SOUTH EAST ATLANTIC FISHERIES ORGANIZATION (SEAFO)

REPORT OF SEAFO SCIENTIFIC COMMITTEE 2010

Scientific Committee of SEAFO
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1. Opening and welcome remarks by the Chairperson, Mr Phil Large

The 6th Annual Meeting of the SEAFO Scientific Committee (SC) was convened on 4-9 October 2010 at the Arebbusch Travel Lodge, Windhoek, Namibia. The Meeting was opened by the Chairperson of the Scientific Committee, Mr. Philip A. Large, who welcomed participants and highlighted the importance of the work of the Committee and expected outcomes of the meeting.

2. Adoption of the Agenda and Arrangements

Minor revisions were made to the agenda to take account of progress by the Scientific Sub-Committee (SSC) and that there was no need to address the Spanish/Namibia joint survey as this had been addressed by SSC (see SSC Report ToR o. The revised agenda was adopted and is appended as Annex I of the SC Report.
The Executive Secretary informed the Meeting of practical organisation and arrangements.

3. Appointment of rapporteur

The Chair appointed a rapporteur (Erich Maletzky). It was agreed that all participants should contribute to the writing of the report by using visual display media. The Meeting accepted the Chair's suggestion.

4. Introduction of observers

One observer from Birdlife International was present (see Annex II of the SC Report for name and address)

5. Introduction of participants

In response to the Chair, participants introduced themselves. A total of 27 scientists representing Angola, EU, Japan, Namibia, Norway and South Africa were present. Participants and their addresses are listed in Annex II of the SC Report.

6. Review the outcomes of the Performance Review Panel relevant to SC

SC and SSC adopted a positive attitude to this report as it provides a useful opportunity for our work to be peer-reviewed. The Chairperson of the SC gave a presentation on the main scientific outcomes cited in the SEAFO Performance Review Panel Report. The response from SC to each recommendation is given below.

Section 4.1.1. Status of living marine resources:-

1. ***The Scientific Committee should develop a strategy for the development of a status report, including a general overview, of the fishery resources in the Convention Area. The report should include information on the stock structure, total abundance, distribution of the biomass between zones and the fishing pressure by zone. Red crab should be given first priority for such a status report.***

SC supports this recommendation and proposes to adopt as a template an extended version of the recently developed Species Profile proforma. However, SC considers that toothfish should be given first priority since (i) it has the most fisheries and biological data available and (ii) red crab is not a transboundary stock as identified in the Panel Report. The species of red crab found in the SEAFO CA is not the same species found in the Angolan and Namibian EEZs.

2. ***The transboundary nature of several fishery resources is recognised and scientific cooperation for evaluating of the status of the resources with other organisations should be encouraged, e.g. in the form of joint working groups with the CCAMLR for Patagonian toothfish and with Namibia and Angola for red crab.***

SC considers that a joint working group between SEAFO and CCAMLR is not needed for toothfish because the SEAFO Secretariat is in regular contact with the CCAMLR Secretariat and obtains the latest updates on management regulations etc, and the SEAFO Scientific Coordinator for toothfish currently attends CCAMLR Working Groups and acts as a conduit for the exchange of information.

Even though the species of red crab found in the Angolan and Namibian EEZs differs to that found in the SEAFO CA, SC considers that an improved exchange of information on sampling strategies and stock assessment methods could be achieved by correspondence between the SEAFO Species Coordinator for red crab and red crab experts in Angola and Namibia. SC is of the view that a joint working group is not needed.

Section 4.1.2. Ecosystem Approach

3. ***The Commission should expressly define priorities for the work of the Scientific Committee based on concerns relating to both the ecosystem in general and the fishery resources in particular.***

Given the time constraints on SSC and SC, there may be a need for FC to allocate priorities to particular tasks.

4. ***While ecosystem-related priorities are highly relevant they should not overshadow other major tasks.***

Regarding the balance between ecosystem related priorities and other tasks, this has been almost entirely driven by international obligations on SEAFO and resulting FC requests. There is also the widely recognised pressing need to develop an ecosystem based approach to fisheries science and management.

Section 4.1.3. Data collection and sharing

5. ***The transparency of the scientific data should be improved by providing more information in the report of the Sub-Committee of the Scientific Committee (SSC) or alternatively, or in addition, by providing this information on the SEAFO website.***

SC considers that the transparency of data in the SSC and SC reports is adequate and comparable with that of other RFMOs e.g. NAFO. Furthermore, these reports are available on the SEAFO website. Further transparency, particularly of more disaggregated biological data and observer data, is likely to result in problems regarding confidentiality and data ownership.

6. ***The Scientific Committee should give a high priority to the completion of identification keys for fish. This is necessary for an observer programme.***

   SC is of the view that a fish ID guide, rather than a key, is needed. Such an observer guide should also include crustaceans and incidental bycatch species such as seabirds and cetaceans (a turtle guide is already in use). SC considers that the hiring of consultant to prepare such a guide would be the best way forward, possibly working in conjunction with Birdlife International who already has a Seabird Guide available.

   SC asks that it be noted that in the last 18 months it has focused on developing a coral and sponge key for use by observers to obtain information on the spatial distribution and composition of VMEs (required to underpin management introduced in response to under UNGA Resolution 61/105).

7. ***Emphasis should be placed on extending the database for existing fisheries. The Panel notes that the scientific observers will provide essential data for this database.***

   Extending the database is already ongoing. A more pressing concern is that observer data is currently punched by hand into the database. SC has agreed a protocol to address this problem.

Section 4.1.4. Quality and precision of scientific advice

8. ***The basis for the Scientific Committee advice should be transparent and clear to all involved. In this regard, the report of the Scientific Committee should clearly describe the information on which its advice is based and the report of the SSC should document all assessments relevant to such advice.***

   SC fully supports this recommendation but wishes it be noted that in terms of stock assessments only two have been described since SC commenced. A rule of thumb assessment for orange roughy based on trends in abundance indices (regularly documented since 2005) and an attempted surplus production model for toothfish carried out this year.

9. ***The Scientific Committee should have a clear set of scientific criteria on which to formulate its advice. Such criteria should be based on those in international fisheries instruments as agreed by the Commission, for example the objective to maintain or restore stocks to levels that can produce the maximum sustainable yield (MSY) with the aim of achieving these goals for depleted stocks on an urgent basis and where possible not later than 2015 as stated in the 2002 Johannesburg Plan of Implementation.***

   SC comprises competent, experienced fisheries scientists many of whom have many years experience of providing advice for data poor deep-water stocks at a national and international level. SC is of the view that it is fully competent to set the scientific criteria on which to formulate its advice.

   SC recognises the objective to maintain or restore stocks to levels that can produce MSY, however developing a framework to accomplish this for data-poor stocks is widely recognised as problematic. ICES is attempting to address this issue and SC will monitor and learn from the progress made.

10. ***When there is no scientific basis, the Commission should provide clear instructions to the Scientific Committee on the interpretation and implementation of the precautionary approach.***

SC supports this recommendation but is of the view that SEAFO, as a new RFMO, has had the opportunity to develop a more dynamic, flexible relationship between FC and SC than perhaps seen in more long-established RFMOs and between ICES and its clients, where there can be a rigid partition between science and management that can give rise to tensions.

SC accepts that it is FC's competence to apply the PA, however the **majority** view of SC is that it should be allowed to take account of the PA in providing advice to FC e.g. recommending precautionary TACs and invoking the PA to recommend seamount closed areas in the absence of information on VMEs (both initiatives from SC). Conversely, FC has been able to submit entire Conservation Measures (CMs) to SC for review and we would hope that this has helped FC.

A **minority** view was that SSC and SC should not use the PA in its work and advice.

11. ***The Commission should provide explicit guidance for the Scientific Committee on priorities for its advice. Consideration of such priorities might be facilitated through a modification of the structure of the Scientific Committee, such as more extensive use of focused expert groups working either by correspondence or at meetings.***

    FC sets the priorities for SC by adding ToRs to the SC Agenda. SC attempts to address all ToRs but gives priority to those concerned with reviewing CMs. SC is not aware, at least from the Commission, of any shortcomings in its advice to FC. On the contrary, SC has received much praise from FC for its work. Notwithstanding, if FC wishes to provide guidance on the priorities for SC advice we are comfortable with this.

    SC already makes used of focused expert groups at meetings, but less use of such groups working by correspondence. SC will review the use of the latter.

12. ***The structure of the Scientific Committee report and the readership of the various scientific reports should be analysed and the reports be redesigned to be fit for purpose taking the following considerations into account.***

    a. ***The Scientific Committee report should be an advisory report, with the Commission and highly interested stakeholders as its primary readership. It should include a summary of the scientific information that underpins the advice.***

       SC disagrees with this and considers that the SC Report should be the primary source of all information addressing the ToRs set for both SC and SSC, except where there is explicit reference to the SSC Report (e.g. landings tables). SC considers this approach is easier for readers in that all pertinent information is in a single document. However, SC acknowledges that this results in some duplication between reports.

    b. ***The SSC report should present the technical assessments that form the basis for the deliberations by the Scientific Committee. The readership of that report is the Scientific Committee and the wider science community.***

SC's comment to point **a.** above applies. It should be noted that because of cost restrictions by their CPs some assessment experts can only attend SC, so assessments sometimes have to be revisited in this meeting.

c. There should be similar technical reports available as background analysis for other topics that require review by the Scientific Committee.

SC agrees. This year, SC had access to the relevant CCAMLR assessment reports for example.

d. The Secretariat should create a series of working papers, or research documents, which should be coded and a copy kept for future reference. Papers that are not properly coded may be discarded after the meeting.

SC supports this and has introduced a protocol for coding and archiving of working documents.

13. The roles and functions of the Scientific Committee and SSC should be clarified, duplication of work avoided and decision-making clarified as described in section 4.3.1.

SSC is a Sub-group created by SC, initially to collate available historical landings and biological data. Good progress has been made and SC considers that this Group has mostly served its purpose and can now be dissolved. SC is of the view that in future a single group (SC) will meet and produce a single report.

14. A review should be undertaken to explore arrangements for giving the Secretariat the responsibility to compile data and produce working papers for the Scientific Committee and SSC, with a view to attaining a smooth workflow. The review should also identify the role of the coordinating scientists in this regard.

SC supports this and will recommend that in future all landings tables currently in the SSC Report will be updated by the Secretariat in advance of SC meetings. Additionally, the Secretariat will compile new tables of data of incidental bycatch (seabirds, turtles etc) and discards. The Secretariat should resolve any arising data queries with the relevant national/scientific coordinators.

15. The Contracting Parties should support the scientific coordinators to allow efficient use of meeting time at the Scientific Committee.

SC supports this.

Finally, a **majority** view of SC is that the Chair of SC should be a member of any future Performance Review Panel so that queries regarding the scientific work of SC can be dealt with efficiently. Also we recommend that, if possible, any future Panel should include scientists working actively in the field of data-poor, deep-water assessments and deep-water ecosystem studies.

7. Report by the Chair of the Scientific Sub-Committee and comments by SC

SC acknowledged the excellent work done by the SSC. All the terms of reference for the SSC have been addressed and, as anticipated, some ToRs were carried over to SC. The work in response to ToRs is presented in the SSC Report (Annex VII of the SC Report).

SC had no explicit responses to the work carried out by SSC. Any comments made by SC on the presentation of SSC Report were addressed in the work of SC and are not repeated here.

The recommendations made by SSC were reviewed, revised where necessary, and incorporated in the recommendations made by SC (see ToR 15 below) as appropriate.

8. Review Conservation Measures 06/06 on the Management of vulnerable deep-water habitats and ecosystems in the SEAFO Convention Area taking into account the outcomes from the NOC contract and the results from any other analyses arising.

The NOC Report

The Chair of SC gave a presentation on the outcomes from the NOC contract.

This work brought together various data-sets from a number of public sources around the world to produce the most up-to-date regional bathymetric map of the South Atlantic in both printed and digital form, along with an interactive 3D view of the same data. This allows not only an appreciation of the gross bathymetric features of the region, but the use of a data control layer in the GIS will allow users of this data an indication of the data accuracy and quality.

Physical and chemical parameters have also been included in the GIS, so that the temperature, salinity and oxygen content of the South Atlantic, all primary agents in the distribution of the various forms of biology can be examined, at different critical depths at the same time.

These critical depths were determined to be those that had most effect on the biology, and were the sea surface (0m), the lower limit of the photic zone, which we approximated to 200m, and the lower limit of the likely vertical migration of zooplankton, a major source of food at 1000m depth.

Other elements presented include:-

- information of biogeographical provinces defined by Longhurst;
- a geographic depiction of the formally UN-backed named Seamount gazetteer;
- a further seamount-science web-based product sponsored by the National Science Foundation (USA)
- a biological catalogue of data supported by the Census of Marine Life.

These final elements of this report suggest that data on South Atlantic seamounts, especially in terms of biologically-significant data is at best described as very patchy and of variable quality. The report discusses the outcomes and these are described below.

Any isolated topographic feature that rises to within 1000m of the ocean/sea surface should be regarded as having the potential to host vulnerable marine ecosystems (VMEs). This conclusion follows from two points:

(a) Commercial fishing operations are possible at these depths.

(b) Isolated topographic features at these depths may experience both enhanced primary production and interaction with vertically migrating zooplankton, providing increased food resources to seafloor populations. Combined with likely increased water movements over/across the topography and the possible occurrence of hard substratum (rocky terrain) these factors are

likely to produce "biological hotspots" with increased standing stocks (abundance and biomass of the seabed fauna) and species richness (biodiversity).

Appropriate protective/conservation measures should therefore consider all isolated topographic features that rise above 1000m water depth.

It is also important to consider the likely regional variations in the VMEs present. For example, the study area encompasses five major oceanic biogeochemical provinces; each of these may be home to significantly different seamount biological communities.

The designation of closed areas should, therefore, attempt to provide some protection in each province, rather than for example a large singe closed area within a single province.

In addition, seamounts with summits at any depth do have the potential to host biological communities associated with hydrothermal systems. Such communities are generally thought to have high conservation value.

The occurrence of seamount 'hotspot' or hydrothermal biological communities can only be definitely established by direct survey. An assessment of bathymetry and oceanographic properties and processes can, however, provide sufficient information for the establishment of protective measures on a precautionary basis.

The study indicates that there is some biological data available over a more-or-less random selection of a few of the seamounts within the general South Atlantic region. Thus it may be possible to identify specific seamounts that have particularly vulnerable ecological systems, but it is highly probable that most of the vulnerable seamount communities in the region will go un-recognised unless, considering the paucity of available data, the most generic potential bio-markers as outlined in the discussion (as outlined above) are used. SEAFO are urged to review any catch records of both fish and invertebrates that they may have access to for use in vulnerable ecosystem assessments.

NOC recommends that a detailed study be undertaken to identify exactly what datasets are available for seamounts, and then to identify those whose ecosystems could be considered "at risk". However, this would be very labour-intensive. NOC suggests that SEAFO examine alternatives. NOC suggests exploring the possibility of requesting this to be an MSc research topic at a suitable academic institution of one of the SEAFO CPs.

Comments by SC

SC noted the outcomes and recommendations from NOC include a number of assumptions and hypotheses, but SC was of the view that they provided a basis to proceed with caution. However, to account to some extent for the possible existence of chemosynthetic communities at depths >1000m and that the maximum potential depth of deep-water fishing is around 2000m, seamounts penetrating into the upper 2000m of the water column were considered in the following analyses.

Available information on VMEs

It is recognized that from a biological standpoint the knowledge of seamount VMEs and chemosynthetic communities continues to be sparse. Apart from information in the historical literature (which we agree could form part of a potential MSc. project) there are currently four potential sources of new information on VME:-

Surveys

- from the recent joint Spanish-Namibian surveys on the Valdivia Bank and Ewing seamount;
- a recent Norwegian survey of the Vema seamount;
- from surveys carried out by the South Atlantic MAR-ECO project

The results from the above surveys are not yet available.

Observer information collected on commercial fishing trips.

Information on reported commercial bycatches of benthic organisms (including corals and sponges) is presented under ToR o in the SSC report.

The data presented are from a single Spanish longline trip fishing for Patagonian toothfish in 2010 in Division D of the SEAFO CA. A total of 17 taxa of benthic organisms were identified (see Table 13 and Figure 19 in the SSC report) with a total weight of 94 kg (maximum catch per set was 7 kg). The two most predominant taxa were of the Order Gorgonacea (mostly branching corals) and the phylum Porifera (sponges). However, very few specimens of sponges captured were alive. The Gorgonacea were mostly found in the western area of Division D on a seamount (47°S 8°W) to the south and outside the EEZ of Gough Island.

This information was taken into account in considering the location of potential closed areas.

SC noted that available information collected by observers indicate there are no records of the VME encounter threshold levels being exceeded in the few trips that were carried out in 2010.

It is recognized that available information on the distribution of VMEs remains sparse. SC, as it did in 2006, decided to proceed on the basis of using currently available information consistent with precautionary approach and the requirement to protect VMEs as specified under UNGA Resolution 61/105.

Procedure adopted by SC for reviewing CM regulation 06/06.

SC adopted the following stepwise approach:

Step 1: The existing closed/open areas were reviewed to determine if they were fit for purpose in relation to the new and improved information available on the distribution of seamounts;
Step 2: Any changes necessary to the existing closed/open areas were identified;
Step 3: The available information and the distribution of VME indicator species was considered;
Step 4: Any revisions to the existing closed/open areas in were made using the modified NOC criteria;
Step 5: Potential new seamount areas were identified on the basis of the modified NOC criteria;
Step 6: Existing closed/open areas (including those proposed to be modified) and proposed new areas were reviewed taking into account the available information on the historical spatial distribution of fishing;
Step 7: Suggested closed areas for inclusion in a revised Regulation 06/06 were identified.

SC reviewed the existing closed/open areas (Figure 1) to determine if they were fit for purpose in relation to the new and improved information available on the distribution of seamounts.

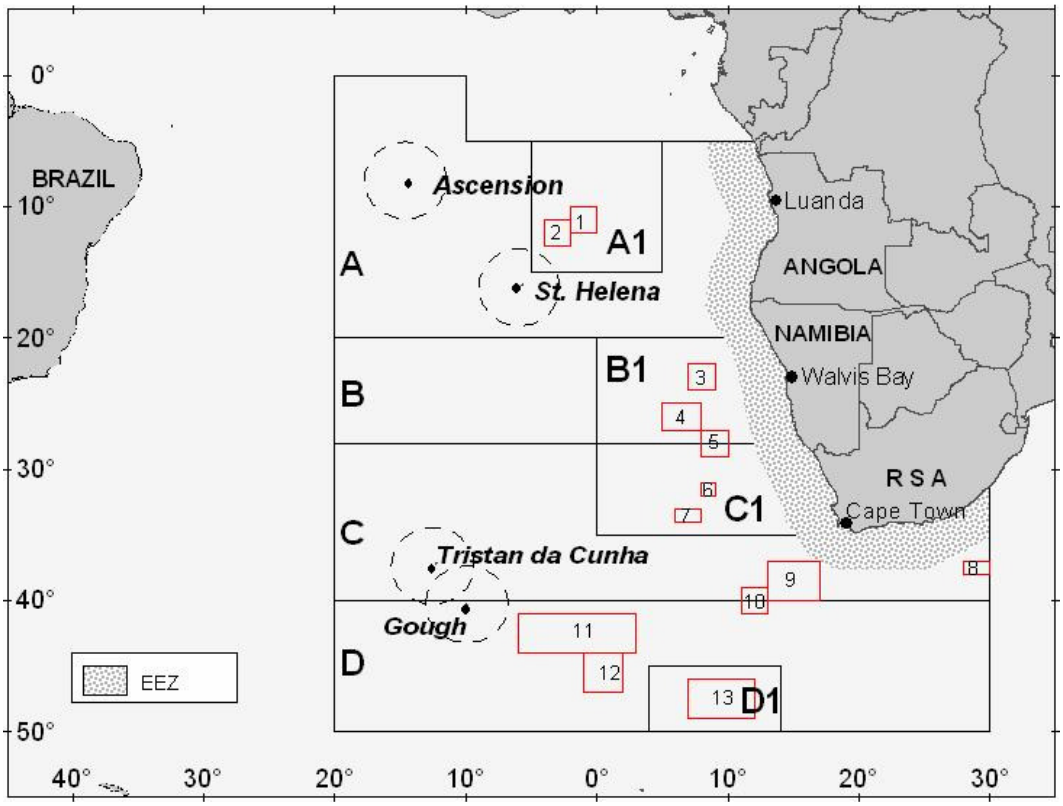

Figure 1. Map of the existing closed/open seamount areas in the SEAFO CA (cited in Reg. 06/06). Note Seamount areas: 3, 4 and 13 are currently open to fishing.

The following conclusions were made:

Closed Area 1 (Dampier Seamount): Only 1 seamount present penetrating into the upper 2000m depth range (signified in the remainder of this ToR as >2000m). Conclusion: Area too large – need to redraw.

Closed Area 2 (Malahiet Guyot Seamount): Only 1 seamount present >2000m. Conclusion: Area too large – need to redraw and possibly combine with area 1.

Open Area 3 – (Ewing Seamount): Only 1 seamount present >2000m. Conclusion: Area too large – need to redraw.

Open Area 4 – (Valdivia Bank): 4 seamounts present >2000m. Conclusion: Area needs to be enlarged and redrawn.

Closed Area 5 (Molloy Seamount): No seamounts >2000m. Conclusion: Re-open.

Closed Area 6 (Vema Seamount): Only 1 seamount >2000m. Conclusion: Area too large – need to redraw.

Closed Area 7 (Wüst Seamount): 4 seamounts >2000m. Conclusion: Area wrongly positioned – needs to be relocated and redrawn.

Closed Area 8 (Africana Seamount): Only 1 seamount >2000m. Conclusion: Area too large – need to be redrawn.

Closed Area 9 (Schmitt-Ott & Erica Seamounts): Only 1 seamount >2000m. Conclusion: Area too large – need to be redrawn.

Closed Area 10 (Panzarini Seamount): No seamounts >2000m. Conclusion: Re-open.

Closed Area 11 (Discovery, Junov & Shannon Seamounts): 10 seamounts >2000m. Conclusion: Redraw.

Closed Area 12 (Schwabenland & Herdman Seamounts): Only 1 seamount >2000m. Conclusion: Redraw and possibly combine with area 11.

Open Area 13 (Xhosa, Zulu, Swazi, Merz & Hintsa Seamounts): 22 seamounts >2000m. Conclusion: Area too small – need to redraw.

Step 3

SC took account of the available information and the distribution of VME indicator species (presence of Gorgonacea – mostly branching corals) mostly found in the western area of Division D on a seamount (47°S 8°W) to the south and outside the EEZ of Gough Island, and noted that this location is outside existing closed and open seamount areas.

Step 4

SC made revisions to the existing closed/open areas in relation to the modified NOC criteria and the new information available on the distribution of seamounts (>2000m) (Figure 2).

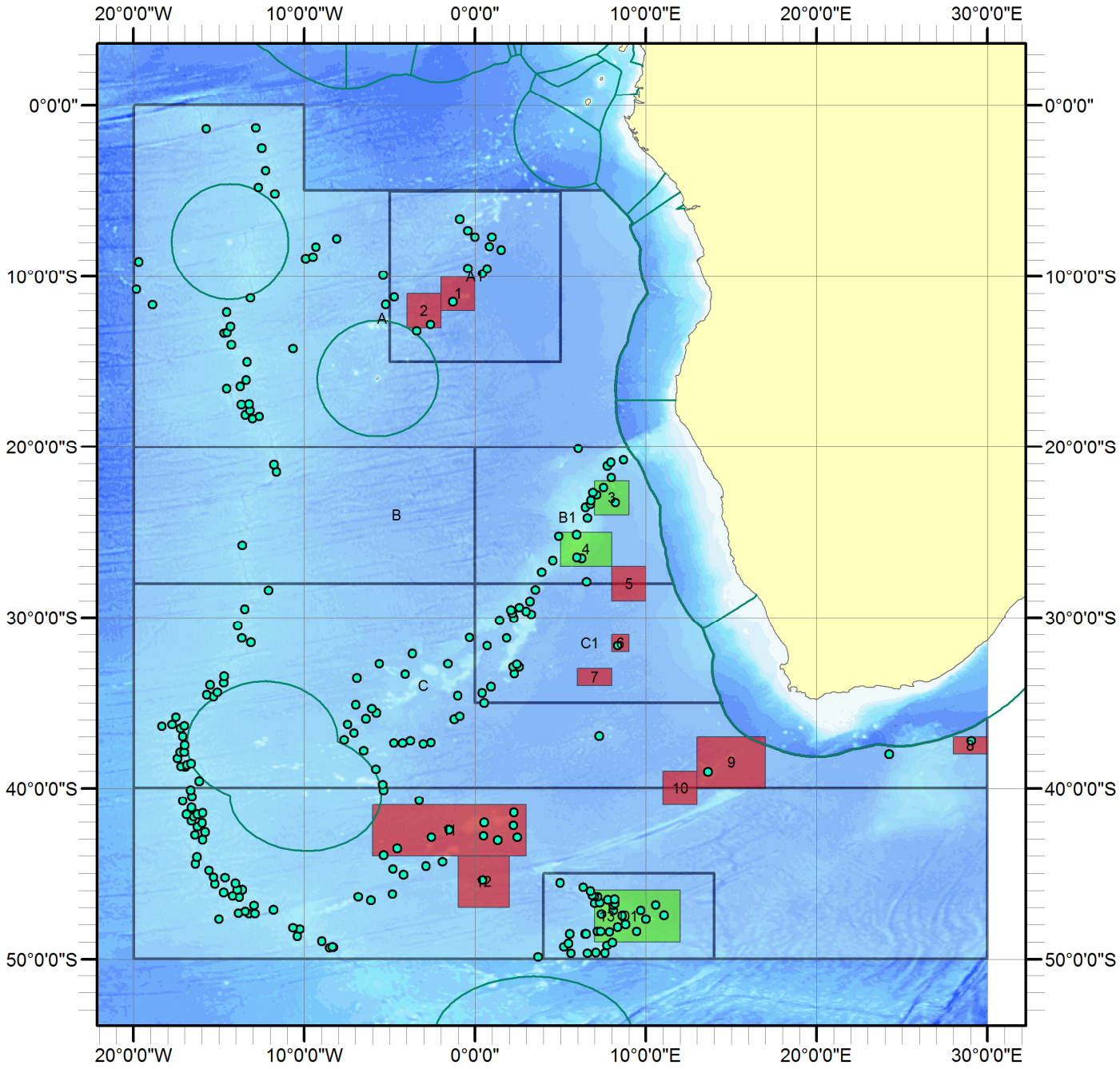

Figure 2. Map of the existing closed and open seamount areas in the SEAFO CA (from SEAFO Regulation. 06/06) showing the spatial distribution of seamounts >2000 m. Note Seamount areas: 3, 4 and 13 are currently open to fishing.

Most areas were substantially reduced in size. Revisions to areas ensured that there was a reasonable buffer zone (not less than 10 nm) around each seamount. The Ewing seamount (Area 3) does not extend into the upper 2000m of the water column.

Step 5
SC then considered the location and dimensions of new seamount areas. The main consideration was to ensure reasonable geographical distribution of closed areas throughout the SEAFO CA, broadly in accordance with the Longhurst Province criteria. The latter were not applied rigorously because of concerns that they are driven by surface phenomena and do not necessarily represent the distribution of fish species or differences in the deep-water environment between different areas of the SEAFO CA.

The main geographical area in the SEAFO CA where there is no protection currently afforded to likely VMEs is on the Mid-Atlantic Ridge (MAR). Consequently five new seamount areas were identified broadly distributed at intervals along the entire part of the MAR in the SEAFO CA. The revised existing SEAFO closed/open areas and the proposed new areas on the MAR are shown in Figure 3.

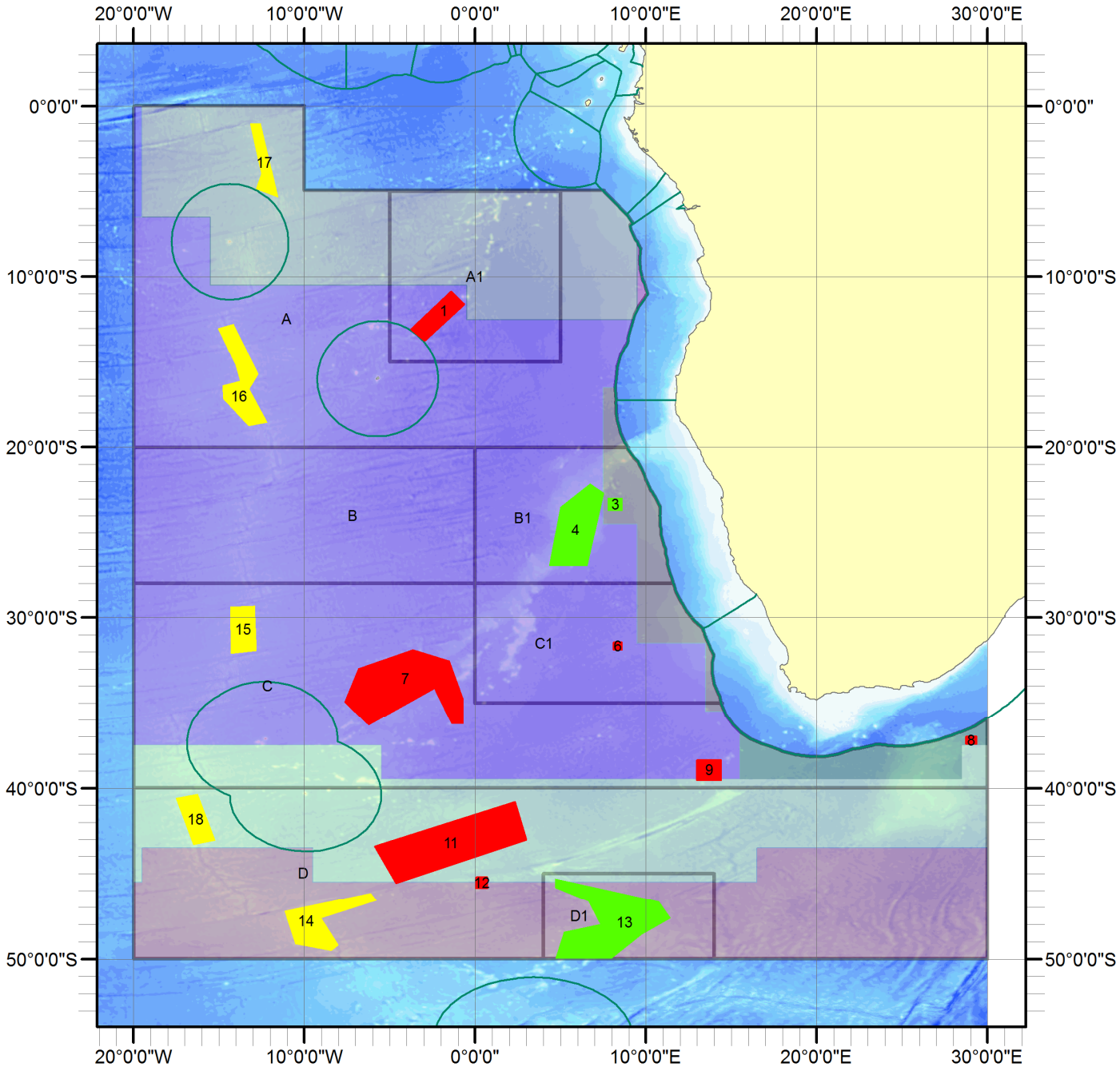

Figure 3. Revised existing SEAFO closed (red), open (green) and proposed new areas on the MAR (yellow). The regional stratification (in different colours) corresponds to Longhurst Provinces.

Step 6

SC then reviewed the revised closed, open seamount areas and proposed new areas taking into account available information on the historical spatial distribution of fishing.

As a first step, SC overlaid the proposed fishing footprint according to the FC criteria using 10' x 10' cells (Figure 4).

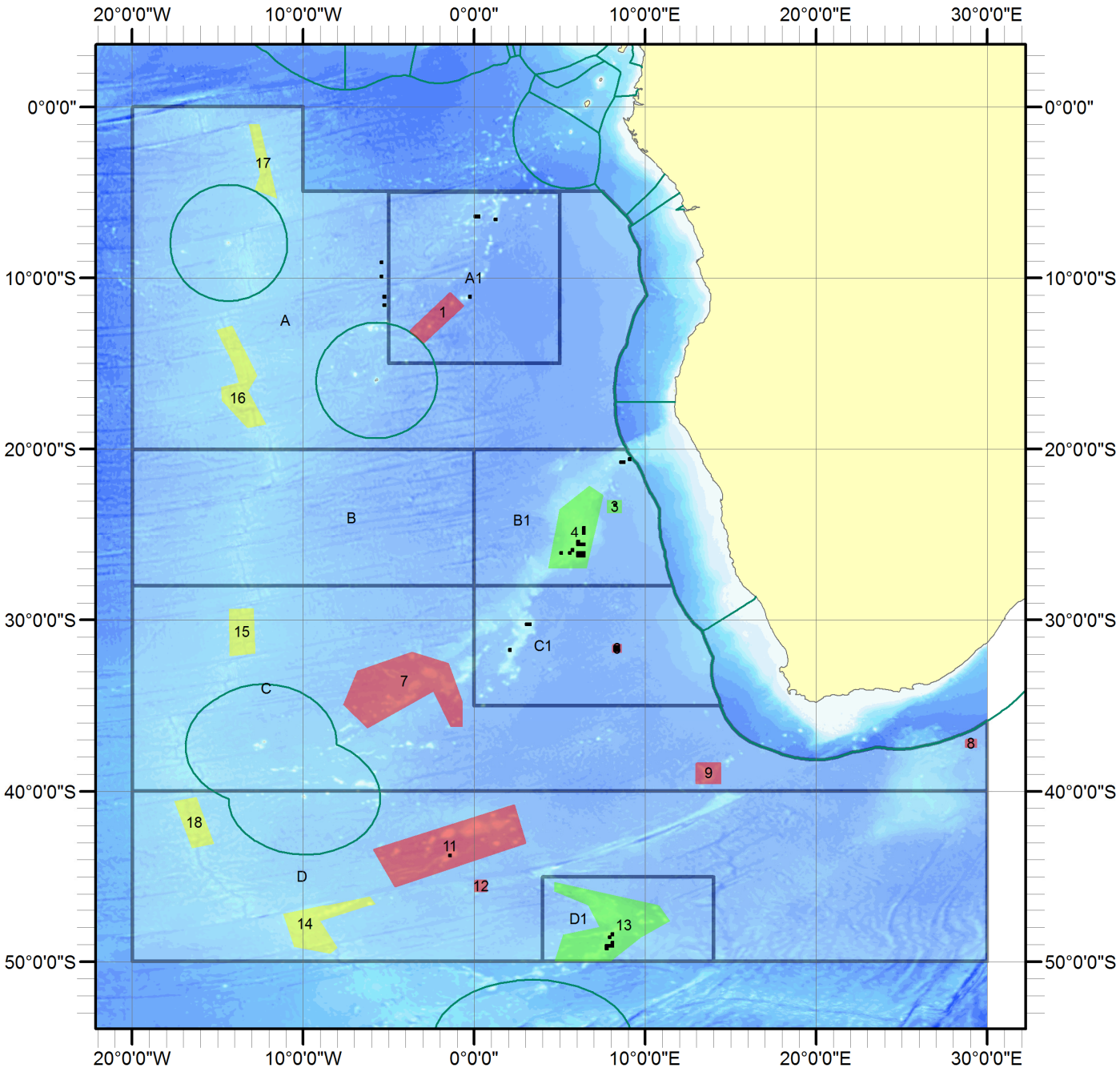

Figure 4. - Proposed fishing footprint according to the FC criteria using 10' x 10' cells overlaid on the revised existing SEAFO closed (red), open (green) and proposed new areas on the MAR (yellow).

On the basis of the fishing footprint data, there has been no fishing on any of the five new proposed areas on the MAR. Of the revised existing closed areas fishing has taken place two or more years in the period 1987-2007 on closed areas 6 (Vema seamount) and 11 (Discovery, Junov & Shannon seamounts). Fishing according

to the footprint criteria has also occurred in the existing open seamount areas 3 (Ewing), 4 (Valdivia) and 13 (unnamed).

Historical fishing from 1996-2010 to date, expressed as the presence and absence of fishing activity, as indicated from logbook data submitted by all CPs, in 10' x 10' cells, was used as an indicator of the level of fishing in identified seamount areas. Data for mid-water trawlers were excluded.

SC could not agree on a protocol to qualitatively distinguish between no fishing, lightly fished, moderately fished and heavily fished, so the protocol used by SC when Regulation 06/06 was developed in 2006 was applied. Three categories were defined: "considered to be unexploited"; "already slightly exploited"; and "already exploited". The spatial pattern of fishing overlaid on the identified seamount areas is shown in Figure 5.

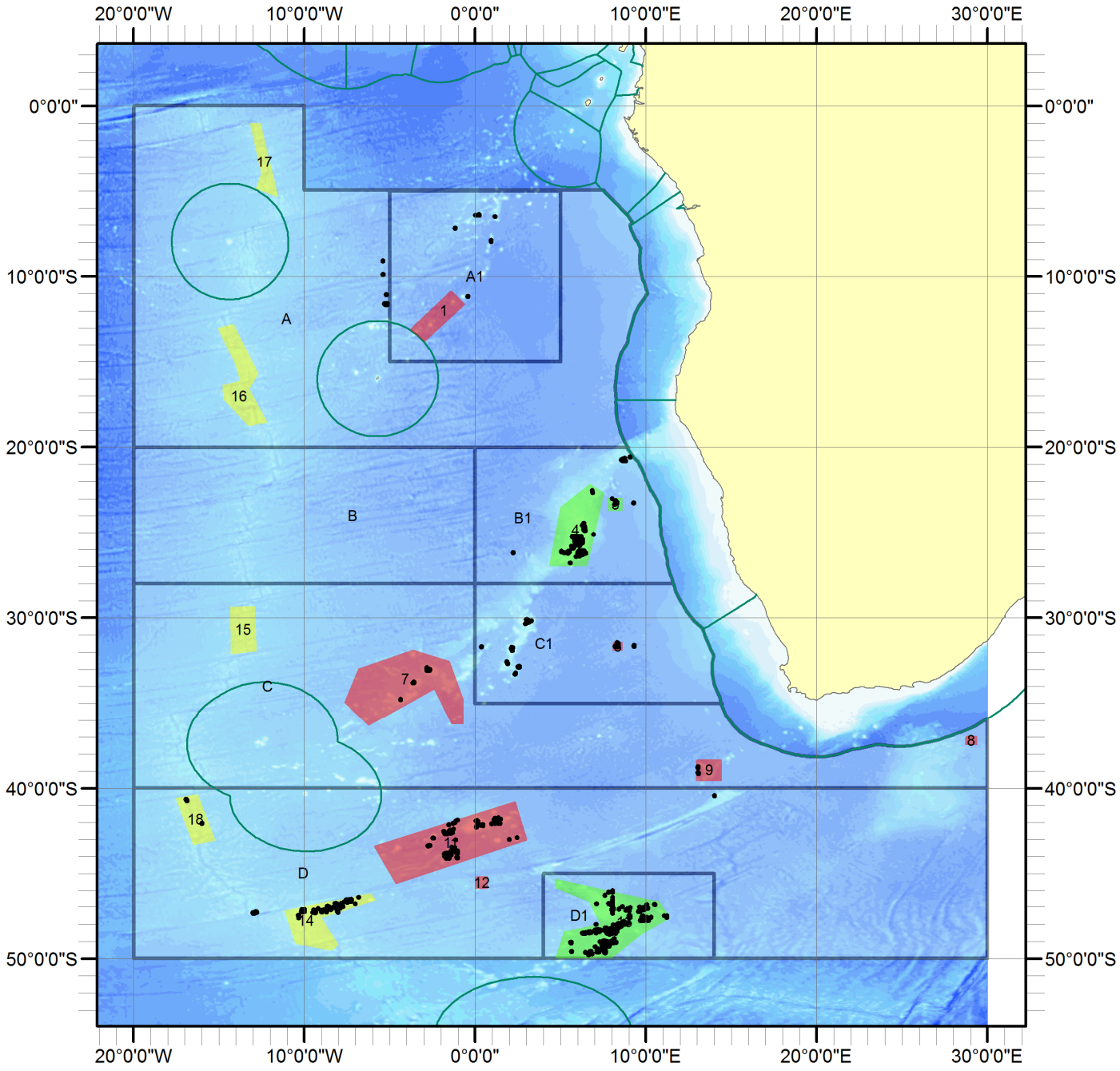

Figure 5. The spatial pattern of fishing (1996-2010 to date) for all CPs excluding data from mid-water trawls overlaid on the revised existing SEAFO closed (red), open (green) and proposed new areas on the MAR (yellow).

Following lengthy discussions the following conclusions were made and constitute recommendations to the FC on revisions to the SEAFO closed areas:

- ⇨ Seamount Area 1 (Unnamed): considered to be unexploited. Recommendation: Closed.

- ⇨ Seamount Area 3 (Ewing): considered to be slightly exploited. Recommendation: Open.
- ⇨ Seamount Area 4 (Valdivia Bank): considered to be already exploited. Recommendation: Open.
- ⇨ Seamount Area 6 (Vema): considered to be slightly exploited. Recommendation: Closed.
- ⇨ Seamount Area 7 (Wüst): considered to be slightly exploited. Recommendation: Closed.
- ⇨ Seamount Area 8 (Africana): considered to be unexploited. Recommendation: Closed.
- ⇨ Seamount Area 9 (Schmitt-Ott): considered to be slightly exploited. Recommendation: Closed.
- ⇨ Seamount Area 11 (Discovery, Junov & Shannon): considered to be already exploited. **Vote between CP coordinators requested.** Recommendation: Open.
- ⇨ Seamount Area 12 (Schwabenland & Herdman): considered to be unexploited. Recommendation: Closed.
- ⇨ Seamount Area 13 (Zulu, Xhosa, Mertz, Swazi & Hintsa): considered to be already exploited. Recommendation: Open.
- ⇨ Seamount Area 14 (Unnamed): considered to be already exploited in the northern part, but unexploited in the southern part. Recommendation: Northern part open; southern part **majority** view closed, **minority** view open.
- ⇨ Seamount Area 15 (Unnamed): considered to be unexploited. Recommendation: Closed.
- ⇨ Seamount Area 16 (Kreps): considered to be unexploited. Recommendation: Closed.
- ⇨ Seamount Area 17 (Unnamed): considered to be unexploited. Recommendation: Closed.
- ⇨ Seamount Area 18 (Unnamed): considered to be slightly exploited. Recommendation: **Majority** view closed, **minority** view open.

Regarding the record of VME indicator species (presence of Gorgonacea – mostly branch corals) found in the western area of Division D on a seamount (47°S 8°W), this was located in the northern part of seamount area 14 which is now recommended to be opened to fishing.

The suggested closed areas are shown in Figure 6 below.

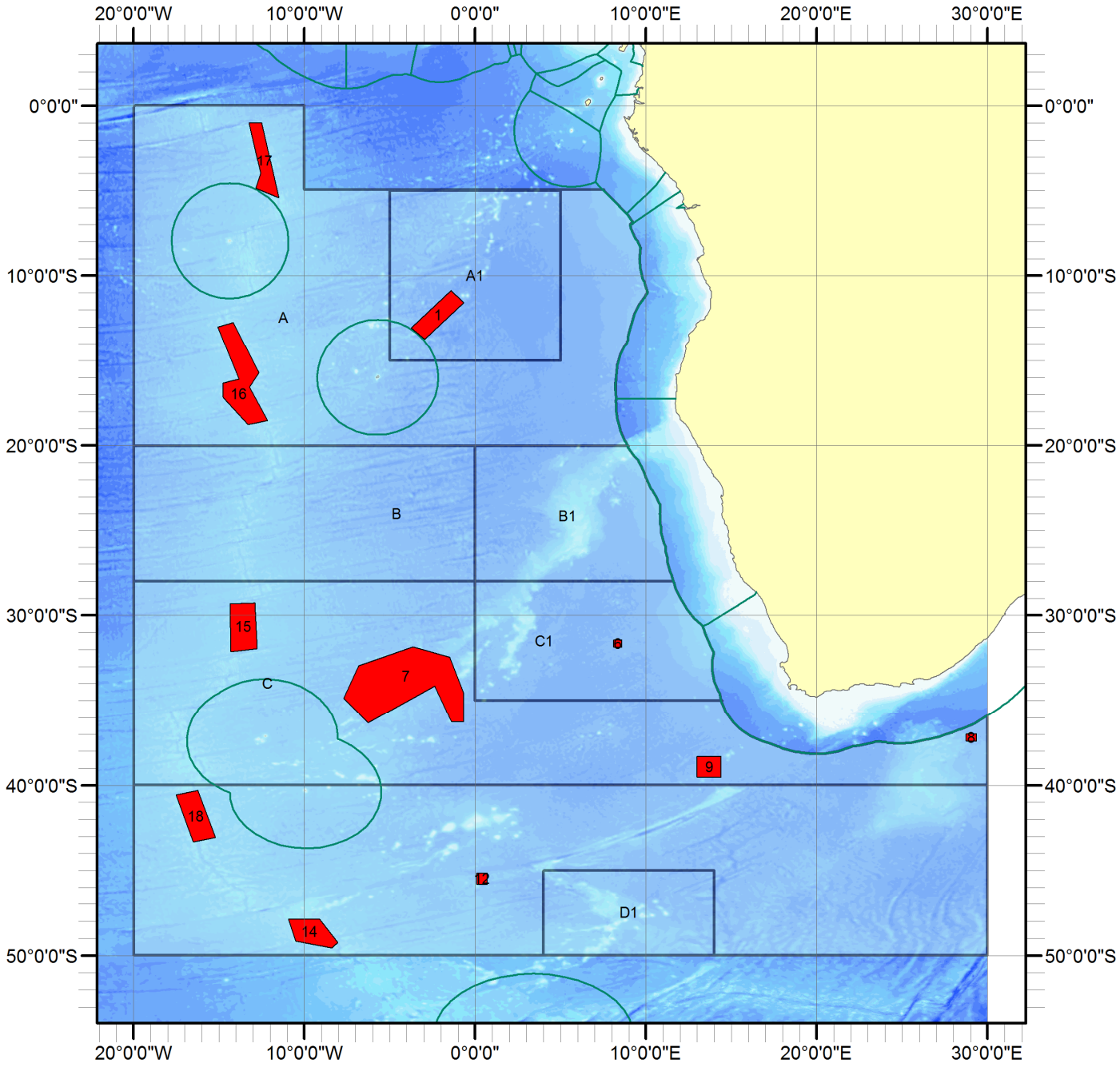

Figure 6. Map of the recommended closed areas.

SC reviewed the CM 06/06 and suggests the following revisions. SC could not arrive at consensus on some aspects and these are described below in the CM text.

The Parties to the SEAFO Convention:

RECOGNISING the need to adopt mechanisms to protect vulnerable deep water habitats and ecosystems in the South East Atlantic Ocean;

TAKING INTO ACCOUNT the FAO Code of Conduct for Responsible Fishing and the need to

respect the biological resources and their environment as well as the interests of consumers and other users;

CONSISTENT with the 1995 UN Fish Stocks Agreement, in particular the provisions requiring the application of the precautionary approach and the protection of biodiversity in the marine environment;

RECALLING the Ministerial Declaration of the Conference on the Governance of High Seas Fisheries and the UN Fish Agreement of May 2005 and the emphasis laid on the need to address gaps in the conservation and sustainable use of marine biodiversity and sensitive marine ecosystems;

ACKNOWLEDGING that the recovery from damage to vulnerable habitats produced by fishing gear is either impossible or very difficult and slow;

TAKING NOTE of the advice provided by the Scientific Committee as regards the areas of vulnerable habitats and ecosystems;

CONSIDERING that it is important to ensure that seamounts which had not been exploited to date or had been slightly exploited, should be protected from any new fisheries until the necessary scientific information has been collected in order to permit an assessment of the areas concerned.

Have agreed as follows:

1. All fishing activities for fisheries resources covered by the SEAFO Convention hall be prohibited from 1 January 2011 to ? in the areas defined in Annex 1 of this CM.

2. In 2007, FC requested the SC to recommend areas that could be fished within each closed area. SC replied that given the lack of information available on the spatial distribution of vulnerable habitats, it would be inappropriate to recommend areas that could be opened to fishing. FC endorsed the SC view that mapping be a condition for the resumption of fishing. This remains the view of the SC in 2010.

3. SC could not arrive at a consensus as to whether experimental fishing should be allowed in the SEAFO closed areas. A majority view and a minority view are expressed below:

   The **majority** view was as follows: Fishing, even of an exploratory nature, should not be allowed until mapping work has been carried out and the results analysed and presented to SC for scrutiny. This multi-beam and seismic mapping work should be augmented by other non-destructive methods such as grabs, quantitative image-based sampling systems (ROV) surveys etc.

   A **minority** view expressed was: Commercial fishing should not be allowed until mapping work has been carried out and the results analysed and presented to SC for scrutiny. VME information can be obtained by non-destructive methods such as multi-beam sonar, grabs and quantitative image-based sampling systems (ROV). In case of the experimental bottom longline fishing, such information can be obtained through the operation by protecting VMEs by following the rule (i.e., keeping 2 miles away from the points a VME is found).

4. The measures provided in the above paragraphs shall be reviewed in ? by the Commission, based on the advice of the Scientific Committee, and a decision shall be taken on future management, which may include the extension of the application of these measures for an additional period or making the closure(s) permanent.

The coordinates for the suggested new closed areas are given in Annex VI.

9. Review Conservation Measure 17/09: on Bottom Fishing Activities in the SEAFO Convention and progress made by the Secretariat in developing a fishing footprint for the SEAFO area (includes reviewing CCAMLR and other relevant VME threshold and encounter protocols)

This work was ongoing from SSC and for clarity the introductory from the SSC report is repeated here.

Fishing Footprint

Last year the Commission agreed to develop a fishing footprint in compliance with Conservation Measure 17/09. The Commission agreed the format that CPs and FPs should report to the Secretariat on the basis of digital catch position data (hauling position in decimal latitude/longitude to the nearest minute) for individual hauls/sets for the period 1987-2007. Each haul/set record should also include gear type (bottom longline, bottom trawl, traps etc) and date. The criteria for the establishment of the footprint will be if an area that has been fished in two consecutive years during the period 1987-2007. Such information should be provided by the Contracting Parties and fishing nations by 1 March 2010.

After the meeting SC identified an error in the above criteria in that two consecutive years during the period 1987-2007 had been specified instead of just any two years during this period. This was notified to the Secretariat and the Secretariat informed the chair of FC.

SC reviewed the information received from CPs and this is summarized below.

Norway

Catch data was provided by gear and species for the 1997, 1998 & 2000. Catch position data were not provided and all catches were allocated to FAO Area 47 – SE Atlantic.

Japan

The data provided comprised VMS data including lat-long, speed of vessel, gear and name of vessel for the period 2003-2007. From the vessel speed information supplied this appears to be raw VMS data as speeds up 11 knots were recorded.

European Union (EU)

EU (Spain)

Information consistent with the Commission's request was received for the period 1996-2007.

EU (Portugal)

SC received data from Portugal for the period 2000-2010 during the course of the SC meeting but these data only comprised VMS data including lat-long, date, time and name of vessel. No vessel speeds were included but the data included steaming positions.

Namibia

Information consistent with the Commission's request was provided and this comprised Skipper logbook data from the bottom trawl orange roughy fishery in the SEAFO CA for the period 1999-2004.

Developing the footprint

Given that some of the data provided to the Secretariat was not in the format requested by the Commission and that some CPs and NCPs did not make any data available, SC proceeded to develop a fishing footprint using the criteria defined by FC and the CP data supplied in the requested format. The data used were those supplied in the format requested by FC, namely those for EU (Spain) and Namibia. SC emphasises that these data do not constitute all the data needed to develop an accurate and final footprint.

The FC did not specify the cell size to be used in the footprint exercise. To explore this SC has investigated the use of two cell sizes: 10' x 10' (10 x 10 nautical miles) and 1° x 1° (60 x 60 nautical miles).

The fishing footprint developed using available data fitting the Commission criteria and a cell size of 10' x 10' plotted against the bottom bathymetry data supplied by NOC is shown in Figure 7. Cells fished in two years or more in the period 1987-2007 are shown to be mostly distributed either on or adjacent to seamounts (see insert in showing Valdivia Bank & Ewing seamount in Sub-division B1).

Using this magnitude of cell size the footprint cells represent a very small proportion (approximately 0.05%) of the overall CA.

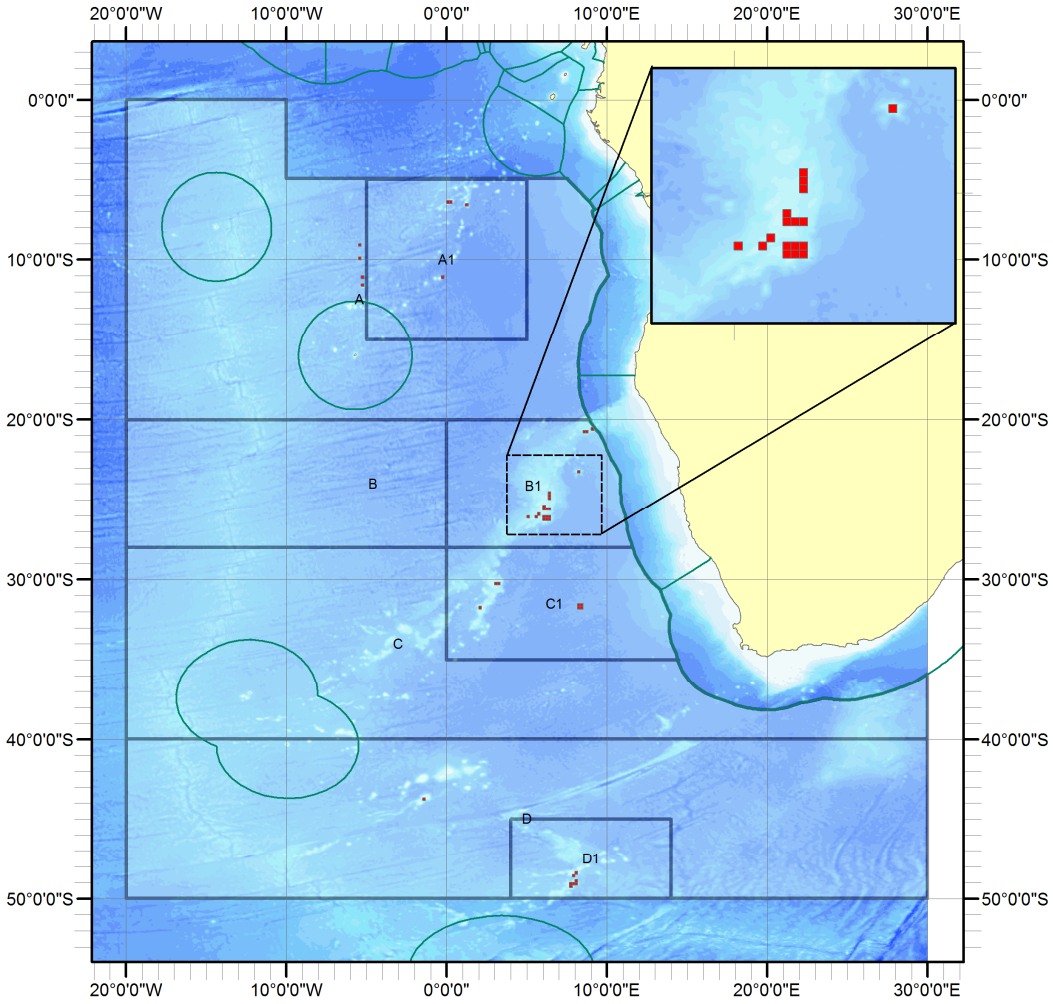

Figure 7 - Footprint developed using available data matching the Commission criteria and a cell size of 10' x 10'. The bottom bathymetry data is that supplied by NOC.

The fishing footprint developed using available data matching the Commission criteria and a cell size of 1° x 1° is shown in Figure 8.

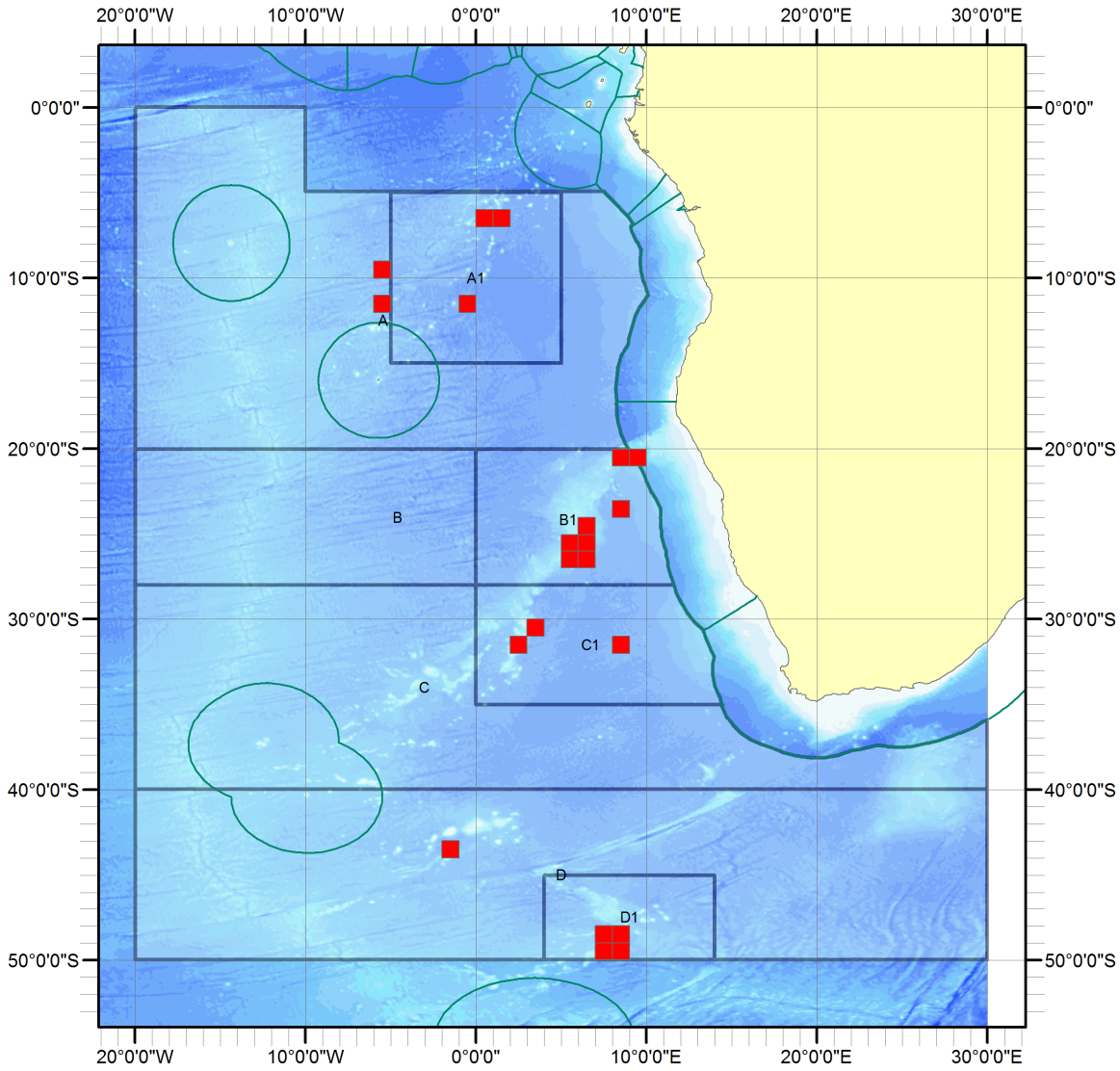

Figure 8 - Footprint developed using available data fitting the Commission criteria and a cell size of 1° x 1°.

Using this magnitude of cell size the footprint cells are clearly conspicuous but still only account for a small proportion (approximately 1%) of the overall CA.

SC considers that the choice of cell size is a FC competence.

A **minority** view was expressed regarding the accuracy and reliability of the bathymetry data used in Figures 7 and 8).

Further exploratory footprint exercise

As a further exploratory exercise, SC developed an additional footprint without any year restriction i.e. including all catch haul data available for the period 1987-2007. The haul-frequency data in each of the above cell sizes were categorized as follows:

- ⇨ One haul/set
- ⇨ 2-30 hauls/sets
- ⇨ >30 hauls/sets

The choice of these frequency intervals was taken for presentational purposes only and should not be interpreted as a qualitative interpretation of the level of fishing activity.

The resulting maps using the two magnitudes of cell size are shown in Figures 9 and 10.

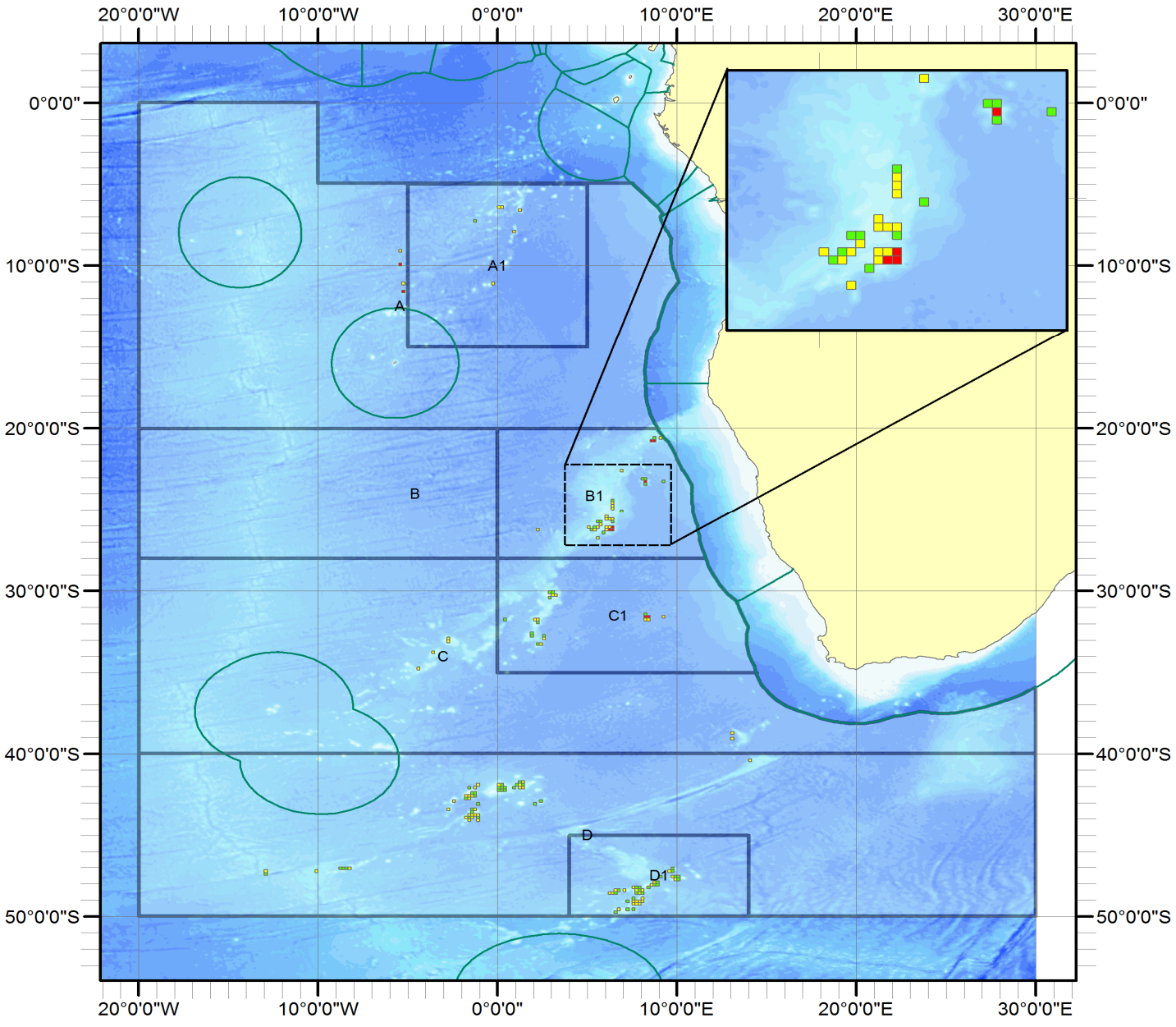

Figure 9. Exploratory footprint using a 10' x 10' cell size and applying the haul frequency criteria (1 haul/set (green), 2-30 (yellow) & >30 (red) haul/sets) to all available catch haul data available for the period 1987-2007.

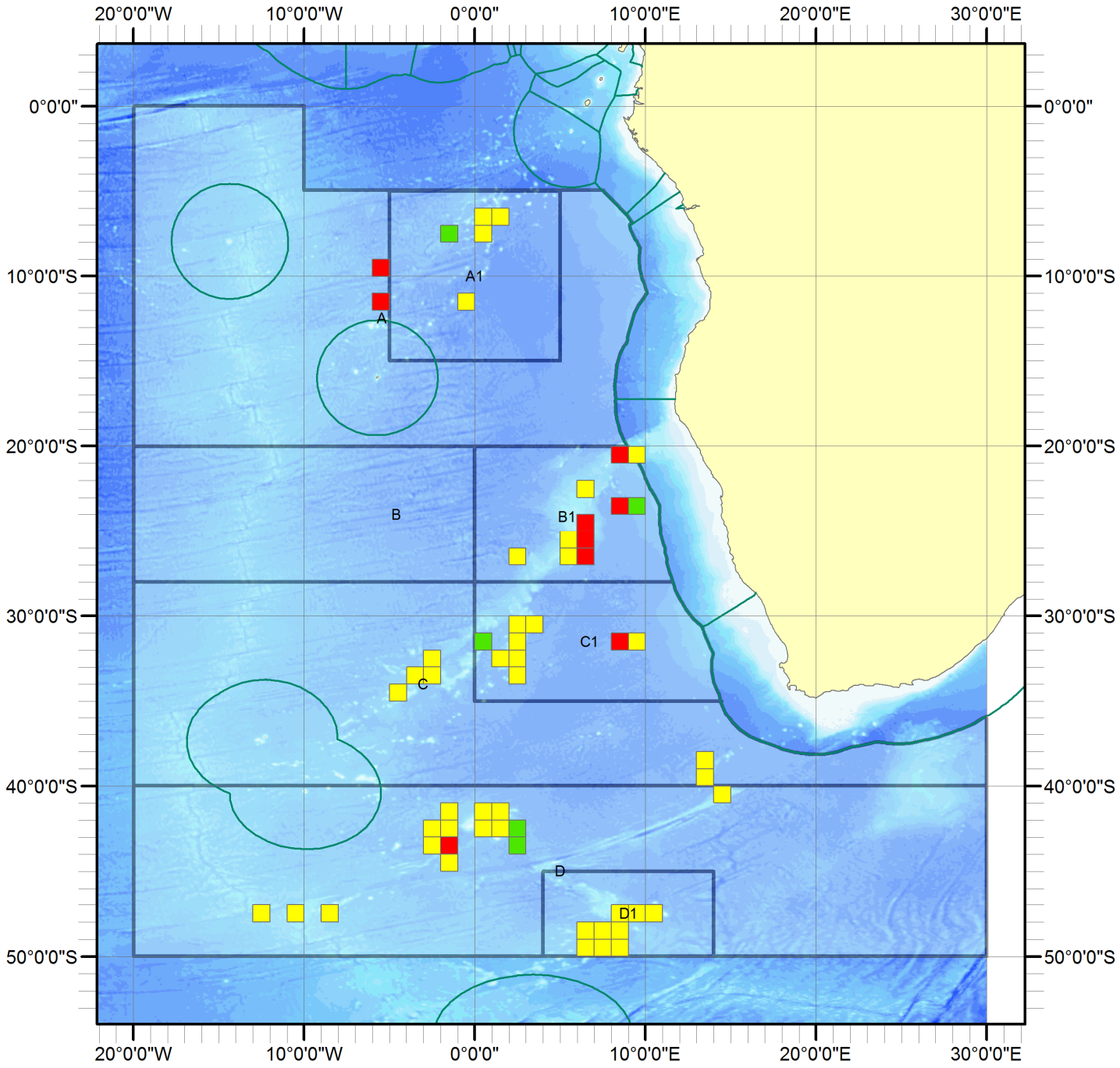

Figure 10. Exploratory footprint using a 1° x 1° cell size and applying the haul frequency criteria (1 haul/set (green), 2-30 (yellow) & >30 (red) haul/sets) to all available catch haul data available for the period 1987-2007.

Reviewing CCAMLR and other relevant VME threshold and encounter protocols

SC attempted to complete this ToR but even by working into the evenings of the final two days and extending the meeting into Saturday morning was unable to finish this work.

10. Review Conservation Measure 16/09: on Total Allowable Catches and related conditions for Patagonian toothfish, orange roughy, alfonsino and deep-sea red crab.

Patagonian toothfish

In attempting to review the TAC for toothfish, SC could not arrive at a consensus. A majority view and the minority view are expressed below:

The **majority** view of the SC was as follows:

As in previous years and in accordance with FC practice, SC took into account the state of toothfish in areas where this resource is likely to be shared with SEAFO. The CCAMLR Scientific Committee in 2009 noted that in most years since 2003 the main species caught in CCAMLR sub-area 48.6 (adjacent to and directly south of SEAFO Division D) is *D. eleginoides* which is the same species in the SEAFO. The distribution of this species is driven by the sub-Antarctic front which extends into the SEAFO area. Whilst there is no information available from tagging experiments it is reasonable to assume that this species is a transboundary species between SEAFO and CCAMLR region 48.6. Additionally, information from the CCAMLR Secretariat suggests that toothfish in the SEAFO area may be a shared resource with CCAMLR sub-area 58.7 (adjacent to and to the east of SEAFO Division D).

This year new information was available from Japanese trot and South Korean Spanish Parallel vessels fishing for toothfish in SEAFO Division D. This comprised nominal and standardized LPUE indices for the trot (2003-2009) and parallel longlines (2005-2009). The standardized indices are considered to be the most scientifically informative as they attempt to adjust for spatial, temporal and depth effects. The indices are shown in Figure 14 of the SSC Report. The ANOVA results for the standardization (Table 8 & 9 in the SSC Report) indicate that only the trot index has a significant year effect reflecting the observed increasing trend in LPUE. The ANOVA for the parallel longline index did not a significant year effect.

A concern, however, is that both standardization procedures only explain 10-12% of the observed variation in LPUE. This indicates that other unknown factors not included in the standardization model are impacting on LPUE. Such factors could include:

- Recruitment
- Increased fishing knowledge of the area (associated with increases in skipper ability) resulting in higher effort expended in areas with a higher density of toothfish.
- Environmental effects which may for example impact on increased immigration of toothfish in the area (bearing in mind Division D is the northern limit of the distribution for this species).
- There may be sequential depletion of areas of higher densities of toothfish at a spatial scale higher than the resolution of the area effect included in the standardization procedure.

From both analyses there is no evidence of a declining trend in abundance. However, there remains considerable uncertainty as to the factors responsible for the unexplained variation in LPUE. The confidence

limits about the standardized LPUE indices are extremely wide, a further indication of the poor fit of the standardization.

The CCAMLR Secretariat forwarded the relevant conservation measures currently enforced. The annual TAC for *Dissostichus* spp. in Sub-area 48.6, as in recent years, is currently set at a "precautionary catch limit" of 200 tonnes north of 60°S and 200 tonnes south of 60°S. A precautionary TAC is set because an assessment is not available for this fishery in Sub-area 48.6. The part of the CCAMLR CA in Sub-area 58.7 continues to be closed to fishing for toothfish.

The abundance index for the trot gear although was considered by SC to be unsuitable as a basis for scientific advice because of the poor fit of the model, the high level of unexplained variation and a lack of information as to the cause of the observed increase in trend in LPUE. Notwithstanding SC recognized that there was no evidence of declining abundance.

In considering the TAC for toothfish in the SEAFO CA, SC therefore took account of the precautionary approach and specifically the precautionary TAC in the northern component of CCAMLR sub-area 48.6. The current CCAMLR TAC for this area is 200 tonnes and SC recommends that, in the absence of reliable information on stock status and the level of fishing mortality, if FC is minded to apply the precautionary approach, SC recommends that a precautionary catch limit of 200 tonnes be maintained in the SEAFO CA for 2011 and 2012.

A **minority** view was:

SC suggests to resume TAC (2011-2012) to 260 t (the 2008-2009 level) for 2 reasons: (a) the 2009 FC and the Performance review mentioned that there are no clear scientific evidence to decrease to 200 t from 260 t by just applying the CCAMLR TAC situation (*) and (b) new information on both nominal and standardized CPUE of trot and parallel bottom longline (2003-2009) in the SEAFO CA show no decreasing trends (see Figures 10 and 14 in SSC Report).

(*) Reasons of no clear scientific evidences:

- There are NO clear scientific evidences to apply the CCAMLR situation to the SEAFO because SEAFO and CCAMLR48.6 have different and independent ecosystems.

- Most fishing grounds in CCAMLR 48.6 and SEAFO are geographically far away, thus each TAC should be considered independently and separately.

- The major reason of the TAC reduction in SEAFO was because of the TAC reduction in the CCAMLR48.6 from 455 t to 200 t. (CCAMLR Fishery reports on subarea 48.6). However, in the reports, there are no clear scientific evidences (no stock assessment results).

- One other reason of the reduction of the TAC in the CCAMLR48.6 was due to large amount of the catch by many IUU vessels. This situation is not in the same in the SEAFO CA.

- Under such situation, there are NO clear scientific evidences to apply the CCAMLR situation to the SEAFO. Thus we should not apply the CCAMLR TAC to the SEAFO.

In general, to decide the TAC, as a first step, we should look at available information in the SEAFO. In 2010, the new information is available, i.e. both nominal and standardized CPUE of trot and parallel bottom longline

(2003-2009). Pros and cons on these indices are well described in the majority statement. Such situation is frequently and commonly observed in any RFMOs. If RFMOs wait for the perfect indices, they cannot do any assessments and implement managements.

In this case, we have the same situation, but no CPUE trends show any decreasing trends at all. The majority statement also recognizes this point. In this connection, even if improved indices were obtained, there were no doubts that they will show no decreasing trends based on various CPUE studies in many RFMOs.

In the past SC referred to the commercial LPUE of orange roughy (available information) to evaluate its TAC. This is the essential and right way to evaluate TAC. Relating to this, we have serious concerns because the SC (majority) did not use commercial LPUE of Patagonian toothfish but used for LPUE of orange roughy TAC. This shows the inconsistent attitudes of the SC.

Under such circumstances, we have serious concerns to substitute the CCAMLR TAC situation to the SEAFO TAC as explained above. If this approach continues, credibility of the SC will further decrease.

Deep-sea Red Crab

For deep-sea red crab (noting that this is a different species to that found in the Angolan-Namibian EEZ) in previous years, in the absence of information on stock status and levels of fishing mortality, TACs have been set on the basis of average catches over three most recent years.

In 2007 the average catch over the years 2005-2007 was 397 tonnes and SC in 2007 agreed to recommend precautionary catch limits in 2008 and 2009 of 200 tonnes in Sub-division B1 and 200 tonnes (i.e. total of 400 tonnes) in the remainder of the SEAFO CA. The rationale behind this was to maintain average catch levels but to ensure they were distributed throughout the SEAFO CA thereby minimizing the potential for localized depletion. Another reason was also to encourage data collection in other areas.

In 2008, SC carried out the same exercise based on average catches which gave an average catch over the three most recent years of 408 tonnes (landings data for 2008 were not available so the same year range was used as in 2007 but with the inclusion of a small additional reported landings). SC commented that there was no evidence to suggest that this species was depleted and recommended that the precautionary catch limits be maintained until such time that additional information became available.

In 2009, there was a revision of the Japanese landings for 2007 from 513 t to 770 t. Taking an average of the landings for the three most recent years this gave an average catch of 326 tonnes. SC again in the absence of information on the size of the resource and fishing mortality recommended that the precautionary catch limits be maintained in 2010 and 2011 until such time as when additional information becomes available.

This year, SC remains in the position where there is an absence of information on the status of stock(s) and the level of fishing mortality. This species is recognized by SEAFO to be relatively slow-growing, sporadically aggregating and has a high vulnerability to fishing (Table 11 in SSC Report). A further concern is the lack of important biological information on the proportion of spawning females in catches as an indicator of whether fisheries are targeting spawning aggregations.

SC therefore recommends continued practice of using precautionary TACs. Taking the average of the last three years' catches (2008-2010) gives an average catch of 145 tonnes. However, as in previous years the averaging procedure has included data for the current year which is incomplete. If this year is excluded the average catch over the three recent years (2007-2009) is 348 tonnes.

SC recommends an annual catch limit of 200 tonnes for Sub-division B1 and 200 tonnes for the remainder of the SEAFO Convention Area for 2011 and 2012. SC notes that the TAC in Sub-division B1 has limited landings at the TAC level. In recent years there has been no fishing for red crab in the remainder of the SEAFO CA.

Orange roughy and alfonsino

For orange roughy and alfonsino, on the basis of experience of deep-water fisheries around the world, SC is of the view that if substantial fisheries develop in the SEAFO CA it is likely that they will be for these species.

Orange roughy:
In 2009 SC commented as follows:
Experience from other orange roughy fisheries around the world (New Zealand, west of Ireland etc) suggests that sustainable catches are of the of order of 2-3% of virgin biomass. Annual landings from the Namibian orange roughy in Sub-Division B1 peaked in 2001 at around 90 t and strongly declined thereafter to very low levels (for clarity presented again in this year's SSC report – Figure 9), which is reflected by available LPUE data. Additionally there is currently a moratorium on fishing for orange roughy in the Namibian EEZ adjacent to Sub-Division B1. The connectivity between the populations supporting these fisheries is unknown, but it is possible that these are from the same stock. Given this, SC recommends a zero catch limit for orange roughy in Sub-Division B1 for 2010 and 2011. In view of the unknown size of any orange roughy populations that may exist in the remainder of the SEAFO CA, SC recommends a precautionary annual catch limit for 2010 and 2011 of 50 tonnes (i.e. around 50% of the maximum annual landings observed in the Sub-division B1 fishery) until such time as when additional information becomes available to identify sustainable fishing levels. This catch limit would prevent a strong increase in activity but permit exploratory fishing.

SC considers that the rationale described above is unchanged. There is no new information available for this species. SC therefore recommends the maintenance of a zero TAC for Sub-division B1 and a TAC of 50 t for the remainder of the SEAFO CA.

Alfonsino:
Alfonsino is not a long-lived, slowing growing species but is vulnerable to fishing because fisheries mostly target aggregations. Experience in the NAFO region suggest that, as with orange roughy, fishing often takes the form of short-term "mining" which can lead to sequential depletion of populations which even for alfonsino may take 15-20 years to recover.

In 2010 the TAC has been taken by a single mid-water trawler but the only information available is a single length frequency distribution of sampled alfonsino from this vessel and spatial catch positions (see Annex III).

SC recommends a precautionary annual catch limit of 200 t for alfonsino in the SEAFO CA for 2010 and 2011 or until additional information becomes available to identify sustainable fishing levels.

A suggested revised text for Conservation Measure 16/09 for consideration by the Commission is given below:-

Conservation Measure ?/10: Fixing catch limits and related conditions for the Patagonian toothfish, red crab, orange roughy and alfonsino fisheries in the SEAFO Convention Area in 2011 and 2012.

The Commission in accordance with the recommendations of the Scientific Committee contained in their 2010 report (paragraphs ….) hereby ……

Patagonian Toothfish
An annual catch limit of **200 or 260** tonnes is fixed for 2011 and 2012 in the SEAFO Convention area.
Each vessel shall report their catch including nil returns by electronic means to the SEAFO secretariat every 5 days of the fishing trip.

Deep-sea red crab
An annual catch limit of 200 tonnes is fixed for Sub Division B1 and 200 tonnes for the remainder of the SEAFO Convention area for 2011 and 2012.

Each vessel shall report their catch, including nil returns, by electronic means, to the SEAFO secretariat every 5 days of the fishing trip.

Orange roughy
An annual catch limit of zero tonnes is fixed for Sub-Division B1 and 50 tonnes for the remainder of the SEAFO CA for 2011 and 2012.

Alfonsino
An annual catch limit of 200 tonnes is fixed for the SEAFO CA in 2011 and 2012.

11. eview progress regarding the development of a SEAFO database. Develop rules of access.

Progress regarding SEAFO Database

Stephanus Voges (NatMIRC) gave a presentation on the status of the SEAFO database (Figure 11) which is now fully operational. Currently separate databases exist for longline, trawl and pots.

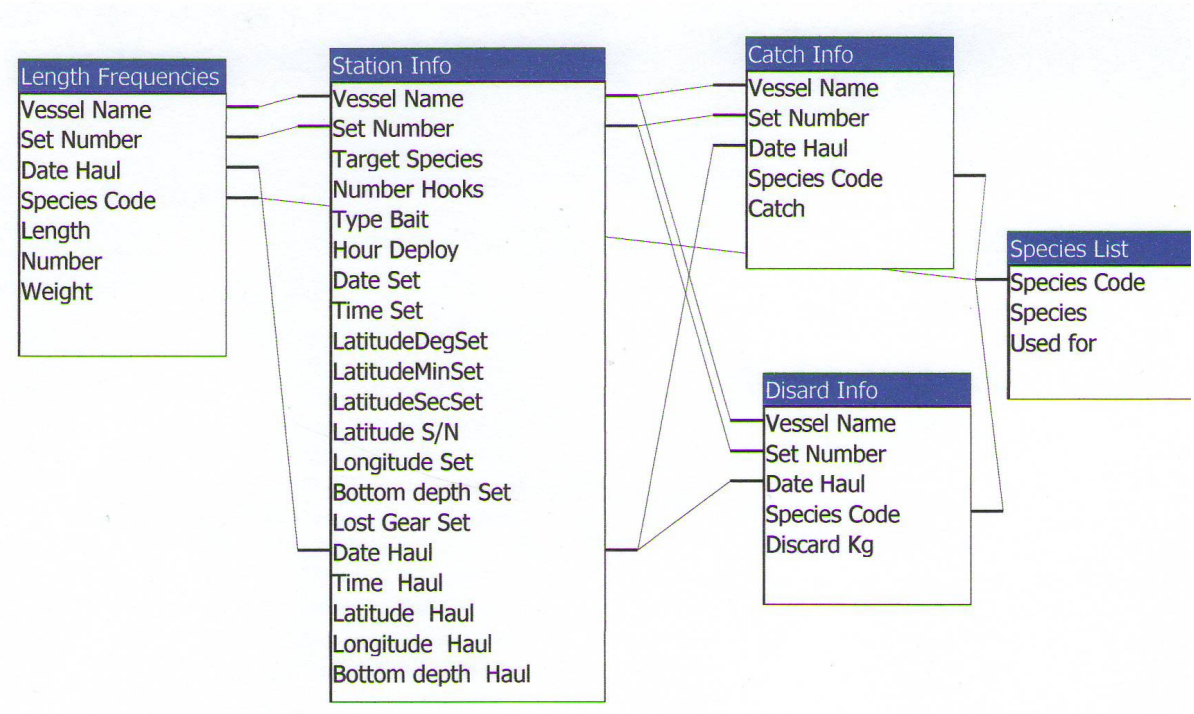

Figure 11. Diagrammatic relationship between the various datasets included in the SEAFO database.

Data stored include those of:

- ⇨ VMS;
- ⇨ Observer forms; and
- ⇨ 5-day Skipper catch reports.

Outstanding data requiring database expansion include those of:

- ⇨ Observer trip reports;
- ⇨ Incidental bycatches;
- ⇨ Discards; and
- ⇨ Historical records.

Outstanding database issues are:

- ⇨ a need to combine separate gear databases into a single database
- ⇨ to develop "required field" protocol
- ⇨ Insert separate fields for unidentified fish, squid sponge, coral, seabirds etc.

It is envisaged that all of the above will be addressed in the coming year with the exception of loading historical data.

Rules of access to the SEAFO database

The SEAFO Commission in its 6TH (2009) meeting took note about the need for SEAFO to have a protocol to manage scientific working documents:

"The Commission approved that the Scientific Committee could continue with compilation of a formal protocol for referencing scientific documents and working papers. The protocol should be tabled and discussed on the next Commission meeting in 2010".

FC commented that this protocol should be a tool to increase the interest of researcher on producing scientific literature in which should be based the scientific advice. This activity would need in some cases access the SEAFO Database to obtain data provided by different sources. In that context, SEAFO needs a protocol to manage the access and use of this data, clarifying which data are or not in the public domain.

SC analyzed different approaches to that matter and decided to proposes to adopt a protocol based on the CCAMLR protocol (see Annex IV).

12. Review outcomes of consultations between SEAFO Secretariat with SEAFO fishing nations regarding the development of maximum limits on the length of fixed gear fleets/sets, soak time and vessel gear capacity.

The Secretariat requested SEAFO Fishing Nations to provide information on what they considered suitable maximum limits on the fleet gear/sets, soak time and vessel gear capacity. Information was received from Japan and EU (Spain) but this comprised actual vessel gear data rather than views on what the maximum limits should be. SC recommends that the Secretariat re-circulate a memo requesting this information.

13. Review progress made by Secretariat in developing the SEAFO website

The Secretariat has made significant progress in developing the SEAFO website and this can be seen by anyone accessing the site, however, SC identified further improvements (listed below):

1. TACs:

    - TACs should have a separate button;
    - One decimal should be used to display catch uptakes;
    - An extra column should be added to indicate the cumulative number of vessels that have fished in the year (i.e. taken and recorded a catch) in the SEAFO CA.

2. Observer forms:

    - Catch forms should be changed to observer forms;
    - Observer forms should have a separate button;
    - Create a link to on the home page to observer forms.

3. Identification guides:

    - Identification guides should have a separate button;
    - Liaise with WWF/Birdlife International to use colour turtle guide.
    - Create a link in the observer forms to the various identification guide;
    - Create a link on the home page to identification guides;
    - Create links to other sites i.e. WWF seabird identification guide.

4. Species information sheets:

    - Species information sheet should have a separate button;
    - Species information sheet should contains (a) FAO Species fact sheet, (b) SEAFO Species profile and (c) SEAFO Marine Resources noting that this is a selective list of species occurring in the SEAFO CA focusing on fish and crustaceans.

5. SEAFO related publications:

    - SEAFO related publications should have a separate button;
    - SEAFO related publications button contains (a) Selective SC working papers and (b) Scientific peer review published papers.

6. Other:

    - Use different colour for the home link buttons;
    - Move basic documents to the section: About SEAFO;
    - Create a members only section under the Scientific Committee section to place the SEAFO database.

14. Co-operation with other organizations/science programs:

The Executive Secretary did not attend any of the following in the last year but gave a brief presentation of outcomes to SEAFO.

- **GESAMP**

SC reviewed the annual report of the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) and supported the initiative of Working Group 35 on deep-water fisheries. However, SC is of the view that much of the information likely to be required by this Working Group is currently available in SEAFO documents on the SEAFO website.

- **CWP**

SC reviewed the report of the 22nd session of the FAO Co-ordinating Working Party on Fisheries Statistics (Feb-Mar 2007). SC is of the opinion that attendance at CWP is of considerable relevance to the SEAFO SC and recommends that funds be made available to facilitate attendance of the Executive Secretary in 2011.

- **FAO Deep Sea Project**

SC understands that funding from FAO is available for the deep-sea project which the Executive Secretary was not able to attend the meeting on the project due to VISA problems.

15. Advice and recommendations to the Commission.

As last year, the SC has identified the responsible entities to take action under each recommendation. These should not be interpreted as instructions, but are provided to facilitate responses and needs in a non-prescriptive manner.

Any minority views are included in their entirety.

Regarding recommendations for TACs, the full advice is repeated for clarity.

1. **SC recommends** an annual catch limit of **200 or 260** tonnes of Paatagonian toothfish in the SEAFO Convention area is fixed for 2011 and 2012. **ACTION : COMMISSION**

In attempting to review the TAC for toothfish, SC could not arrive at a consensus. A majority view and the minority view are expressed below:

The **majority** view of the SC was as follows:

As in previous years and in accordance with FC practice, SC took into account the state of toothfish in areas where this resource is likely to be shared with SEAFO. The CCAMLR Scientific Committee in 2009 noted that in most years since 2003 the main species caught in CCAMLR sub-area 48.6 (adjacent to and directly south of SEAFO Division D) is *D. eleginoides* which is the same species in the SEAFO. The distribution of this species is driven by the sub-Antarctic front which extends into the SEAFO area. Whilst there is no information available from tagging experiments it is reasonable to assume that this species is a transboundary species between SEAFO and CCAMLR region 48.6. Additionally, information from the CCAMLR Secretariat suggests

that toothfish in the SEAFO area may be a shared resource with CCAMLR sub-area 58.7 (adjacent to and to the east of SEAFO Division D).

This year new information was available from Japanese and South Korean vessels fishing for toothfish in SEAFO Division D. This comprised nominal and standardized LPUE indices for the trot (2003-2009) and parallel longlines (2005-2009). The standardized indices are considered to be the most scientifically informative as they attempt to adjust for spatial, temporal and depth effects. The indices are shown in Figure 14 of the 2010 SSC Report. The ANOVA results for the standardization (Table 8 & 9 in the SSC Report) indicate that only the trot index has a significant year effect reflecting the observed increasing trend in LPUE. The ANOVA for the parallel longline index did not a significant year effect.

A concern, however, is that both standardization procedures only explain 10-12% of the observed variation in LPUE. This indicates that other unknown factors not included in the standardization model are impacting on LPUE. Such factors could include:

- Recruitment
- Increased fishing knowledge of the area (associated with increases in skipper ability) resulting in higher effort expended in areas with a higher density of toothfish.
- Environmental effects which may for example impact on increased immigration of toothfish in the area (bearing in mind Division D is the northern limit of the distribution for this species).
- There may be sequential depletion of areas of higher densities of toothfish at a spatial scale higher than the resolution of the area effect included in the standardization procedure.

From both analyses there is no evidence of a declining trend in abundance. However, there remains considerable uncertainty as to the factors responsible for the unexplained variation in LPUE. The confidence limits about the standardized LPUE indices are extremely wide, a further indication of the poor fit of the standardization.

The CCAMLR Secretariat forwarded the relevant conservation measures currently enforced. The annual TAC for *Dissostichus* spp. in Sub-area 48.6, as in recent years, is currently set at a "precautionary catch limit" of 200 tonnes north of 60°S and 200 tonnes south of 60°S. A precautionary TAC is set because an assessment is not available for this fishery in Sub-area 48.6. The part of the CCAMLR CA in Sub-area 58.7 continues to be closed to fishing for toothfish.

The abundance index for the trot gear although was considered by SC to be unsuitable as a basis for scientific advice because of the poor fit of the model, the high level of unexplained variation and a lack of information as to the cause of the observed increase in trend in LPUE. Notwithstanding SC recognized that there was no evidence of declining abundance.

In considering the TAC for toothfish in the SEAFO CA, SC therefore took account of the precautionary approach and specifically the precautionary TAC in the northern component of CCAMLR sub-area 48.6. The current CCAMLR TAC for this area is 200 tonnes and SC recommends that, in the absence of reliable information on stock status and the level of fishing mortality, if FC is minded to apply the precautionary approach, SC recommends that a precautionary catch limit of 200 tonnes be maintained in the SEAFO CA for 2011 and 2012.

A **minority** view was:

SC suggests to resume TAC (2011-2012) to 260 t (the 2008-2009 level) for 2 reasons: (a) the 2009 FC and the Performance review mentioned that there are no clear scientific evidence to decrease to 200 t from 260 t by just applying the CCAMLR TAC situation (*) and (b) new information on both nominal and standardized CPUE of trot and parallel bottom longline (2003-2009) in the SEAFO CA show no decreasing trends (see Figures ? and ? in SSC Report).

(*) Reasons of no clear scientific evidences:

- There are NO clear scientific evidences to apply the CCAMLR situation to the SEAFO because SEAFO and CCAMLR48.6 have different and independent ecosystems.

- Most fishing grounds in CCAMLR 48.6 and SEAFO are geographically far away, thus each TAC should be considered independently and separately.

- The major reason of the TAC reduction in SEFAO was because of the TAC reduction in the CCAMLR48.6 from 455 t to 200 t. (CCAMLR Fishery reports on subarea 48.6). However, in the reports, there are no clear scientific evidences (no stock assessment results).

- One other reason of the reduction of the TAC in the CCAMLR48.6 was due to large amount of the catch by many IUU vessels. This situation is not in the same in the SEAFO CA.

- Under such situation, there are NO clear scientific evidences to apply the CCAMLR situation to the SEAFO. Thus we should not apply the CCAMLR TAC to the SEAFO.

In general, to decide the TAC, as a first step, we should look at available information in the SEAFO. In 2010, the new information is available, i.e. both nominal and standardized CPUE of trot and parallel bottom longline (2003-2009). Pros and cons on these indices are well described in the majority statement. Such situation is frequently and commonly observed in any RFMOs. If RFMOs wait for the perfect indices, they cannot do any assessments and implement managements.

In this case, we have the same situation, but no CPUE trends show any decreasing trends at all. The majority statement also recognizes this point. In this connection, even if improved indices were obtained, there were no doubts that they will show no decreasing trends based on various CPUE studies in many RFMOs.

In the past SC referred to the commercial LPUE of orange roughy (available information) to evaluate its TAC. This is the essential and right way to evaluate TAC. Relating to this, we have serious concerns because the SC (majority) did not use commercial LPUE of Patagonian toothfish but used for LPUE of orange roughy TAC. This shows the inconsistent attitudes of the SC.

Under such circumstances, we have serious concerns to substitute the CCAMLR TAC situation to the SEAFO TAC as explained above. If this approach continues, credibility of the SC will further decrease.

2. **SC recommends** an annual catch limit for deep-water red crab of 200 tonnes for Sub-division B1 and 200 tonnes for the remainder of the SEAFO Convention Area for 2011 and 2012. **ACTION:COMMISSION**

SC recommends the continued practice of using precautionary TACs. Taking the average of the last three years' catches (2008-2010) gives an average catch of 145 tonnes. However, as in previous years the averaging

procedure has included data for the current year which is incomplete. If this year is excluded the average catch over the three recent years (2007-2009) is 348 tonnes.

3. **SC recommends** the maintenance of a zero TAC for orange roughy in Sub-division B1 and a TAC of 50 t for the remainder of the SEAFO CA. **ACTION:COMMISSION**

There is no new information available for this species so SC repeats the advice given in 2009.

Experience from other orange roughy fisheries around the world (New Zealand, west of Ireland etc) suggests that sustainable catches are of the of order of 2-3% of virgin biomass. Annual landings from the Namibian orange roughy in Sub-Division B1 peaked in 2001 at around 90 t and strongly declined thereafter to very low levels (see Figure 9 in the SCC Report), which is reflected by available LPUE data. Additionally there is currently a moratorium on fishing for orange roughy in the Namibian EEZ adjacent to Sub-Division B1. The connectivity between the populations supporting these fisheries is unknown, but it is possible that these are from the same stock. Given this, SC recommends a zero catch limit for orange roughy in Sub-Division B1 for 2010 and 2011. In view of the unknown size of any orange roughy populations that may exist in the remainder of the SEAFO CA, SC recommends a precautionary annual catch limit for 2010 and 2011 of 50 tonnes (i.e. around 50% of the maximum annual landings observed in the Sub-division B1 fishery) until such time as when additional information becomes available to identify sustainable fishing levels. This catch limit would prevent a strong increase in activity but permit exploratory fishing.

4. SC recommends a precautionary annual catch limit of 200 t for alfonsino in the SEAFO CA for 2010 and 2011 or until additional information becomes available to identify sustainable fishing levels. **ACTION: COMMISSION.**

Alfonsino is not a long-lived, slowing growing species but is vulnerable to fishing because fisheries mostly target aggregations. Experience in the NAFO region suggest that, as with orange roughy, fishing often takes the form of short-term "mining" which can lead to sequential depletion of populations which even for alfonsino may take 15-20 years to recover. In 2010 the TAC has been taken by a single mid-water trawler but the only information available is a single length frequency distribution of sampled alfonsino from this vessel and spatial catch positions.

5. **SC recommends** that that the seamount closed areas in the SEAFO CA be revised as described in Figure 6 **ACTION COMMISSION**

6. **SC recommends** that, in advance of all future meetings, the Secretariat revise all landings tables, develop new tables for species not previously tabulated and include incidental bycatch and discard data in all tables. **ACTION: SECRETARIAT**

7. SC recommends that SSC be dissolved as attendance at this WG has gradually diminished. It has largely fulfilled its role and there will be significant cost savings for the Secretariat. **ACTION: SC/COMMISSION**

8. SC recommends that an ID guide for fish, crustaceans, incidental bycatch species such as seabirds and cetaceans (a turtle guide is already in use) be developed. SC considers that the hiring of consultant to prepare such a guide would be the best way forward, possibly working in conjunction with Birdlife International who already has a seabird guide available. **ACTION:COMMISSION**

9. **SC recommends (majorit**y) that the Chair of SC should be a member of any future Performance Review Panel so that queries regarding the scientific work of SC can be dealt with efficiently. **ACTION:COMMISSION**

10. **SC recommends** that any future Panel should include a scientist working actively in the field of data-poor deep-water assessments and deep-water ecosystem studies.
ACTION:COMMISSION

11. SC recommends a comprehensive list of species found in commercial and research catches in the SEAFO CA be developed. **ACTION:SC**

12. **SC recommends** that the Secretariat explore with NAFO and NEAFC the protocols used for excluding VMS signals when vessels are steaming and to trial suitable methodologies in the SEAFO CA.
ACTION: SECRETARIAT

13. SC recommends that the species profile template developed for toothfish should be adopted for all species profiles. **ACTION:SECRETARIAT**

14. **SC recommends** that Scientific Coordinators should ensure that all catches sampled for length are raised to the total catch of that trip, raising by division and/or sub-division initially if the vessel has fished in more than one area. **ACTION:SC**

15. SC recommends that the protocol described under the ToR s in the SSC Report be adopted for referencing Working Documents. **ACTION:FISHERIES COMMISSION**

16. SC recommends that a series of Working Documents be initiated commencing with documents submitted in 2010 adopting the following referencing format [i.e. Scientific Committee Working Document: SEAFO SCW Doc 01/YYYY]. **ACTION:SECRETARIAT**

17. **SC recommends** that SC should review Working documents and select those suitable to be placed on the public part of the SEAFO website by the Secretariat. **ACTION:SC and SECRETARIAT**

18. **SC recommends** that the Secretariat forward a copy of the NOC report and data to the MARECO South Atlantic coordinator. **ACTION:SECRETARIAT**

19. **SC recommends** that Secrearіat explores the possibility of accessing and uploading historical VMS data for NEAFC vessels fishing in the SEAFO CA. **ACTION:SECRETARIAT**

20. **SC recommends** a more formal work arrangement be put in place to address the development and maintenance of the SEAFO database. SC recommends that funds be made available to pay for database related work including data input. **ACTION:COMMISSION**

21. **SC recommends** that the Secretariat combines the existing SEAFO Observer forms into an excel workbook template. This template will be supplied to all sea-going observers for use at sea. **ACTION:SECRETARIAT**

22. **SC recommends** that the Secretariat solicit the views of CPs on the suitable maximum limits for the total length of fixed gear fleet gear/sets, soak time and vessel gear capacity. .
ACTION:SECRETARIAT

23. SC recommends that funds be made available to facilitate the attendance of the Executive Secretary CWP in 2011.
ACTION:COMMISSION

24. **SC recommends** that observers be reminded to include maturity data for deep-water crabs on observer sampling sheets. **ACTION:SECRETARIAT**

25. **SC recommends** that all CPs be requested to provide the Secretariat with all available historical catch and effort data subject to approval by the data owner. **ACTION:COMMISSION**

26. **SC recommends** that stock **assessments be carried out only using tried and tested assessment packages and programs.** **ACTION:SC**

27. **SC recommends** that the rules relating to decision making in the SC including the election of Chair and Vice-chair be reviewed. **ACTION:COMMISSION**

28. SC recommends that available catch and effort data be used to develop abundance indices for red crab.
ACTION: SC

16. Election of new Chair of SC

An election was carried out but the outcome is yet to be confirmed by the Commission.

17. Future work program

SC suggests that future work should include Precautionary harvest control rules in relation to abundance indices and EAF issues.

18. Budget for 2011

SC had insufficient time to address this ToR

19. Any other matters

19.1 Meeting protocol adopted in 2010

Due to extensive discussions in SSC two important ToRs had to be carried forward to SC. SC extended the normal working day to 1800 hrs and considerably beyond on Thursday and Friday, but nevertheless had to reconvene on Saturday morning at 0800 hrs to address outstanding ToRs. The numbers attending were seven plus the Chair and the Executive Secretary and following advice from the Executive Secretary it was agreed that the meeting be reconvened.

20. Adoption of the report
The report was presented and adopted by the meeting.

21. Date and place of the next meeting
Assuming that there will be no future meetings of SSC, SC proposes an SC meeting in 2011 but to not set a date and await the agreed date for the 2011 Commission meeting. SC expressed the view that scientific meetings immediately precede the Annual Commission meeting, as in this and previous years. SC expressed the view that if the Annual Commission meeting in 2011 is in Namibia, SC would wish to convene in Windhoek.

SC is of the view that if a single scientific meeting takes place next year it should be 7-8 days long.

22. Closure of meeting
On Saturday 9th October at 1300 hrs the Chairperson declared the closure of the meeting after all items had been concluded. In his closing remarks, the Chair expressed his satisfaction for the work accomplished and thanked all participants for their valuable contributions.

ANNEX I

Agenda for the 6th Annual Meeting of the SEAFO Scientific Committee

Venue: Arebbusch Lodge, Windhoek

1. Opening and welcome remarks by the Chairperson, Mr. Phil Large
2. Adoption of the agenda and arrangements
3. Appointment of rapporteur
4. Introduction of observers
5. Introduction of participants
6. Review the outcomes of the Performance Review Panel relevant to SC
7. Report by the Chair of the Scientific Sub-Committee and comments by SC
8. Review Conservation Measures 06/06 on the "Management of vulnerable deep-water habitats and ecosystems in the SEAFO Convention Area" taking into account the outcomes from the NOCS contract and the results from any other analyses arising.
9. Review Conservation Measure 17/09: on Bottom Fishing Activities in the SEAFO Convention and progress made by the Secretariat in developing a fishing footprint for the SEAFO area (includes reviewing CCAMLR and other relevant VME threshold and encounter protocols)
10. Review of Conservation Measure 16/09: on Total Allowable Catches and related conditions for Patagonian toothfish, orange roughy, alfonsino and deep-sea red crab.
11. Review progress regarding the development of a SEAFO database for SEAFO data. Develop rules of access to the SEAFO database.
12. Review outcomes of consultations between SEAFO Secretariat with SEAFO fishing nations regarding the development of maximum limits on the length of fixed gear fleets/sets, soak time and vessel gear capacity.
13. Review progress made by the Secretariat in developing the SEAFO website.
14. Co-operation with other organisations/science programmes
    - GESAMP
    - CWP
    - FAO Deep-sea Project
15. Advice and recommendations to the Commission
16. Election of new Chair of SC
17. Future work program
18. Budget for 2011
19. Any other matters
    19.1 Meeting protocol adopted in 2010
20. Adoption of the report
21. Date and place of the next meeting

Closure of the meeting

Annex II

List of Participants to the 6th Annual Meeting of SEAFO Scientific Committee

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Annex III

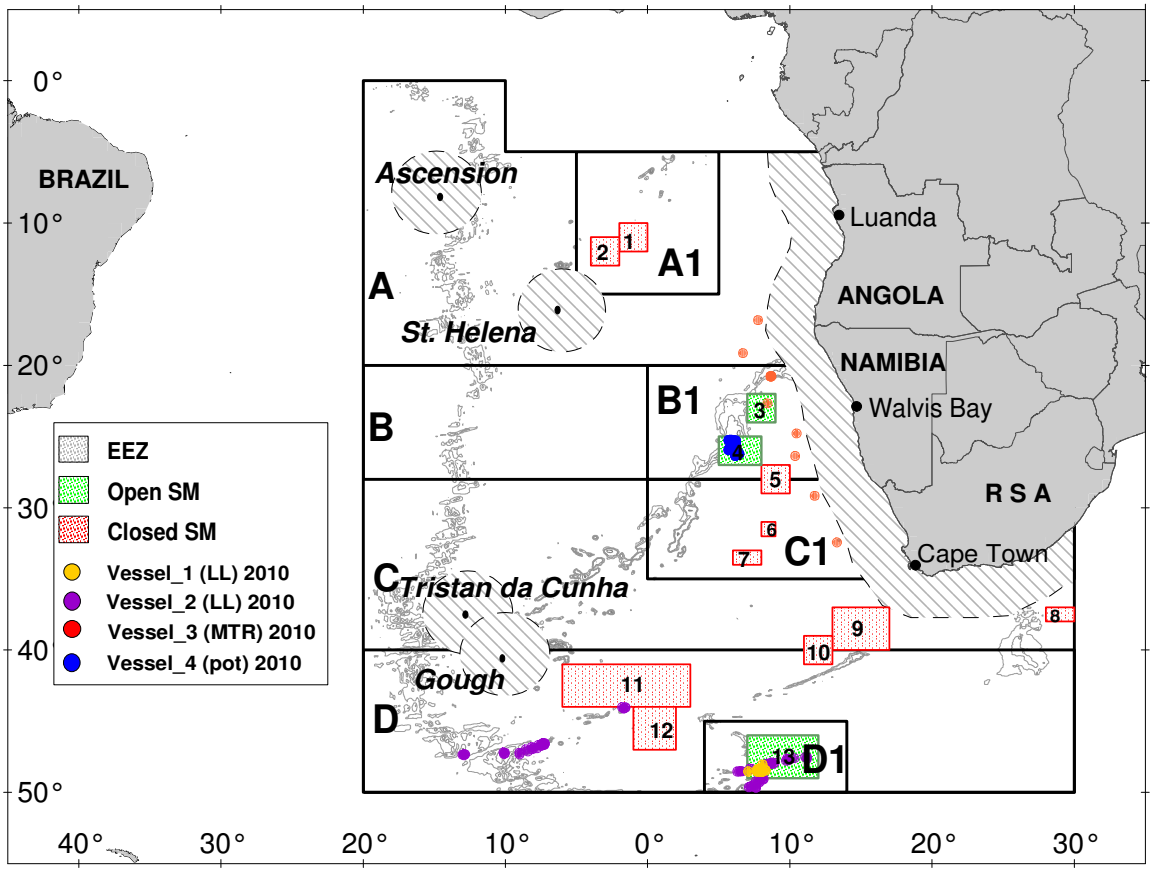

Figure 12 – The spatial catch data of four vessels that fished in the SEAFO CA in 2010 (MT – mid-water trawl).

ANNEX IV

"RULES FOR ACCESS AND USE OF SEAFO DATA"

RULES FOR ACCESS AND USE OF SEAFO DATA

The following Rules for Access and Use of SEAFO Data were adopted by the ---------- Meeting of the Commission (----------, paragraphs to) :

It is recognised that:

1. All data submitted to and maintained by the SEAFO Secretariat shall be freely available to CP scientists, participants of all SEAFO committees and delegates for data analysis and preparation of documents for the Commission, Scientific Committee and their subsidiary bodies.

2. The inclusion of data, analyses or results from data held on the SEAFO database into Working Papers and any other documents tabled at any SEAFO meeting does not constitute publication and therefore is not released into the public domain.

3. The inclusion of data held in the SEAFO database into the published reports of the Commission, Scientific Committee, Scientific Sub-Committee or any other SEAFO publication constitutes release into the public domain.

4. Inclusion of data held in the SEAFO database in any publication outside SEAFO constitutes release into the public domain.

5. Reference to paragraphs (1) and (2), the originators/owners of data have the right to:

(a) be consulted (including assignation of authorship) on the preparation, if necessary including publication, of documents describing analyses and interpretation of their data;

(b) approve the level of detail revealed in documents using their data;

(c) stipulate terms and/or levels of data security if necessary.

Accordingly,

6. Requests to the Secretariat for access and/or use of data maintained by the SEAFO Secretariat by individual Member scientists/officials shall be approved in writing as appropriate by that Member's Commission Representative or Scientific Committee Representative. Members are responsible for informing individual scientists or individuals requesting data of the rules governing access and use of SEAFO data and for obtaining agreement to comply with such rules.

7. Requests in support of analyses should include the type of data requested, the degree of data aggregation required, the spatial and temporal detail required, and the anticipated format to be used in presenting results of the analyses. For such requests, the Secretariat shall ensure that each request meets the conditions of the approval granted for the original endorsement, and, if so, release the data and inform the data owner(s)/originator(s) accordingly. Release of data by the Secretariat to the requestor does not constitute permission to publish or release data into the public domain. Such permission remains a matter to be determined between the requestor and the data originator(s).

8. Requests in support of data/analyses not specifically required for SEAFO purposes should include the information of the analytical procedures to be used and the opportunity for data owner(s)/originator(s) to be involved. For such requests, the Secretariat shall be satisfied that each request contains the required information before forwarding it to the data originator(s) for approval within a specified time period. Once approval has been received the Secretariat shall release the data. Release of data does not constitute permission to publish or for release into the public domain. Such permission remains a matter to be determined between the requestor and the data owner(s)/originator(s).

9. If approval for data release under (8) is not forthcoming within the specified period, the Secretariat shall initiate and facilitate consultation between the data requestor and data owner(s)/originator(s). The Secretariat shall not release data without the written approval of the data owner(s)/originator(s). Failure to achieve agreement shall be brought to the attention of the Scientific Committee and Commission.

10. Regarding access to the SEAFO database in the proposed member's section in the SEAFO website, SC recommends that the Secretariat develops and implements appropriate security protocol.

11. The following statement shall be placed on the cover page of all Working Papers and any other papers tabled at meetings of the Commission, Scientific Committee or their subsidiary bodies:

> '*This paper is presented for consideration by SEAFO and may contain unpublished data, analyses, and/or conclusions subject to change. Data in this paper shall not be cited or used for purposes other than the work of the SEAFO Commission, Scientific Committee or their subsidiary bodies without the permission of the originators and/or owners of the data.*'

ANNEX VI

Areas (Seamounts) and their coordinates prohibited to fisheries in accordance with paragraph 1

DIVISION A

Area: (Kreps seamount), Number 16 on the attached map – considered to be unexploited.

Coordinates: 01°00'S 13°15'W
01°00'S 12°30'W
05°25'S 11°30'W
04°52'S 12°51'W
04°00'S 12°33'W

Area: (Unnamed seamount), Number 17 on the attached map – considered to be unexploited.

Coordinates: 13°00'S 15°05'W
12°44'S 14°10'W
15°43'S 12°40'W
16°34'S 13°13'W
18°32'S 12°10'W
18°46'S 13°18'W
17°10'S 14°46'W
16°20'S 14°46'W
16°05'S 13°50'W

SUB-DIVISION A1

Area: (Malachit Guyot Seamount), Number 1 on attached map – considered to be unexploited.

Coordinates: 10°51'S 01°25'W
11°35'S 00°40'W
13°44'S 02°57'W
13°03'S 03°45'W

DIVISION C

Area: (Wüst seamount), Number 7 on the attached map – considered to be slightly exploited.

Coordinates: 32°57'S 06°50'W
31°51'S 03°39'W
32°28'S 01°30'W
34°34'S 00°40'W
36°17'S 00°40'W
36°17'S 01°23'W
34°10'S 02°23'W
36°20'S 06°16'W
34°53'S 07°43'W

Area: (Africana seamount), Number 8 on the attached map – considered to be unexploited.

Coordinates: 37°00'S 28°45'E
37°00'S 29°21'E
37°25'S 28°45'E
37°25'S 29°21'E

Area: (Schmidt-Ott Seamount), Number 9 on the attached map - considered to be slightly exploited.

Coordinates: 38°20'S 13°00'E
38°20'S 14°24'E
39°32'S 14°24'E
39°32'S 13°00'E

Area: (Unnamed), Number 15 on the attached map - considered to be unexploited.

Coordinates: 29°19'S 14°22'W
29°17'S 12°54'W
31°57'S 12°47'W
32°08'S 14°18'W

SUB-DIVISION C1

Area: (Vema Seamount), Number 6 on the attached map – considered to be slightly exploited.

Coordinates: 31°27'S 08°06'E
31°27'S 08°35'E
31°53'S 08°35'E
31°53'S 08°06'E

DIVISION D

Area: (Herdman Seamounts), Number 12 on the attached map – considered to be unexploited.

Coordinates: 45°10'S 00°05'E
45°10'S 00°42'E
45°50'S 00°42'E
45°50'S 00°05'E

Area: (Unnamed Seamounts), Number 14 on the attached map – considered to be unexploited.

Coordinates: 47°54'S 10°57'W
47°54'S 09°07'W
49°15'S 08°03'W
49°34'S 08°24'W
49°10'S 10°31'W

Area: (Unnamed Seamounts), Number 18 on the attached map – considered to be slightly exploited.

Coordinates: 40°35'S 17°32'W
40°18'S 16°15'W
43°04'S 15°12'W
43°20'S 16°30'W

ANNEX VIII –

Template of Header page for SC Working Documents.

Document Nº: [to be completed by the Secretariat]
Date submitted: [to be completed by the Secretariat]
Language [to be completed by the Secretariat] Original:
Agenda Agenda Item Nº(s):

Title:
Author(s):
Affiliation(s):
Published or accepted for publication elsewhere? Yes ☐ No ☐
If published, give reference:

ABSTRACT

SUMMARY OF FINDINGS AS RELATED TO NOMINATED AGENDA ITEMS

Agenda Item Findings

This paper is presented for consideration by SEAFO and may contain unpublished data, analyses, and/or conclusions subject to change. Data in this paper shall not be cited or used for purposes other than the work of the SEAFO Commission, Scientific Committee or their subsidiary bodies without the permission of the originators and/or owners of the data.