asked to proceed with its task of preparing a draft footprint map based on the submissions and the VMS data. The draft footprint map will be forwarded to the SC for review at its June 2009 meeting and to the FC for its adoption in September 2009. It was stressed by some Contracting Parties that the footprint map needed to include the co-ordinates of the existing fishing area in order to provide for legal certainty for fishermen since the implications for fishing in new and existing fishing areas were not the same.

8. Recommendations

Mitigation measures

In response to the UNGA Resolution 61/105 calling for RFMOs to take action on the protection of Marine Vulnerable Ecosystems, the WGFMS examined three options regarding mitigation measures in the protection of corals and assessed the relative risks associated with the options:

1. The areas identified by SC in its October 2008 report (SCS Doc. 08/26) would be closed.
2. The areas identified by Canada in its proposal (WGFMSWP 09/03 Rev. 1) would be closed.
3. The areas identified in either Option 1 or 2 remain open to bottom fisheries.

The WGFMS considered that Option 1 represented a lower risk of significant adverse impact of bottom fishing activities to coral communities while Option 3 represents a higher risk. Option 2 represented an intermediate risk.

The WGFMS recommended to the FC the consideration of Option 2 as amended by the WG. The specific proposals of mitigation measures under this option are contained in the WGFMSWP 09/03 Rev. 2 (Annex 6). The WGFMS highlighted that in taking this decision, the FC should identify the level of risk that it would wish to take. For its future work, the WGFMS requests guidance in this regard.

In forwarding the recommendation, the WGFMS notes that proposed mitigation measures are interim considering future scientific work including the first results of the international survey coordinated by EU-Spain (see item 4) which are expected to be available in 2010.

Thresholds

The WGFMS discussed in detail the issue of thresholds in relation to corals only. It was noted that two sets of threshold values currently exist within NAFO with respect to corals:

1. Those set by FC in the Annual Meeting of 2008 (100 kg of live corals). These are listed in the Interim Encounter Provisions of the NCEM, Chapter Ibis, Article 5bis.
2. Those used by SC to identify significant concentrations and key locations of certain coral species in or near the candidate VME's (in response to a request by FC) (SCS Doc. 08/26).

The WGFMS noted that additional work on identifying sponge fields is ongoing within the SC. The WGFMS considered that 100 kg of live corals as a criterion triggering the interim encounter provision was on the high side, but could not recommend a revised value. It was noted that these interim threshold weights used by the Fisheries Commission had never been seen in maximum observed catch data between 2000 and 2007. There was no unanimous agreement in the WGFMS that the thresholds defined by SC (for identification of key locations) were comparable with or linked to the other threshold definitions (for interim encounter provision). The threshold values calculated by the SC using cumulative weight catch curves were used as reference points to delineate significant catches of corals for the purposes of mapping the survey catches, in addressing the FC request 9 a).

The SC values were not translated into CPUE units due to the short tows used in the research vessel survey data, and the patchiness of the distribution of certain species of corals. The validity of such a translation may not be appropriate.

The WGFMS emphasized the need for a threshold level that is applicable and practical for commercial fishing to be used for indicating an encounter. WGFMS concluded that the issue of coral thresholds should be reviewed by this WGFMS, including, inter alia, information obtained from the SC and the experience gained in contexts beyond NAFO.

9. Other matters

a. Requirement to conduct assessment

The United States, which had requested this agenda item, spoke to its concern that UNGA Resolution 61/105, in its paragraph 83(a), calls for the assessment of the impacts of bottom fishing on known or suspected VMEs without condition, while Article 4bis of Chapter 1bis of the NAFO CEM requires assessments only "where possible". NAFO's Exploratory Protocol for New Fishing Areas intimates that assessments may or may not be "required". In the U.S. view, this inconsistency should not lead to NAFO or its Contracting Parties failing to carry out the provisions of UNGA Resolution 61/105. The EU expressed a similar view, saying that it intended to follow the UNGA guidance in submitting assessments of its bottom fishing activities.

The Secretariat was asked to remind CPs regarding the compliance of Article 4bis.3.i – the obligation to submit information on its fishing plans for 2010 and an initial assessment of the known and anticipated impacts of its bottom fisheries in new and existing fishing areas. The submission will be forwarded to SC and FC. The SC will review and assess the submissions in June 2009, if available, and provide advice to FC.

b. NAFO progress report on the protection of VMEs

Contracting Parties inquired whether the NAFO Secretariat had started to prepare a progress report on its actions concerning the protection of the VMEs, in response to operative paragraph 91 of UNGA resolution 61/105 (also paragraph 107 of 63/112). The Secretariat was asked to circulate the draft to the CPs by April 15 for comments. The report will be forwarded to the UN in time of the April 30 deadline.

c. Process of the WGFMS and Future steps

The WGFMS decided to meet again this year between June (after the SC meeting) and September (before the Annual Meeting in Bergen, Norway) to discuss the findings of the SC on possible sponge fields and other follow-up recommendations to FC. It was determined that the most practical time to hold this meeting was just before the Annual Meeting. The Secretariat was asked to inquire with Norway if it would be possible to hold a two day meeting of the WG in Bergen in September the week before the Annual Meeting.

d. Exploratory Fishery Data Collection form

Denmark (in respect of Faroe Islands and Greenland) introduced a form for discussion and consideration (Annex 7). The form was to be used for data collection during Exploratory Fishery. It captures all the information required as stipulated in Annex XXV of the NAFO Conservation and Enforcement Measures.

The WGFMS agreed that this matter will be further discussed at the next meeting.

10. Adoption of the report

The report was adopted through correspondence after the meeting.

11. Adjournment

The Chair thanked the participants from all Contracting Parties for their hard work over the course of the meeting, the SC Chair for his presentation and contribution, and the NAFO Secretariat for their usual excellent support at the meeting, including the work done by the Rapporteur. EU thanked the Chair for his work in chairing the session.

The meeting was adjourned at 4:10 PM on March 20, 2009.

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Annex 2. Agenda

1. Opening.
2. Appointment of Rapporteur
3. Adoption of Agenda
4. Presentation on the Study Project on the Bottom Vulnerable Marine Ecosystems in the NAFO Regulatory Area (NRA)
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6. Review of recent information on corals
 - a) Review of information regarding the identification/refinement of VMEs, and assessment of risk
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8. Recommendations
9. Other matters
 - a) Requirement to conduct assessment
 - b) NAFO progress report on the protection of VMEs
 - c) Processes of the WGFMS and future steps
 - d) Exploratory Fishery Data Collection form
10. Adoption of the report
11. Adjournment

Annex 3. Presentation by EU

Study Project on the Bottom Vulnerable Marine Ecosystems in the NAFO Regulatory Area



Introduction

The project :

Spain announced at the last NAFO September meeting its intention to begin next summer 2009 a study aimed to mapping the potential VME's which may exist in the NRA at depths shallower than 2000 m.

The Spanish "Secretaria General del Mar" will use for that survey its R / V Miguel Oliver.

Participants:

Scientists from institutions from NAFO contracting parties (Canada USA and EU; UK and Spain).

Tentative schedule

- November – December 2008: Creating Steering Committee
- January – June 2009: Project planning
- June – September 2009: (3 cruises >700 m)
- June – September 2010: (3 cruises < 700 m)

Results

- 2010: Preliminary results (1st year)
- 2011: Final report

Research Vessel (2007)



Name	Miguel Oliver
Overall length	70.00 m
Beam	14.40 m
Freeboard deck pillar	5.50 m
Drive engine	13000 kW
Hold capacity	60 m ³
Mowmax	100 t
Max hold depth	600 m
Range	60 days
Speed	14 knots
Crew (scientific+salable)	45 persons
Tow power	35 1st 4 knots

Scientific equipment

• TOPAS PS-001 water probe for sea bottom, profiling.	• SVP (surface) positioning system
• EM 300-12.1" multi-beam probe	• ANDERAA weather station
• DS 100 (45, 40 and 100 kHz) graphic navigational probe	• Chir electronic cartography system
• Short and long range hydrographic sensor EA-600.	• Central Gear Quantity Control
• 45-60 support probe for the echo integrator	• Automatic identification AIS
• Vertical beam Doppler Profiler ADCP RD1 150 kHz	• Doppler DL 500
• Scientific probe EK 60	• Automatic identification AIS 100
• Sagging, rolling and pitching control system	• Data recorder VDR
• Frequency synchronization unit SSU	

Main objectives

- Mapping potential VME's which may occur in the NRA at depths less than 2000 m.
- To study the distribution of fishing effort in the NRA
- Propose the closure sensitive areas to bottom fisheries

Data sources

- Geomorphology
- Benthic ecology
- Fisheries (Footprint)

Geomorphology

Methodology

- Multibeam echo sounder.
- Sub-bottom profilers.
- Benthic grabs

Scope

- Identify the main geomorphologic features, as coldwater corals, sea mounts, seep and vent, etc.
- Mapping

Benthic ecology

Methodology

- Benthic grabs
- Underwater photography
- ROV's, etc

Scope

- Define benthic communities.
- Relate it with different kind of bottoms found

Fisheries

Methodology

- Commercial fishery information.
- On board observers.
- VMS analysis.

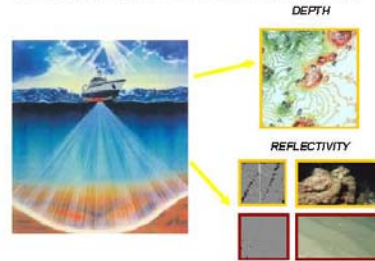
Scope

- Footprint of the fishery
- Seasonality
- Interactions between fishery and VME's.

Study Area

NAFO Regulatory Area in Divisions 3L, 3M, 3N and 3O at depths shallower than 2 000 m.

MULTI BEAM ECOSOUNDER EM 300



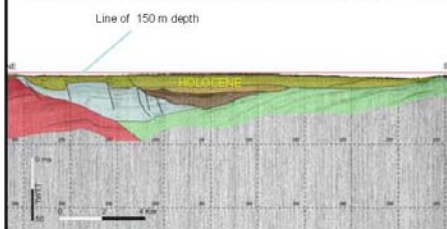
Geophysical Data Collected



The transects carried out with the multibeam echosounder will cover the entire study area.

These transects overlaps 25%

High resolution seismic: TOPAS PS- 018



TOPAS give you the stratification below the seabed up to more than 100 m deep

Annex 4. Presentation by Canada

Canada's Actions to Protect Vulnerable Marine Ecosystems

NAFO Working Group of Fisheries Managers and Scientists on VMEs

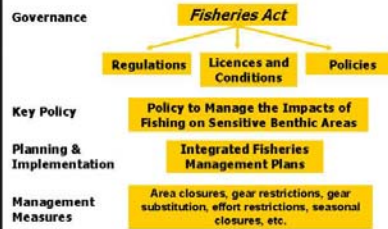
Vigo Spain
March 19-20, 2009



A Toolbox Approach to Protecting VMEs



Fisheries Management Tools



Policy to Manage the Impacts of Fishing on Sensitive Benthic Areas

- Purpose of the Policy:
 - To help manage fisheries to mitigate impacts of fishing on sensitive benthic areas or avoid impacts of fishing that are likely to cause serious or irreversible harm to sensitive marine habitat, communities and species
 - To help meet the requirements of the UN Resolution 61/105, and the FAO Technical Guidelines on Deep Sea Fisheries
- Applies to:
 - All vessels licensed to fish under Canada's Fisheries Act
 - All fishing gear
 - Commercial, aboriginal and recreational fishing
 - Areas determined to be ecologically and biologically significant (EBBSAs) and sensitive to fishing
 - Priority Areas defined by the FAO Deep Sea Fisheries Guidelines, e.g. corals and sponges, seamounts, hydrothermal vents, etc.
- Draft Developed in 07/08
- Consultations with Various Stakeholder Groups throughout 2008
- Policy Completed in February 2009

Policy to Manage the Impacts of Fishing on Sensitive Benthic Areas

- General steps outlined in the Policy:
 1. Assemble and map existing data and information that would help determine the extent and location of benthic habitat types, features, communities and species, including whether the benthic features (communities, species and habitat) situated in areas where fishing activities are occurring or being proposed are important from an ecological and biological perspective,
 2. Assemble and map existing information and data on the fishing activity;
 3. Based on all available information, and using the Ecological Risk Analysis Framework, assess the risk that the activity is likely to cause harm to the benthic habitat, communities and species, and particularly if such harm is likely to be serious or irreversible;
 4. Determine whether management measures are needed, and implement such management measures, and;
 5. Monitor and evaluate the effectiveness of the management measure and determine whether changes are required to the management measures following this evaluation.

Policy to Manage the Impacts of Fishing on Sensitive Benthic Areas

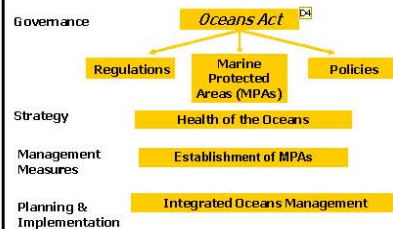
- Key Elements to the Policy:
 1. Requirement for the mapping and delineation of historical fishing footprints
 2. Develop processes for frontier, historically-fished areas and areas where there is a history of fishing but no history of bottom contact fishing
 3. Preliminary evaluation of historically-fished areas that have not been fished by bottom contact gear to identify and map general areas of high, medium or low risk based on availability of data, information and knowledge of the benthic features and characteristics of that area
 4. Ongoing requirements for ecological risk analysis of fisheries in historically-fished areas and for proposed fisheries in frontier areas
 5. Ecological risk analysis of impact of fishing on corals and sponges to be completed this year to establish minimum standards following research to take place this summer



Fisheries Management Measures: Examples

- [illegible]

Oceans Sector Management Tools



Oceans Sector Management Measures: Examples

Marine Protected Areas (MPAs)
MPAs are areas which have been reserved by (DFO) under the Oceans Act to protect and conserve:

- commercial and non-commercial fisheries resources and their habitats;
 - endangered marine species and their habitat;
 - unique habitat;
 - marine areas of high biodiversity or biological productivity; and
 - any other marine resource or habitat necessary to fulfill the Minister's mandate.
- Ecologically and Biologically Significant Areas (EBSAs)**
 EBSA areas are significant from an ecosystem structure/function perspective. The EBSA identification framework uses five selected criteria to identify EBSAs:
- Uniqueness
 - Aggregation
 - Fitness consequences
 - Resilience
 - Naturalness



- Canada currently has 7 MPAs across the country and several "areas of interest"
- EBSAs have been identified across Canada and are considered an information base to support decision making

Similarities between VME and EBSA Criteria



FAO (VME):



Canadian (EBSA)

- | | |
|---------------------------------------|-----------------------------|
| 1. Uniqueness / rarity | • Uniqueness (1) |
| 2. Functional significance of habitat | • Aggregation (2, 4, 5) |
| 3. Fragility | • Fitness Consequence (2,4) |
| 4. Life history attributes of species | • Resilience (3) |
| 5. Structural Complexity | • Naturalness |

Other Measures to Help Protect VMEs

- **Centre of Expertise on Corals and Sponges**
 - Centre of Expertise on Corals and Sponges is mandated to develop common tools and approaches that will be used by all DFO regional and national commitments. The CoEE will support a coordinated approach from various DFO sectors (FMA, Oceans, Science, etc.)
- **Regional Coral and Sponge Strategies**
 - Some regions have plans to develop strategies that will outline conservation, management, and research objectives for DFO marine conservation (e.g. Maritime Coral Conservation Strategy 2007, NL Region Strategy by 2012, British Columbia Coral and Sponge Strategy under development)
- **Science Sector Initiatives**
 - Workshops on Monitoring of Long-term health of MVEs
 - Discussions on MVE thresholds level and "significant concentrations"
 - Ongoing identification of EBSs
 - International Governance Strategy (IGS)- Science Projects in support of MVE protection, e.g. analysis of corals and sponge species distributions and abundance in NADP NRA, Benthic Survey, etc.
- **Development of Integrated Ocean Management Plans, e.g. for Pacific Bay/Grand Bay**
 - Priority Conservation Objectives include ecosystem components such as corals, sponges

Summary of Measures

- **Fisheries Management Measures:**
 - New Policy to Manage the Impacts of Fishing on Sensitive Benthic Areas
 - Expansion of Pacific Region Glass Sponge Reserve
 - Introduction of 30 and 9A Closures to Protect Corals
- **Oceans Management Measures:**
 - EBSA Identification Process
 - Establishment of MPAs and Areas of Interest
 - Integrated Oceans Management Plans
- **Voluntary Measures by Industry:**
 - 12,500 km² Voluntary Closure by Groundfish Enterprise Allocation Council and Canadian Association of Prawn Producers off the coast of British Island
- **Science Projects:**
 - Ongoing EBSA Work
 - IMRE Research
 - IOS Project
- **Special Initiatives:**
 - Centers of Expertise on Corals and Sponges and on Habitat
 - DFO Regional Coral and Sponge Strategies

Annex 5. Identification of Bottom Fishing Areas (Footprint) (FCWGWP 09/2, Revised – presentation by Secretariat)

Introduction

In 2007, the United Nations General Assembly (UNGA, 2007. Res. 61/105, paragraph 83) requested RFMOs to regulate bottom fisheries that cause a significant adverse impact on vulnerable marine ecosystems. Guidelines on implementation drafted by FAO during 2007–2009 call for the mapping of existing bottom fisheries (FAO, 2009, section 5). NAFO FC drafted a new chapter for the NAFO Conservation and Enforcement Measures in 2008 (CEM, 2009, Chapter 1bis, Article 2bis) that calls for the submission of maps identifying bottom fishing activity in the NRA for 1987–2007 with trawl activity given priority. The Secretariat compiled these maps and presented the information to FC and SC during the September 2008 Annual Meeting in Vigo, Spain (FC WP 08/25, 08/25 Addendum, 08/25 Addendum 2). The Secretariat highlighted, during its presentation to FC, that the composite map produced was difficult to interpret owing to the incompatibility of the submitted data. SC reviewed the submitted maps and noted that some anomalous bottom fishing locations were likely due to errors in the data, and that areas beyond 2000 m were already considered “new bottom fishing areas” (NAFO, 2009, CEM Chapter 1bis, Article 1bis, paragraph 4). Additionally, SC further considered that separate footprints for bottom trawling and other kinds of bottom contact gears would add value (FC WP 08/36). FC requested CPs to submit or re-submit their respective footprint data in consideration of the above comments (FC Doc. 08/22, paragraph 13) and the Secretariat produced guideline specifications (FC WP 08/33).

Submissions

The Secretariat has received information on bottom fishing activity from eleven Flag States. Seven maps (Estonia, Faroe Islands, Greenland, Iceland, Portugal, Russia, and Spain) were reviewed at the Annual Meeting in Vigo. Four new submissions are included in this document (Canada, Germany, Japan, and Norway). Iceland has also re-submitted data since the Annual Meeting in Vigo. Germany’s footprint did not contain bottom fishing in the NRA during the 1987–2007 period. A summary of Flag State submissions is given in Table 1. All the original maps submitted by Flag States are presented in Part 1 of this document and re-plots undertaken by the Secretariat using the Ocean Data View software (Schlitzer, 2009) are presented in Part 2. NAFO VMS data filtered by speed (2.0–4.0 kn), for the period 2003–2007, is presented in Part 3 along with an overlay of the delineated candidate VME locations as provided by SC in October 2008 (SCS Doc. 08/26).

Part 1

This section displays the original submissions of the bottom fishing activity maps as provided to the Secretariat by Flag States. Owing to the varied nature of these plots, no attempt has been made here to provide a composite plot (as provided earlier in the first figure of FC WP 08/25). The reason for this is that it really is not possible to provide a meaningful composite when such different methods have been used to prepare the maps. (A composite map of bottom trawling activity has been produced in Part 3 from the VMS database held in the Secretariat that provides the best compatible information.).

The maps in Figure 1a-g were sent to the Secretariat as map images plotted by Flag States. Figure 2 was sent as coordinates delimiting bottom fishing activity polygons in a text file and the map was produced by the Secretariat.

Part 2

Eight Flag States submitted point coordinate data along with their bottom fishing activity maps (see Part 1). This point data was plotted in a consistent manner on maps that also include 1000, 1500 and 2000 m contour lines (Figure 3a-h). This makes for relatively easy comparison of the bottom fishing activities. The data come from a mixture of log books, observer data and VMS analyses, and so some care needs to be taken in their interpretation. In general, a use of a wider speed range to determine trawling from VMS data will result in a slightly larger footprint as it is likely to include information that is not actual trawling (see further discussion in Part 3). No point data was provided by Germany, Spain, Russia, and so these Flag States are not included in Figure 3.

Part 3

Contracting Parties transmit position data every two hours for all commercial fishing vessels targeting fish, other than the large pelagics, to the Secretariat via VMS. Speed is calculated by triangulation and the location and amount of bottom trawling can be estimated. In general, bottom trawls operate at speeds of 2.0 to 4.0 knots, with pelagic trawls operating at slightly higher speeds (WGDEC, 2008, Anon, 2009a, b). This restrictive speed range may slightly under-estimate effort, but will provide the most accurate geographical locations of bottom trawling activity. In addition, it provides the only good information for the plotting of a composite map covering the years 2003-2007 when VMS data is available (Figure 4). This method will not provide any information on the use and distribution of static gears such as long lines and gillnets. In order to estimate the impact of bottom fishing on the candidate VME areas, and to be consistent with the FAO Deep Sea Guidelines (4.1.ii) “identify areas or features where VMEs are known or likely to occur, and the location of fisheries in relation to these areas and features”, an overlay of the VMEs is also included on Figure 4.

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- FC Doc. 08/22. Report of the Fisheries Commission 30th Annual Meeting, 22 - 26 September 2008, Vigo, Spain. NAFO. 86 pp. <http://archive.nafo.int/protect/fc/2008/fcdoc08-22.pdf>
- FC Working Paper 08/25. Identification of existing bottom fishing areas (footprint). 12 pp. <http://archive.nafo.int/protect/fc/2008/fcwp08-25.pdf>
- FC Working Paper 08/25 (Addendum). Identification of existing bottom fishing areas (footprint) 2 pp. <http://archive.nafo.int/protect/fc/2008/fcwp08-25add.pdf>
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- WGDEC, 2008. ICES. 2008. Report of the ICES-NAFO Joint Working Group on Deep Water Ecology (WGDEC), 10–14 March 2008, Copenhagen, Denmark. ICES CM 2008/ACOM:45. 126 pp. http://www.ices.dk/reports/ACOM/2008/WGDEC/WGDEC_2008.pdf

Table 1. Summary of Flag State submissions on bottom fishing activities in the NRA for the period 1987-2007.

Flag State	Submission Information			Data Supplied				Reviewed
	Date	Data format	Maps / activity	Years	Lat/Lon ¹	Date/time	Speed	
Canada	18 Sep 08	point data	5 nm ²	1987-2007	dec	year	-	
Estonia	12 Sep 08	haul data	point data	1996-2007	dec	year	-	Vigo '08
Faroe Is.	16 Sep 08	haul data	track	2003-2007	dec	year	-	Vigo '08
Germany	3 Mar 09	-	track	2001-2007	-	-	-	
Greenland	10 Sep 08	haul data	-	1993-2008	deg	year	-	Vigo '08
Iceland	19 (23) Sep 08	point data	5 × 10nm	1993-2006	dec	-	-	Vigo '08 ²
Japan	24 Nov 08	point data	-	2001-2007	dec	date/time	0-7 kn	
Norway	30 Dec 08	point data	-	2000-2007	dec	year/month	1-5 kn	
Portugal	12 Sep 08	point data	-	1997-2007	deg	date/time	0-7 kn	Vigo '08
Russia	2 Sep 08	-	polygon	1987-2007	-	-	-	Vigo '08
Spain	10 Sep 08	-	5 × 10 nm	2000-2007	-	-	-	Vigo '08

¹ dec: decimal degrees as DD.dddd; deg: DDMMdd

² Iceland re-submitted their information after the September Annual Meeting

- is not submitted or no information

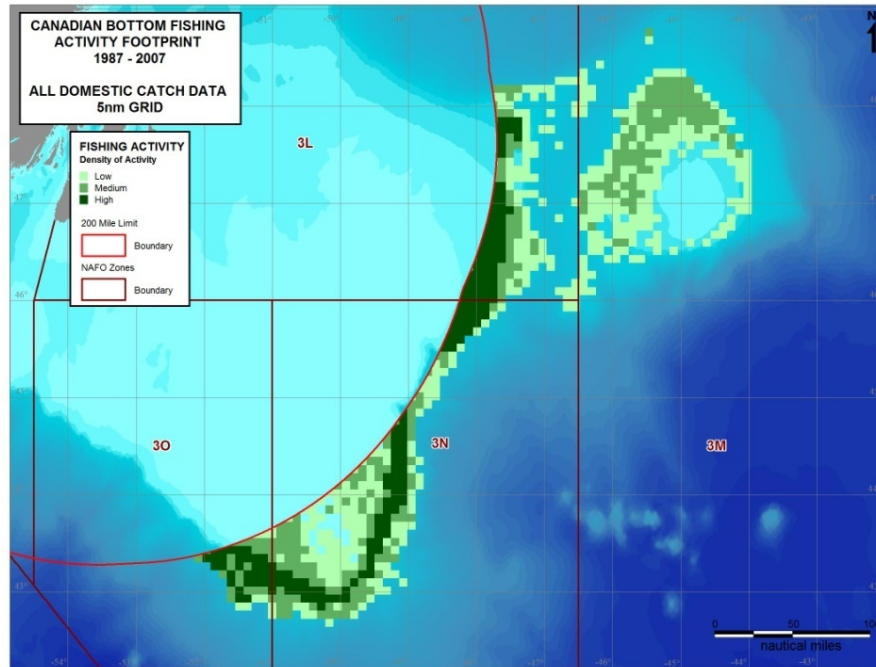


Figure 1a. Bottom fishing activity in the NRA for 1987-2007 for Canada (Map provided by Canada).

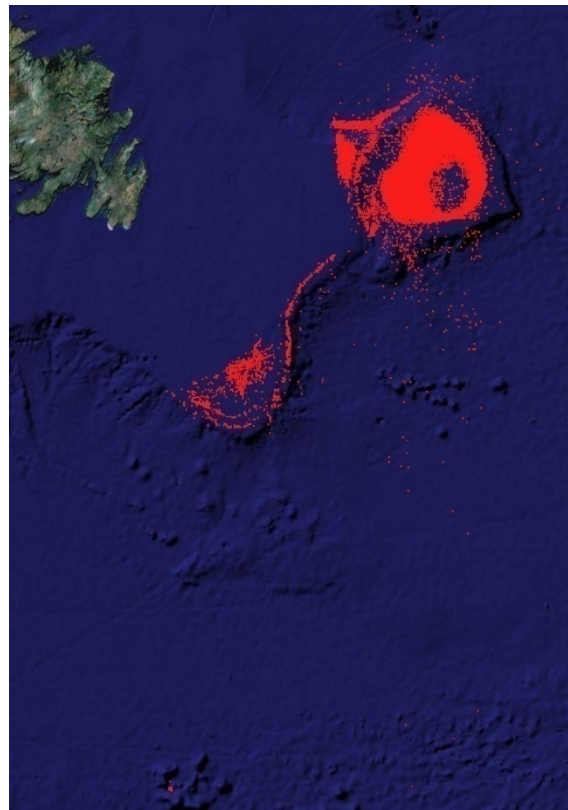


Figure 1b. Bottom fishing activity in the NRA for 1996-2007 for Estonia (Map provided by Estonia).

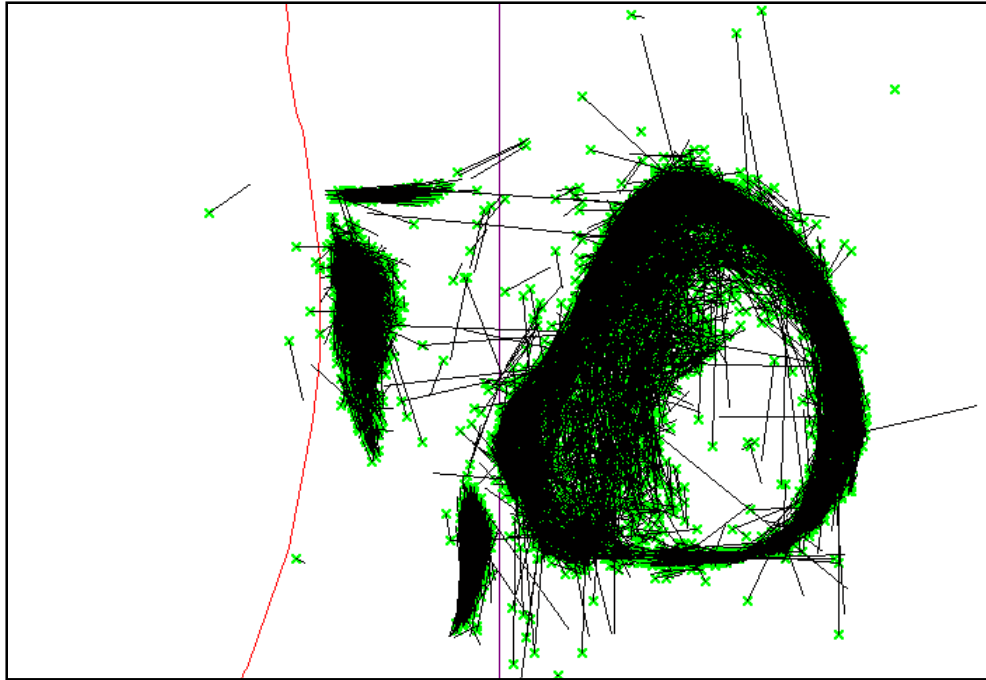


Figure 1c. Bottom fishing activity in the NRA for 2003-2007 for Faroe Islands (Map provided by Faroe Islands).

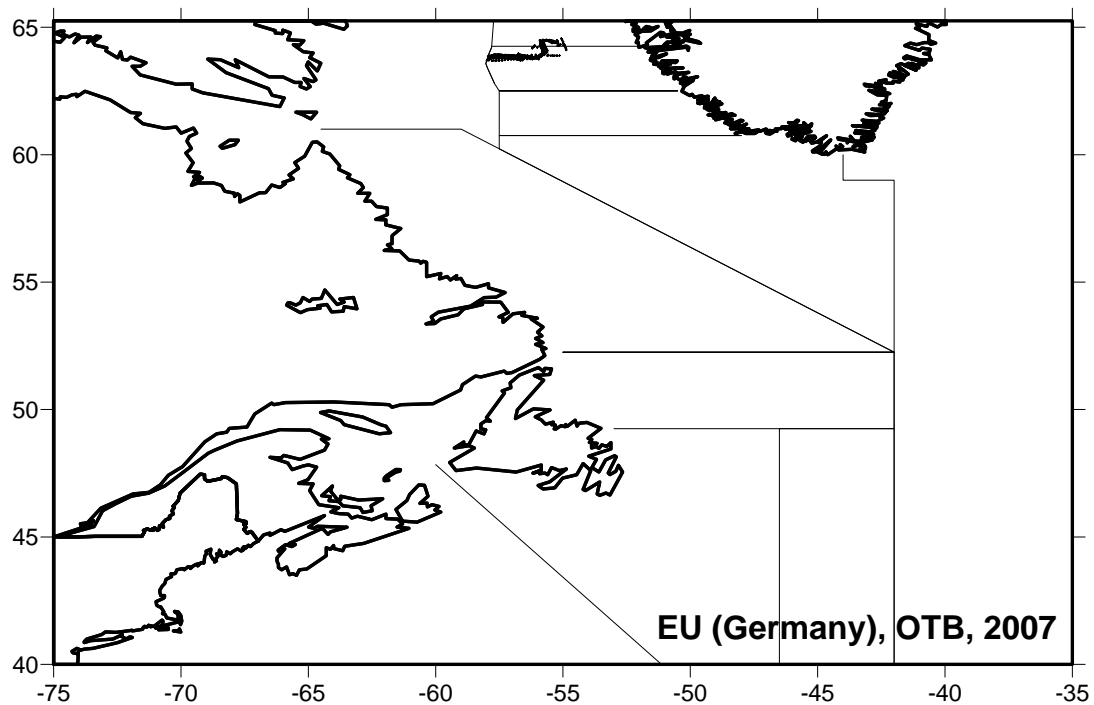


Figure 1d. Bottom trawling activity by otter trawls in the NAFO Convention Area for 2007 for Germany (Map provided by Germany). Germany submitted separate maps for each year for 2001 – 2007. In all cases, Germany only fished in NAFO Sub-Area 1D which is outside of the NRA. no bottom fishing occurred within the NRA.

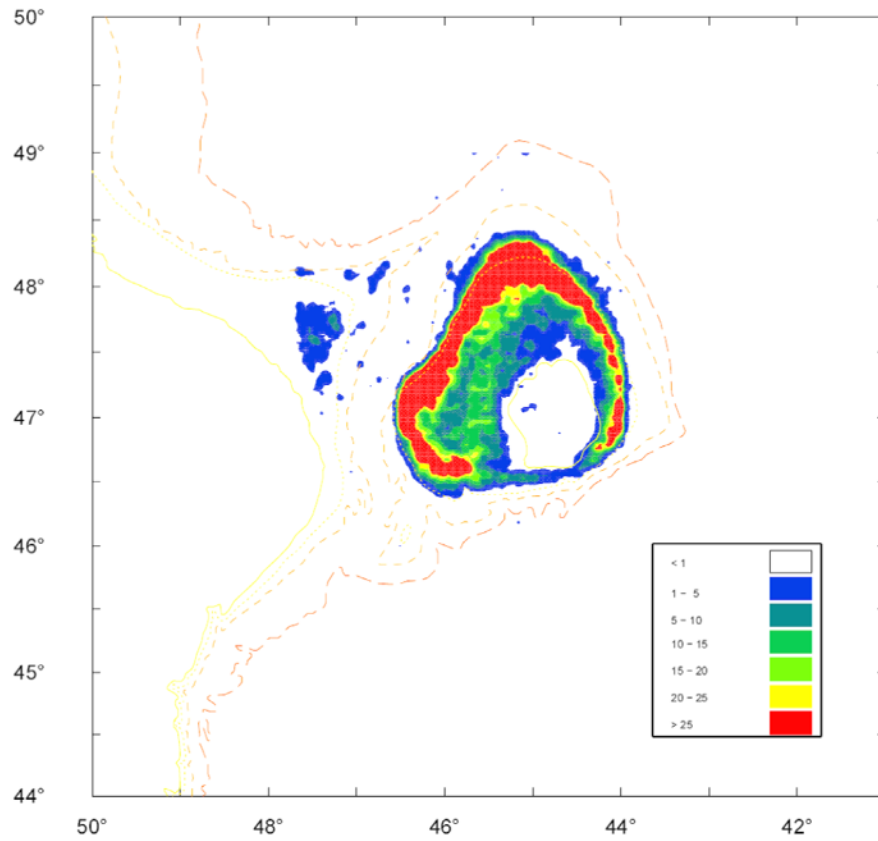


Figure 1e. Bottom fishing activity in the NRA for 1993-2006 for Iceland (Map provided by Iceland).

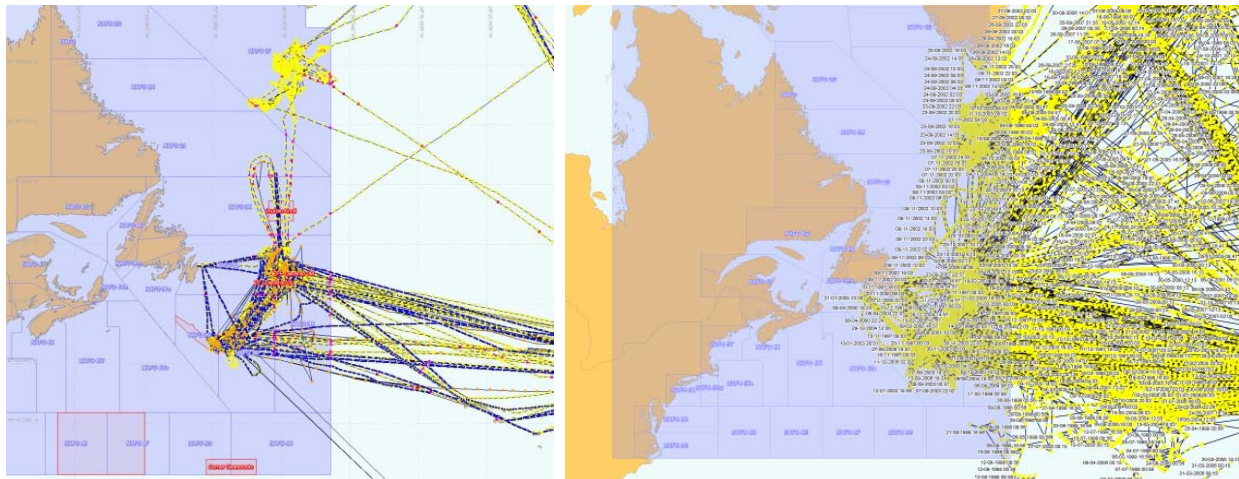


Figure 1f. Bottom fishing activity in the NRA for 1997-2007 for Portugal (Top) and an example for 2006 (Bottom) (Maps provided by Portugal). These maps includes both fishing and steaming.

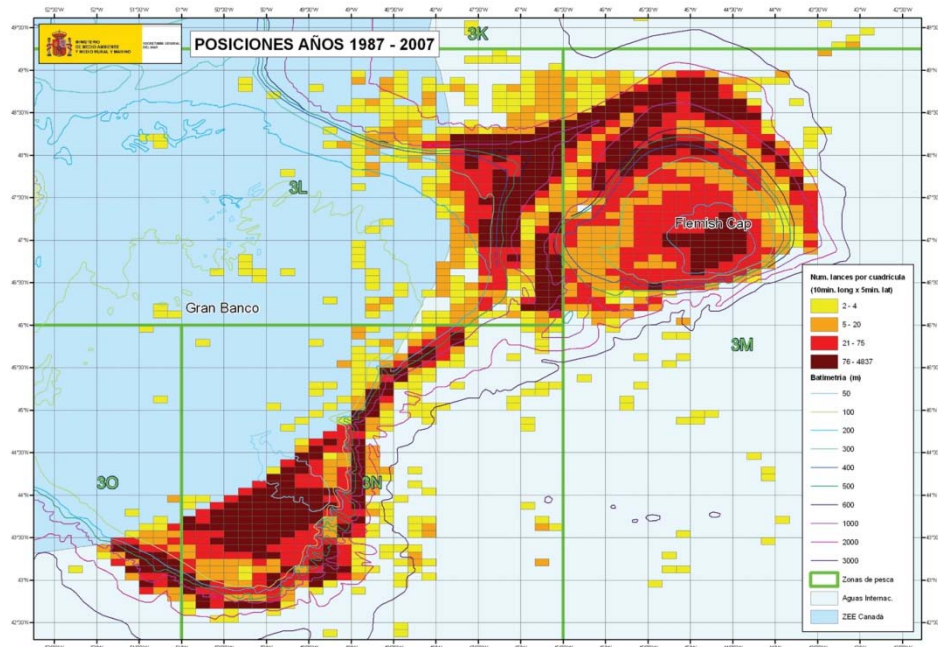


Figure 1g. Bottom fishing activity in the NRA for 1987-2007 for Spain (Map provided by Spain).

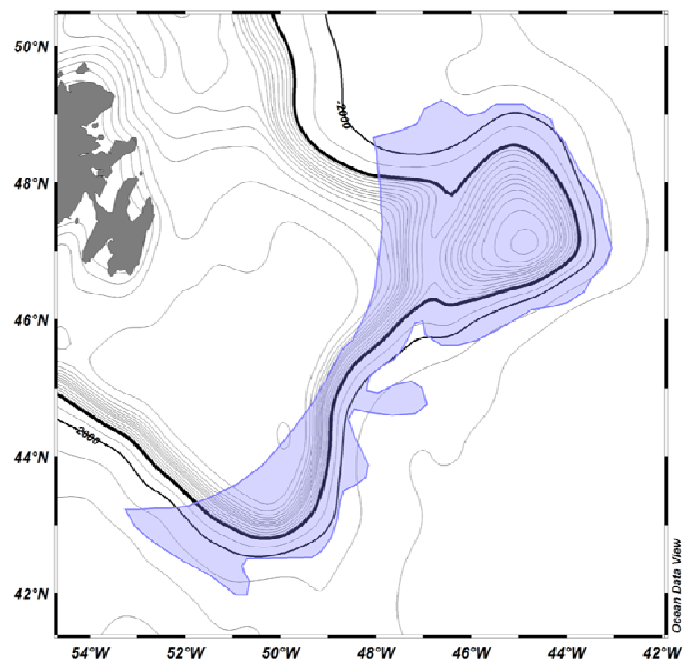


Figure 2. Bottom fishing activity in the NRA for 1987-2007 for Russia (Data provide by Russia and map plotted by Secretariat). Russia submitted the coordinates of polygons delimiting bottom fishing activity for each year from 1987-2007. The above map is a composite of all the separate annual maps and shows the cumulative areal bottom fishing activities.

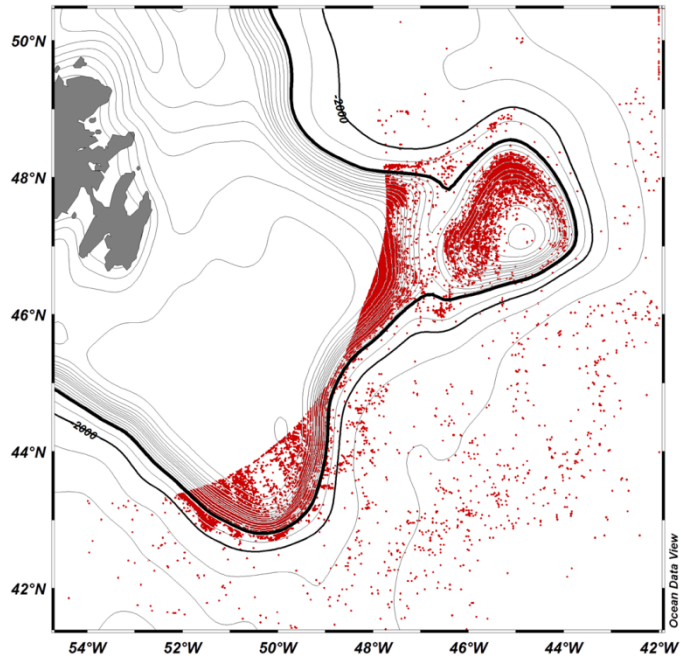


Figure 3a. Bottom fishing activity for Canada in the NRA for 1987-2007.

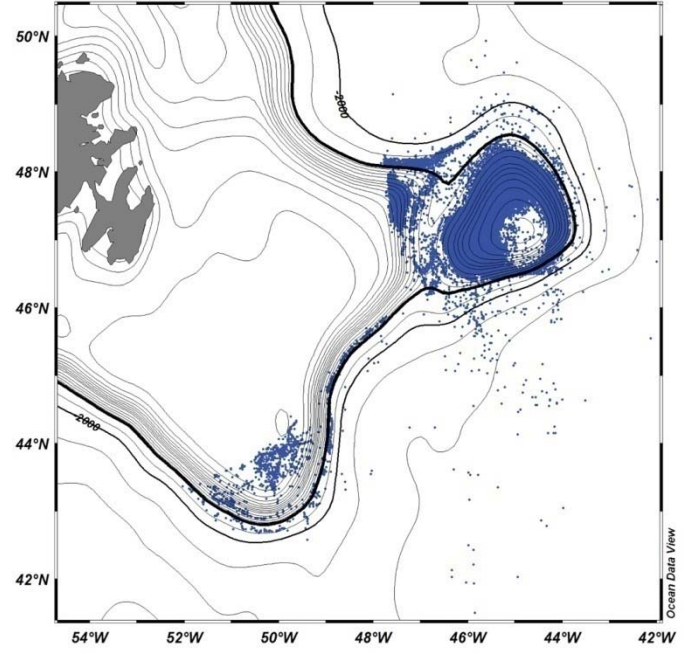


Figure 3b. Bottom fishing activity for Estonia in the NRA for 1996-2007.

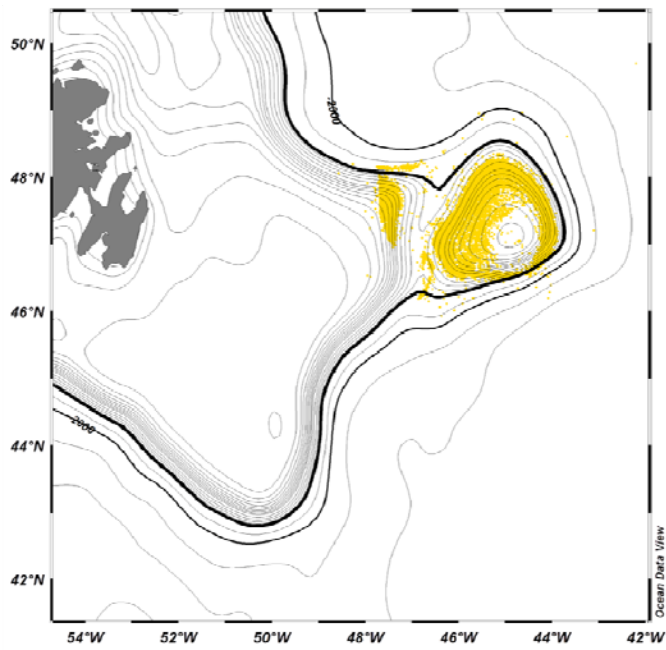


Figure 3c. Bottom fishing activity for Faroe Islands in the NRA for 2003-2007.

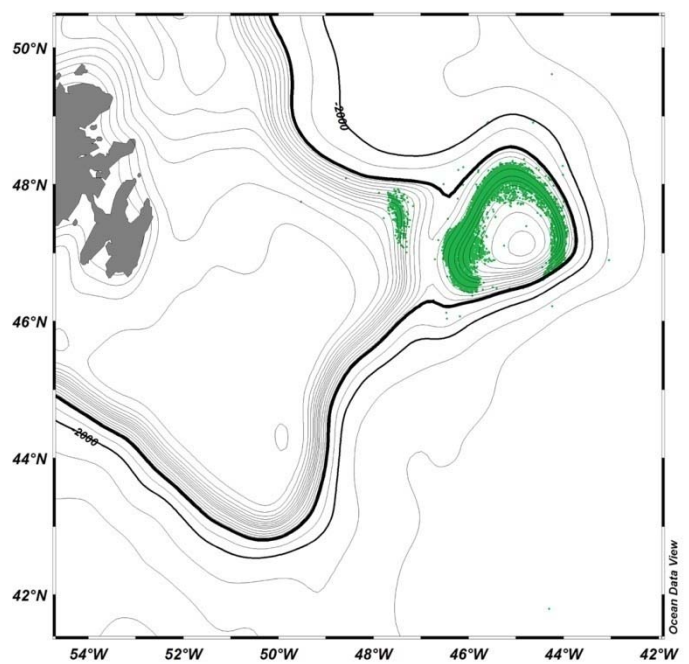


Figure 3d. Bottom fishing activity for Greenland in the NRA for 1993-2007.

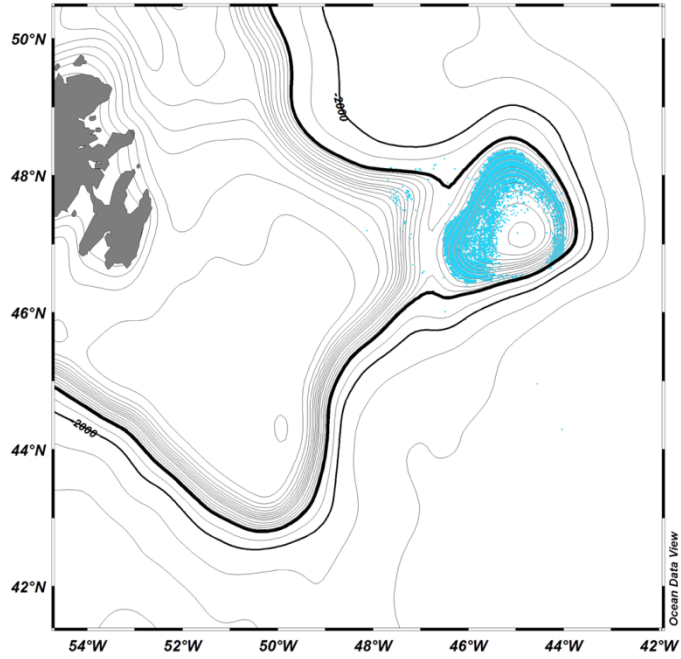


Figure 3e. Bottom fishing activity for Iceland in the NRA for 1993-2006.

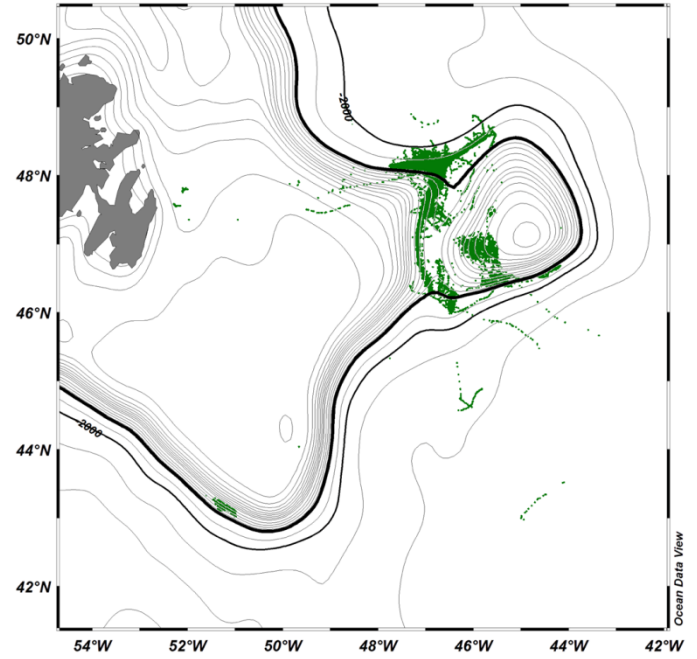


Figure 3f. Bottom fishing activity for Japan in the NRA for 2001-2007.

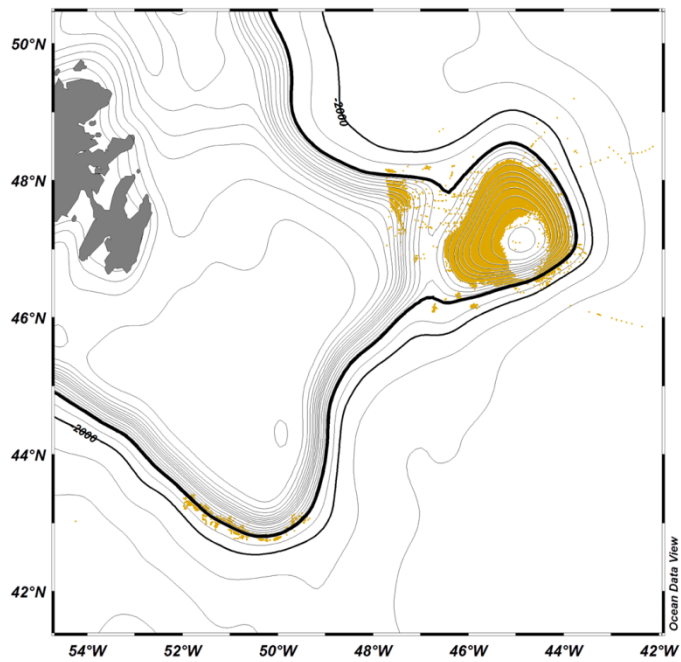


Figure 3g. Bottom fishing activity for Norway in the NRA for 2000-2007.

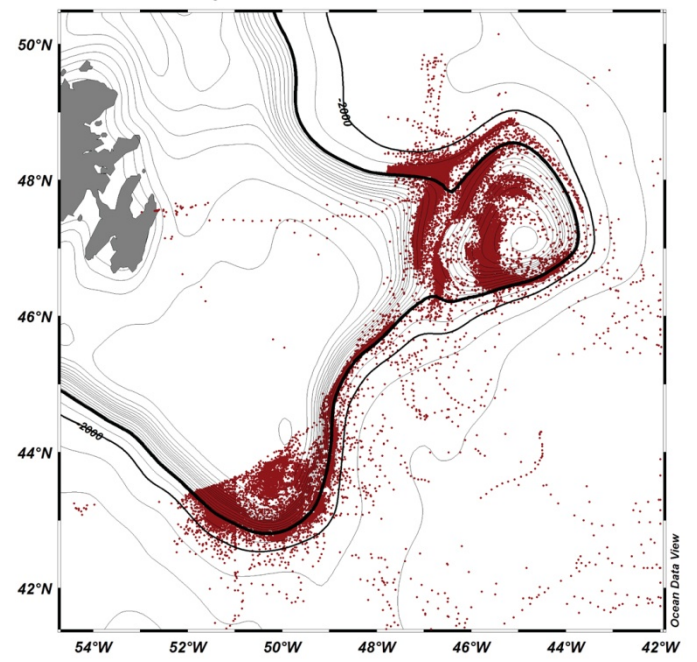
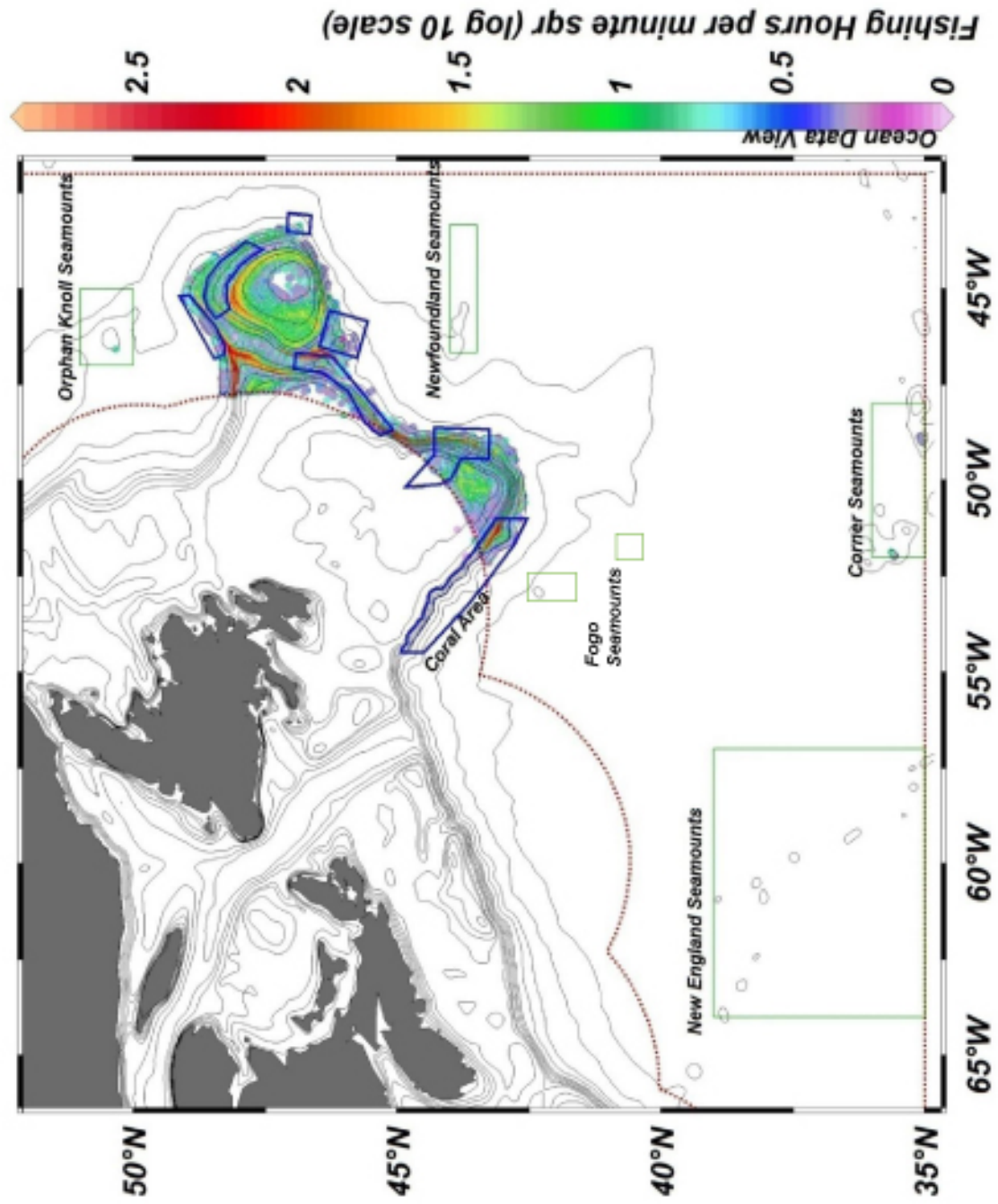


Figure 3h. Bottom fishing activity for Portugal in the NRA for 1997-2007.



ii Figure 4a. Distributional map of the intensity of bottom trawl effort by commercial fishing vessels for 2003–2007 in the NRA with an overlay of the candidate VME areas.

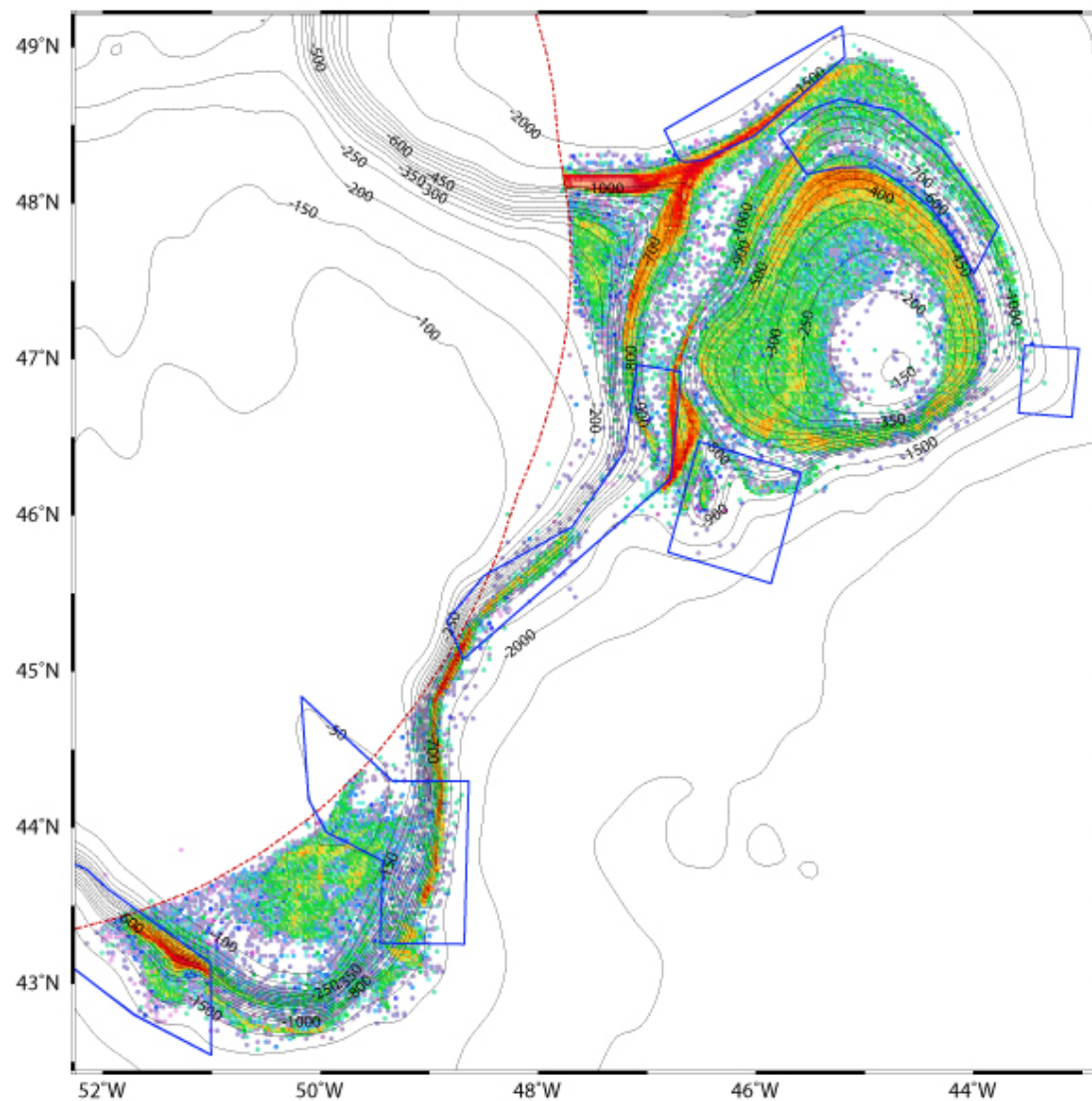


Figure 4b. Detail of Figure 4a.

Annex 6. Recommendation to Fisheries Commission (FCWGWP 09/3, Revision 2)

Interim Measures to Protect Significant Coral Concentrations

Background

In 2006, the United National General Assembly (UNGA) in its Sustainable Fisheries Resolution 61/105 called for States and Regional Fisheries Management Organizations (RFMOs) to adopt conservation and management measures in order to prevent significant adverse impacts on vulnerable marine ecosystems. UNGA will review the actions of States and RFMO in this respect in the fall of 2009.

Mindful of the work of the FAO in facilitating the development of international guidelines for the management of deep-sea fisheries operating in the high seas that serve to guide the identification of VMEs

Noting the commitment of NAFO Contracting Parties to implement an ecosystem approach and implement measures following the precautionary approach to address the impacts of fishing on VMEs

Recognizing the significant steps already taken by NAFO to protect Vulnerable Marine Ecosystems (VMEs) in the NAFO Regulatory Area (NRA) including inter alia:

- the closure of four seamounts to commercial fishing (2006)
- the establishment of a 30 Coral Protection Zone (2007)
- the closure of the Fogo Seamounts (2008)
- the adoption of a comprehensive framework for the implementation of UNGA Resolution 61/105 including provisions for the identification of existing bottom fishing areas (footprint), assessment of bottom fishing, Exploratory Fishery Protocol for new fishing areas and the interim Encounter provisions for VMEs in both fished and unfished areas of the NRA (2008)

Further recognizing the numerous international scientific research efforts that are designed to enhance knowledge in the area of VMEs, in particular with respect to addressing knowledge gaps on benthic habitat, communities and species in the NAFO Regulatory Area, especially the upcoming Spanish survey in 2009 and the Canadian survey in 2010

Conscious of the 2008 Intersessional Fisheries Commission Meeting which established a process to determine the boundary for existing fisheries and non-fished areas, and the 2008 NAFO Annual Meeting Fisheries Commission request to Scientific Council to more precisely identify significant concentrations of corals at its October 2008 meeting and significant concentrations of sponge at its June 2009 meeting

Recognizing the SC response which identified remaining concentrations of corals in its October 2008 report

It is proposed that, as part of a continuing commitment to implement the UNGA Resolution, the Working Group of Fisheries Managers and Scientists recommends to the Fisheries Commission for adoption in September 2009:

1. Establishment of additional coral protection zones in Divisions 3L and 3M:

Insert new Article 16 (2) of NCEM:

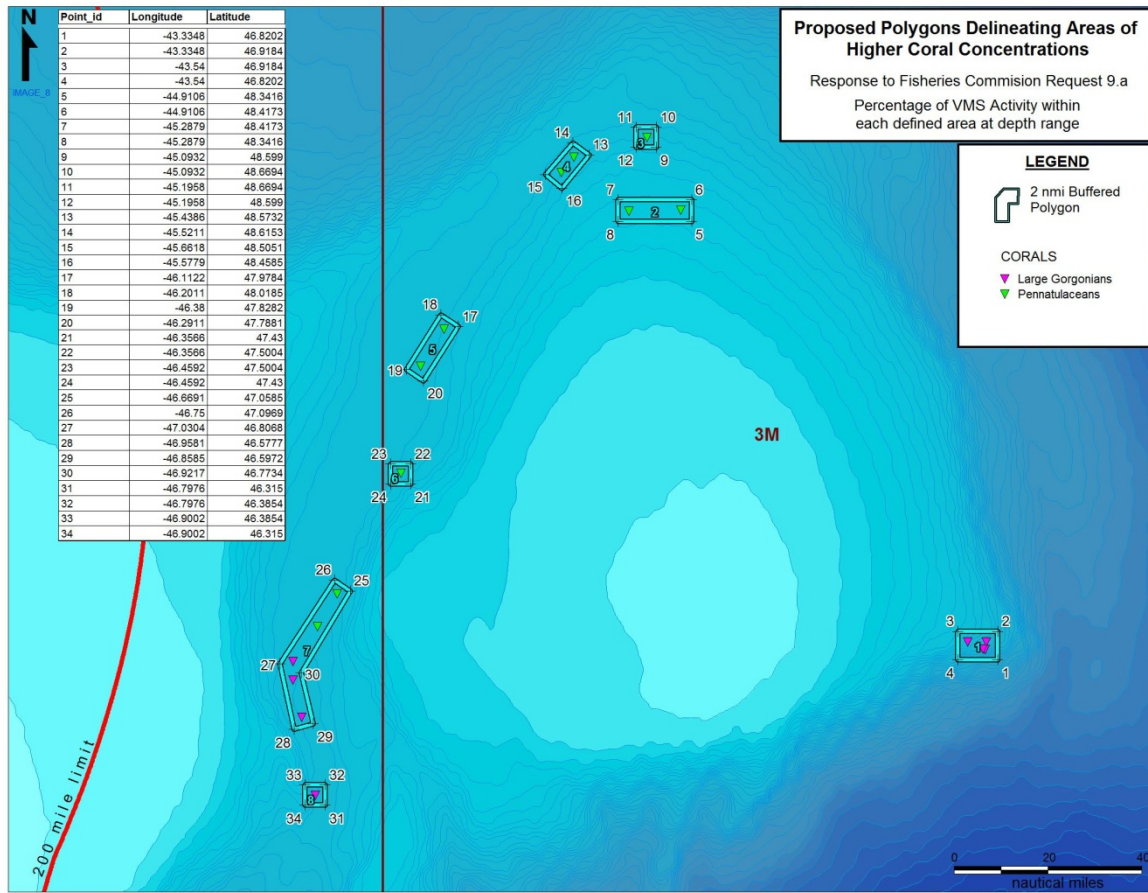
2. As of January 1, 2010 the following areas shall be closed on an interim basis to all bottom fishing activities until **December 31, 2011**. The closed areas are defined by connecting the following coordinates (in numerical order and back to coordinate 1).

Revoke current Article 16 (2) as this work has been completed.

Amendment to Article 16 (3)

3. The measures referred to in **Article 16(1)** shall be reviewed in 2012 by the Fisheries Commission taking account 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.

Area	Sub-Area	Coordinate 1	Coordinate 2	Coordinate 3	Coordinate 4
Eastern Flemish Cap	1	46°49'13"N 43°20'05"W	46°55'06"N 43°20'05"W	46°55'06"N 43°32'24"W	46°49'13"N 43°32'24"W
Northern Flemish Cap	1	48°20'30"N 44°54'38"W	48°25'02"N 44°54'38"W	48°25'02"N 45°17'16"W	48°20'30"N 45°17'16"W
Northern Flemish Cap	2	48°35'56"N 45°05'36"W	48°40'10"N 45°05'36"W	48°40'10"N 45°11'45"W	48°35'56"N 45°11'45"W
Northern Flemish Cap	3	48°34'24"N 45°26'19"W	48°36'55"N 45°31'16"W	48°30'18"N 45°39'42"W	48°27'31"N 45°34'40"W
Northwest Flemish Cap	1	47°58'42"N 46°06'44"W	48°01'07"N 46°12'04"W	47°49'42"N 46°22'48"W	47°47'17"N 46°17'28"W
Northwest Flemish Cap	2	47°25'48"N 46°21'24"W	47°30'01"N 46°21'24"W	47°30'01"N 46°27'33"W	47°25'48"N 46°27'33"W
Southwest Flemish Pass	1	47°03'31"N 46°40'09"W	47°05'49"N 46°45'00"W	46°48'24"N 47°01'49"W	46°34'40"N 46°57'29"W
		Coordinate 5	46°35'50"N 46°51'31"W	Coordinate 6	46°46'24"N 46°55'18"W
Southwest Flemish Pass	2	46°18'54"N 46°47'51"W	46°23'07"N 46°47'51"W	46°23'07"N 46°54'01"W	46°18'54"N 46°54'01"W



Annex 7. Exploratory Fishery Data Collection Form (FCWGW09/4)

Flag state		Day	Month	Year		1	2	3
Vessel					Gear type			
Call sign					No of mesh/hooks			
					Mesh size (if any)			

TOW START										TOW END										VME encounter	
GMT			Pos				Depth m	GMT			Pos				Depth m						
hour	min		grd	min				hour	min		grd	min				yes	No				

[illegible]

Bio Sa.	Biological Sampling	Tick for biological sample taken
VI Sp.	Vulnerable Indicator species	Tick for biological sample taken

Refer to annex 1 FAO international guidelines for the management of deep-sea fisheries in the high seas