SOUTH EAST ATLANTIC FISHERIES ORGANISATION (SEAFO)

REPORT OF THE SEAFO SCIENTIFIC COMMITTEE

30 September– 9 October 2015

Windhoek, NAMIBIA

Scientific Committee of SEAFO
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1. Opening and welcome remarks by the Chairperson

1.1 The 11th Annual Meeting of the SEAFO Scientific Committee (SC) was convened on 30 September to 9 October 2015at the Safari Hotel & Court, Windhoek, Namibia. The Chairperson, Mr. Paulus Kainge, opened the meeting and welcomed delegates. He emphasized that it would be a discussion of scientific issues and that all delegates were expected to freely express their scientific views so that issues can be resolved and the best possible advice forwarded to the Commission.

2. Adoption of agenda and meeting arrangements

2.1. SC adopted the agenda (Appendix I) with minor revisions. Members were informed of practical arrangements for the meeting by the Executive Secretary.

3. Appointment of Rapporteur

3.1 After nomination and secondment, Mr. Erich Maletzky was appointed as rapporteur for the Scientific Committee meeting.

4. Introduction of Observers

4.1 Observers from the Agreement on the Conservation of Albatrosses and Petrels (ACAP) and the Food and Agriculture Organisation (FAO) attended the 11th SEAFO Scientific Committee and are listed under the "Observers" section of Appendix II.

5. Introduction of Delegates

5.1 A total of 12 Scientific Committee members representing six CPs, excluding the SEAFO Secretariat, attended the 11th SEAFO Scientific Committee meeting (see Appendix II for list of participants). No member from Angola attended.

6. Review of submitted SEAFO working documents and any related presentations, allocation to the agenda items

6.1 A total of 22working documents were discussed during the Scientific Committee for review and considered during the 2015 SC meeting (Appendix III).

7. Review of the 2015 Work Program

7.1 SC listed in 2014 the following tasks for 2015:

(a) Training of observers from developing countries on High Seas scientific sampling procedures.
(b) FAO ABNJ Deep-Sea Project activity.
(c) Nansen survey (Jan-Feb 2015) follow-up.
(d) Guidelines on handling and submission of Logbook data, required for landings validation, to the SEAFO Secretariat.

(e) Secretariat to provide potential fishing areas for the current target species based upon bathymetry.
(f) SC to compile, for individual target species and assessment types, the required data fields for submission to the SEAFO Data Manager.

7.2 Output from task (a):
The Executive Secretary informed SC that 12 observers from Namibia were trained during 2015.

7.3 Output from task (b):
The SC refers to Agenda Points 18 and the activity associated with the *R/V Dr. Fridtjof Nansen* cruise (Agenda Point 13).

7.4 Output from task (c):
The SC refers to Agenda Points 13 and recommendations pertinent to VME issues (Agenda Point 21).

7.5 Output from task (d):
The SC recommends:

i. that fishing logbook data (completed as per Chapter 3 – Article 10 of the SEAFO System†) shall be submitted within 30 days after the end of a fishing trip;
ii. that fishing logbook data shall be submitted to the Secretariat in electronic form – Appendix IV;
iii. that CPs should use the attached fishing logbook formats (Appendix IV).
iv. these recommendations (i-iii) be included in the "SEAFO System";
v. that a small group consisting of scientists and compliance experts meet inter-sessionally to review the reporting forms, for example:
    a. Observer Forms (not referred to in the SEAFO System);
    b. Incomplete reporting format;
    c. To streamline all reporting systems of SEAFO;
    d. The following CPs volunteered to assist in the abovementioned tasks: South Africa, Namibia, Japan & Korea.

7.6 Output from task (e):
The Executive Secretary reported back to SC on the outcomes of the "Potential Fishing Areas" modelling exercise done by the Secretariat. SC appreciates the report and work done in attempting to get some quantitative assessment of the potential fishing grounds for commercially exploited species, but SC noted that there is uncertainty with regards to the GEBCO bathymetry as well as the predicted fish distributions from AquaMaps (www.aquamaps.org). The result indicates that fisheries currently exploit the subareas with the highest probability of occurrence of the resources and that potential new grounds are likely to be limited. The SC will continue to pursue these analyses.

7.7 Output from task (f):
SC tasked the Stock Co-ordinators with drafting data fields and submit the draft for comments to the Data Manager by the 30th of October 2015. The stock co-ordinators are:

- Patagonian Toothfish – Dr. Tom Nishida
- Deep-Sea Red Crab – Mr. Erich Maletzky
- Orange Roughy – Mr. BeauTjizoo
- Southern Boarfish – Dr. Ivonne Figueiredo
- Alfonsino – Dr. Jae Bong Lee

8. Report by the Executive Secretary presenting all landings, incidental bycatch and discard tables updated to September2015

8.1 The Executive Secretary presented updated landings, bycatch and discards data for the period up to September 2015 (Appendix V). Catches were recorded for Patagonian toothfish (Tables 1A and 1B of Appendix V), as well as Deep-sea red crab (Table 4 of Appendix V) during 2015. For the first time catches of Antarctic toothfish (Table 1B of Appendix V) were reported from three sets in Sub-Area D.

8.2 During 2015 only two vessels fished in the SEAFO CA:one Japanese-flagged vessel (*Shinsei Maru No. 3*) targeting Patagonian toothfish in Sub-Area D, and one Korean-flagged vessel (*Meridian No. 8*) targeting deep-sea red crab in Division B1.

8.3 SC further noted that there were no recorded encounters in 2015 of individual set bycatches exceeding the current VME threshold values (60kg for corals and 600kg for sponges). See Appendix VI for more information on incidental catches of VME indicators and other benthos within the SEAFO CA.

9. Review data of the 2014 Exploratory Fishing and the 2016 Exploratory Fishing Proposal by Japan

9.1 Japan presented results for the 2014 exploratory fishing conducted on the Discovery Tablemount seamount in Sub-Area D (Appendix IX). SC further **recommends that catch data for future exploratory fishing reports be presented in both numbers and weights for all species**.

9.2 SC considered the results of the experimental fishing conducted in Division D0, and agreed that the experiments (2012-2014) fulfilled the requirements of the rules & procedures of CM 29/14 for opening new fishing areas. **SC therefore advises that the Commission consider converting the area shown in Figure 1 (with co-ordinates in a Table)into an existing fishing area, and amends CM 29/14 ANNEX 1 accordingly**.

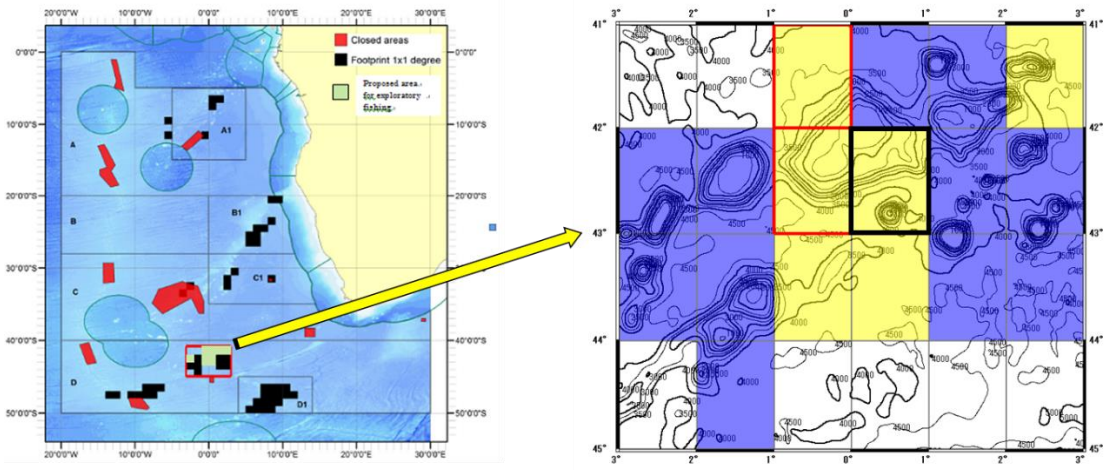

Figure 1-Map illustrating the subareas of new fishing area in Sub-Area D opened to exploratory fishing (red and black frames), and subareas where Japan has plans for exploratory fishing (unframed yellow areas).The yellow area (1˚x 1˚) outlined in black indicates the area proposed for conversion to an existing fishing area.

Table 1: Co-ordinates for proposed area to be converted to existing fishing ground. IDs represent boundary marking positions.

ID	Latitude	Longitude
1	42° 0.000' S	0° 0.000' E
2	42° 0.000' S	1° 0.000' E
3	43° 0.000' S	1° 0.000' E
4	43° 0.000' S	0° 0.000' E

9.3 SC assessed the proposal by Japan to continue exploratory fishing during 2016 (Appendix X). SC advises that the proposal meets the requirements as per ANNEX 3 of CM 29/14.

9.4 SC supported an expression of interest by one SC member (South Africa) to participate in the abovementioned 2016 Japanese exploratory fishing as an observer.

10. Review landings, spatial and temporal distribution of fishing activity and biological data on non-benthic bycatch species

10.1 The SC reviewed and updated all landings data on bycatch species – see Tables 6-18 of Appendix V. VMS data were presented by the Secretariat and provided a useful overview of fishing activity in the past year.

10.2 SC noted that for the two currently targeted species catches have been low compared to the agreed TACs in recent years (Fig. 2).

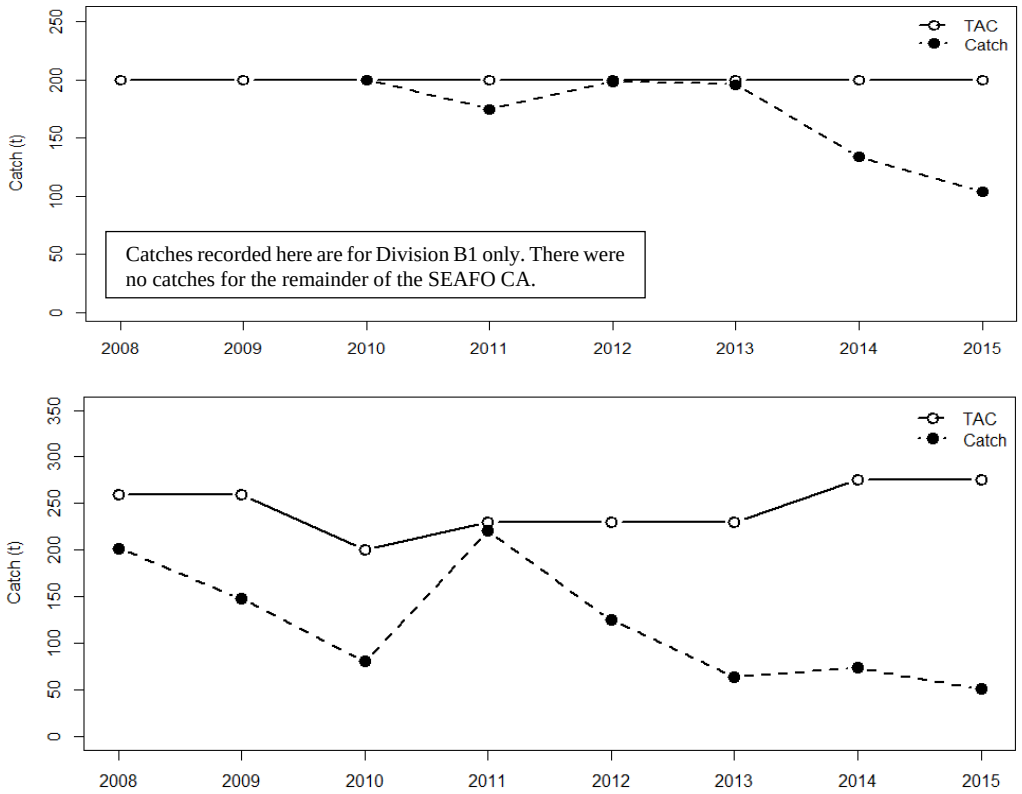

Figure 2: Annual catches in relation to TACs for two SEAFO currently targeted species – Deep-Sea Red Crab (upper) and Patagonian toothfish (lower).

10.3 In 2014 SC agreed that if a bycatch species exceeds the 10% threshold of the existing TAC-specific species (Equation 1), SC will recommend a management measure.

$$\frac{Bycatch\ in\ 2014}{Catch\ of\ TAC\ species\ in\ last\ 3\ years}\ x\ 100 \qquad \ldots\ \ldots\ \ldots \text{Equation 1}$$

10.4 To date no bycatch species exceeded the 10% threshold. Spatial data on fishery-specific bycatches are incorporated in some of the stock status reports.

11. Review the spatial distribution of reported catches of benthic organisms (corals, sponges etc.)

11.1 Figure 1 provides an updated map of VME indicator taxa (Table 19 of Appendix V) records by year. There were no recorded encounters over the period 2010-2015 of bycatches exceeding the current VME threshold levels – as per CM 29/14 and Table 19 of Appendix V. SC noted that VME indicator taxa were recorded form both the longline and pot fisheries – for detailed mapping information please refer to the relevant Stock Status reports.

11.2 During 2015 SC reported non-VME indicator benthic species separately (Appendix V).

11.3 For details on catches of VME indicator species see Appendix V.

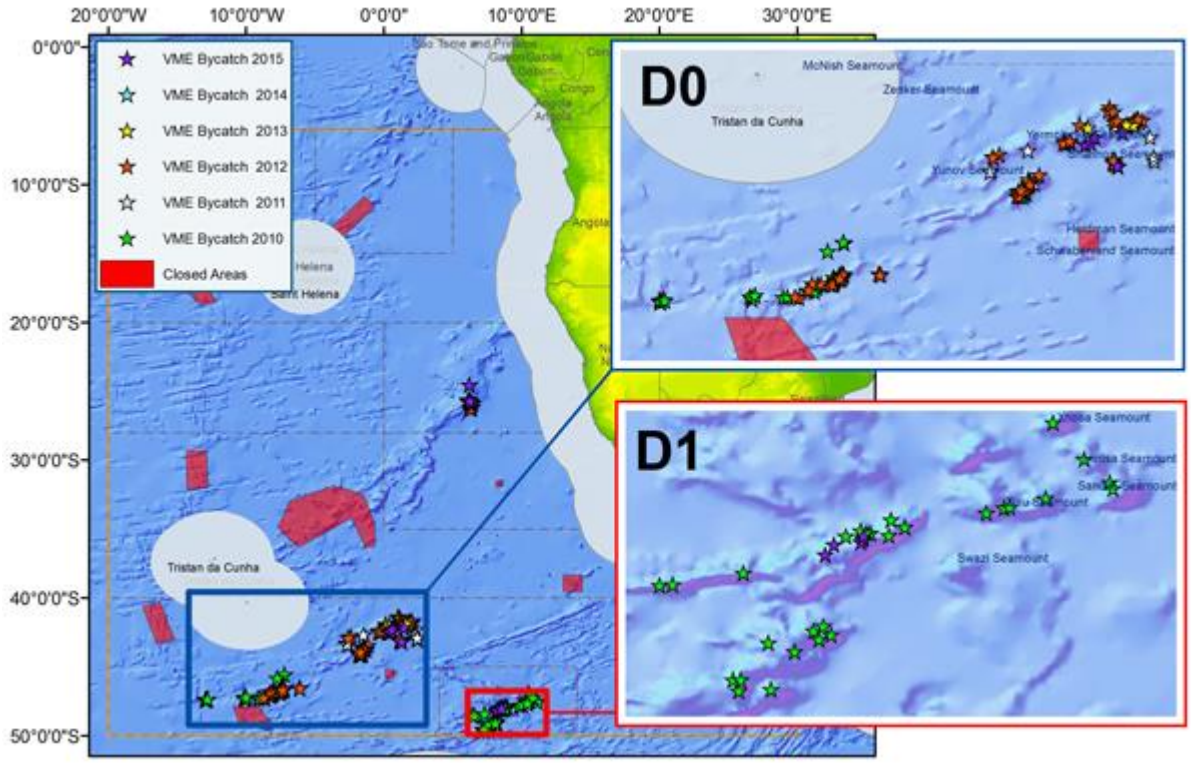

Figure 3: Spatial distribution of VME indicator bycatch as recorded by fishing activities within the CA.

12. Review Stock Status Reports

12.1 Only the stock status reports for Patagonian toothfish and Deep-Sea Red Crab were reviewed and updated as these were the only two stocks for which new data were available in 2015. The stock status reports are presented as follows:

- ⇨ Deep-Sea Red Crab - Appendix VII; and
- ⇨ Patagonian toothfish - Appendix VIII.

13. Review research activities in the SEAFO CA since October 2014 to date

13.1 In January-February 2015 the *RV Dr Fridtjof Nansen*, supported by the EAF Nansen programme, the FAO Common Ocean Programme and SEAFO conducted a 29 day cruise to seamounts in the SEAFO Convention Area. The scientific study was run by an international party of scientists, most of whom represented the SEAFO Contracting Parties. The intent was to conduct basic mapping and identification of vulnerable marine ecosystems (VMEs) and SEAFO fisheries resources in a selection of seamounts and seamount complexes, some of which are currently closed to fishing and some that are being fished for e.g. Patagonian toothfish, alfonsino, pelagic armourhead (boarfish), and deep sea red crab.

13.2 The investigation included studies at the following seamounts: Schmitt-Ott (Closure no. 9), Wüst (2 locations, SEAFO Closure no. 7), Vema (SEAFO Closure no. 6), Valdivia (4 locations), and Ewing. Unfortunately bad weather forecasts prevented studies in the Discovery seamounts, i.e. the southernmost planned study area where fisheries for Patagonian toothfish are being conducted.

13.3 The report presents first results on bathymetry, VME-indicator organism presence, fisheries resources, and evidence of human footprint in the different study areas. Data have been submitted to SEAFO and the biological collection is deposited in the IZIKO Museum in Cape Town. Data and material will be analysed further and results published.

13.4 The SEAFO Convention Area is naturally much less productive than adjacent coastal and upwelling areas, and seamounts are but small relatively shallow sites in a vast deep ocean.

13.5 Many seamounts were appreciably deeper than given by authoritative sources (GEBCO, reflected in NOC-report from 2010). In most areas, the potential fishing areas are thus smaller than appreciated earlier.

13.6 Most seamounts visited have VME indicators (mainly corals), but there is diversity amongst the seamounts presumably depending on depth, shape, hydrographical setting, history etc. At Schmitt-Ott there was a pronounced dominance of gorgonian corals. In all others, diversity was greater, and more scleractinians (stony corals) occurred. In many cases scleractinians were mainly dead and probably ancient. In Valdivia and Ewing, which are open to fisheries, scleractinians (dead or alive) seemed restricted to slopes of knolls, and in e.g. the Valdivia Bank the summit substrate was virtually bare rock.

13.7 Abundance estimation of SEAFO fish resources was very difficult due to rugged topography and the character of distributions of the target organisms. Fishing with midwater trawl and use of hydro-acoustics is challenging but has some potential. Unidentifiable summit schools were observed in Erica, Valdivia, and Ewing. In Ewing these were likely to be orange roughy, in Valdivia North probably

alfonsino. Bottom trawling was only possible on sandy bottoms on deep plains, not in the main fishing areas on slopes and summits. Pelagic armourhead was locally numerous in video records, but generally limited in distribution. Very few were observed in the main fishing area of Valdivia, none in Ewing. Orange roughy was common in video records around the summit in Ewing. A few juveniles occurred in a bottom trawl catch on the deep plain in Valdivia. Even in Valdivia, which is a large area <2000m compared with all the other seamounts (probably the largest of the 'existing fishing areas' in SEAFO), actual potential fishing areas are restricted because only minor subareas are shallower than 500-1000m and suitable for the target fish resources alfonsino, armourhead and orange roughy. The fishing area for crab is much larger, however, because crabs are distributed across a more extensive depth range than the fishes.

13.8 Frequent video observations of lost pots and rope were made in Vema and some in Valdivia. These items could not be aged, but may well have been abandoned/lost many years ago.

13.9 In Ewing, lost trawl gear was observed in one of the summit dives. On the main Valdivia Bank and Valdivia West summit what was suspected to be trawl door skid marks on the bare rocky substrate were observed. No evidence of impacts of trawling or pot fishing was observed in areas of soft sediments, including the extensive areas with coral rubble. In areas with high densities of live (and dead) coral that may be regarded as candidate VMEs, the impression from the video records is that the benthic communities are intact and not impacted by fishing.

13.10 Some experience was gained with the use of different technologies and methods for mapping of VME indicators. A prerequisite is detailed bathymetry data collected by multi-beam echo-sounders. Maps generated by multi-beam sounders were used to direct sampling by other technologies, in particular video transects up the slopes of seamounts and on the summits and summit knolls. In essence, the experience gained confirmed that satisfactory VME indicator mapping required application of video systems. In the predominantly hard-substrate seamount habitats classical samplers such as grabs and trawls only provide samples for identification. While such samplers may document presence of VME indicators, they are unlikely to provide accurate data on density and spatial distribution patterns of VME taxa needed to determine if a VME is present in the area studied.

13.11 Abundance estimation of SEAFO fish resources proved very difficult due to topography and the character of distributions of the target species. Fishing with midwater trawl and the use of hydroacoustics provided some information on presence of resources, but quantification was difficult. Bottom trawling was only possible on sandy bottoms on deep plains, not in the main fishing areas on slopes and summits.

14. Examine, where appropriate, assessments and research done by neighbouring states and other organisations

14.1 Namibia reported that no research and assessment were conducted for orange roughy within the EEZ in 2015. South Africa reported that annual assessment based on commercial data for *Dissostichus eleginoides* is conducted within the Prince Edward Islands South African EEZ (Subareas 58.6 and 58.7 and part of Area 51). SC took note of the 2014 CCAMLR fisheries report on exploratory fishery for Dissostichus spp. conducted in CCAMLR Sub-Area 48.6.

14.2 SC took note that the Coalition of Legal Toothfish Operators (COLTO) conducted an Inaugural Toothfish Industry-Science workshop (Norway), and that CCAMLR held a symposium (Chile) during 2015.

15. SC to discuss if stock assessment or harvest control rules should be applied for future TACs

15.1 The SC discussed the issue in general terms, but also with reference to Patagonian toothfish. The Patagonian toothfish discussion is reflected under Agenda Pt. 16 and 21.

15.2 The SC noted that harvest control rules (HCRs) were adopted by the Commission in 2014 for all the SEAFO stocks. This action was a response to SC advice in 2014.

15.3 The SC concluded the discussion by advising that the application of HCRs for TAC advice has to be continued, but that in parallel exploratory stock assessments should also be conducted. In the future, with enhanced data provision and extended time series, it is conceivable that valid assessments can be achieved for some stocks, hence also TAC advice based on assessments rather than HCRs may become possible. Another very important reason for encouraging stock assessments is that assessments may provide potentially valuable information for monitoring stocks and evaluations of the appropriateness of the HCRs and their application.

16. Review Total Allowable Catches and related management conditions for Patagonian toothfish and Deep-Sea Red Crab

16.1 The SC reviewed the Total Allowable Catches (TAC) and related management rules for Patagonian toothfish and Deep-Sea Red Crab as these are the only stock for which TAC reviews are pending for 2015. Please see relevant Stock Status Reports (Appendices VII&VIII) or revert to Section 21 of this report for details on this topic.

Patagonian Toothfish

16.2 SC acknowledges the efforts done by Dr. T. Nishida on the assessment of the stock status of toothfish in SEAFO CA.

16.3 Following the 2014 SEAFO SC suggestion, longer time series of catch (13 years, 2002-2014) and effort (12 years, 2003-2014) data were used. The CPUE series for 2003-2014 was standardized using a GLM model. The standardization process identified year, area and quarter as significant factors but only explained 27.4% of the total variation. SC recognized that such levels are frequently observed in CPUE standardization in fisheries science due to the quality of the fisheries data, but also that this limits the utility of the modelling approach SC noted that while this situation is frequently observed in various RFMOs, and results have been used in some cases for stock assessments and scientific advice, there was no consensus on the application of the assessment model under such conditions for Patagonian toothfish.

16.4 A non-equilibrium surplus production models incorporating covariates (ASPIC; Prager, 2005) was adjusted to the CPUE and catch data. The surplus-production model has a long history in fishery science and has repeatedly proven useful in management of fish stocks.

16.5 In view of the lack of the age-structured catch data, the production model was considered a potential useful option for assessing the stock. The adjustment of the models to data did not converge and no

model parameters could be determined. This fact is likely to reflect the lack of contrast on CPUE data used, as a reliable index of abundance for the stock. An alternative is to use Bayesian Production Models as used in some other RFMOs, but the limitations with regards to the input data are likely to persist.

16.6 To circumvent this problem, a total of 24 scenarios considering different ranges for K and B2002/K. were proposed in the adjustment of the model. Convergence was possible for some scenarios, particularly those with values of K higher than 1000t and depletion levels in 2002 higher than 80%.

16.7 Among the latter scenarios not great differences were detected on the goodness of fit of the model measured by RMSE (Root Mean Square Error). SC noted that this emphasizes the weakness of the information provided by data to the model. This is likely to reflect a problem commonly encountered with other examples of fitting production models, which is related to the lack of contrast in the abundance indices used. However, 25% (including T. Nishida) of the SC participants expressed that the estimated parameters were consistent and claimed that this demonstrated robust and reliable F and TB (Total biomass) useful for scientific advice.

16.8 The result of ASPIC model (2015) is consistent with three previous exploratory stock assessments, such as ASPIC, length cohort analyses, and Y/R analyses (2014 SC Report, reflecting co-operative exploratory assessments assisted by FAO consultant).

16.9 However SC noted that the levels of uncertainty of the model runs and the results were too high and the assessments were therefore not considered sufficiently reliable as a basis for scientific advice. Another view expressed by 25% (including Dr. T. Nishida) of the SC participants in the 2015 meeting states that this level of uncertainty is commonly observed in the stock assessments and that similar results have been used for scientific advice, hence it was claimed that the ASPIC results for 2015 is also useful for scientific advice.

16.10 Finally SC has agreed that assessments of the stock should proceed, particularly by exploring and integrating other sources of information available, such biological and spatial data, so that the deficiencies and uncertainties identified in the stock assessment results be minimized.

16.11 **SC recommends Patagonian toothfish TAC (2016) to be 264 tons based on the application of the harvest control rule adopted by the Commission in 2014.**

Deep-Sea Red Crab

16.12 Given that the TACs set for Deep-Sea Red Crab under CM 27/13 are up for review this year, SC implemented the HCR, as adopted by the Commission in 2014, for setting the 2016 TACs.

16.13 Under the rules of the HCR the abundance index available for the fishery (in this case CPUE) is used to gauge the trend of the catch rates over the last five years. Considering the p-value of the slope for the regression line fitted to the annual CPUEs for 2011 to 2015, it is clear that the slope is not significantly different from zero. Under this scenario the HCR stipulates the use of “Rule 2” for setting the TAC.

16.14 Considering that no catches were recorded outside Division B1 the 2016 TAC recommendations are only applied to Division B1. However, the difference between the 2015 and proposed 2016 TAC is greater than the 5% limit stipulated by the HCR. **SC therefore recommends a TAC for 2016 be set at 190 tons for Division B1, and 200 tons (status quo) for the remainder of the SEAFO CA.**

17. Review of progress regarding the development of an ID guide for fish

17.1 The Executive Secretary informed SC that official work on the SEAFO species ID guides have been completed and are available for CPs to use during fishing and research activities.

18. Observer information, recap of observer training & possible changes to data forms & SmartForms

18.1 FAO provided an update on the ABNJ Deep Seas Project, to which SEAFO is a key partner. The SC was provided with an update on the VME database, and the need for continued data inputs from SEAFO to keep it up-to-date was stressed. Information was provided on several global technical reviews including the VME processes and practices report, the 2nd edition of the World Wide Review1 and global deep-sea species reviews, highlighting regional specific expert inputs provided or requested. A range of tools designed to assist future data collection was presented including SMARTFORMS, an electronic data collection form for onboard use (including an optional biodiversity application) to which SEAFO is contributing. Furthermore, species identification tools for vulnerable species groups are being developed, and a catalogue and an onboard guide for cartilaginous fish are now available for the Southeast Atlantic. Training in the use of the guides has been provided, and feedback was requested on the usefulness of the guides, further training needs and on need for guides for additional species groups. One key activity this year was the survey with the R/V Dr Fridtjof Nansen, and possible follow up activities to further explore the scientific information from the survey were suggested. The SEAFO area is pilot area for EAF under the project, and as a first step an EAF baseline report should be prepared. The final workplan for the different activities will be agreed between with SEAFO Secretariat and the project.

18.2 The SC took note of the different activities proposed and highlighted specifically the important contribution of the *R/V Dr Fridtjof Nansen* survey that had provided new information on VMEs and fisheries for the SEAFO region, and expressed that they would value the possibilities of further surveys in the future. The availability of biodiversity information from the fisheries by-catch records was also indicated by the SC, which could be useful in the context of the biodiversity app or to other partnerships (e.g. ACAP).

18.3 The SC noted that the Seabird Bycatch Identification guide prepared by ACAP (Agreement on the Conservation of Albatrosses and Petrels) in collaboration with the Japanese Fisheries Research Agency has recently been published, and can be downloaded from the ACAP website: http://www.acap.aq/en/bycatch-mitigation. The guide is intended for use at sea by fisheries observers to assist in the identification of albatrosses and some commonly caught petrels and shearwaters brought aboard after being killed in longline operations. The guide also outlines protocols for taking photographs of dead seabirds, and the collection of feather samples for DNA analysis.

18.4 The SC agreed that it would be useful for SEAFO and ACAP to develop a closer working relationship on issues of seabird bycatch and associated conservation and management measures. **The SC noted that ACAP has MoUs in place with other RFMOs that serve to provide a framework for interaction and support on matters relating to seabird bycatch, and recommended that the**

[1] *Worldwide Review of Bottom Fisheries in the High Seas* (2nd edition)

SEAFO and ACAP Secretariats investigate the use of a similar mechanism for SEAFO, which can be brought back to CPs and member parties for their consideration.

19. Specific guidelines for scientific research pertinent to assessing the appropriateness of SEAFO fishing closures

19.1 The SC discussed the task description and concluded that the task for the SC was to develop guidelines for scientific investigations pertinent to the scientific evaluation of appropriateness of the SEAFO fishing closures (CM 29/14). Such scientific research is needed for providing sound scientific advice on the re-opening of closures.

19.2 A draft guideline and associated background information and discussion was presented by Dr. O.A. Bergstad from Norway. This received substantial support in the SC, but no final decision to recommend it to the Commission was achieved due to reservations from the two Japanese members of the SC.

19.3 The guideline document proposed by Dr. Bergstad is appended to the report for information (Appendix XIV).

20 SC to follow up on the 2014 bycatch of seabirds in the SEAFO longline fishery

20.1 Apart from 3 seabirds reported during 2014, no additional bycatch of seabirds was recorded during 2015 to date. The birds recorded in the 2014 bycatch included two Great Shearwaters (*Puffinus gravis*) and one Black-Browed Albatross (*Thalassarche melanophris*). In terms of the conservation status of the seabirds, based on the IUCN Red List, the Great Shearwaters are classified as "Least Concerned", while the Black-Browed Albatross is classified as "Near Threatened". As for the seabird bycatch mitigation measures, CM 25/12 stipulates that the use of Tori Lines (or Streamer Lines) are compulsory for all longline and trawl vessels fishing south of 30°S, as well as using "Bottle Tests" to demonstrate compliance with minimum sink rates of longlines, failing which vessels are also required to fish at night. Furthermore any bycatch of seabirds exceeding a total of 3 birds during the day mandates the change of fishing operations to night-setting. The SC noted that CM 25/12 requires Contracting Parties to collect and provide all information on interactions with seabirds to the Secretariat, and highlighted that such reports should include records of zero bycatch, rather than leaving the relevant sections blank. In addition the Observer Forms require observation of seabird activity.

21. Advice and recommendations to the Commission on issues emanating from the 2015 meeting

Agenda Point 7:

21.1 SC recommends:

i. that fishing logbook data (completed as per Chapter 3 – Article 10 of the SEAFO System†) shall be submitted within 30 days after the end of a fishing trip;
ii. that fishing logbook data shall be submitted to the Secretariat in electronic form – Appendix IV;
iii. that CPs should use the attached fishing logbook formats (Appendix IV).
iv. these recommendations (i-iii) be included in the "SEAFO System";
v. that a small group consisting of scientists and compliance experts meet inter-sessionally to review the reporting forms, for example:
    a. Observer Forms (not referred to in the SEAFO System);

b. Incomplete reporting format;
c. To streamline all reporting systems of SEAFO;
d. The following CPs volunteered to assist in the abovementioned tasks: South Africa, Namibia, Japan & Korea.

Agenda Point 9:

21.2 SC recommends that catch data for future exploratory fishing reports be presented in both numbers and weights for all species.

21.3 SC assessed the proposal by Japan to continue exploratory fishing during 2016 (Appendix IX). SC advises that the proposal meets the requirements as per ANNEX 3 of CM 29/14.

21.4 SC therefore advises that the Commission consider converting the area shown in Figure 1 of this main report (with co-ordinates in Table 1 of this main report) into an existing fishing area, and amends CM 29/14 ANNEX 1 accordingly.

Agenda Point 13:

21.5 The investigation conducted by the *RV Dr Fridtjof Nansen* visited three of the SEAFO Closed Areas, i.e. the Schmitt-Ott (Closure no. 9), Wüst(Closure no. 7), and Vema (Closure no. 6) seamounts (DOC/SC/22/2015). It was found that all these closed areas have seamount summits inhabited by VME indicators, and even if density varies, the closures afford protection to these communities. In some of the closures evidence was found of coral gardens that would likely satisfy the definition of VMEs as described in the FAO Guidelines (2009). **The SC therefore recommends that the current closures are maintained.**

21.6 The study also comprised extensive investigations and mapping efforts in two of the 'existing fishing areas', i.e. Valdivia Seamount Complex and Ewing Seamount on the Walvis ridge. These areas have diverse habitats, and video mapping confirmed that the flat 235 m deep plateau of the Valdivia Bank and a similar plateau on Valdivia West was practically bare rock without VME indicators. Also the slopes of the Valdivia Bank had few and scattered VME indicators. The SC concluded that these subareas of the Valdivia Complex would most likely not satisfy the VME criteria. The same conclusion could be drawn for the deep, wide and flat sedimentary plains adjacent to the Valdivia Seamounts. **The SC considers it unlikely that these subareas have VMEs and therefore recommends that they remain open to fishing.**

21.7 However, adjacent to the aforementioned subareas without VMEs are knolls and rugged terrain areas which have rich coral presence. In some knolls to the south and southeast of the Valdivia Bank the density and diversity was such that the features would be classified as coral gardens and/or reefs, indeed more well developed features than in all other areas explores (Fig. 2). These features would in all likelihood be classified as VMEs. With the current management measure under which Valdivia is an 'existing fishing area', these VMEs are afforded limited protection, i.e. only through the encounter protocol. **The SC expresses the opinion that the risk of significant adverse impacts on these knoll-associated VMEs is uncertain, and would suggest the following alternative actions: Either 1) to close to all fishing the subarea where VMEs were documented, or 2) to leave open these subareas to pot fishing for crabs only, i.e. close them to other gears.** A possible new closure is indicated in Figure 2 as blue outlined polygon. (co-ordinates given in Table 2) The choice between the two actions depends on the risk of cumulative impacts from pot fishing. The SC does not have sufficient information to assess this risk, but notes that reports of VME indicator by-catch from pot fishing in this area were received by SEAFO in 2015 (See Agenda pt. 11). However, the SC also

notes that the VMEs now documented appear intact despite that pot fisheries have been conducted in the relevant subarea of Valdivia for 4 years out of a total of 8 years (2005-2015) for which there are reported crab catches from Valdivia (Table 3).A fine resolution map suggests that a high proportion of the pot sets lie outside the subarea where VME observations were made (Fig. 3).

Table 2: Co-ordinates for possible new VME closure, illustrated in Figures 2 and 3. IDs represent boundary marking positions.

ID	Latitude	Longitude
1	26° 15.202' S	6° 16.677' E
2	26° 14.831' S	6° 17.175' E
3	26° 14.328' S	6° 17.525' E
4	26° 13.417' S	6° 18.037' E
5	26° 12.743' S	6° 18.742' E
6	26° 12.285' S	6° 19.369' E
7	26° 11.795' S	6° 20.553' E
8	26° 10.883' S	6° 21.421' E
9	26° 10.763' S	6° 21.822' E
10	26° 10.470' S	6° 22.000' E
11	26° 8.071' S	6° 22.102' E
12	26° 10.106' S	6° 26.080' E

ID	Latitude	Longitude
13	26° 14.126' S	6° 23.841' E
14	26° 18.625' S	6° 12.502' E
15	26° 16.137' S	6° 10.981' E
16	26° 14.044' S	6° 12.564' E
17	26° 14.439' S	6° 13.425' E
18	26° 14.595' S	6° 13.954' E
19	26° 14.605' S	6° 14.486' E
20	26° 14.379' S	6° 14.846' E
21	26° 14.431' S	6° 15.146' E
22	26° 14.760' S	6° 15.475' E
23	26° 15.485' S	6° 15.611' E
24	26° 15.511' S	6° 16.207' E

21.8 In other slopes of Valdivia and Ewing, the presence of live coral is either limited or patchy, and current fishing activity only comprises pot fishing. **SC recommends that these areas remain "existing fishing areas".**

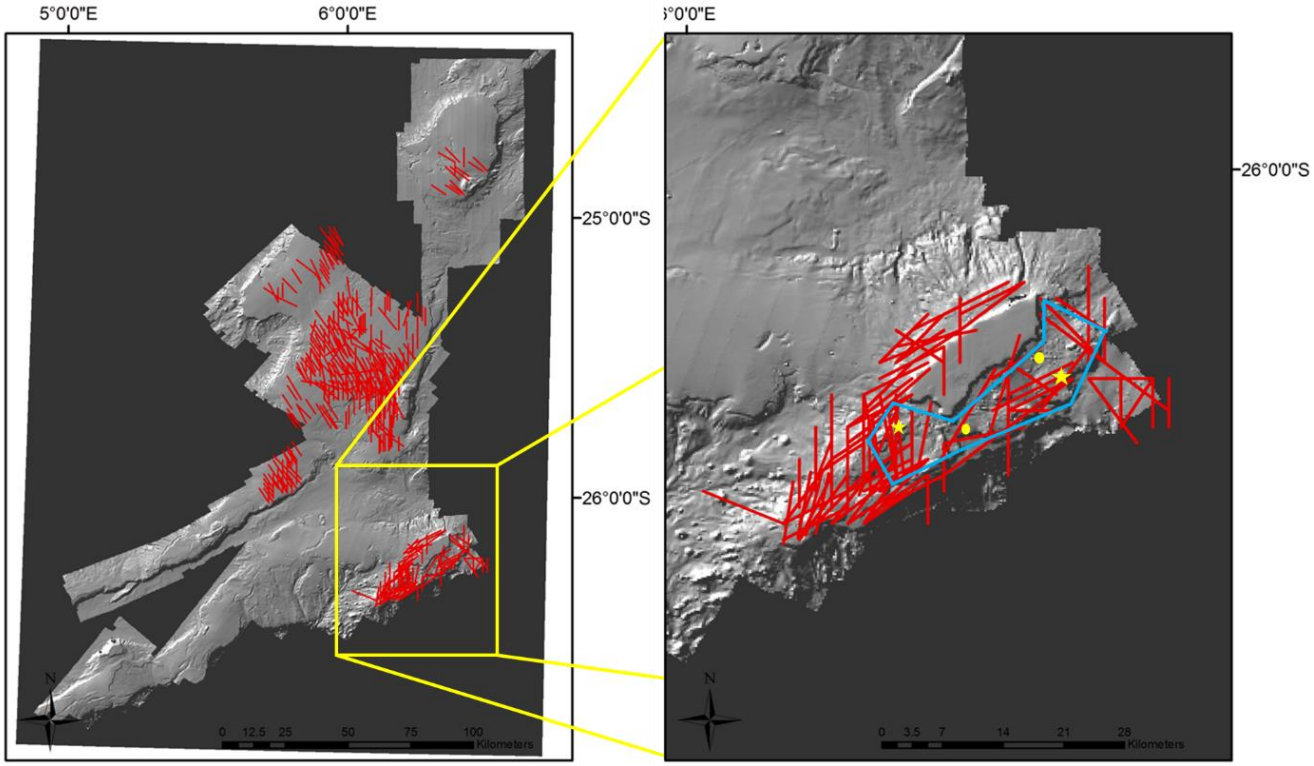

Figure 2: Relief map of the Valdivia Complex (left) and Valdivia Bank area (right) with records of crab pot sets reported to SEAFO 2005-2015 (red lines). Yellow symbols are sites where video dives were conducted during the *RV Dr. Fridtjof Nansen* cruise 2015. Sites marked with stars had coral gardens, while sites marked with circles had VME indicator

records but not in a density normally recognised as coral gardens. The subarea delineated with the light blue line represents a possible fishing closure or an area with access restricted to pot fishing.

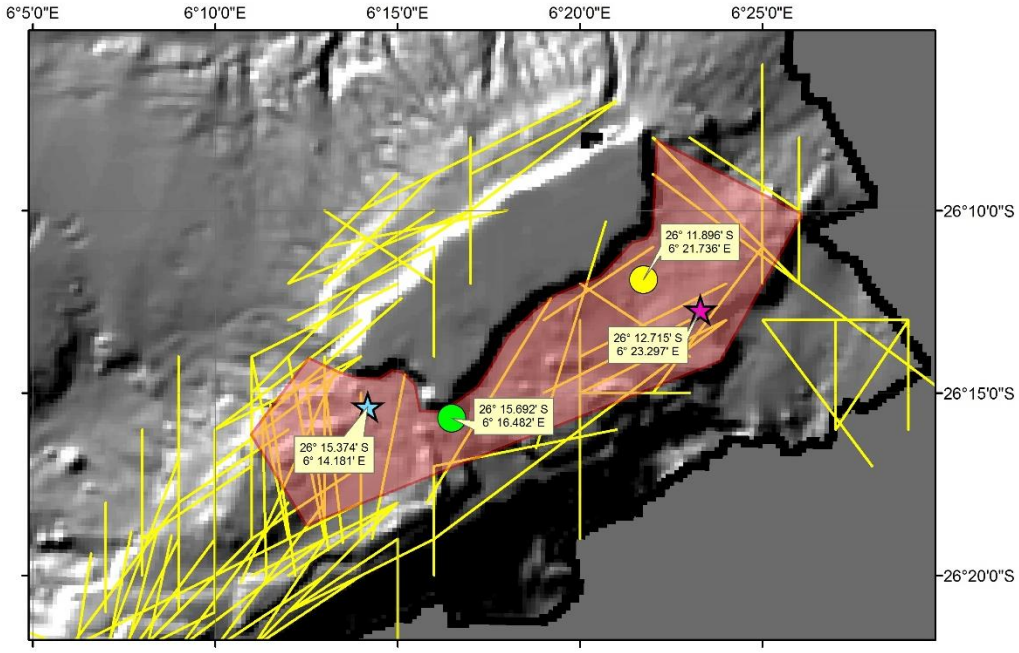

Figure 3: Detailed map of potential new VME closure and co-ordinates of VME observations. Yellow lines represent pot fishing tracks, while stars and circles are locations of coral gardens and other coral observations by video, respectively.

Table 3: Catch and number of pots compared for Valdivia South in relation to entire Valdivia fishing zone.

Year	Valdivia Bank Area - Catch (t)	Rest of Valdivia Area - Catch (t)	Total Catch (t)	% of total Catch in VBA
2005	11	243	254	4%
2010	80	120	200	40%
2011	84	91	175	48%
2015	37	67	104	36%

Year	Valdivia Bank Area (VBA) - # Pots	Rest of Valdivia Area - # Pots	Total # Pots	% of total Number of Pots in VBA
2005	2100	62840	64940	3%
2010	26840	44080	70920	38%
2011	23650	26940	50590	47%
2015	7545	16040	23585	32%

Agenda Point 16:

21.9 SC recommends the following TACs for 2016 - based on the harvest control rule adopted by the Commission in 2014:

- Patagonian toothfish TAC to be **264 tons for Sub-Area D**, and zero tons for the remainder of the SEAFO CA.

- Deep-Sea Red Crab TAC to be **190 tons for Division B1**, and 200 tons (status quo) for the remainder of the SEAFO CA.

Agenda Point 18:

21.10 The SC took note of the different activities proposed related to the FAO ABNJ Project, and the SC highlighted specifically the important contribution of the *R/V Dr Fridtjof Nansen* survey that had provided new information on VMEs and fisheries for the SEAFO region. It was also expressed that the SC would value the possibilities of further surveys in the future. The availability of biodiversity information from the fisheries by-catch records was also indicated by the SC, which could be useful in the context of the biodiversity app or to other partnerships (e.g. ACAP).

21.11 The SC considered alternative study areas for future scientific cruises, if opportunities arise. It was agreed to prioritize two such areas within the CA, both including existing fishing areas and fishing closures. The two areas are:
a) Discovery and Meteor Seamount complexes in Sub-Area D, including Closures #12 and 14.
b) Existing fishing areas and Closure #1 in SEAFO Division A1, if possible, all closures and existing fishing areas in Sub-Area A.

21.12 The SC noted that ACAP has MoUs in place with other RFMOs that serve to provide a framework for interaction and support on matters relating to seabird bycatch, and recommended that the SEAFO and ACAP Secretariats investigate the use of a similar mechanism for SEAFO, which can be brought back to the SEAFO Commission and ACAP Member Parties for their consideration.

22. SC to draft a proposal for a binding Conservation Measure on Recommendation 1/2008 on the "Banning of deep-water shark catches"

22.1 As a response to the request from the EU, the SC drafted a proposal for a binding Conservation Measure (CM) based on the Recommendation 1/2008 The SC did, however, not discuss the substance of the recommendation, nor whether or not the recommendation should be converted to a CM.

22.2 The draft is appended to the report as Appendix X.

23. SC to draft a proposal for a binding Conservation Measure on Recommendation 1/2009 on the "Banning of Gillnets"

23.1 As a response to the request from the EU, the SC drafted a proposal for a binding Conservation Measure (CM) based on the Recommendation 1/2009 The SC did, however, not discuss the substance of the recommendation, nor whether or not the recommendation should be converted to a CM.

23.2 The draft is appended to the report as Appendix XI.

24. Review of the 2016 Work Plan

24.1 SC asked the Secretariat to submit the 2015 Patagonian toothfish assessment (DOC/SC/17/2015) for independent peer review; and it was suggested that the FAO is asked to select a qualified assessment scientist as an anonymous reviewer. The identity of the reviewer should not be revealed to the Secretariat nor to the SC, only an anonymised report.

24.2 SC asked the Secretariat to obtain comments from Dr. Pedro Barros on the 2015 assessment of the Patagonian toothfish stock (DOC/SC/17/2015), including the appropriateness of the choice of assessment model and the outputs and diagnostics. It was suggested that the FAO representative in the meeting would facilitate.

24.3 Pertinent to CM 29/14 Articles 7.2 and 7.3, the SC shall provide guidance on assessments of exploratory fisheries, and develop procedures and standards for SC evaluation of such assessments.

24.4 The Secretariat suggested a small group consisting of scientists and compliance experts meet inter-sessionally to review the reporting forms, for example:

a. Observer Forms (not referred to in the SEAFO System);
b. Incomplete reporting format;
c. To streamline all reporting systems of SEAFO;
d. The following CPs volunteered to assist in the abovementioned tasks: South Africa, Namibia, Japan & Korea.

25. Any Other Matters

25.1 The Conservation Measure 29/14 was adopted by SEAFO in 2014. The SC would like to draw to the attention of the Commission that there are some minor issues (linguistic issues, mistakes, omissions) that would seem to require small amendments to the current CM text. The objective is to enhance readability, clarity and consistency. These minor issues discovered and proposed amendments are provided to the Commission as a separate CM text where the proposed amendments agreed by the SC are highlighted using 'track changes' (Appendix XV).

25.2 The SC amended the "Rules of Procedures" pertaining to the election of the Chair and Vice-Chairpersons (Appendix XII)

26. Budget for 2016

26.1 SEAFO SC participation in the FAO ABNJ project:- **Budget estimate: N$ 80000**.

26.2 SC would like to encourage continued participation in the FAO ABNJ project in which SEAFO has priority as a pilot area. Many elements of the project will benefit the activity of SC, and the interaction needs to be maintained and strengthened.

26.3 It is recommended that funds are allocated to facilitate participation of the SC in activities of the project, and the allocation would be used to fund or co-fund travel for appointed members of the SC to ensure presence in selected science-related meetings convened by the FAO program.

26.4 Participation in inter-sessional meetings to streamline SEAFO System data requirements and forms:- **Budget estimate: N$** 40000.

27. Election of SC Chairperson and Vice Chairperson

27.1 Namibia and South Africa were elected as Chair and Vice-Chair respectively for the next term of three years (2016-2018).

28. Adoption of the 2015 SC Report

The 2015 SC Report was adopted by all SC members at 16:55 on Friday, 9 October 2015.

29. Date and place of next SC meeting

Date: 6-14 October 2016
Venue: Windhoek, Namibia.

30. Closure of the 2015 SC meeting

On Friday 9th of October 2015 at 16h57, the Chairperson declared the 11th SEAFO Scientific Committee meeting closed. The Chairperson expressed his satisfaction for the work accomplished and thanked all participants for their valuable contributions.

31. References

PRAGER, M. H. (2005) – User manual for ASPIC: a stock-production model incorporating covariates (ver. 5) and auxiliary programs. Beaufort Lab. Doc., No. BL-2004-01.

APPENDIX I – Agenda for 11th SEAFO Scientific Committee Meeting

APPENDIX II – List of Participants

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No participation in 11th SEAFO SC meeting.

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APPENDIX III – List of Working Documents submitted for the 11th SEAFO SC Meeting

Document Ref. Number	Agenda Item	Document Title	Provider	Availability of Document
DOC/SC/00/2015	All	List of documents	Secretariat	Availably before the meeting
DOC/SC/01/2015	All	Provisional agenda of the 11th Annual Meeting of the Scientific Committee	Secretariat	Availably before the meeting
DOC/SC/02/2015	All	Provisional Annotated Agenda of the 11th Annual Meeting of the Scientific Committee	Secretariat	Available before the meeting
DOC/SC/03/2015	7/9/10	2015 Landings tables	Secretariat	Available before the meeting
DOC/SC/04/2015	8	Report of the 2014 Exploratory Fishing (JNP) revised	Japan	Available before the meeting
DOC/SC/05/2015	11	Stock Status Report - *Dissostichus eleginoides*	Secretariat	
DOC/SC/06/2015	11	Stock Status Report - *Hoplostethus atlanticus*	Secretariat	
DOC/SC/07/2015	11	Stock Status Report - *Chaceonerytheiae*	Secretariat	
DOC/SC/08/2015	11	Stock Status Report - *Pseudopentaceros richardsoni*	Secretariat	Available before the meeting
DOC/SC/09/2015	11	Stock Status Report - *Beryx splendens*	Secretariat	
DOC/SC/10/2015	12	Initial Cruise Report - DFN 2015402	Secretariat	Available before the meeting
DOC/SC/11/2015	13	CCAMLR Symposium	Secretariat	Available before the meeting
DOC/SC/12/2015	13	CCAMLR toothfish workshop	Secretariat	Available before the meeting
DOC/SC/13/2015	13	CCAMLR assessment of Patagonian toothfish in Area 48.6	Secretariat	Available before the meeting
DOC/SC/14/2015	7	Potential Fishing Grounds within the SEAFO Convention Area	Secretariat	
DOC/SC/15/2015	17	ABNJ Deep Seas Project Update SEAFO_SC_2015	FAO	
DOC/SC/16/2015	8	Plan of exploratory fishing in new bottom fishing ground in the SEAFO Convention Area in 2016	Japan	
DOC/SC/17/2015	11	Stock assessment of Patagonian toothfish (*Dissostichus eleginoides*) in the SEAFO CA (2002-2014)	Japan	
DOC/SC/18/2015	18	Guidelines for reopening of the closed areas in the SEAFO Convection Area	Japan	
DOC/SC/19/2015	17	SmartForms - reporting tool for species observations	FAO	
DOC/SC/20/2015	18	Draft proposal for scientific research in SEAFO fishing closures	Norway	
DOC/SC/21/2015		Minor amendments of Conservation Measure 29/14 on Bottom Fishing Activities and Vulnerable Marine Ecosystems in the SEAFO Convention Area	Secretariat	
DOC/SC/22/2015	12	Investigation of vulnerable marine ecosystems (VMEs), fisheries resources and biodiversity in the Convention Area of the Southeast Atlantic Fisheries Organisation (SEAFO)	Norway	

APPENDIX IV – Electronic Log Books

Example of an Electronic Log book as adopted from the CCAMLR Log book format.

All the e-forms will be available on the SEAFO website by January 2016.

SEAFO

LOG BOOK FOR LONGLINE FISHERIES
Data Form v2015

Guidelines for submitting these data are given in Chapter 3 – Article 10 of the SEAFO System.

Data must be submitted to info@seafo.org and gcampanis@seafo.org no later than 30 days after the end of a fishing trip.

Use SEAFO codes only, if a code is not listed please provide full details, e.g. species and or common name.

Rows in this data form may be added as required .
Field descriptions are listed in column 'A'
For examples expand column 'B'

	Example		
		GENERAL INFORMATION	
flag State	enter 3-alpl	Vessel flag	
registered	enter vesse	Vessel name	
internatio	enter call si	Vessel call sign	
Gross To	2534	Vessel size (GT)	
Date of e	01/Dec/13	SEAFO CA Entry Date	
Tonnage	150t	Fish stored onboard at time of entry	
Tonnage	30t	Fish stored onboard at time of entry	
Tonnage	80t	Fish stored onboard at time of entry	
Date of e	01/Dec/13	SEAFO CA Exit Date	
Tonnage of fish on ve		Fish stored onboard at time of exit	
name(s) o	enter name	Name of observer	
name of p	enter name	Name of person filling in this form	
email add	enter email	Email address of person responsible for data enquiries	
		Weight Conversion Factors	
species fa	TOP	Species	
type of pr	HGT	Processing type	
conversio	1.73	Conversion factor = Live weight/processed weight	
species fa	TOA	Species	
type of pr	HGT	Processing type	
conversio	1.82	Conversion factor = Live weight/processed weight	
		FINE-SCALE DATA	
		(1) Haul Identification	
species ta	TOT	Target species	
main acti	C	Type of fishing (**C**)ommercial; (**E**)xploratory fishing; (**S**)urvey data	
the subar	B1	Subarea or Division	
unique nu	1	Haul number	
		(2) Longline Gear - ***for exploratory fisheries only gear notified can be used***	
type of lo	TR	Type of longline	
type of m	I	Type of line	
type of ba	CHP	Type of bait	
percentag	97	Hooks baited (%)	
mean wid	30	Hook size (mm)	
the type o	50	Hook code or make	
spacing b	120	Hook spacing (cm)	
length of	11550	Length of line (m)	
total num	9600	Number of hooks set	
total num	0	Number of hooks lost that were attached to lost sections of the longline	
total num	20	Number of other hooks lost (excluding hooks attached to lost sections)	
		Trotline details - Complete only when trotline has been used	
was a cet	No	Trotline cetacean exclusion device used (**Y**es/**N**o)	
spacing b	45	Spacing between droplines (m)	
number o	4	Number of hook clusters per dropline	
spacing b	0.5	Spacing between hook clusters (m)	
number o	5	Number of hooks per cluster	
distance o	0.3	Distance of lowest (first) hook cluster above bottom (m)	
		(3) Set and Haul Details – ***Complete for every haul, including those where no fish were taken***	
difference	0	Time zone (UTC +/– hours)	
date (dd-	01/Dec/13	**Start setting** Date (dd-mm-yy)	
time (HH	19:00	Time (HH:mm)	
latitude (-	-72	Latitude (-DD for south)	
latitude m	48.3	Latitude minutes and fraction of minutes (MM.mm)	
longitude	177	Longitude (DD for east or -DD for west)	
longitude	26.5	Longitude minutes and fraction of minutes (MM.mm)	
depth (m)	1800	Fishing depth (m)	
date (dd-	01/Dec/13	**End setting** Date (dd-mm-yy)	
time (HH	20:10	Time (HH:mm)	
latitude (-	-72	Latitude (-DD for south)	
latitude m	48.7	Latitude minutes and fraction of minutes (MM.mm)	
longitude	177	Longitude (DD for east or -DD for west)	
longitude	28.3	Longitude minutes and fraction of minutes (MM.mm)	
depth (m)	1680	Fishing depth (m)	
distance b	0	Bottom to line distance (m)	
average v	270	Setting direction (bearing)	
date (dd-	02/Dec/13	**Start hauling** Date (dd-mm-yy)	
time (HH	03:00	Time (HH:mm)	
date (dd-	02/Dec/13	**End hauling** Date (dd-mm-yy)	
time (HH	11:15	Time (HH:mm)	
		(4) Catch – ***Complete for every haul*** - **Report ALL target, by-catch species** - ***report total VME-indicator organisms in section (6)***	
if the target species is		***If target species not caught, enter '0'***	

APPENDIX V – Landings, discards and bycatch tables

Retained & Discarded TAC species

Table 1A: Catches (tons) of Patagonian toothfish (*Dissostichus eleginoides*) by South Africa, Spain, Japan and Korea.

Nation	Spain		Japan				Korea				South Africa			
Fishing method	Longlines		Longlines				Longlines				Longlines			
Management Area	D0		D0		D1		D0		D1		D0		D1	
Catch details (t)	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.
2002	18													
2003	101				47		245	0						
2004	6				124									
2005	N/F	N/F			158		15	0						
2006	11				152		7	0						
2007	N/F		151		15		247	0						
2008	N/F	N/F	19	0	104	0	79	0						
2009	N/F	N/F	82	0	4	0	16	0	46	0	N/F	N/F	N/F	N/F
2010	26	0	41	0	12	2	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2011	N/F	N/F	172	6	N/F	N/F	N/F	N/F	N/F	N/F	15	0	28	0
2012	N/F	N/F	86	3	N/F	N/F	N/F	N/F	N/F	N/F	24	0	12	0
2013	N/F	N/F	41	2	20	1	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2014	N/F	N/F	68	<1	6	<1	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2015*	N/F	N/F	51	<1	0	0	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F

N/F = No Fishing. Blank fields = No data available. *Provisional (September 2015). Ret. = Retained Disc. = Discarded

Table 1B: Catches (tons) of Antarctic toothfish (*Dissostichus mawsoni*) by South Africa, Spain, Japan and Korea.

Nation	Spain		Japan				Korea				South Africa			
Fishing method	Longlines		Longlines				Longlines				Longlines			
Management Area	D0		D0		D1		D0		D1		D0		D1	
Catch details (t)	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.
2014	N/F	N/F	< 1	0	0	0	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2015*	N/F	N/F	0	0	0	0	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F

N/F = No Fishing. Blank fields = No data available. *Provisional (September 2015). Ret. = Retained Disc. = Discarded

Table 2. Catches (tons) of Orange roughy (*Hoplostethus atlanticus*) made by Namibia, Norway and Republic of South Africa.

Nation	**Namibia**		**Norway**		**South Africa**	
Fishing method	**Bottom trawl**		**Bottom trawl**		**Bottom trawl**	
Management Area	**B1**		**A1**		**B1**	
Catch details (t)	**Retained**	**Discarded**	**Retained**	**Discarded**	**Retained**	**Discarded**
1995	40		N/F			
1996	8		N/F			
1997	5		22		27#**	
1998	N/F	N/F	12			
1999	<1		N/F	N/F		
2000	75		0			
2001	94		N/F	N/F		
2002	9		N/F	N/F		
2003	27		N/F	N/F		
2004	15		N/F	N/F		
2005	18		N/F	N/F		
2006	N/F	N/F	N/F	N/F		
2007	N/F	N/F	N/F	N/F	N/F	N/F
2008	N/F	N/F	N/F	N/F	N/F	N/F
2009	N/F	N/F	N/F	N/F	N/F	N/F
2010	N/F	N/F	N/F	N/F	N/F	N/F
2011	N/F	N/F	N/F	N/F	N/F	N/F
2012	N/F	N/F	N/F	N/F	N/F	N/F
2013	N/F	N/F	N/F	N/F	N/F	N/F
2014	N/F	N/F	N/F	N/F	N/F	N/F
2015*	N/F	N/F	N/F	N/F	N/F	N/F

N/F = No Fishing. Blank fields = No data available.
* Provisional (Aug 2014)
** Sum of Catches from 1993 to 1997.
#Values taken from the Japp (1999).

Table 3A: Catches (tons) of Alfonsino (*Beryx splendens*) made by various countries.

Flag State	Namibia		Norway		Russia		Portugal		Ukraine		Korea	
Fishing method	Bottom trawl		Bottom trawl		Bottom trawl		Bottom trawl		UNK		Mid-water trawl	
Management Area	B1		A1		UNK		UNK		UNK		B1	
Catch details (t)	Retained	Discarded	Retained	Discarded	Retained	Discarded	Retained	Discarded	Retained	Discarded	Retained	Discarded
1976					252#							
1977					2972#							
1978					125#							
1993									172§			
1994												
1995	1#		N/F	N/F								
1996	368#		N/F	N/F					747§			
1997	208#		836		2800#				392§			
1998	N/F	N/F	1066		69§							
1999	1		N/F	N/F			3§					
2000	<1		242				1§					
2001	1		N/F	N/F			7§					
2002	0		N/F	N/F			1§					
2003	0		N/F	N/F			5§					
2004	6		N/F	N/F	210							
2005	1		N/F	N/F	54							
2006	N/F	N/F	N/F	N/F	N/F	N/F	<1					
2007	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2008	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2009	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2010	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	159	0
2011	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	165	0
2012	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	172	0
2013	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	13	0
2014	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2015*	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F

* Provisional (Aug 2014) N/F = No Fishing. Blank fields = No data available.
UNK = Unknown. # = Values taken from the Japp (1999). § = Values from FAO Two species targeted, however, *Beryx splendens* constitutes majority of the catch total.

Table 3B: Catches (tons) of Alfonsino (*Beryx spp*.) made by various countries.

Nation	Spain		Poland		Cook Island		Mauritius		Cyprus		South Africa	
Fishing method	Mid-water trawl and Longlines		UNK		Bottom trawl		Bottom trawl		Bottom trawl		Bottom trawl	
Management Area	UNK		UNK		UNK		UNK		UNK		B1	
Catch details (t)	Retained	Discarded	Retained	Discarded	Retained	Discarded	Retained	Discarded	Retained	Discarded	Retained	Discarded
1976												
1977												
1978												
1993												
1994												
1995			1964§								60#	
1996											109#	
1997	186§										124#	
1998	402§											
1999												
2000												
2001	2											
2002												
2003	2											
2004	4				142		115		437			
2005	72											
2006	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2007	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2008	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2009	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2010	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2011	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2012	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2013	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2014	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2015*	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F

* Provisional (Aug 2014) N/F = No Fishing. Blank fields = No data available. UNK = Unknown.

= Values taken from the Japp (1999). § = Values from FAO

Two species targeted: Beryx splendens represents majority of catch.

Table 4: Catches (tons) of Deep-sea red crab (*Chaceon spp*., considered to be mostly *Chaceon erytheiae*).

Nation	Japan		Korea		Namibia		Spain		Portugal	
Fishing method	Pots		Pots		Pots		Pots		Pots	
Management Area	B1		B1		B1		UNK		A	
Catch details (t)	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.
2001			N/F	N/F			<1			
2002			N/F	N/F						
2003			N/F	N/F			5			
2004			N/F	N/F			24			
2005	253	0	N/F	N/F	54					
2006	389		N/F	N/F						
2007	770		N/F	N/F	3	0			35	
2008	39		N/F	N/F						
2009	196		N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2010	200	0	N/F	N/F			N/F			
2011	N/F	N/F	N/F	N/F	175	0	N/F	N/F	N/F	N/F
2012	N/F	N/F	N/F	N/F	198	0	N/F	N/F	N/F	N/F
2013	N/F	N/F	N/F	N/F	196	0	N/F	N/F	N/F	N/F
2014	N/F	N/F	N/F	N/F	135	0	N/F	N/F	N/F	N/F
2015*	N/F	N/F	104	0	N/F	N/F	N/F	N/F	N/F	N/F

* Provisional (September 2015) Ret. = Retained Disc. = Discarded
N/F = No Fishing.
Blank fields = No data available.
UNK = Unknown.

Table 5a: Catches (tons) of Pelagic armourhead (*Pseudopentaceros richardsoni*).

Nation	Namibia		Russia		Ukraine		South Africa	
Fishing method	Bottom trawl		Bottom trawl		Bottom trawl		Bottom trawl	
Management Area	B1		B1		UNK		B1	
Catch details (t)	Retained	Discarded	Retained	Discarded	Retained	Discarded	Retained	Discarded
1976			108					
1977			1273					
1978			53					
1993			1000		435§			
1994								
1995	8				49		530	
1996	284				281		201	
1997	559				18		12	
1998	N/F							
1999	N/F							
2000	20							
2001	N/F							
2002	N/F							
2003	4							
2004								
2005								
2006								

2007								
2008								
2009	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2010	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2011	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2012	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2013	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2014	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2015*	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F

* = Provisional (September 2015)
N/F = No Fishing.
Blank fields = No Data Available.
UNK = Unknown.
§ = Values from FAO

Table 5b: Catches (tons) of Pelagic armourhead (*Pseudopentaceros richardsoni*).

Nation	**Spain**		**Cyprus**		**Korea**	
Fishing method	**Bottom trawl and Longline**		**Bottom trawl**		**Mid-water trawl**	
Management Area	**B1**		**UNK**		**B1**	
Catch details (t)	**Retained**	**Discarded**	**Retained**	**Discarded**	**Retained**	**Discarded**
1976						
1977						
1978						
1993						
1994						
1995						
1996						
1997						
1998						
1999						
2000						
2001	<1					
2002						
2003	3					
2004	3		22			
2005						
2006						
2007						
2008						
2009	N/F	N/F	N/F	N/F	N/F	N/F
2010	N/F	N/F	N/F	N/F	688	0
2011	N/F	N/F	N/F	N/F	135	0
2012	N/F	N/F	N/F	N/F	152	<1
2013	N/F	N/F	N/F	N/F	13	0
2014	N/F	N/F	N/F	N/F	N/F	N/F
2015*	N/F	N/F	N/F	N/F	N/F	N/F

* = Provisional (September 2015)
N/F = No Fishing.

Blank fields = No Data Available.
UNK = Unknown.
§ = Values from FAO

Retained & Discarded Bycatch species

Table 6: Catches (tons) of oreo dories (*Allocyttusverucossus, Neocyttusr hombiodalis, Allocyttus guineensis*). Smooth oreo dories- *Pseudocyttu smaculatus*.

Nation	Russia		Cyprus		Mauritius		Namibia	
Fishing method	UNK		UNK		UNK		Bottom trawl	
Management Area	UNK		UNK		UNK		UNK	
Catch details (t)	Retained	Discarded	Retained	Discarded	Retained	Discarded	Retained	Discarded
1995							<1	
1996							0	
1997							35	
1998							N/F	N/F
1999							3	
2000							33	
2001							14	
2002							1	
2003							1	
2004	<1		21		25		0	
2005							4	
2006								
2007								
2008								
2009								
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0
2014	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2015*	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F

* Provisional (September 2015)
N/F = No Fishing. Blank fields = No data available. UNK = Unknown.

Table 7: Catches (tons) of Wreckfish (*Polyprion americanus*). (WRF)

Nation	Portugal	
Fishing method	Longlines	
Management Area	A	
Catch details (t)	Retained	Discarded
2004	1	
2005		
2006	6	
2007	9	
2008		
2009	0	0

2010	0	0
2011	0	0
2012	0	0
2013	N/F	N/F
2014	N/F	N/F
2015*	N/F	N/F

* Provisional (September 2015)
N/F = No Fishing. Blank fields = No data available. UNK = Unknown.

Table 8: Catches (tons) of Blackbelly rosefish (*Helicolenus* spp.). (BRF)

Nation	**Korea**	
Fishing method	**Mid-water trawl**	
Management Area	**B1**	
Catch details (t)	**Retained**	**Discarded**
2010	161	0
2011	47	0
2012	44	0
2013	4	0
2014	N/F	N/F
2015*	N/F	N/F

* Provisional (September 2015)

Table 9: Catches (tons) of Imperial Blackfish (*Schedophilus ovalis*). (HDV)

Nation	**Korea**	
Fishing method	**Mid-water trawl**	
Management Area	**B1**	
Catch details (t)	**Retained**	**Discarded**
2010	24	0
2011	35	0
2012	24	0
2013	<1	0
2014	N/F	N/F
2015*	N/F	N/F

* Provisional (September 2015)

Table 10: Catches (tons) of Silver Scabbardfish (*Lepidotus caudatus*). (SVS)

Nation	**Korea**	
Fishing method	**Mid-water trawl**	
Management Area	**B1**	
Catch details (t)	**Retained**	**Discarded**
2010	30	0
2011	15	0
2012	2	0

2013	0	<1
2014	N/F	N/F
2015*	N/F	N/F

* Provisional (September 2015)

Table 11: Catches (tons) of Mackerel (*Scomber japonicus*). (MAZ)

Nation	**Korea**	
Fishing method	**Mid-water trawl**	
Management Area	**B1**	
Catch details (t)	**Retained**	**Discarded**
2010	50	0
2011	0	0
2012	0	0
2013	0	0
2014	N/F	N/F
2015*	N/F	N/F

* Provisional (September 2015)

Table 12: Catches (tons) of Cape Horse Mackerel (*Trachurus capensis*). (HMC)

Nation	**Korea**	
Fishing method	**Mid-water trawl**	
Management Area	**B1**	
Catch details (t)	**Retained**	**Discarded**
2010	1	0
2011	0	0
2012	0	0
2013	0	0
2014	N/F	N/F
2015*	N/F	N/F

* Provisional (September 2015)

Table 13: Catches (tons) of Cape Bonnetmouth (*Emmelichthys nitidus*). (EMM)

Nation	**Korea**	
Fishing method	**Mid-water trawl**	
Management Area	**B1**	
Catch details (t)	**Retained**	**Discarded**
2010	11	0
2011	2	0
2012	<1	0
2013	0	0
2014	N/F	N/F
2015*	N/F	N/F

* Provisional (September 2015)

Table 14: Catches (tons) of Oilfish (*Ruvettus pretiosus*). (OIL)

Nation	**Korea**	
Fishing method	**Mid-water trawl**	
Management Area	**B1**	
Catch details (t)	**Retained**	**Discarded**
2010	5	0
2011	13	0
2012	7	<1
2013	<1	0
2014	N/F	N/F
2015*	N/F	N/F

* Provisional (September 2015)

Table 15: Catches (tons) Gemfish (*Roudiescolar*, *Promethichthys prometheus*). (PRP)

Nation	**Korea**	
Fishing method	**Mid-water trawl**	
Management Area	**B1**	
Catch details (t)	**Retained**	**Discarded**
2010	0	0
2011	0	0
2012	<1	0
2013	0	0
2014*	N/F	N/F

* Provisional (September 2015)

Table 16: Catches (tons) of Orange bellowfish (NPR)

Nation	**Korea**	
Fishing method	**Mid-water trawl**	
Management Area	**B1**	
Catch details (t)	Retained	Discarded
2010	0	0
2011	0	0
2012	0	<1
2013	0	<1
2014	N/F	N/F
2015*	N/F	N/F

* Provisional (September 2015)

Table 17: Catches (tons) of Grenadiers nei (*Macrourus* spp.) (GRV)

Nation	**Spain**				**Japan**				**Korea**		**South Africa**			
Fishing method	**Longlines**				**Longlines**				**Longlines**		**Longlines**			
Management Area	**D0**		**D1**		**D0**		**D1**		**D0**		**D0**		**D1**	
Catch details (t)	Retained	Discarded	Retained	Discarded	Retained	Discarded	Retained	Discarded	Retained	Discarded	Retained	Discarded	Retained	Discarded
2009	N/F	N/F	N/F	N/F	0	0	0	6	0	<1	N/F	N/F	N/F	N/F
2010	4	<1	2	0	0	0	0	3	N/F	N/F	N/F	N/F	N/F	N/F
2011	N/F	N/F	N/F	N/F	0	22	0	0	N/F	N/F	0	0	0	0
2012	N/F	N/F	N/F	N/F	0	21	0	0	N/F	N/F	0	3	0	<1
2013	N/F	N/F	N/F	N/F	0	7	0	<1	N/F	N/F	N/F	N/F	N/F	N/F
2014	N/F	N/F	N/F	N/F	0	6	0	<1	N/F	N/F	N/F	N/F	N/F	N/F
2015*	N/F	N/F	N/F	N/F	0	<1	0	0	N/F	N/F	N/F	N/F	N/F	N/F

* Provisional (September 2015)

Table 18: Catches (tons) of Blue antimora (*Antimora rostrata*). (ANT)

Nation	**Spain**				**Japan**				**Korea**				**South Africa**			
Fishing method	**Longlines**				**Longlines**				**Longlines**				**Longlines**			
Management Area	**D0**		**D1**		**D0**		**D1**		**D0**		**D1**		**D0**		**D1**	
Catches (t)	Ret	Dis	Ret	Dis	Ret	Dis	Ret	Dis	Ret	Dis	Ret	Dis	Ret	Dis	Ret	Dis
2009	N/F	N/F	N/F	N/F	0	0	0	5	0	<1	0	<1	N/F	N/F	N/F	N/F
2010	0	<1	0	<1	0	0	0	1	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2011	N/F	N/F	N/F	N/F	0	5	0	0	N/F	N/F	N/F	N/F	0	0	0	0
2012	N/F	N/F	N/F	N/F	0	4	0	0	N/F	N/F	N/F	N/F	0	<1	0	<1
2013	N/F	N/F	N/F	N/F	0	<1	0	<1	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2014	N/F	N/F	N/F	N/F	0	2	0	<1	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2015*	N/F	N/F	N/F	N/F	0	<1	0	0	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F

* Provisional (September 2015) N/F = No Fishing Ret = Retained Dis = Discarded

APPENDIX VI – Data on catches of VME indicator species within the SEAFO CA

Tables 20-28 contain data on VME indicators as listed in Table 19. Tables29&30 represent data on benthic taxa that are not confirmed as VME indicators.

Table 19: Provisional list of benthic invertebrate VME indicator taxa for the SEAFO CA.

Group / Species code	Phylum / Order / Family	Common name
PFR	Porifera (Phylum)	Sponges
GGW	Gorgonacea (Order)	Gorgonian corals
AZN	Anthoathecatae (Family)	Hydrocorals
CSS	Scleractinia (Order)	Stony corals
AQZ	Anthipatharia (Order)	Black corals
ZOT	Zoantharia (Order)	Zoanthids
AJZ	Alcyonacea (Order)	Soft corals
NTW	Pennatulacea (Order)	Sea pens
BZN	Bryozoa (Phylum)	Erect bryozoans
CWD	Crinoidea (Class)	Sea lilies
OWP	Ophiuroidea (Class)	Basket stars
SZS	Serpulidae (Family)	Annelida
SSX	Ascidiacea (Class)	Sea squirts
ATX[#]	Ceriantharia (Order)	Tube-dwelling Sea anemones

[#]FAO code changed to Ceriantharia

Table 20: Catches (kg) of Gorgonians (VME indicators) (GGW).

Nation	Japan		Spain	Korea
Management Area	D		D	B
Fishing method	LLS		LLS	Pots
Catch details	Bycatch (kg)		Bycatch (kg)	Bycatch (kg)
	D0	D1		B1
2010	0	0	47.5	N/F
2011	3.8	0	N/F	N/F
2012	30.3	0	N/F	N/F
2013	1.2	0	N/F	N/F
2014	2.34	2.6	N/F	N/F
2015*	0	0	N/F	11.5

***** Provisional (Sep 2015)
N/F = No Fishing. Blank fields = No data available.

Table 21: Catches (kg) of Black corals and thorny corals (VME indicators) (AQZ)

Nation	Japan	Spain	Korea
Management Area	D	D	B1
Fishing method	LLS	LLS	Pots
Catch details	Bycatch (kg)	Bycatch (kg)	Bycatch (kg)
2010	0	4.4	N/F

2011	0	N/F	N/F
2012	0.02	N/F	N/F
2013	0	N/F	0.4
2014	0	N/F	N/F
2015*	0	N/F	0.25

***** Provisional (Sep 2015)
N/F = No Fishing. Blank fields = No data available.

Table 22: Catches (kg) of Scleractinia (VME indicators) (CSS)

Nation	**Japan**		**Spain**	**Korea**
Management Area	**D**		**D**	**B**
Fishing method	**LLS**		**LLS**	**Pots**
Catch details	**Bycatch (kg)**		**Bycatch (kg)**	**Bycatch (kg)**
	D0	**D1**		**B1**
2010	0	0	2.2	N/F
2011	15.4	0	N/F	N/F
2012	17.6	0	N/F	N/F
2013	0	0	N/F	N/F
2014	2.8	0.3	N/F	N/F
2015*	0	0	N/F	29.5

***** Provisional (Sep 2015)
N/F = No Fishing.

Table 23: Catches (kg) of sea pens (VME indicators) (NTW)

Nation	**Japan**	**Spain**	**Korea**
Management Area	**D**	**D**	**B**
Fishing method	**LLS**	**LLS**	**Pots**
Catch details	**Bycatch (kg)**	**Bycatch (kg)**	**Bycatch (kg)**
			B1
2010	0	1.3	N/F
2011	0	N/F	N/F
2012	0.02	N/F	N/F
2013	0	N/F	N/F
2014	0	N/F	N/F
2015*	0	N/F	0.05

***** Provisional (Sep 2015)
N/F = No Fishing.

Table 24: Catches (kg) of sponges (VME indicators) (PFR)

Nation	**Japan**	**Spain**	**Korea**
Management Area	**D**	**D**	**B**

Fishing method	LLS	LLS	Pots
Catch details	Bycatch (kg)	Bycatch (kg)	Bycatch (kg)
			B1
2010	0	29.7	N/F
2011	0	N/F	N/F
2012	0	N/F	N/F
2013	0	N/F	N/F
2014	0	N/F	N/F
2015*	0	N/F	0.3

***** Provisional (Sep 2015)
N/F = No Fishing.

Table 25: Catches (kg) of Zoanthids (VME indicators) (ZOT)

Nation	Japan	Spain
Management Area	D	D
Fishing method	LLS	LLS
Catch details	Bycatch (kg)	Bycatch (kg)
2010	0	0.3
2011	0	N/F
2012	0	N/F
2013	0	N/F
2014	0	N/F
2015*	0	N/F

***** Provisional (Sep 2015)
N/F = No Fishing.

Table 26: Catches (kg) of soft corals (VME indicators) (AJZ)

Nation	Japan	Spain
Management Area	D	D
Fishing method	LLS	LLS
Catch details	Bycatch (kg)	Bycatch (kg)
2010	0	0.3
2011	0	N/F
2012	0	N/F
2013	0	N/F
2014	0	N/F
2015*	0	N/F

***** Provisional (Sep 2015)
N/F = No Fishing.

Table 27: Catches (kg) of sea lilies (VME indicators) (CWD)

Nation	Japan	Spain
Management Area	D	D
Fishing method	LLS	LLS
Catch details	Bycatch (kg)	Bycatch (kg)
2010	0	1.0
2011	0	N/F
2012	0.02	N/F
2013	0	N/F
2014	0	N/F
2015*	0	N/F

***** Provisional (Sep 2015)
N/F = No Fishing.

Table 28: Catches (kg) of Basket stars (VME indicators) (OWP)

.Nation	Japan		Spain	Korea
Management Area	D		D	B
Fishing method	LLS		LLS	Pots
Catch details	Bycatch (kg)		Bycatch (kg)	Bycatch (kg)
	D0	D1		B1
2010	0	0	0	N/F
2011	0	0	N/F	N/F
2012	0	0	N/F	N/F
2013	0	0	N/F	N/F
2014	0.1	0	N/F	N/F
2015*	0	0	N/F	0.3

***** Provisional (Sep 2015)
N/F = No Fishing.

Table 29: Catches (kg) of Sea anemones (ATX).

Nation	Japan		Spain	Korea
Management Area	D		D	B
Fishing method	LLS		LLS	Pots
Catch details	Bycatch (kg)		Bycatch (kg)	Bycatch (kg)
	D0	D1		B1
2010	0	0	0	N/F
2011	0	0	N/F	N/F
2012	0	0	N/F	N/F
2013	0	0	N/F	N/F
2014	0.2	0	N/F	N/F
2015*	0	0	N/F	0.7

***** Provisional (Sep 2015)
N/F = No Fishing.

Table 30: Catches (kg) of Gastropoda (GAS)

Nation	**Japan**		**Spain**	**Korea**
Management Area	**D**		**D**	**B**
Fishing method	**LLS**		**LLS**	**Pots**
Catch details	**Bycatch (kg)**		**Bycatch (kg)**	**Bycatch (kg)**
	D0	D1		B1
2010	0	0	0	N/F
2011	0	0	N/F	N/F
2012	0	0	N/F	N/F
2013	0	0	N/F	N/F
2014	0	0	N/F	N/F
2015*	0	0	N/F	8.6

***** Provisional (Sep 2015)
N/F = No Fishing.

There were no recorded encounters in 2015 of individual set bycatches exceeding the current VME threshold values (60kg for corals and 800kg for sponges).

APPENDIX VII – Stock Status Report – Deep-sea red crab

STATUS REPORT

Chaceon erytheiae

Common Name: Deep-sea red crab

FAO-ASFIS Code: GER

2015

Updated: 30-Sep-15

TABLE OF CONTENTS

1. Description of the fishery

1.1 Description of fishing vessels and fishing gear

Data within the SEAFO database indicate that the deep-sea red crab (DSRC) resource has been utilized by two nations primarily, Namibia and Japan. The Namibian-flagged vessel, *FV Crab Queen 1*, known to fish crab in the SEAFO CA is a 49.61m, 1989-built steel vessel with an onboard holding capacity of 610m^3. The vessel can process on average 1200 traps (i.e. three sets with 400 traps each) per day.

During 2005 an older Japanese-flagged vessel, *FV Kinpo Maru no. 58*, conducted crab fishing activities in the SEAFO CA. This vessel was built in 1986, is 62.60m in length and has an onboard holding capacity of 648m^3. The *Kinpo Maru*, however, was replaced by the *FV Seiryo Maru* which is 37.06m in length, was built in 1987 and has an on-board holding capacity of 289 m^3.

The Namibian and Japanese vessels' gear setup (set deployment & design) are very similar. Both vessels use the same type of fishing gear – known as Japanese beehive pots (Fig. 1). The beehive pots are conical metal frames covered in fishing net with an inlet shoot (trap entrance – Fig. 1) on the upper side of the structure and a catch retention bag on its underside. When settled on the seabed the upper side of the trap are roughly 50cm above the ground ensuring easy access to the entrance of the trap. The trap entrance leads to the kitchen area of the trap – which is sealed off by a plastic shoot that ensures all crabs end up in the bottom of the trap.

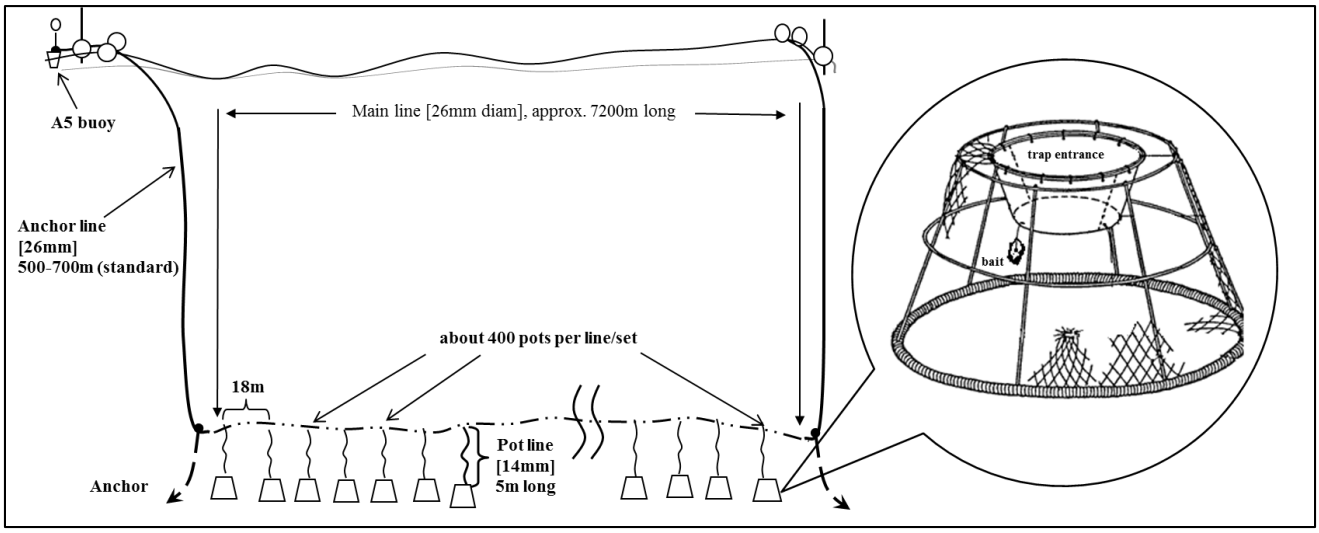


Figure 1: Deep-sea red crab fishing gear setup (set deployment and design) and illustration of a Japanese beehive pot (shown in enlarged form on the right).

One set or pot line consists of about 200-400 beehive pots, spaced roughly 18m apart, on a float line attached to two (start & end) anchors for keeping the gear in place on the seabed (Fig. 1). The start & end points of a set are clearly marked on the surface of the water with floats and one A5 buoy that denotes the start of a line. Under this setup (i.e. 400pots at 18m intervals) one crab fishing line covers a distance of roughly 7.2km (3.9nm) on the sea floor and sea surface.

1.2 Spatial and temporal distribution of fishing

In the SEAFO Convention Area fishing for deep-sea red crab is focussed mainly on *Chaceon erytheiae* on Valdivia Bank – a fairly extensive seamount that forms part of the Walvis Ridge (Fig. 2-6). This seamount

is located in Division B1 of the SEAFO CA and has been the main fishing area of the crab fishery since 2005 when the resource was accessed by Japan. Records from the SEAFO database indicate that fishing for crab in this area occurred over a depth range of 280-1150m.

Table 1: The total number of sets from which deep-sea red crab catches were derived for the period 2010-2015.

2010	2011	2012	2013	2014	2015
181	133	129	103	107	73

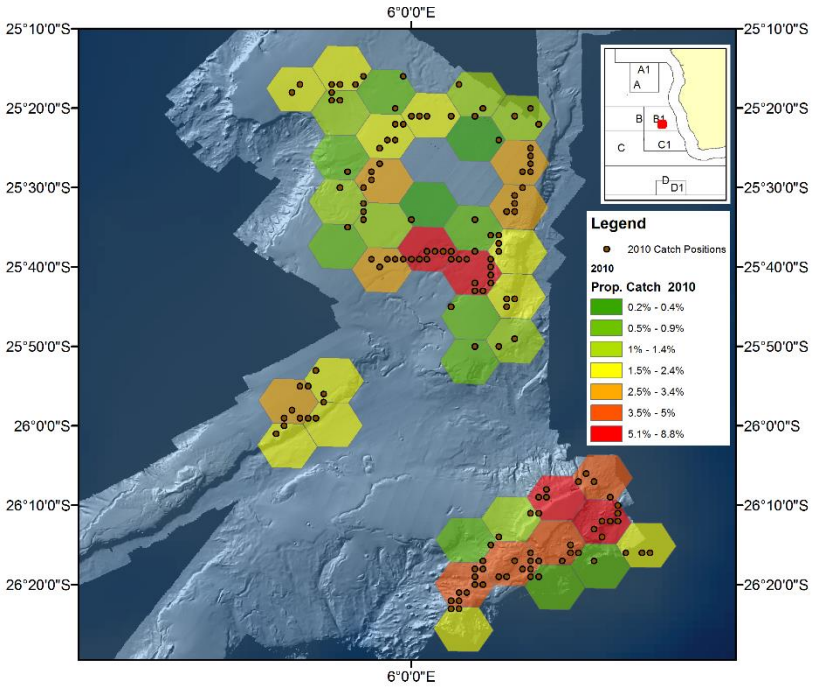


Figure 2: The 2010 catch distributions for deep-sea red crab in Division B1 aggregated to a 10 km^2 hexagonal area.

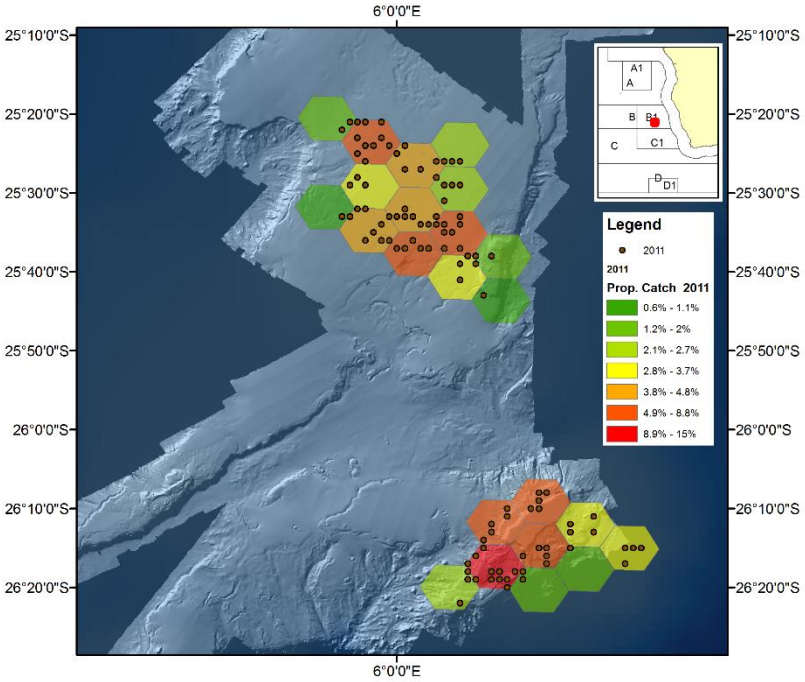


Figure 3: The 2011 catch distributions for deep-sea red crab in Division B1 aggregated to a 10 km^2 hexagonal area.

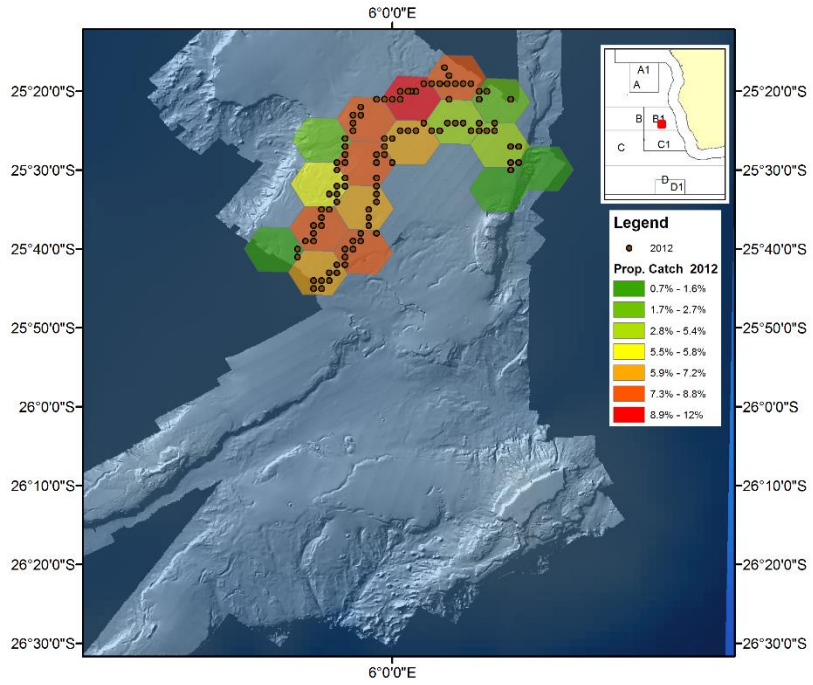


Figure 4: The 2012 catch distributions for deep-sea red crab in Division B1 aggregated to a 10 km^2 hexagonal area.

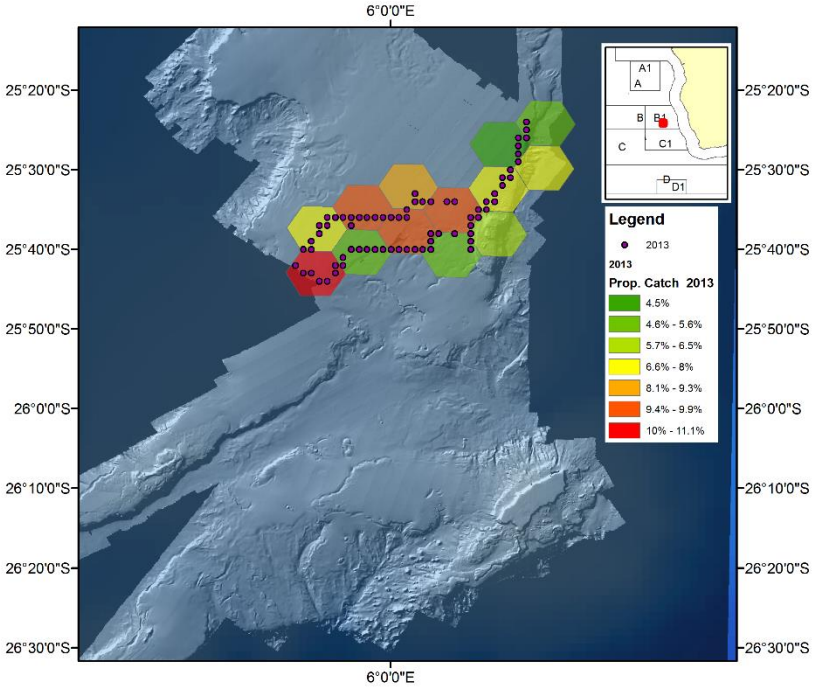


Figure 5: The 2013 catch distributions for deep-sea red crab in Division B1 aggregated to a 10 km^2 hexagonal area.

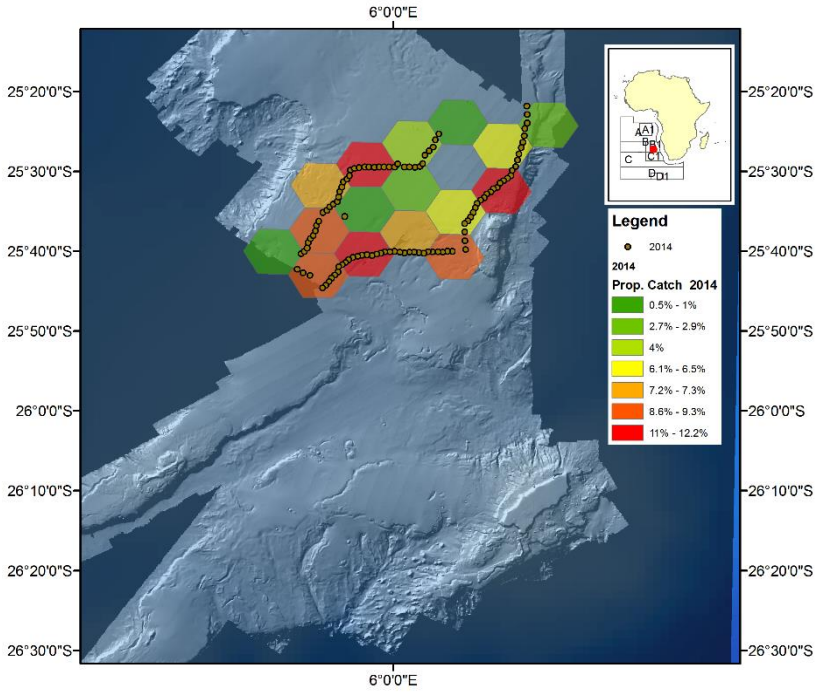


Figure 6: The 2014 catch distributions for deep-sea red crab in Division B1 aggregated to a 10 km^2 hexagonal area.

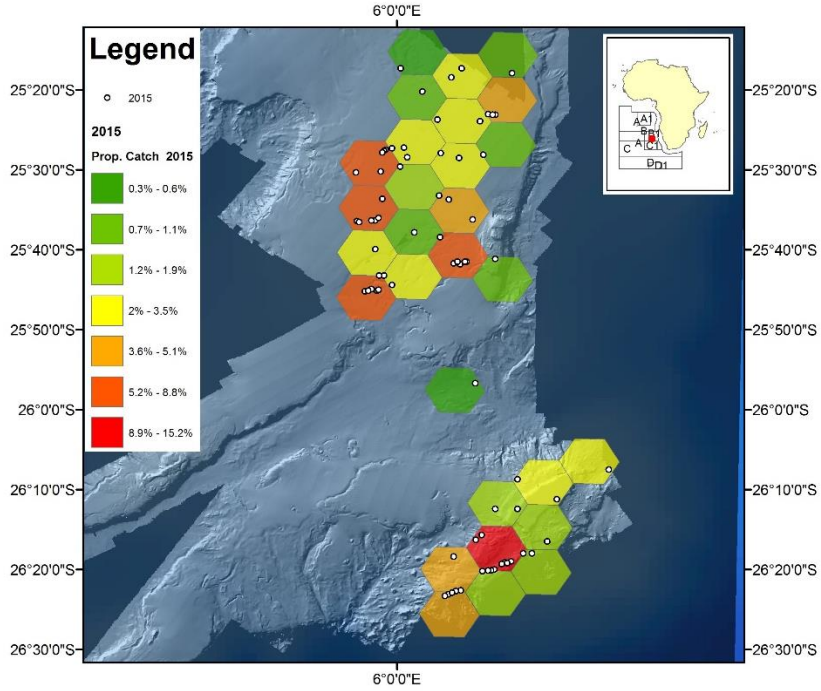


Figure 7: The 2015 catch distributions for deep-sea red crab in Division B1 aggregated to a 10 km^2 hexagonal area.

1.3 Reported landings and discards

Reported landings (Table 2) comprise catches made by Japanese, Namibian, Spanish, Portuguese and Korean-flagged vessels over the period 2001-2015. As is evident from Table 2 the two main players in the SEAFO crab fishery are Japan and Namibia, respectively, with Spanish and Portuguese vessels having only sporadically fished for crab in the SEAFO CA over the period 2003 to 2007. Spanish-flagged vessels actively

fished for crab in the SEAFO CA during 2003 and 2004, whereas Portuguese-flagged vessels only fished for crab once during the 2007 season (Table 2).

Table 2: Catches (tonnes) of deep-sea red crab (*Chaceon spp*. – considered to be mostly *Chaceon erytheiae*).

Nation	Japan		Korea		Namibia		Spain		Portugal	
Fishing method	Pots		Pots		Pots		Pots		Pots	
Management Area	B1		B1		B1		UNK		A	
Catch details (t)	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.
2001			N/F	N/F			<1			
2002			N/F	N/F						
2003			N/F	N/F			5			
2004			N/F	N/F			24			
2005	253	0	N/F	N/F	54					
2006	389		N/F	N/F						
2007	770		N/F	N/F	3	0			35	
2008	39		N/F	N/F						
2009	196		N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2010	200	0	N/F	N/F			N/F			
2011	N/F	N/F	N/F	N/F	175	0	N/F	N/F	N/F	N/F
2012	N/F	N/F	N/F	N/F	198	0	N/F	N/F	N/F	N/F
2013	N/F	N/F	N/F	N/F	196	0	N/F	N/F	N/F	N/F
2014	N/F	N/F	N/F	N/F	135	0	N/F	N/F	N/F	N/F
2015*	N/F	N/F	104	0	N/F	N/F	N/F	N/F	N/F	N/F

* Provisional (September 2015) Ret. = Retained Disc. = Discarded
N/F = No Fishing.
Blank fields = No data available.
UNK = Unknown.

Being a pot fishery, the deep-sea red crab fishery has an almost negligible bycatch impact. To date only 5kg of teleost (Marine nei and European sprat) fish discards have been recorded, during 2010, from this fishery. As of 2010, however, minimal to moderate bycatches of king crabs have also been recorded from this fishery (see Section 5.3 for additional information).

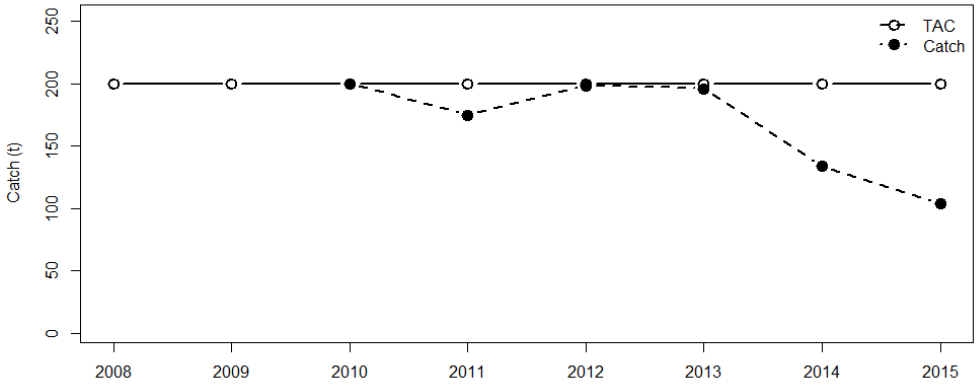


Figure 8: Annual catches in relation to TAC for Deep-Sea Red Crab in Division B1. No catches were taken elsewhere in the SEAFO CA.

1.4 IUU catch

IUU fishing activity in the SEAFO CA has been reported to the Secretariat latest in 2012, but the extent of IUU fishing is at present unknown.

2. Stock distribution and identity

One species of deep-sea red crab has been recorded in Division B1, namely *Chaceon erytheiae* (López-Abellán *et al*. 2008), and is thus considered the target species of this fishery. Aside from the areas recorded in catch records the overall distribution of *Chaceon erytheiae* within the SEAFO CA is still unknown. Further encounter records documented through video footage during the 2015 FAO-Nansen VME survey in the SEAFO CA indicate that deep-sea red crab are distributed across a major part of the Valdivia seamount range, as well as the Ewing and Vema seamounts (DOC/SC/22/2015).

Preliminary results from genetics studies, based on Mitochondrial DNA, indicate that the deep-sea red crab targeted by the pot fishery on the Valdivia Bank is confirmed as *C. erytheiae* (López-Abellán *pers. comm.*).

3. Data available for assessments, life history parameters and other population information

3.1 Fisheries and surveys data

Fishery-dependent data exist only for more recent years (2010-2014) of the SEAFO deep-sea red crab fishery (Fig. 7). Biological data from the fishery comprise gender-specific length-frequency, weight-at-length, female maturity and berry state data (Table 3).

Table3: Illustration of sampling frequencies (2010-2015) from the deep-sea red crab commercial fleet within the SEAFO CA.

	2010	**2011**	**2012**	**2013**	**2014**	**2015**
Total Number of Sets	181	133	120	103	107	74
Crabs Sampled per Set	30	30	30	30	100	136
Total Crabs Sampled	5430	3990	3600	3077	10654	32500

Very limited fisheries-independent data on deep-sea red crabs exists for the SEAFO CA. A total of 479 deep-sea red crabs were sampled during the 2008 Spanish-Namibia survey on Valdivia Bank. The data was collected over a depth range of 867-1660m. Additionally 127 deep-sea red crab samples were collected onboard the *RV Fridtjof Nansen* during the SEAFO VME mapping survey conducted at the start of 2015 (DOC/SC/22/2015).

3.2 Length data and frequency distribution

Available length-frequency data for crabs caught in the SEAFO CA over the period 2010-2014 are presented in Figure 8. Length-frequency data from all areas sampled in Division B1 were pooled as no significant differences were detected between areas.

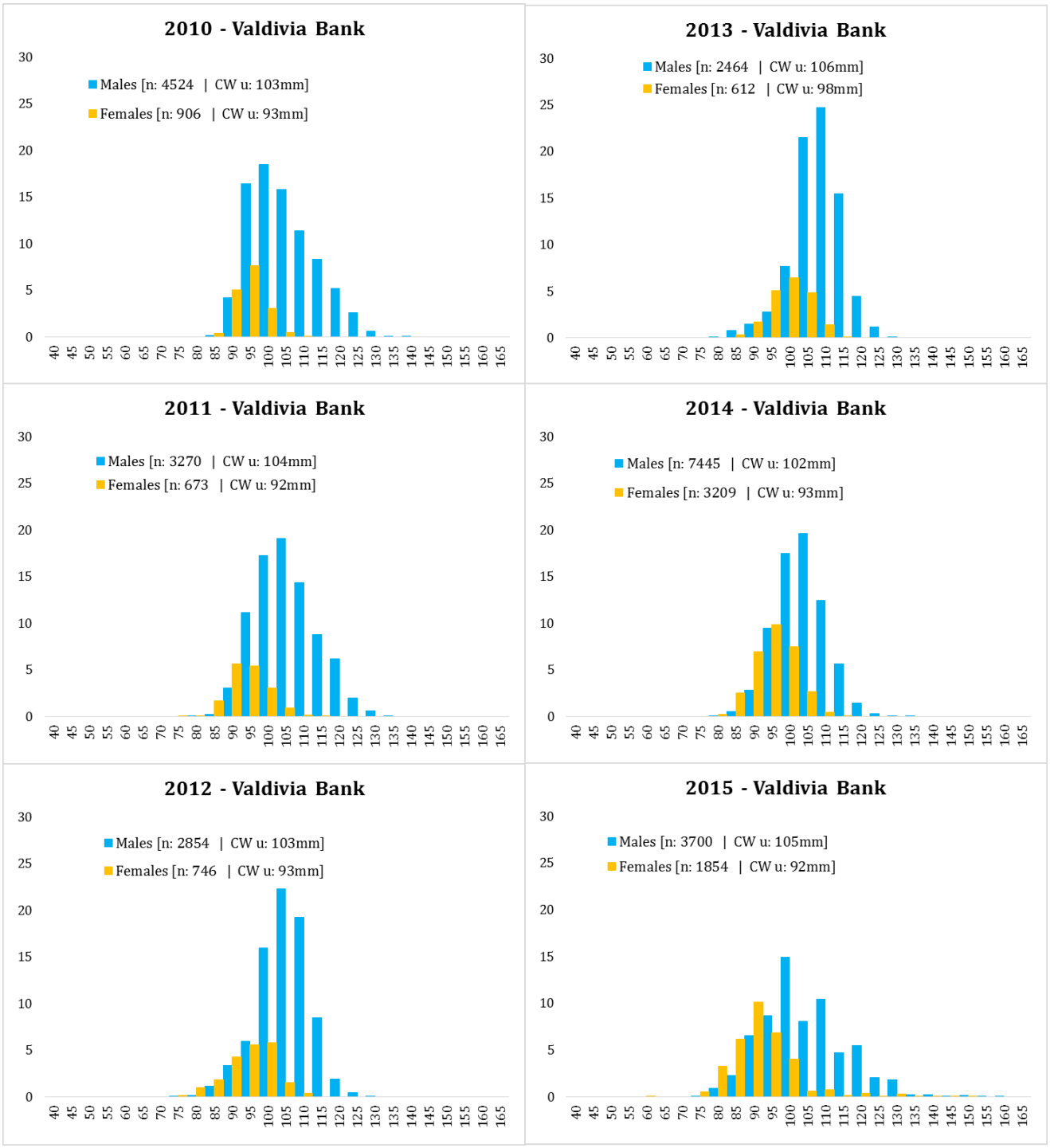


Figure 8: Carapace width (mm) frequencies (in percentages) of crabs sampled from commercial catches [2010-2015]. Notes: "n" refers to sample size; "u" refers to the carapace width arithmetic mean for each sample as indicated.

For the period 2010-2014 there have been no significant changes in the female crab size distribution (Fig. 8). The male crab size distribution changed from a wider size distribution in 2010 and 2011, where larger male crabs were recorded, to a slightly narrowed size distribution in 2012-2014 of smaller crabs. During 2015 a lot more female crabs larger than 110mm were recorded than any preceding years since 2010 (Fig. 8). Sex ratio from crab commercial samples fluctuated around 4:1 in favour of male crabs – a well-known bias of the commercial traps used in this fishery.

3.3 Length-weight relationships

Length-weight relationship derived from catches on Valdivia Bank reveal the gender-specific growth disparity (Fig. 9). Male crabs grow at a faster rate than females and thus attain much larger sizes than female crabs. This species attribute, however, is not unique to *Chaceon erytheiae* and has been recorded for other crab species in the *Chaceon* genus (Le Roux 1997). Data from the 2008 survey show a much more coherent length-weight relation for both male and female crabs (Fig. 10).

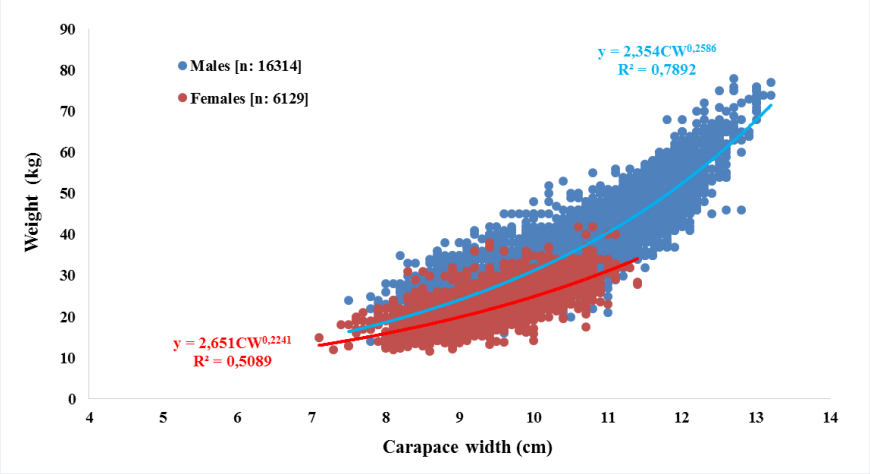


Figure 9: Length-at-weight data for *Chaceon erytheiae* as recorded from catches on Valdivia Bank (2008-2015). Red text show female length-weight relationship, blue text show male length-weight relationship.

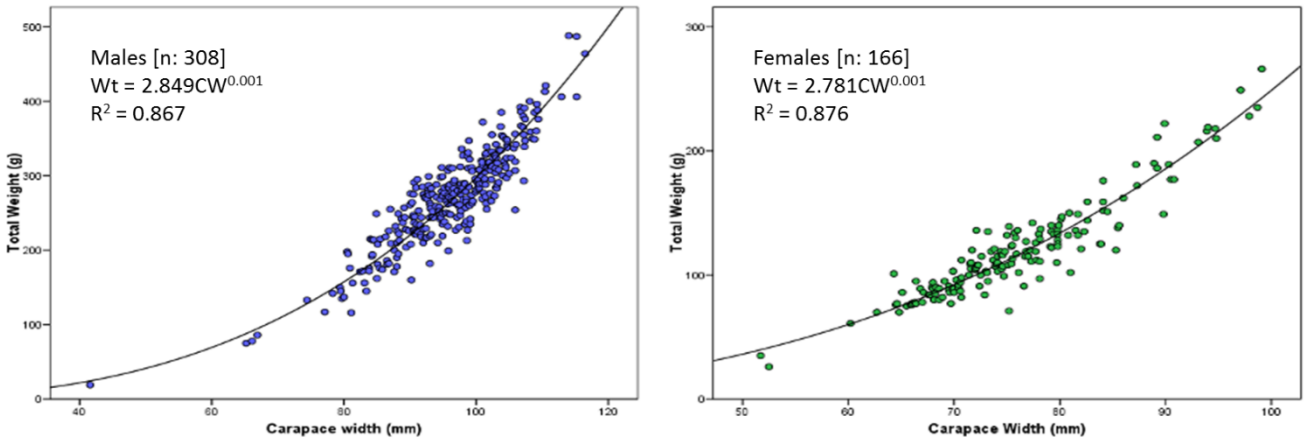


Figure 10: Length-at-weight data for *Chaceonerytheiae* as recorded from the 2008 Spain-Namibia survey (López-Abellán *et al*. 2008).

3.4 Age data and growth parameters

No information exists on the age and growth attributes of *Chaceon erytheiae*.

3.5 Reproductive parameters

Very limited reproductive data exist for *Chaceon erytheiae* from commercial samples. This dataset constitute female maturity and berry data collected during 2010-2015. However, the mating and spawning seasons for *C. erytheiae* within the SEAFO CA are still unknown.

3.6 Natural mortality

No natural mortality data exist for *Chaceon erytheiae*.

3.7 Feeding and trophic relationships (including species interaction)

No data exist for *Chaceon erytheiae*.

3.8 Tagging and migration

No data on migration exist for *Chaceon erytheiae* in the SEAFO CA.

4. Stock assessment status

4.1 Available abundance indices and estimates of biomass

Currently the only data available for the assessment for *C. erytheiae* abundance within the SEAFO CA are the catch and effort data from which a limited catch-per-unit effort (CPUE) series can be constructed.

4.2 Data used

The available SEAFO data (2005-2014) for purposes of considering possible assessment strategies are presented in Table 4.

Table 4: Description of the entire deep-sea red crab database highlighting important datasets.

Year	Flag State	Data Type - Source	Brief Description [NB Data Groups only]
2005	JPN	Catch Data – Observer Report	Set-by-Set data (vessel ID, set-haul positions & dates), Depth, Catch, Effort - (157 records).
2007	NAM	Catch Data – Observer Report	Set-by-Set data (vessel ID, set-haul positions & dates), Depth, Catch, Effort - (10 records - sets).
2010	JPN	Catch & Biological Data – Observer Report	Set data (vessel ID, set-haul positions & dates), Depth, Length, Weight, Catch, Effort - (Catch: 181 records, Biological: 5430 records).
2011	NAM	Catch & Biol. Data – Observer Report	Set-by-Set data (vessel ID, set-haul positions & dates), Depth, Length, Weight, Catch, Effort - (Catch: 133 records, Biological: 3990 records).
2012	NAM	Catch & Biol. Data – Obs. Report & Captain's Logbook [log sheet data]	Set-by-Set data (vessel ID, set-haul positions & dates), Depth, Length, Weight, Catch, Effort - (Catch: 129 records, Biological: 3600 records).
2013	NAM	Catch Data – Captain's Logbook [log sheet data]	Set-by-Set data (vessel ID, set-haul positions & dates), Depth, Catch, Effort - (Catch: 103 records, Biological: 3090 records).
2014	NAM	Catch Data – Captain's Logbook [log sheet data]	Set-by-Set data (vessel ID, set-haul positions and dates), Depth, Length, Weight, Catch, Effort – (Catch: 107 records, Biological: 10660 records)
2015	KOR	Catch Data – Fishing Logbook data	Set-by-Set data (vessel ID, set-haul positions and dates), Depth, Length, Weight, Catch, Effort – (Catch: 73 records, Biological: 5554 records)

4.3 Methods used

CPUE Standardization:

As part of the annual updating of the deep-sea red crab abundance index another attempt was made during 2015 at standardizing the CPUE index. With the agreement made in 2014 to use all available catch and effort data in the CPUE model, a problem was encountered with the soak time data recorded during 2015. Prior to 2015 the duration of time for which baited crab pots were left in the water during fishing operations (i.e. soaking time of baited crab pots), ranged between 11.7 and 99.5 hours with a mean of 25.1 hours (Table 5). However, during 2015 the soak time of baited traps during fishing operations changed drastically to a range of 93.7 and 233.5 hours with a mean of 120.8 hours. Out of the 73 sets recorded for 2015 only one set had a soak time of 93.5 hours, while 88% of the sets had soak times ranging between 100 and 117 hours; and the remaining 11% recorded soak times greater than 200 hours. This increase in the soak time during 2015 greatly reduces the annual CPUE when compared with other years as illustrated in Figure 11.

Table5: Comparison of "Soak Time" in hours as reported from the deep-sea red crab fishery for the period 2010 to 2015.

	2010-2014	**2015**
Minimum	11.7	93.7
1st Quantile	22.3	105.0
Median	23.0	108.3
Mean	25.1	120.8
3rd Quantile	23.6	113.5
Maximum	99.5	233.5

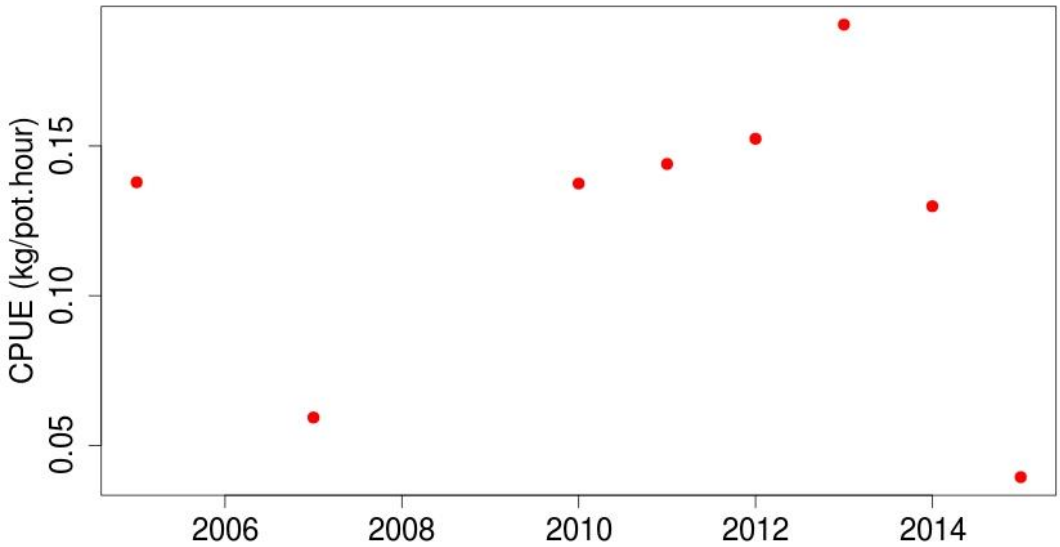


Figure 11: Nominal CPUE (base on "Soak Time") from the SEAFO deep-sea red fishery for the period 2005 to 2015.

To solve this problem one option would be to keep the range of soak times the same as that recorded during the pre-2015 years, which means removing all sets with soak times greater than 100 hours from the 2015 dataset. This option, however, was not feasible as it would mean removing 99% of the 2015 CPUE data – since all but one set had a soak time less than 100 hours. The second option was to define a normal distribution of soak times on the average soak time for which bait used in the fishery remains viable (i.e. the average amount of time bait remains in the trap before being consumed and/or disintegrating). From other crustacean fisheries it is known that bait usually only last for roughly 24 hours, and thus the defined soak time

distribution would be similar to that recorded from the SEAFO crab fishery during the pre-2015 years. The final option was to exclude soak time from the calculation of CPUE, and to only consider the number of pots used during fishing operations. This was the approach used during the 2015 standardization of the annual CPUE from the SEAFO deep-sea red crab fishery.

Table 6: Description of the sets for which catch and effort data are available for the CPUE standardization.

2005	2007	2010	2011	2012	2013	2014	2015
157	10	181	133	129	103	107	73

The records from 2007 were excluded from the analysis as they were derived from an area not exploited in the remaining years and, constituting only 10 sets, were not comparable to datasets from the rest of the data series.

The following variables from each record were considered in the model:

Year - A 12-month period – explanatory variable (covariate).
Semester - A calendar semester in a fishing year – explanatory variable (covariate).
VesselID - Identification code for a participating vessel – explanatory variable (covariate).
Zone - Identification code for a fishing area – explanatory variable (covariate). Co-ordinates where categorized into three smaller fishing zones reflecting the fishing records within Division B1.
Depth - Fishing depth – explanatory variable (covariate). Depth was categorized into 50 metre intervals covering the entire range of depths recorded by the fishery.
Pots - The number of baited pots used per set during fishing operations – explanatory variable (co-variate).
CPUE - Catch/number of pots – response variable.

4.4 Results

Results from the CPUE standardization are presented below to illustrate some of the more important outputs and methods applied.

The maximum set of model parameters offered to the stepwise selection procedure was:

$$\text{CPUE} = \beta_0 + \beta_1 \text{ Year} + \beta_2 \text{ VesselID} + \beta_3 \text{ Depth} + \beta_4 \text{ Zone} + \beta_5 \text{ Semester} + \beta_6 \text{Pots} + \varepsilon$$

A stepwise backward model selection procedure was deployed in selecting the covariates, to the model. The model with lowest Akaike value (AIC - Akaike Information Criterion) was selected as the best model, since it has a better predictive power. The best model (outlined below) was then used for further analysis.

$$\text{CPUE} = \beta_0 + \beta_1 \text{ Year} + \beta_3 \text{ Depth} + \beta_4 \text{ Zone} + \beta_5 \text{ Semester} + \beta_6 \text{Pots} + \varepsilon$$

Table 7 presents the estimates of the coefficients, standard error and *t* values for different levels of the factors entered into the selected model. Model, covariate year, depth, semester and pots are very significant with p-values of $2.2*10^{-16}$, $1.546*10^{-9}$,$4.831*10^{-4}$and $4.138*10^{-8}$indicating strong covariance with deep-sea red crab catch rates. Zone, as a covariate, was also significant but to a lesser degree than the aforementioned variables.

Table 7: ANOVA results for the CPUE model.

Covariates	Df	Deviance	Residual Df	Residual Deviance	Pr(>Chi)
NULL			859	913.42	
Year	6	277.864	853	635.56	< 2.2e-16 ***
Depth	16	48.552	837	587.01	1.546e-09 ***
Zone	2	3.980	835	587.03	0.0470093 *
as.factor(SEMESTER)	1	7.928	834	575.10	0.0004831 ***
Pots	15	42.000	819	533.10	4.138e-08 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

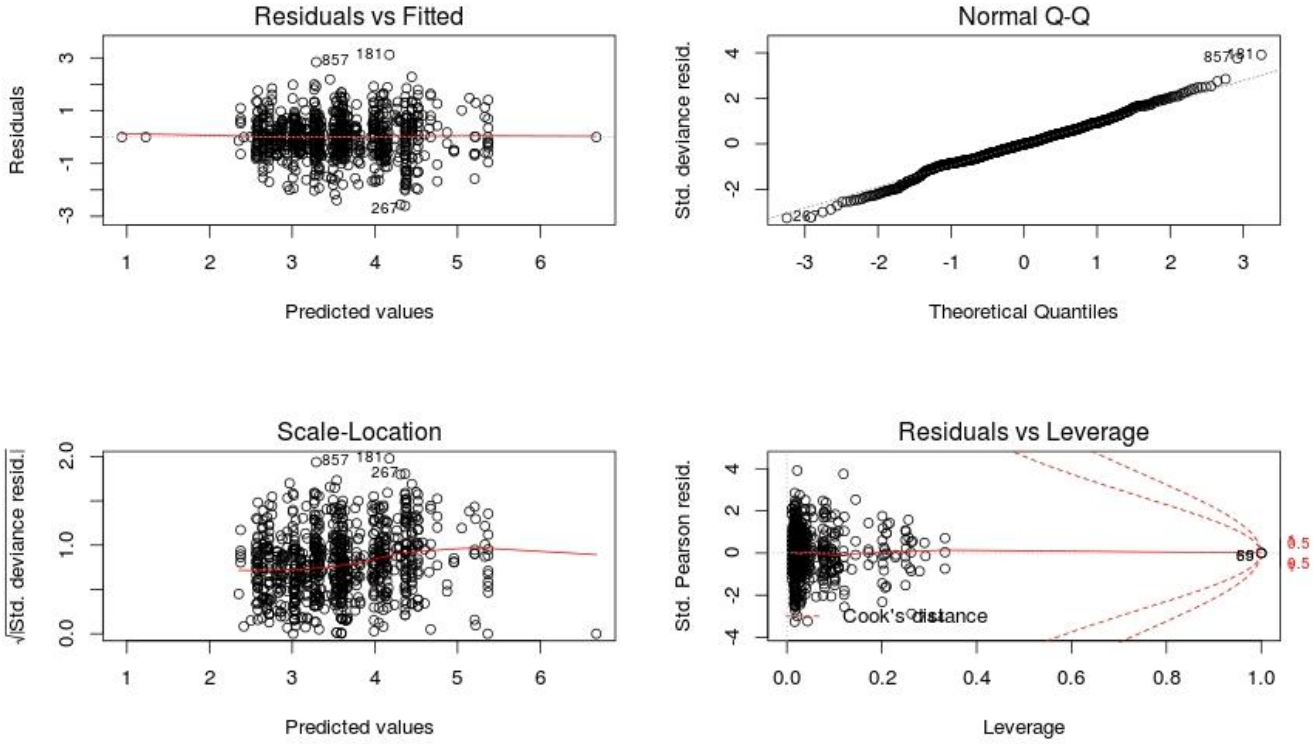


Figure 12: QQ and studentized residual plots of the best lognormal fit model for retained catch CPUE (kg/pot).

Model diagnostics of the best model were assessed. This involved checking for normality of the residuals and the spread of the residuals across the fitted values. A total of 23 outliers were removed (out of a total of 883 data points – i.e. outliers removed equates to 2.7% of entire dataset) on the basis of residual skewness and Cook's Distance disparity. After the removal of the outliers diagnostic plots revealed improve distributions thus indicating that model assumptions were not violated. QQplots of the residuals indicated that the model residuals were well within the excepted limits for data skewness (Fig. 12). Plots of the residuals versus fitted values indicated evenly distributed data points, no overridingly skewed patterns in the plot (Fig. 12). Therefore there is no evidence of non-constant error variance in the residual plot and independence assumption also appeared reasonable.

Results from the standardized CPUE exercise suggest that CPUE has fluctuated over a moderate range (of 0.248 and 5.108) during the period 2005 to 2015. However, the confidence margins are fairly wide for the main part of the CPUE series – which indicates that the CPUE hasn't change significantly over the period 2011-2015, with the exception of 2010 and 2014 undoubtedly (Fig. 13).

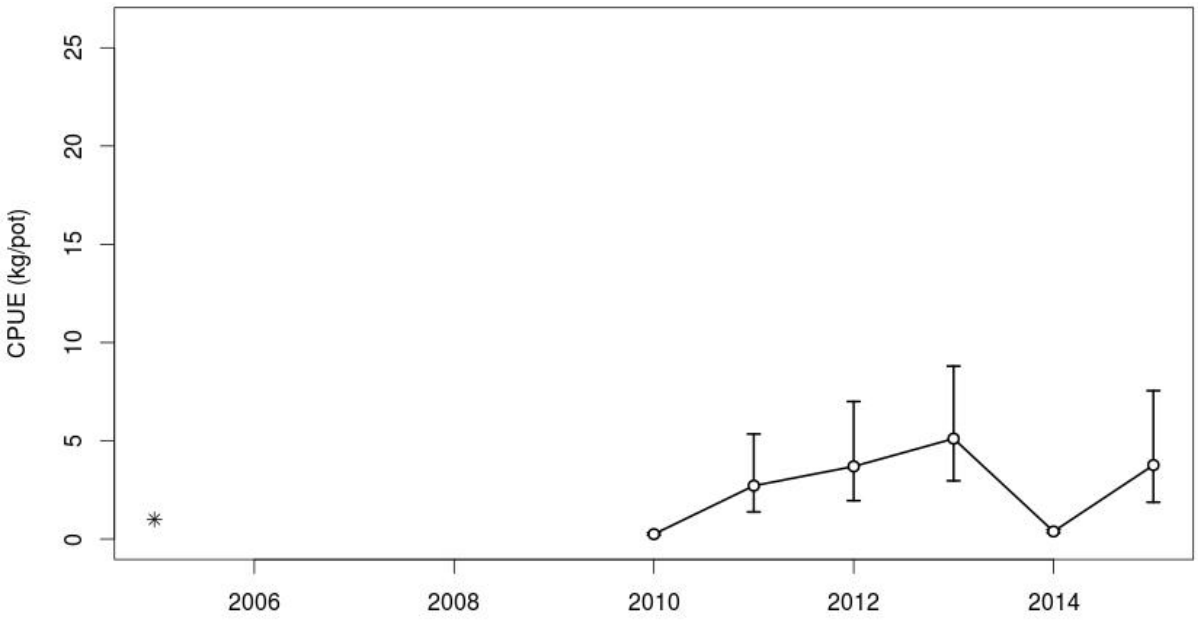


Figure 13: Trends in catch CPUE indexes for catches per pot-hour of crabs – with soak time as a categorical variable (factor). Standardized Index: black line with standard deviation (error bars).

4.5 Discussion

In light of new catch and effort data received from the deep-sea red crab fishery in 2015 another run on the standardization of crab CPUE series was conducted in 2015. In contrast to the CPUE standardization of 2014, soak time was not considered as a predictive variable or covariate in the GLM implemented during 2015. The reason for this were twofold:- firstly, the soak times recorded for the 2015 crab fishing operations were far in excess of those calculated for years prior to 2015; and secondly, there doesn't seem to be any correlation between the viability of bait and catch rates in the crab fishery that would necessitate the inclusion of soak time as a predictive variable in the CPUE standardization. For these reasons the CPUE calculated in 2015 for the crab fishery is referenced as "Kg/Pot" and not "Kg/Pot Hour" as was the case in 2014. The CPUE standardization revealed that, although the data series is very short, there was no severe changes in the CPUE trend since 2010 and that it is well within range of the 2005 CPUE.

In 2014 an exploratory Length Cohort Analysis (LCA) was conducted, and was found to be inconclusive but nevertheless indicated that the SEAFO deep-sea red crab resource is not in any risk of over-exploitation. This exploratory exercise was not repeated in 2015.

SC also noted that sampling on deep-sea red crab is quite good, but not all valuable data are available hence it is affecting our choice of an assessment method.

SC discussed in 2014 the possibility of applying the harvest rule and it was decided that the Greenland Halibut harvest control rule used in NAFO may be the most appropriate option for deep-sea red crab. This was adopted by the Commission in 2014.

In 2014 only near 50% of the TAC was caught. The reason for this is unknown to the SC.

4.6 Conclusion

The biological data series obtained from the SEAFO deep-sea red crab fishery, although short, is of relatively good quality. Nevertheless, important data such as growth parameter for the *C. erytheiae* stock, which will enhance the cohort analyses of the resource, was not available for the SEAFO CA and emphasis needs to be given in collecting this data for future assessments.

4.7 Biological reference points and harvest control rules

At this point in time it should be noted that no biological reference points exist for this stock in the SEAFO CA.

However, it is worthwhile to note that the *C. erytheiae* stock, based on the grounds of it being a long-lived and relatively stable stock, is a good candidate for an empirical Harvest Control Rule (HCR) similar to that applied to the Greenland halibut stock by the North Atlantic Fisheries Organization (NAFO). This is a simple HCR that merely considers that slope of an abundance index such as the CPUE and applies a catch limit to future years based in the current year's TAC. The concept is as follows:

$$TAC_{y+1} = \begin{cases} TAC_y \times (1 + \lambda_u \times slope) & if \quad slope \geq 0 \quad \textbf{...rule 1} \\ TAC_y \times (1 + \lambda_d \times slope) & if \quad slope < 0 \quad \textbf{...rule 2} \end{cases}$$

Slope: average slope of the Biomass Indicator (CPUE, Survey) in recent 5 years.

- λ_u :TAC control coefficient if slope > 0 (Stock seems to be growing) : λ_u=1
- λ_d :TAC control coefficient if slope < 0 (Stock seems to be decreasing) : λ_d=2
- TAC generated by the HCR is constrained to ± 5% of the TAC in the preceding year.

For the interim this is considered to be a fairly good starting point, given the current status of the *C. erytheiae* resource, until such time that additional data are available for more advance stock assessment approaches.

5. Incidental mortality and bycatch of fish and invertebrates

5.1 Incidental mortality (seabirds, mammals and turtles)

No incidental catches of seabirds, mammals and turtles have been recorded from the deep-sea red crab fishery to date.

5.2 Fish bycatch

Incidental and bycatch records from the deep-sea red crab fishery indicate that only one species is currently impacted by this fishery.

Table 6: Incidental (bycatch) catch from the deep-sea red crab fishery (kg).

	2009	**2010**	**2011**	**2012**
Species	**-**	**B1**	**-**	**-**
***MZZ**		5.23		

*** Marine Nei fishes (*Osteichthyes*)**

5.3 Invertebrate bycatch including VME taxa

Very limited bycatches of invertebrate and VME taxa have been reported from the SEAFO deep-sea red crab fishery. To date roughly 1343kg of King crab (*Lithodesferox* – KCA) bycatches been recorded from the deep-sea red crab fishery in Division B1 (Fig. 14). All these bycatches were made during 2015 only.

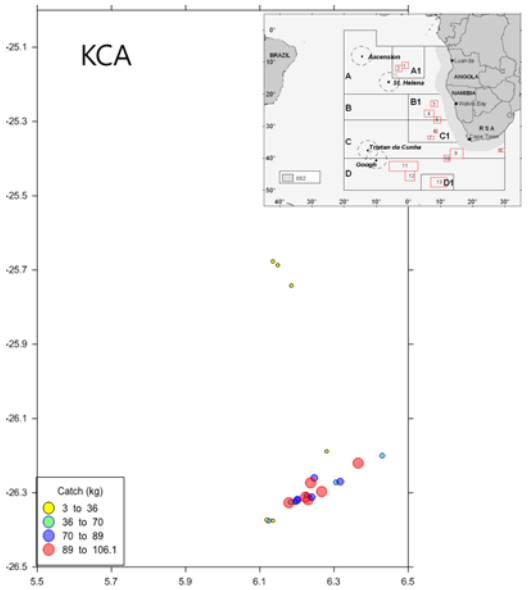


Figure 14: Spatial reference of King crab (*Lithodes ferox*) bycatches recorded from the deep-sea red crab fishery in Division B1 during 2015.

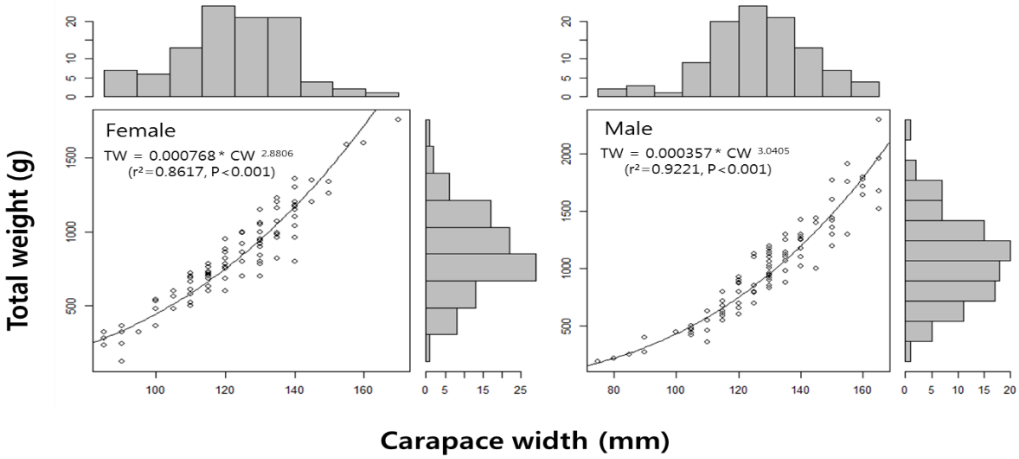


Figure 15: Sample statistics of King crab bycatches recorded by the deep-sea red crab fishery in Division B1 during 2015.

Incidental bycatches of VME indicator species have been minimal, and to date no bycatches exceeding the encounter thresholds have been recorded from the SEAFO deep-sea red crab fishery.

5.4 Incidental mortality and bycatch mitigation methods

There currently exist no incidental and bycatch mitigation measures for the deep-sea red crab fishery in the SEAFO CA.

5.5 Lost and abandoned gear

No lost and abandoned gear data have been reported for the deep-sea red crab fishery in the SEAFO CA.

5.6 Ecosystem implications and effects

The SEAFO deep-sea red crab fishery has very limited to no negative ecosystem impacts in terms of it temporal and spatial context.

6. Current conservation measures and management advice

Given that the TACs set for Deep-Sea Red Crab under CM 27/13 are up for review this year, SC implemented the HCR, as adopted by the Commission in 2014, for setting the 2016 TACs.

Under the rules of the HCR the abundance index available for the fishery (in this case CPUE) is used to gauge the trend of the catch rates over the last five years (Fig. 16). Considering the p-value of the slope, for the regression line fitted to the annual CPUEs for 2011 to 2015, it is clear that the slope is not significantly different from zero, however, the SC agreed to adopt the best estimate of the slope which is -0.1213. Under this scenario the HCR stipulates the use of "Rule 2" for setting the TAC.

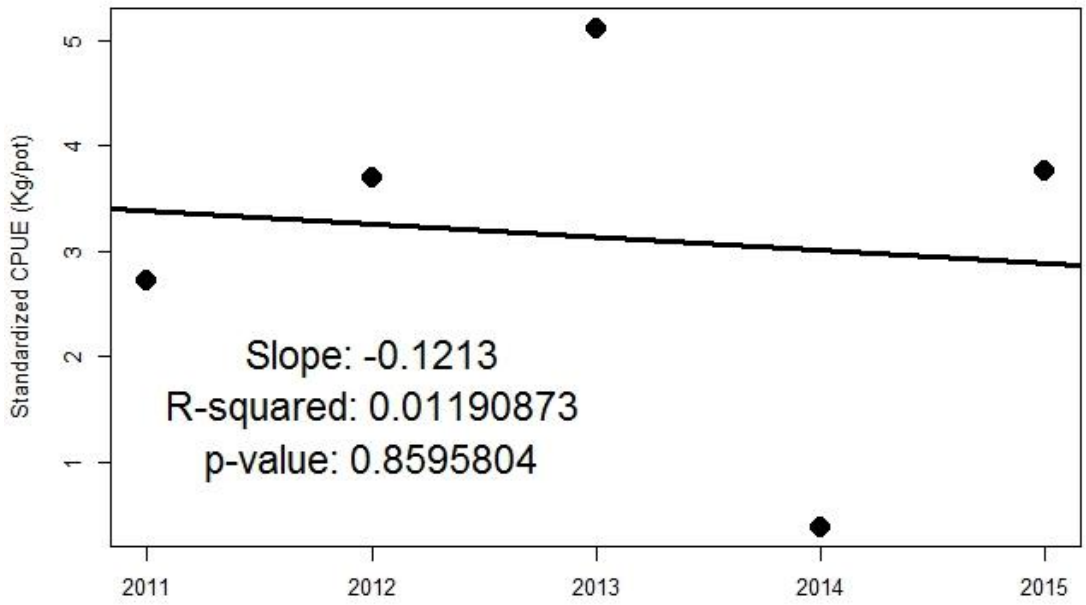


Figure 16: Regression line fitted to averaged annual CPUEs (2011-2015) for use in Harvest Control Rule.

Considering that no catches were recorded outside Division B1 the 2016 TAC recommendations are only applied to Division B1.

$$TAC_{2016} = TAC_{2015} * (1 + (2 * slope))$$

$$TAC_{2016} = 200 \text{ tons} * (1 + (2 * -0.1213))$$

$$TAC_{2016} = 152 \text{ tons}$$

However, the difference between the 2015 and proposed 2016 TAC is greater than the 5% limit stipulated by the HCR. **SC therefore recommends a TAC for 2016 be set at 190 tons for Division B1, and 200 tons for the remainder of the SEAFO CA.**

Table 7: Other Conservation Measures that are applicable to this fishery.

Conservation Measure 04/06	Conservation of sharks caught in association with fisheries managed by SEAFO.
Conservation Measure 14/09	Reduce sea turtle mortality in SEAFO fishing operations.
Conservation Measure 18/10	Management of vulnerable deep water habitats and ecosystems in the SEAFO Convention Area.
Conservation Measure 25/12	Reducing incidental bycatch of seabirds in the SEAFO Convention Area.
Conservation Measure 26/13	Bottom fishing activities in the SEAFO Convention Area.

7. References

Le Roux L. 1997 – Stock assessment and population dynamics of the deep-sea red crab *Chaceon maritae* (Brachyura, Geryonidae) off the Namibian Coast. M.Sc. thesis, University of Iceland, Department of Biology. 88 pp.

López-Abellán, L.J., J.A. Holtzhausen, L.M. Agudo, P. Jiménez, J. L. Sanz, M. González-Porto, S. Jiménez, P. Pascual, J. F. González, C. Presas, E. Fraile and M. Ferrer. 2008. Preliminary report of the multidisciplinary research cruise on the Walvis Ridge seamounts (Atlantic Southeast-SEAFO). http://hdl.handle.net/10508/370, Part I-II: 191 pp.

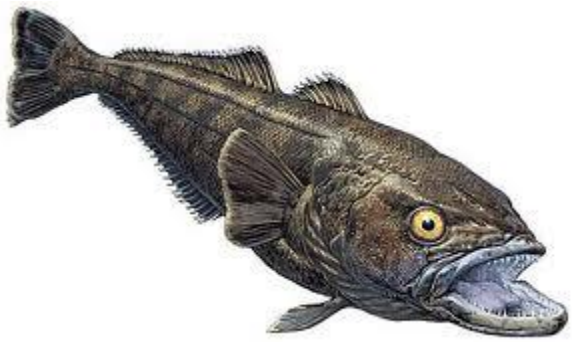
APPENDIX VIII – Stock Status Report – Patagonian toothfish

STATUS REPORT

Dissostichus eleginoides

Common Name: Patagonian toothfish

FAO-ASFIS Code: TOP



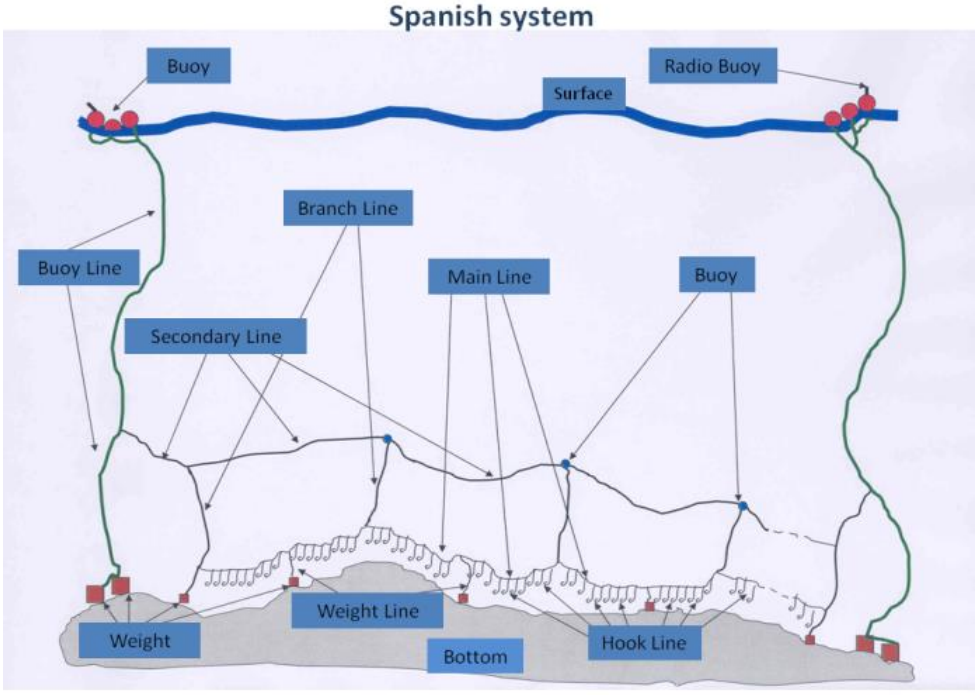
2015

Updated: 09-Oct-15

1. Description of the fishery

1.1 Description of fishing vessels and fishing gear

Fishing for Patagonian toothfish in the SEAFO CA started around 2002. The main fishing countries working in the area include vessels from Japan, South Korea, Spain and South Africa. Historically a maximum of four vessels per year fished in the SEAFO CA. The Spanish longline system and the Trotline (Fig. 1) are the fishing gears commonly used.



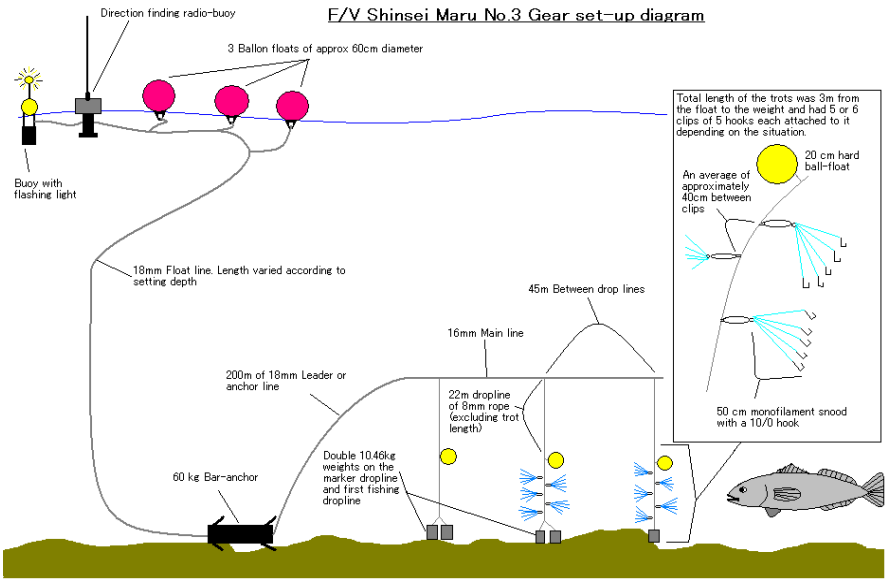
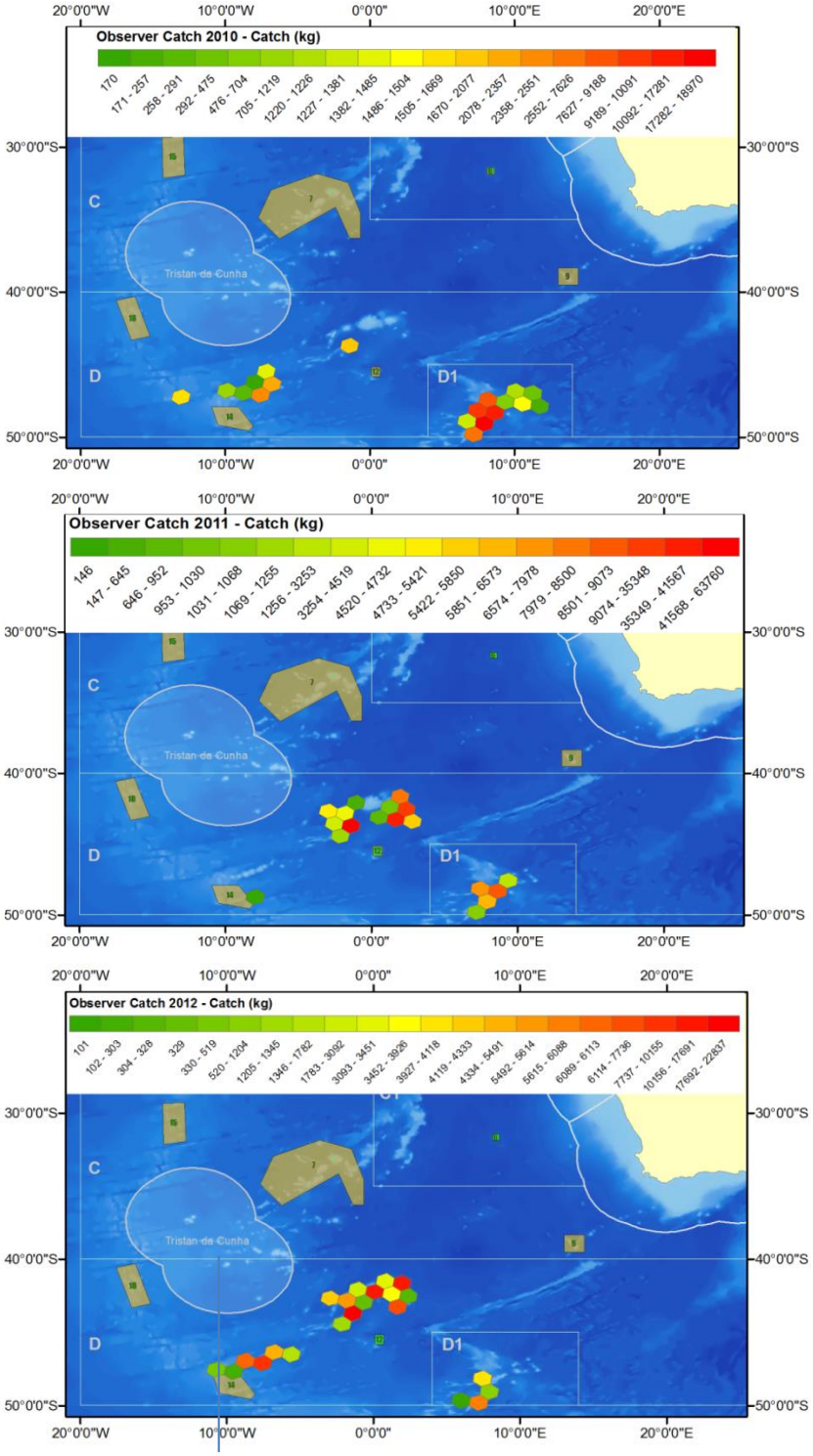


Figure 1: Fishing gears used to fish *D. eleginoides*: Spanish longline system (top) and the Trotline (bottom).

1.2 Spatial and temporal distribution of fishing

In SEAFO CA, the fishery from 2010 to 2014took place in Sub-Area D, being concentrated over seamounts in Division D1, at Discovery seamount and also at seamounts located in the western part of Sub-Area D (Fig. 2).



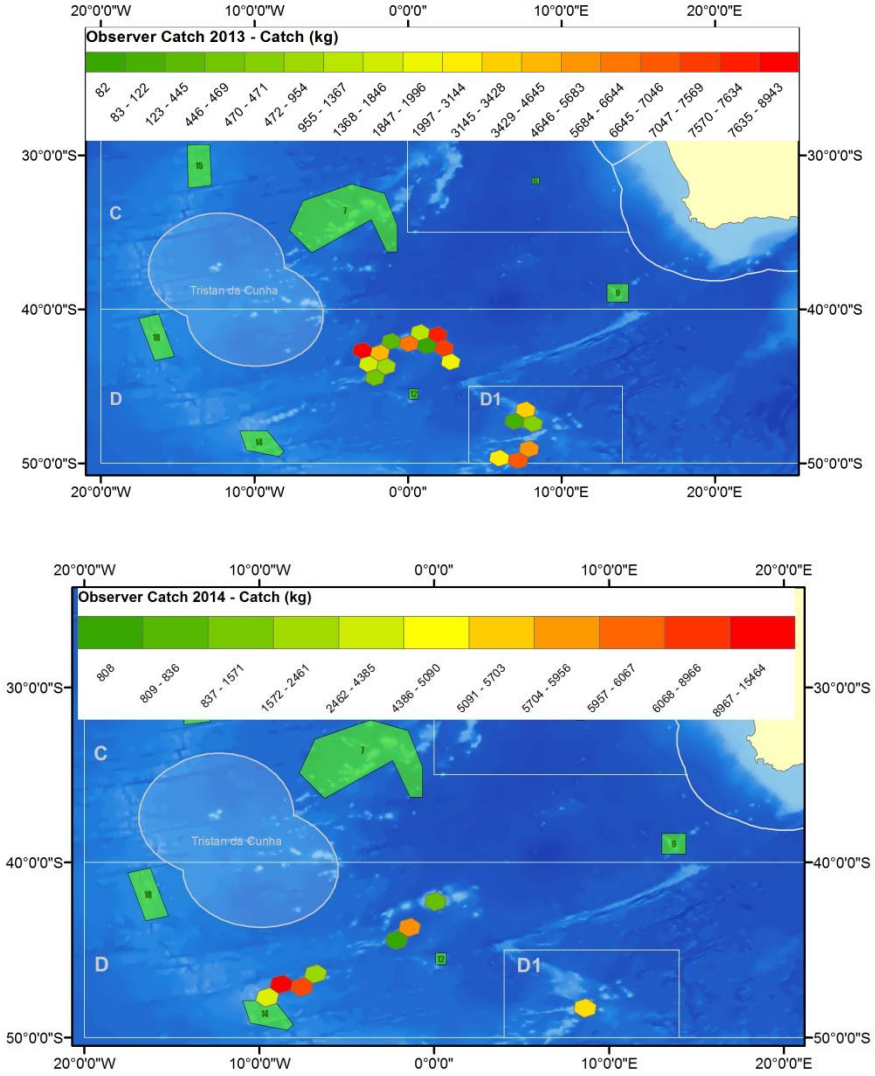


Figure 2: Reported catch of Patagonian toothfish (*Dissostichus* eleginoides) aggregated to 100km diameter hexagonal cells (2010, 2011, 2012, 2013 and 2014).

Table 1: Number of sets by year and location

Year	Western	Discovery	D1- Meteor
2010	27	5	118
2011	1	207	54
2012	68	207	25
2013	0	108	57
2014	100	64*	13

*No catch information provided for 56 sets

Table 1 shows that the main fishing ground is located on Discovery seamount and also in D1 but less hauls were deployed in the western seamounts of Sub-Area D.

1.3 Reported retained catches and discards

Table 2A presents data on Patagonian toothfish catches and discards listed by country, as well as fishing gear used and the management area from which catches were taken. Annual catches varied between 18t (2002) and 413t (2007). Discards were mainly due to parasite infection of fish. In the last three years with complete data (2012, 2013 and 2014) retained catches were 122, 61 and 74 t respectively and the annual weight of discarded specimens was3, 3 and 2 t in the three year period.

Table 2: Catches (tons) of Patagonian toothfish (*Dissostichuseleginoides*) by South Africa, Spain, Japan and Korea.

Nation	Spain		Japan				Korea				South Africa			
Fishing method	Longlines		Longlines				Longlines				Longlines			
Management Area	D0		D0		D1		D0		D1		D0		D1	
Catch details (t)	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.
2002	18													
2003	101				47		245	0						
2004	6				124									
2005	N/F	N/F			158		15	0						
2006	11				152		7	0						
2007	N/F		151		15		247	0						
2008	N/F	N/F	19	0	104	0	79	0						
2009	N/F	N/F	82	0	4	0	16	0	46	0	N/F	N/F	N/F	N/F
2010	26	0	41	0	12	2	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2011	N/F	N/F	172	6	N/F	N/F	N/F	N/F	N/F	N/F	15	0	28	0
2012	N/F	N/F	86	3	N/F	N/F	N/F	N/F	N/F	N/F	24	0	12	0
2013	N/F	N/F	41	2	20	1	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2014	N/F	N/F	68	<1	6	<1	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2015*	N/F	N/F	51	<1	0	0	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F

N/F = No Fishing. Blank fields = No data available. *Provisional (Sep 2015). Ret. = Retained Disc. = Discarded

Table 2Bpresents data on Atlantic toothfish catches and discards listed by country, as well as fishing gear used and the management area from which catches were taken.

Table 2B: Catches (tons) of Antarctic toothfish (*Dissostichusmawsoni*) by South Africa, Spain, Japan and Korea.

Nation	Spain		Japan				Korea				South Africa			
Fishing method	Longlines		Longlines				Longlines				Longlines			
Management Area	D0		D0		D1		D0		D1		D0		D1	
Catch details (t)	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.	Ret.	Disc.
2014	N/F	N/F	< 1	0	0	0	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F
2015*	N/F	N/F	0	0	0	0	N/F	N/F	N/F	N/F	N/F	N/F	N/F	N/F

N/F = No Fishing. Blank fields = No data available. *Provisional (Sep 2015). Ret. = Retained Disc. = Discarded

Retained and discarded bycatch from the patagonian toothfish fishery are presented in Table 3. The two most important species (in terms of weight) are grenadiers (GRV) and Blue antimora (ANT).

Table 3: Retained and discarded bycatch from the Patagonian toothfishfisheries (kg).

	2009				2010				2011		2012				2013				2014			
	Retained		Discarded		Retained		Discarded		Retained	Discarded	Retained		Discarded		Retained		Discarded		Retained		Discarded	
Species	D0	D1	D0	D1	D0	D1	D0	D1	D0	D0	D0	D1	D0	D1	D0	D1	D0	D1	D0	D1	D0	D1
GRV			89	5 833	4 047	1 936	93	2 601		22 414			23 705	186			7 273	869				267
ANT			126	4 786			453	1 348		4 794			4 442	65			796	610			329	106
BYR	1 221		573																			
MCC			336	896																		
BYR																						
BEA	360																					
MZZ								168														
SRX										30			124				20					
MRL			108					1		2			37				1					
COX			2							21			75									
SKH			90																			
LEV			36				4															
KCX				1			3	35									83	10				
HYD													31				17					
BUK							17															
NOX										7												
MWS										6												
ETF																	3					
SEC													2									
SSK							2															
CKH							1	1														
KCF			1																			
TOA																			99			
RTX																					1122	

ANT:Blue antimora (*Antimora rostrata*); BEA:Eaton's skate (*Bathyraja eatonii*); BYR:Kerguelen sandpaper skate (*Bathyraja irrasa*); COX:Conger eels, etc. nei (*Congridae*); CKH:Abyssal grenadier (*Coryphaenoides armatus*); BUK:Butterfly kingfish (*Gasterochisma melampus*); HYD:Ratfishes nei (*Hydrolagus spp*); LEV:Lepidion codlings nei (*Lepidion spp*); KCX:King crabs, stone crabs nei (*Lithodidae*); MCC:Ridge scaled rattail (*Macrourus carinatus*); GRV:Grenadiers nei (*Macrourus spp*); MWS:Smallhead moray cod (*Muraenolepis microcephalus*); MRL:Moray cods nei (*Muraenolepis spp*); NOX:Antarctic rockcods, noties nei (*Nototheniidae*); MZZ:Marine fishes nei (*Osteichthyes*); KCF:Globose king crab (*Paralomis formosa*); Blackbelly lantern shark (*Etmopterus lucifer*); SEC:Harbour seal (*Phoca vitulina*); SRX:Rays, stingrays, mantas nei (*Rajiformes*); SKH:Various sharks nei (*Selachimorpha(Pleurotremata*)); (Rajiformes); SSK:Kaup's arrowtooth eel (*Synaphobranchus kaupii*).

1.4 IUU catch

IUU fishing activity in the SEAFO CA has been reported to the Secretariat latest in 2012, but the extent of IUU fishing is at present unknown.

2. Stock distribution and identity

Patagonian toothfish is a southern circumpolar, eurybathic species (70-1600m), associated with shelves of the sub-Antarctic islands usually north of 55ºS. Young stages are pelagic (North, 2002). The species occurs in the Kerguelen-Heard Ridge, islands of the Scotia Arc and the northern part of the Antarctic Peninsula (Hureau, 1985; DeWitt et al., 1990). This species is also known from the southern coast of Chile northward to Peru and the coast of Argentina, especially in the Patagonian area (DeWitt, 1990), and also present in Discovery and Meteor seamounts in the SE Atlantic (Figure 3) and El Cano Ridge in the South Indian Ocean (López-Abellán and Gonzalez, 1999, López-Abellán, 2005).

In SEAFO CA the stock structure of the species is unknown. 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*. The distribution of the species appears to be driven by the sub-Antarctic front which extends into the SEAFO CA.

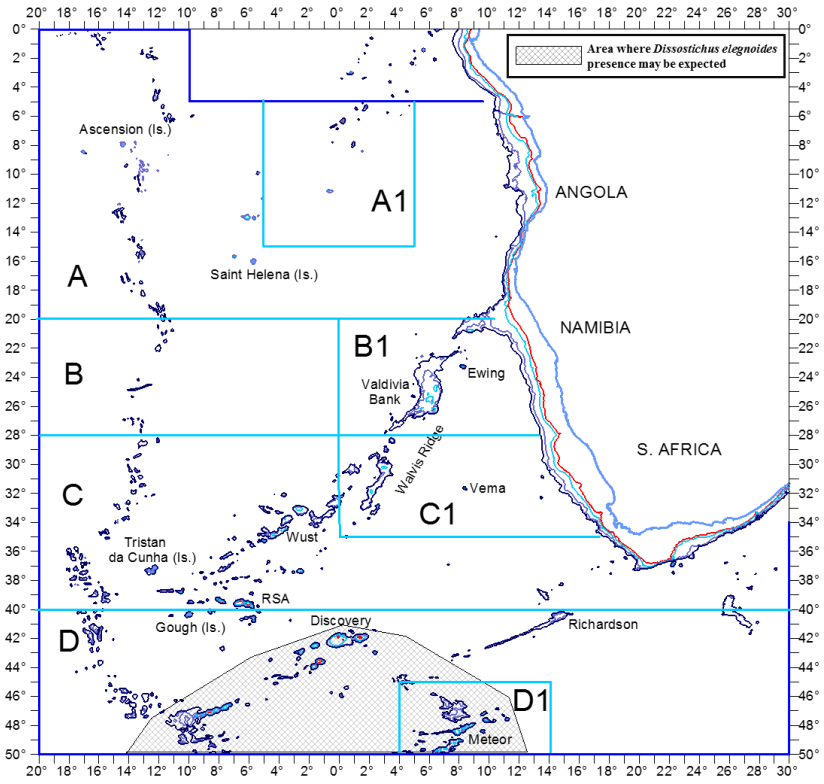


Figure 3: Species geographical distribution in the SEAFO CA (source: Species profile on the SEAFO website).

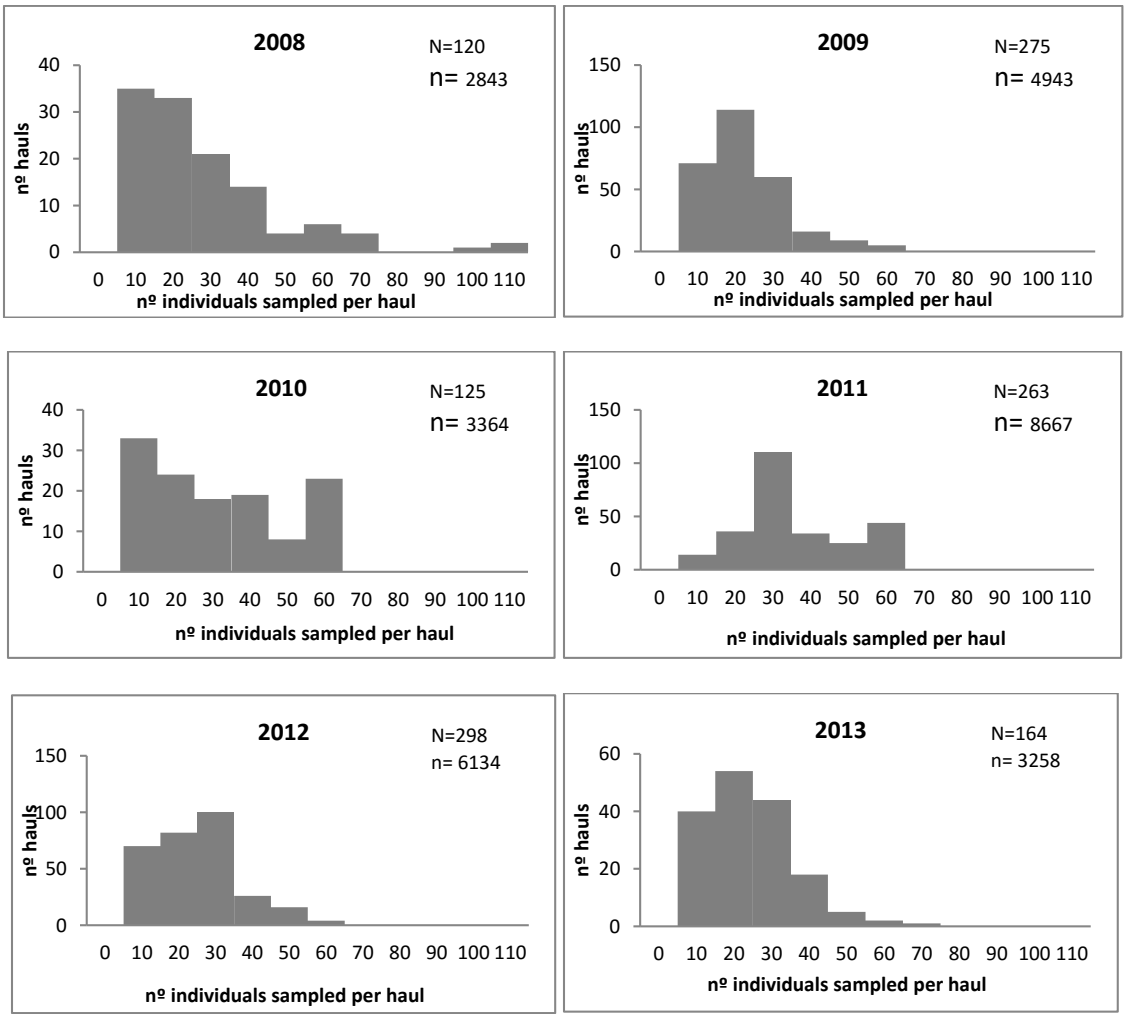
3. Data available for assessments, life history parameters and other population information

3.1 Fisheries and surveys data

The number of fishing sets sampled from 2006 onwards indicates a good sampling level in line with the SEAFO preliminary guidelines for data collection (Table 4). On average 20 specimens were measured per sampled fishing set, which is considered acceptable given the length range of the exploited population. It will be necessary to apply in future this sampling effort of 20 individuals in all sampled fishing sets (Figure 4).

Table 4. Annual analysis of sampling effort conducted on board fishing vessel.

Year	No. of Sets sampled	Mean number of Individuals sampled per set	Min. Individuals sampled per set	Max. Individuals sampled per set	Mean sample size/tonne
2006	146	22.16	1	31	-
2007	222	11.61	1	57	-
2008	120	23.69	2	110	-
2009	275	17.97	1	58	0.13
2010	125	26.91	1	60	0.32
2011	263	32.95	1	60	0.16
2012	298	20.58	1	57	0.17
2013	164	19.87	1	70	0.32
2014	176	25.50	3	50	0.35



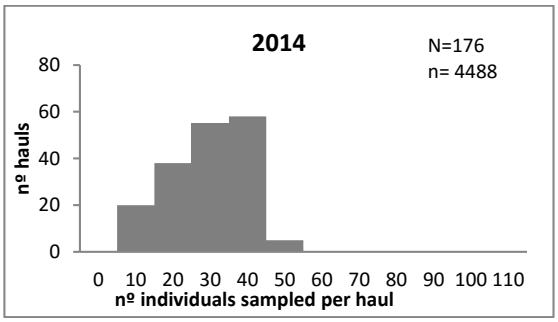


Figure 4: Frequency distribution of sample size per set. Data from Observer Reports submitted to SEAFO. N = number of sets sampled per year; n = total number of individuals sampled.

3.2 Length data and frequency distribution

Figure 5 shows the annual total length frequency distributions of Patagonian toothfish catches based on the observer data from all fleets submitted to SEAFO. Length frequency distributions for the period 2006-2013 suggest a shift towards smaller lengths in the catches in more recent years. The proportion of large fish appears to be declining.

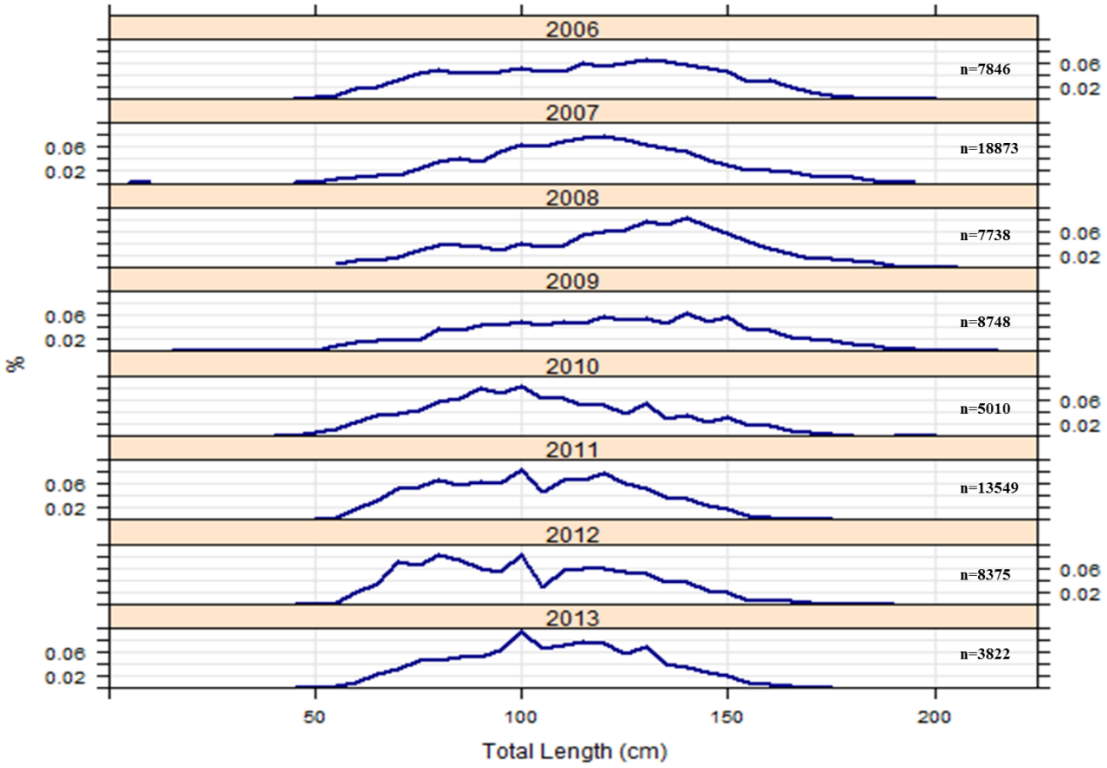


Figure 5: Annual total length frequency distributions *D. eleginoides*raised to total catches per year for SEAFO CA Sub-Area D.

3.3 Length-weight relationships

Table 5 shows the length-weight relationships by sex based on observer data from Japanese fleet in 2013.

Table 5: Length-weight relationships by sex (based on 2013 Japanese observer data)

Samples	a	b	r^2	n
Males	1E-06	3.4484	0.9768	405
Females	2E-06	3.4296	0.9579	860

3.4 Age data and growth parameters

There is no available information for this species in SEAFO CA.

3.5 Reproductive parameters

There is no available information for this species in SEAFO CA.

3.6 Natural mortality

There is no available information for this species in SEAFO CA.

3.7 Feeding and trophic relationships (including species interaction)

There is no available information for this species in SEAFO CA.

3.8 Tagging and migration

Eleven specimens were tagged in Subarea D in 2006 and fourteen in 2010 (Spanish flagged Viking Bay vessel). However, there is no available information on recoveries of tagged specimens or on tagged specimens tagged at adjacent areas of CCAMLR.

4. Stock assessment status

There are no agreed stock assessments.

4.1 Harvest control rules

The harvest control rule (below) was adopted in 2014.

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

Where 'Slope' = average slope of the Biomass Indicator (CPUE) in the recent 5 years; and
λu :TAC control coefficient if slope > 0 (Stock seems to be growing) : λu=1
λd :TAC control coefficient if slope < 0 (Stock seems to be decreasing) : λd=2

The TAC generated by this HCR is constrained to ± 5% of the TAC in the preceding year.

5. Incidental mortality and bycatch of fish and invertebrates

Incidental mortality (seabirds, mammals and turtles)

In the SEAFO database there are records of three seabirds having been caught during Japanese longline daytime fishing in 2014. The seabirds caught were recorded by the ID codes "PUG" – *Puffinus gravis* (Great shearwater) & "DIM" – *Thalassarche melanophris* (Southern black-browed albatross).

5.1 Fish bycatch

Table 3 shows the bycatch speciesin the Patagonian toothfish (*Dissostichus eleginoides)* Fishery and its weights based on the observer reports. SC noted that the major bycatch is grenadiers (Macrouridae - GRV) and the bycatch is discarded. The impact of this bycatch on grenadiers spp. is unknown.

5.2 Invertebrate bycatch including VME taxa

Table 6 shows the bycatch of VME species and its amount based on the observer data for the period 2010-2015. Figure 7 shows their geographic location.

Table 6: Bycatch from Patagonia toothfish fishery (kg)

	2010		2011	2012	2013	2014	
Species	**D0**	**D1**	**D0**	**D0**	**D0**	**D0**	**D0**
Gorgonians (Gorgoniidae)	33.9	13.6	3.8	30.3	1.2	2.3	2.6
Hard corals, madrepores nei (Scleractinia)	2.1	0.1	15.4	17.6		0.3	2.8
Black corals and thorny corals (Antipatharia)	3.9	0.5		0.2			
Basket and brittle stars (Ophiuroidea)	1.3	2.0					
Sea pens (Pennatulacea)	1.0	0.3		0.0			
Soft corals (Alcyonacea)	0.2	1.0		1.2			
Feather stars and sea lilies (Crinoidea)	0.9	0.1					

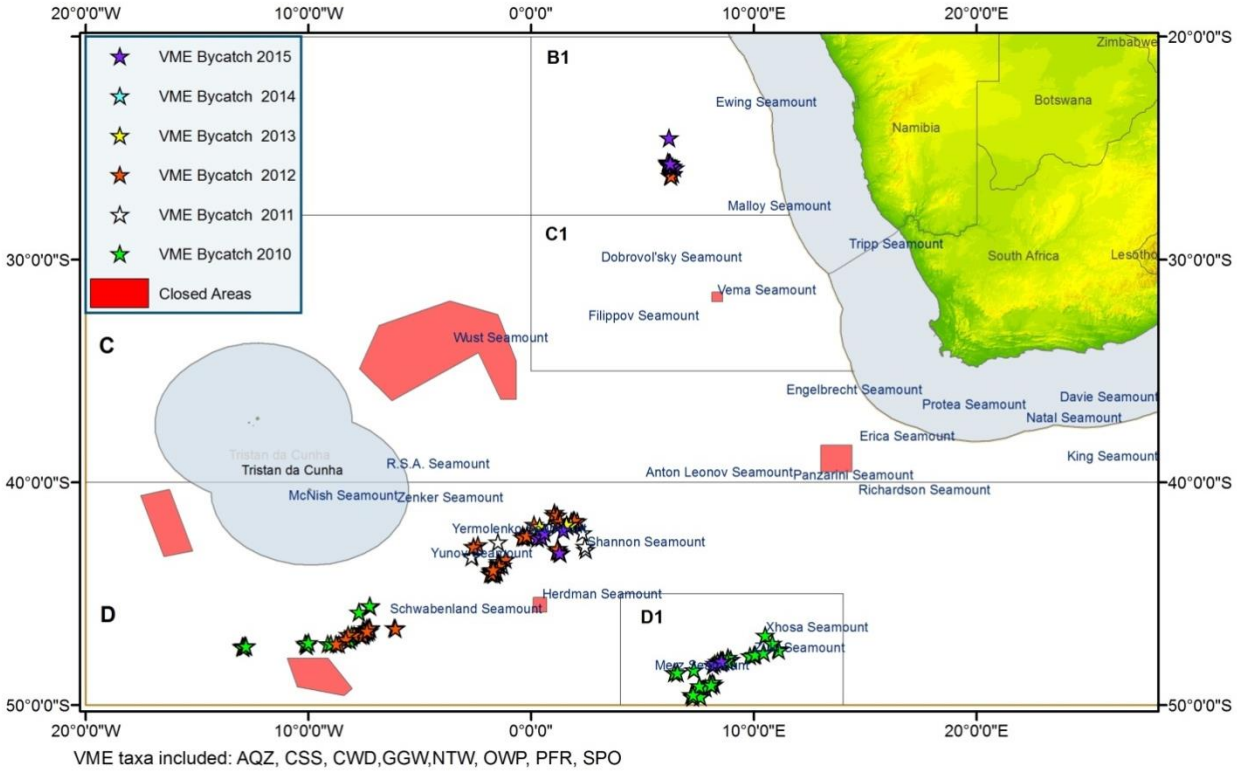


Figure 7: Locations for incidental bycatch of VME species from SEAFO Patagonian toothfish fishery.

5.3 Incidental mortality and bycatch mitigation methods

Offal dumping during hauling and bird scaring devices (Tori lines) are mandated to mitigate seabird bycatch.

5.4 Lost and abandoned gear

Figure 8 shows locations and amount of the lost gears based on the observer data from 2010 to 2013.

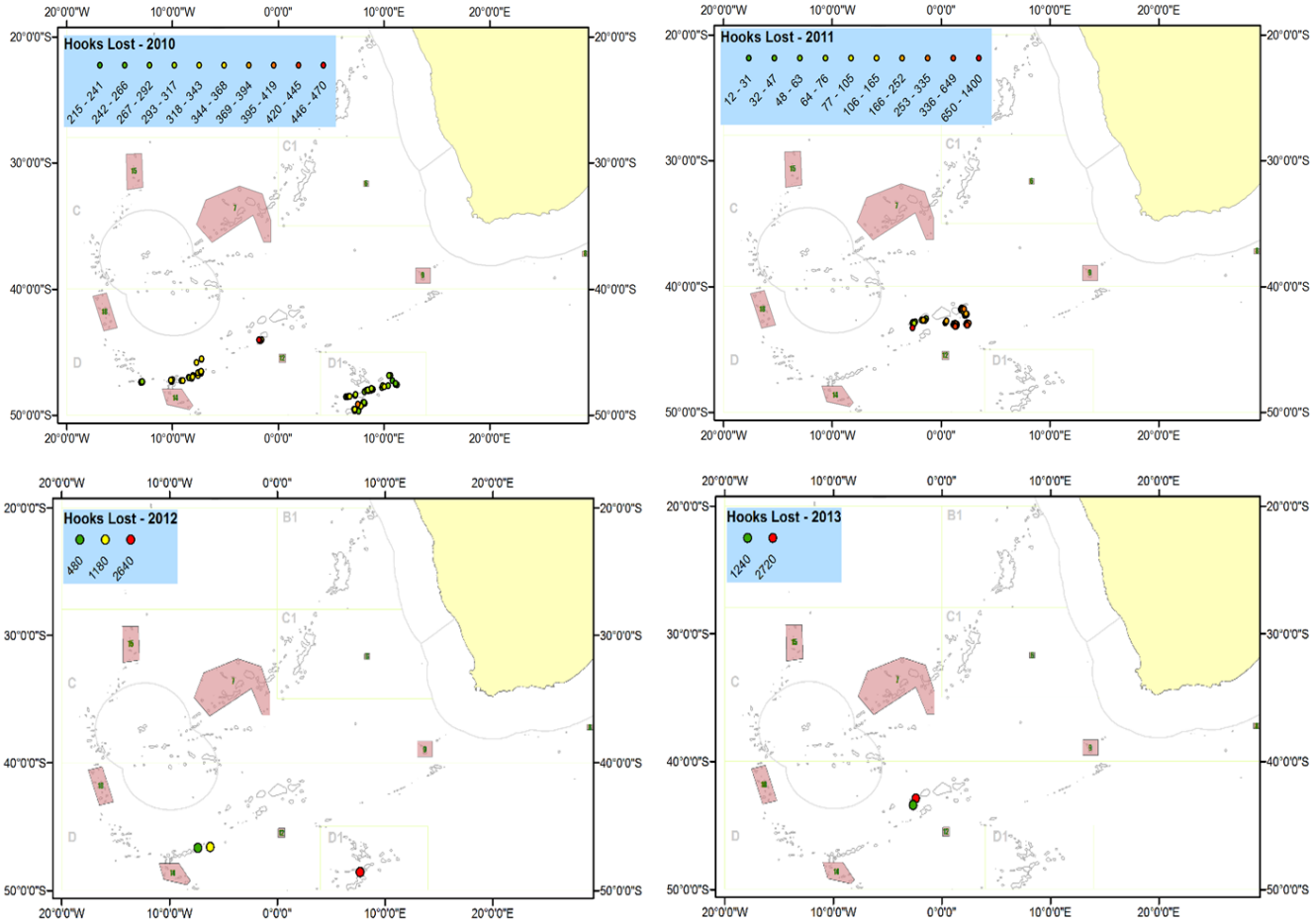


Figure 8: Locations and amount of the lost gears (hooks with attached short line) based on observer data (2011-2013).

5.5 Ecosystem implications and effects

There is no formal evaluation available for this fishery.

6. Current conservation measures and management advice

In 2014 the Commission adopted a TAC of 276t in Sub-Area D, and zero tonnes for the remainder of the SEAFO CA for 2014 and 2015 (CM 29/2014). SC (2015) suggests a TAC of 264 tons in Sub-Area D and zero tonnes for the remainder of the SEAFO CA for 2016.

Table 7: Other Conservation Measures that are applicable to this fishery

Conservation Measure 04/06	On the Conservation of Sharks Caught in Association with Fisheries Managed by SEAFO
Conservation Measure 14/09	To reduce sea turtle mortality in SEAFO fishing operations.
Conservation Measure 25/12	On reducing incidental bycatch of Seabirds in the SEAFO Convention Area
Conservation Measure 18/10	Management of Vulnerable Deep Water Habitats and Ecosystems in the SEAFO Convention Area
Conservation Measure 27/13	Total Allowable Catches and related conditions for Alfonsino and Orange Roughy for 2014 for Patagonian Toothfish and Deep-Sea Red Crab for 2014 and 2015 in the SEAFO Convention Area.

Conservation Measure 29/14	Bottom Fishing Activities and Vulnerable MarineEcosystems in the SEAFO Convention Area

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APPENDIX IX – Results from exploratory fishing conducted within the SEAFO CA during 2014

SEAFO/SC/WP/04_Revised_/2015

Report of the Japanese exploratory fishing by FV Shinsei-maru No. 3 in 2014

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September, 2015

Abstract

FV Shinsei maru No. 3 conducted the exploratory bottom fishing in the new fishing ground in the Discovery seamount area of the SEAFO CA (Map 1) for 27 sets in 11 days (March 18-28, 2014). This is the report of the results of the exploratory fishing. According to the results, it was found that (a) there were negligible amounts of VME species (corals) in three locations (0.52 kg, 0.35 kg and 0.10 kg respectivelyless than the threshold values) and (b) there are continuous Patagonian toothfish distributions from the existing fishing area to the exploratory fishing area. It was recognized that the trot bottom longline was the VME safe gear. One 1°x1° area satisfiesthree conditions to open the new fishing area to the existing fishing area.

Contents

Submitted to the SEAFO 12th Scientific Committee (Sept. 30-Oct. 9, 2015) (Windhoek, Namibia)

1. INTRODUCTION

In 2011, existing bottom fishing areas have been identified in response to 2006 UNGA resolution 61/105. This has resulted to split some of fishable sea mountains shallower than 2000m such as Discovery Seamounts into existing and new bottom fishing areas.

There is no clear geographical (seafloor-topological) boundary around Discovery Seamounts so it is considered that fish might move across the boundary of existing and new bottom fishing areas. Furthermore VME information, fish distribution, detailed sea bed map, etc. in new bottom fishing area will never be known unless fishing activities occur there.

We believe that collecting such primary information in new bottom fishing areas is meaningful and accumulating such information could contribute to achieve the objective of the SEAFO Convention to ensure the long term conservation and sustainable use of fishery resources.

Under such circumstances, the primary objectives of this exploratory fishing are to investigate Patagonian toothfish resources using some part of TAC and to evaluate if this exploratory fishing produces Significant Adverse Impact (SAI) on VME species

In the past, three exploratory fishing have completed during 2012-2013. In 2014, the4thexploratory bottom fishing was conducted.

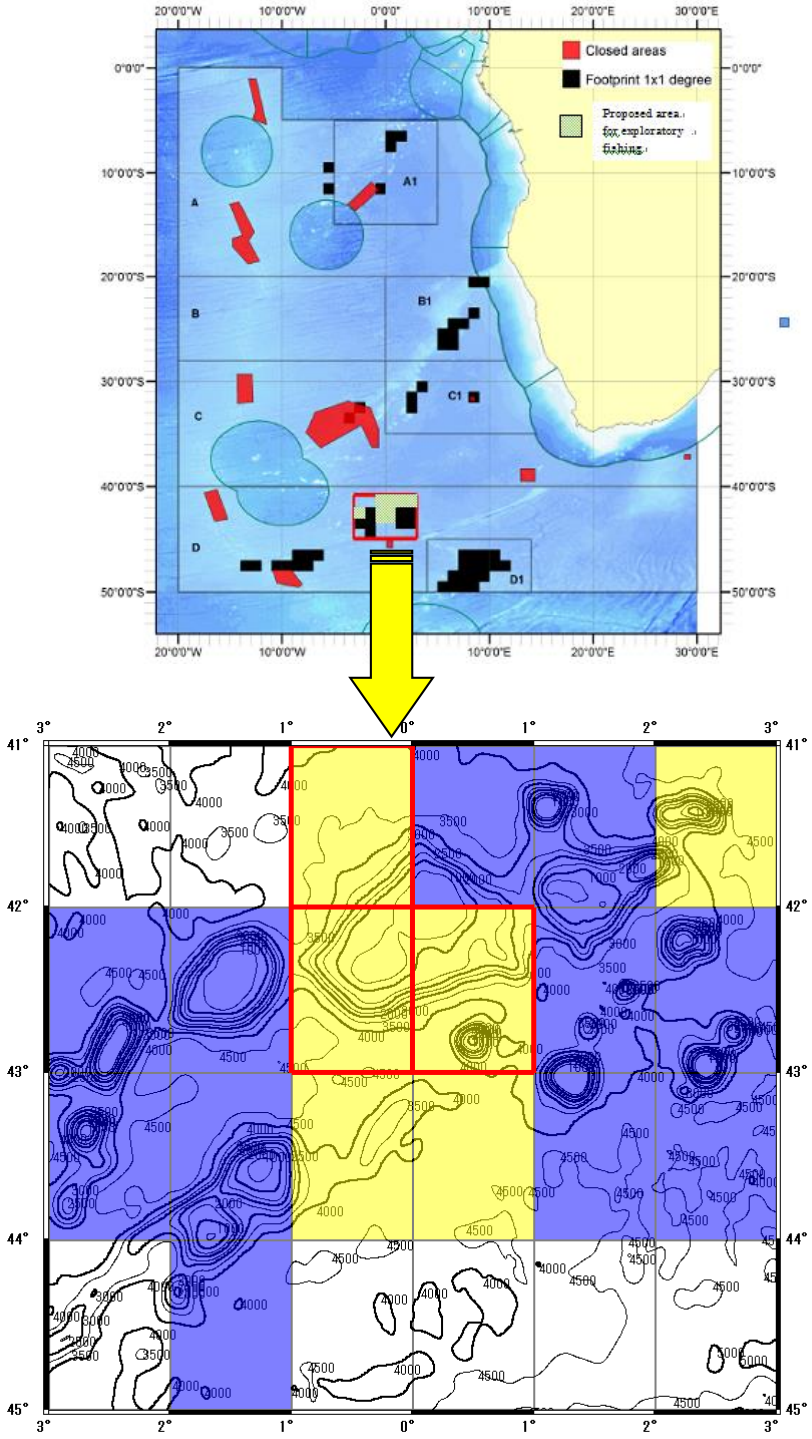
2. EXPLORATORY FISHING PLAN (2014)

The original plan is shown in Appendix A which was approved by the SEAFO Scientific Committee and the annual commission meeting in 2013

3. Results

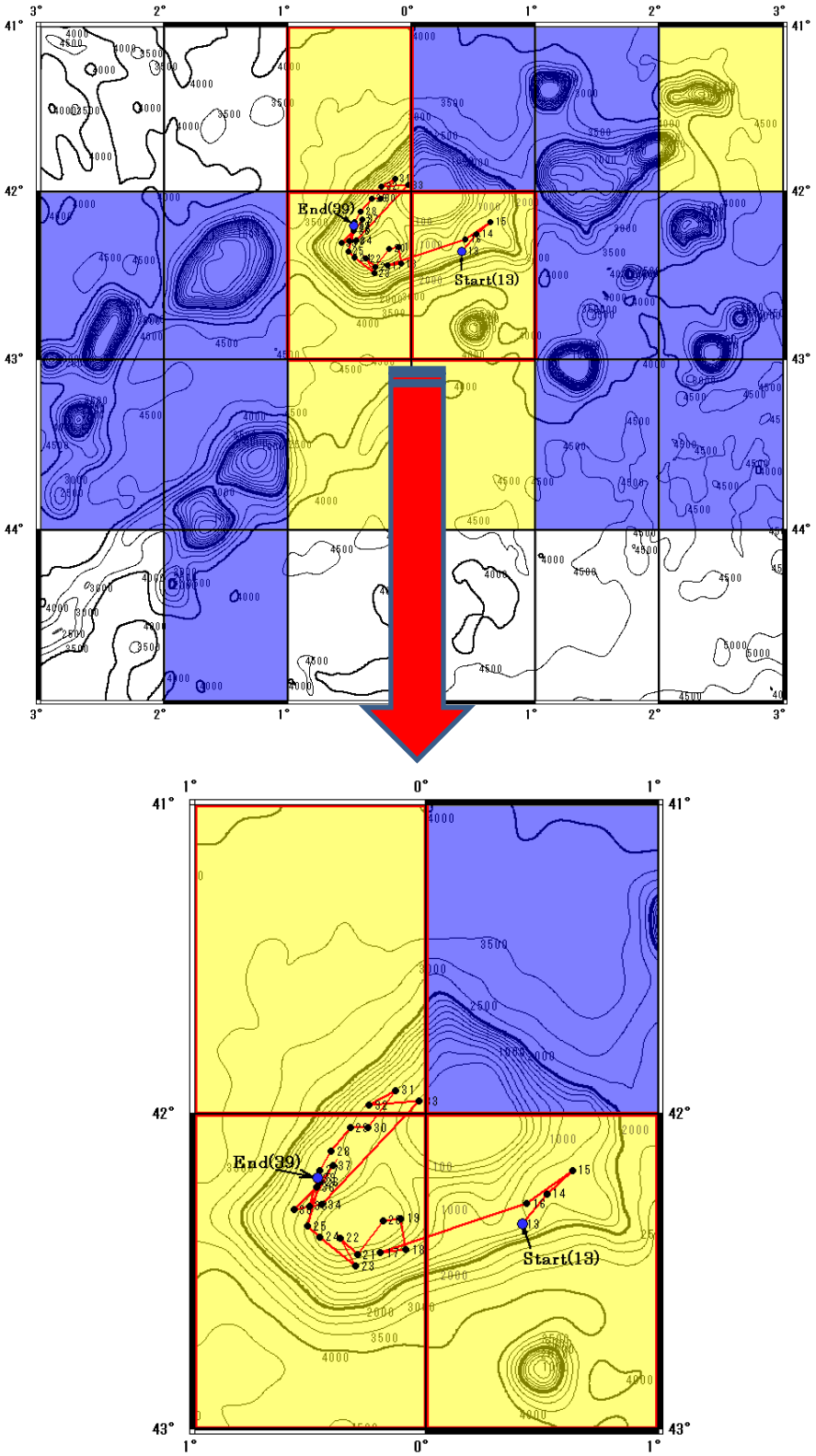
3.1 Areas and periods of the exploratory fishing completed

The exploratory fishing was conducted in three $1^{o}x1_{o}$ cells (red frames in Map 1) in the new fishing ground of the Discovery seamount area for 11 days (March 18-28, 2014) (27 sets: set number 13-39). The western part of the D area (see the proposal submitted in 2013 SC) was not covered.



Map 1
[Yellow zone] Exploratory fishing area planned in 2014
[Yellow zone within 3 red frames] Exploratory fishing area actually completed in 2014
[Light blue]Existing fishing area

3.2 Track lines (Map 2)



Map 2 Track lines of RV Shinsei Maru No 3 in the exploratory fishing area (2014)

3.3Gear description (Box 1)

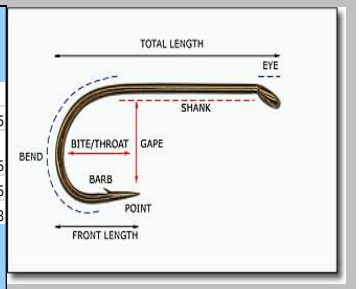
Box 1 Longline gear description

Longline description

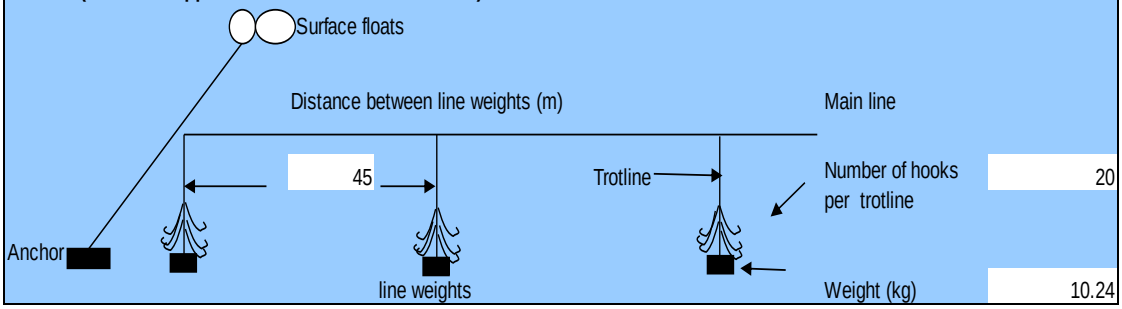
Longline Type	Trotline (vertical droppers/trots attached to mainline)						
Period in which the gear was used (dd/mm/yy)	Start	13-Mar-14	End	6-Apr-14			
Target Species	Dissostichus eleginoides : TOP						
Main Line:	Material	Polyester	Diameter (mm)	16	Integrated Wt (g/m)	n/a	
Branch Lines:	Material	Polyester	Length (m)	22	Spacing (m)	45	
Hooks:	Type	Straight	Make	Poutada Poligono 10/0	Total length (mm)	65	
	Shank (mm)	50	Gape (mm)	25	Throat (mm)	30	Front length (mm)	35
Usual setting position:	Line off bottom (m)	26	Hooks off bottom (m)	0.3			
Method of Baiting	Manual						
Automatic baiting equipment:	Make	n/a	Model	n/a			
Hook sinkers:	Size (g)	n/a	Position from hook (mm)	n/a			
Offal dumping position	Port side		Longline setting position	Stern			
Offal dumping during hauling	Always		Propeller rotation direction (clockwise/anti-clockwise)	Clockwise			

Weigh at least 30 line weights at random.
Show working below if necessary

Number	Average weight (kg)	SD (+-kg)
30	10.24	0.58



Trotline (vertical droppers/trots attached to a mainline)



3.4 Fishing efforts Catch, species compositions and CPUE

Table 1 shows the summary of fishing effort and Table 2 shows catch (retain, discards, release information) during the exploratory fishing operations. Maps 4-13 depicts distributions of catch (10 species).

Table 1 Fishing effort information in the exploratory fishing operations

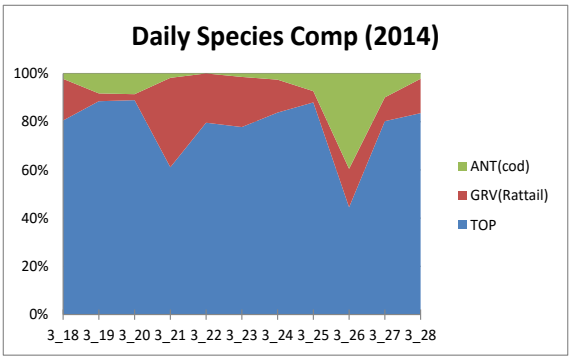
Subjects	Items	Figures
Fishing effort	Fishing days	12 days
	Number of total sets	27 operations
	Total number of hooks used	54,540 hooks
	Number of hooks lost	0 hooks

Table 2 Catch information (retain, discards and release)

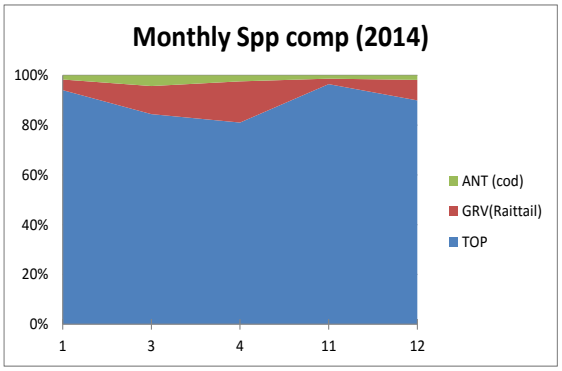
Species name (number)		observed number retained without tags	observed number discarded dead	observed number lost/dropped off at surface	observed number released alive good health	observed number released alive and seen predated	observed number released alive poor health	observed number released alive average health
TOP	Patagonian toothfish	169						
GRV	Rattail		928	93	1021			
ANT	Deep sea cod		411	20	431			
GSK	Greenland Shark		1		22			
KCX	Crab species	12		13	1			
HIB	Deepwater arrow tooth eel		26		26			
SRX	Skates and rays			18	17	35		
HYD	Chimaeras ghost sharks		47	4			51	
CGE	Deep sea red crab	21						21
MRL	Moray cods		1					1

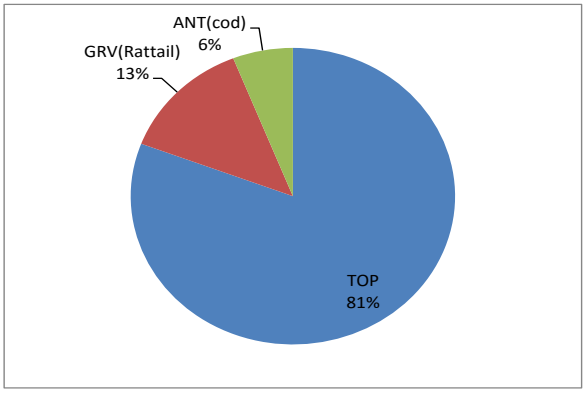
Box 2 Species compositions and CPUE

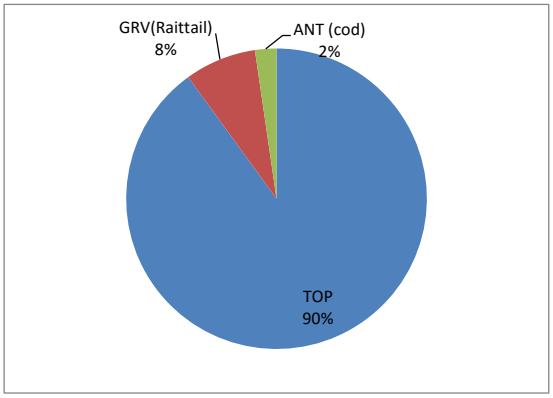
During exploratory fishing (2014)

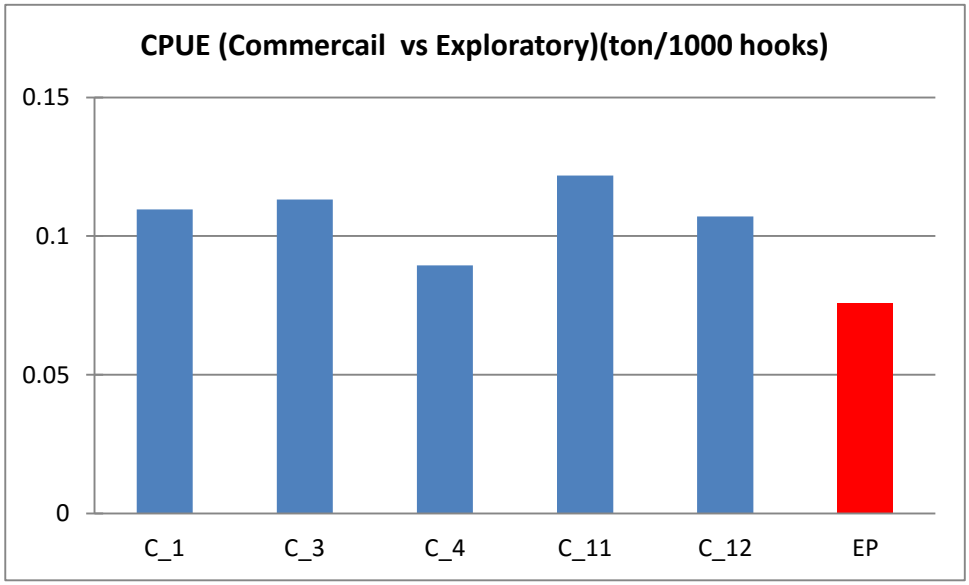


All operations (2014)

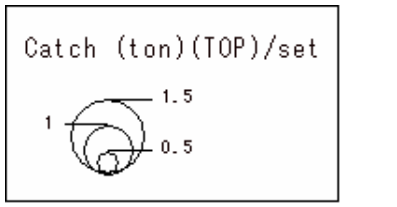




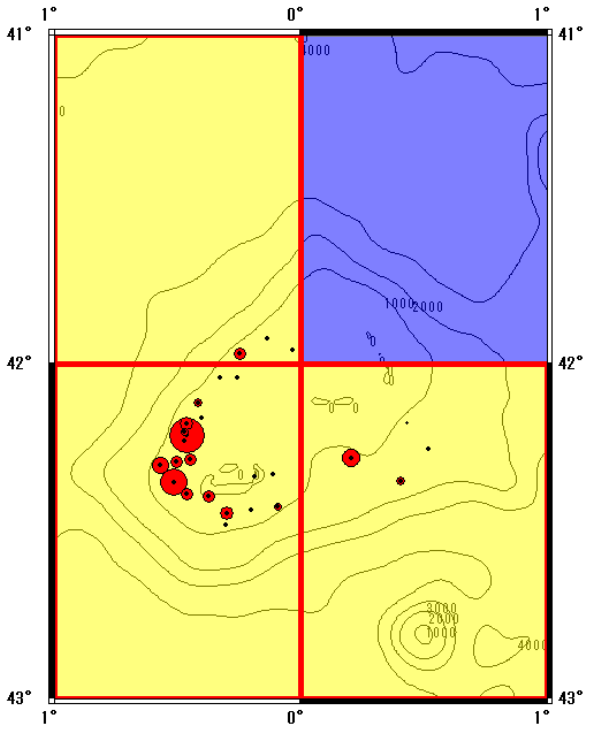




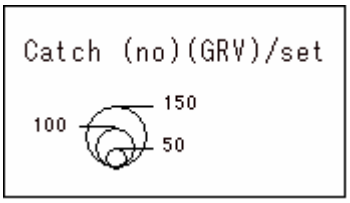
Legend (eg) C_1: average CPUE in January by the commercial operations



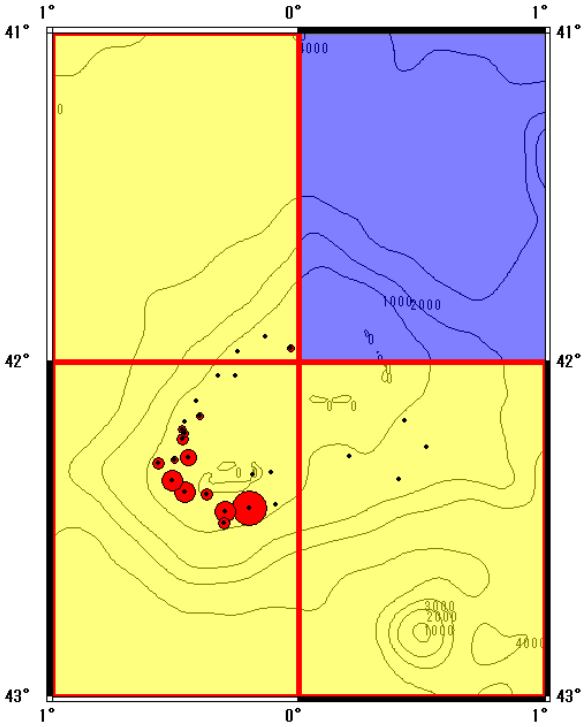
(·) black dot ➔0 (zero) catch



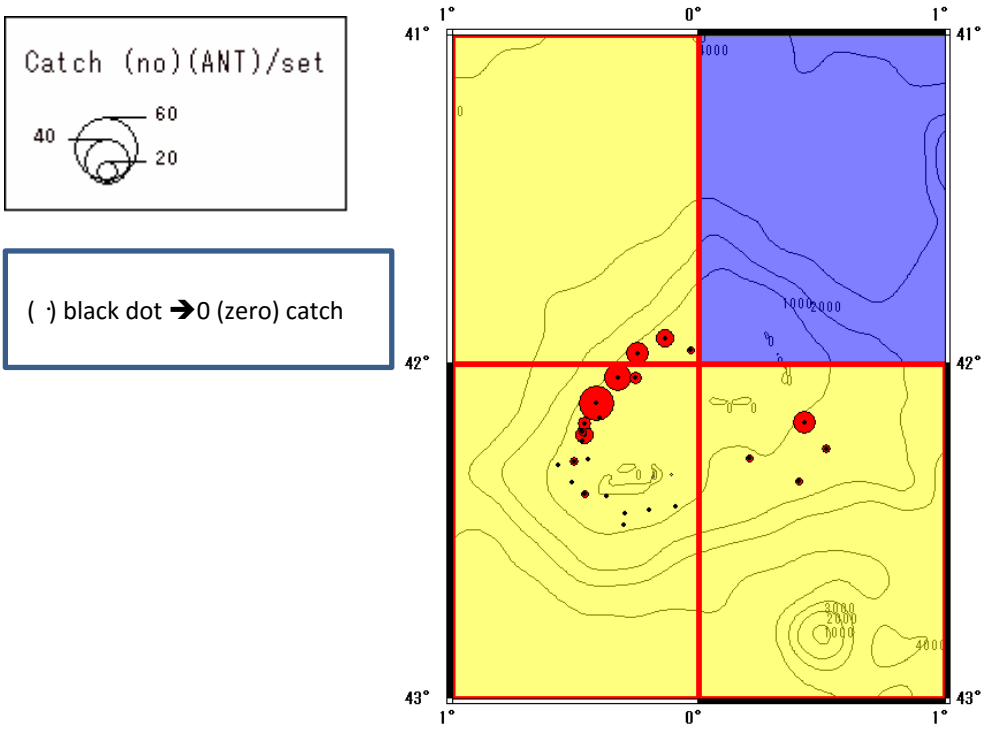
Map 3 Catch (tons) (TOP) Patagonian toothfish



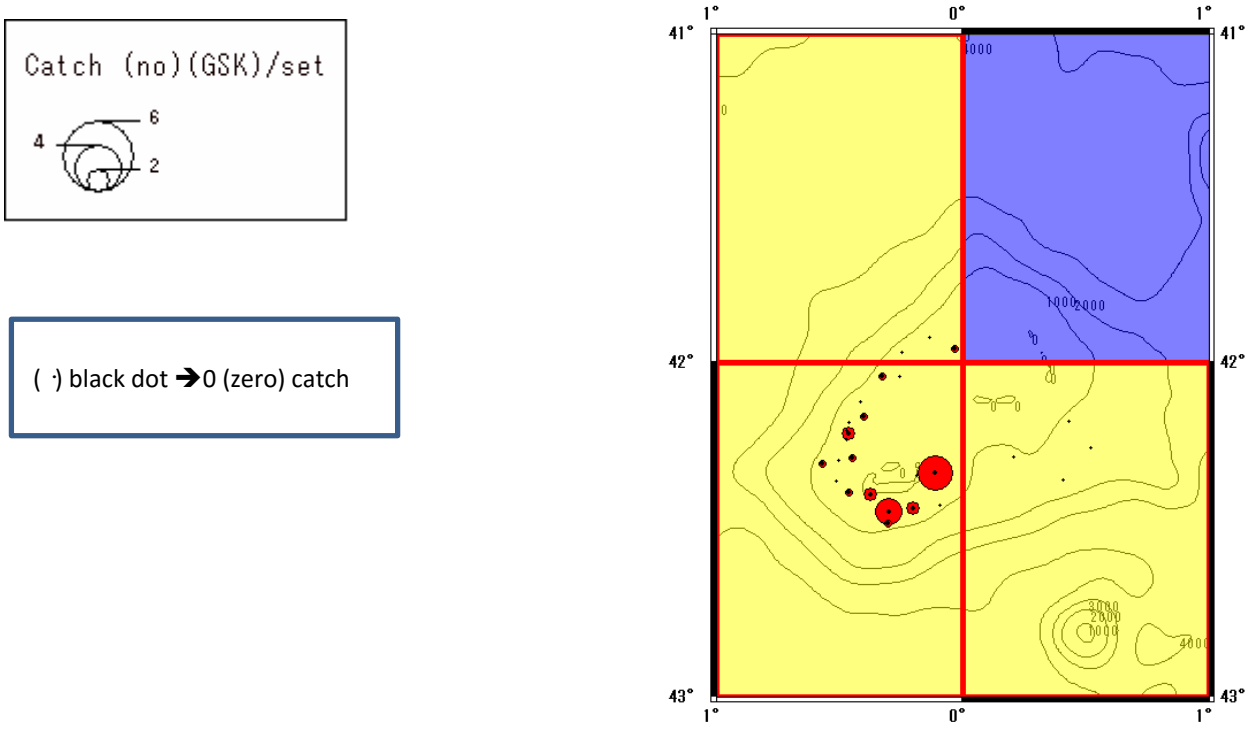
(·) black dot ➔0 (zero) catch



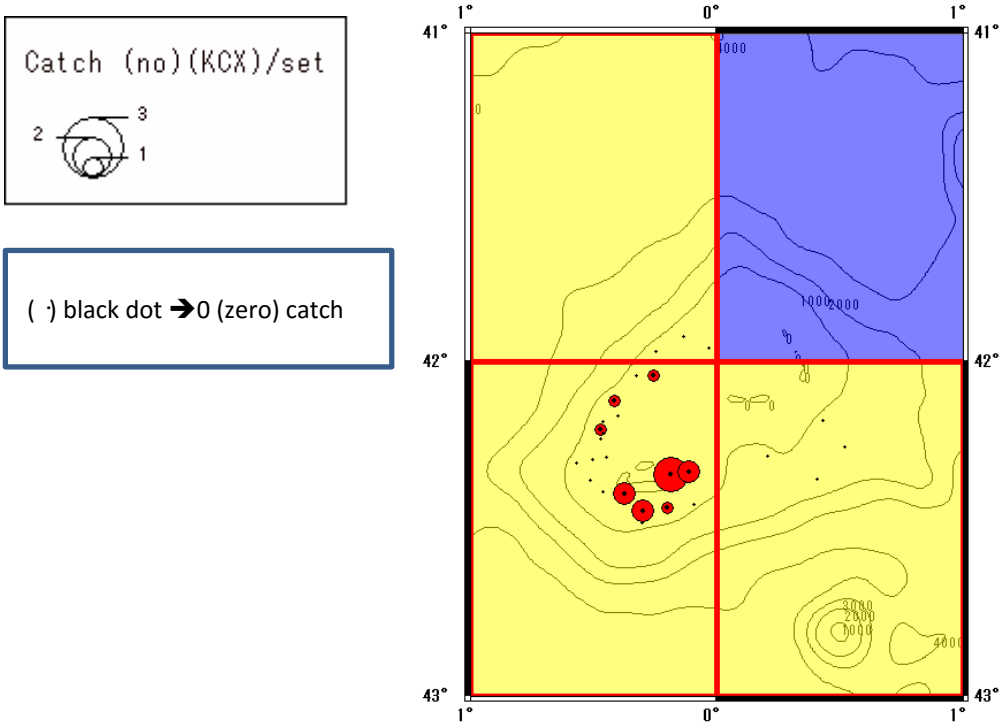
Map 4 Catch (no of fish) (GRV) Rattail



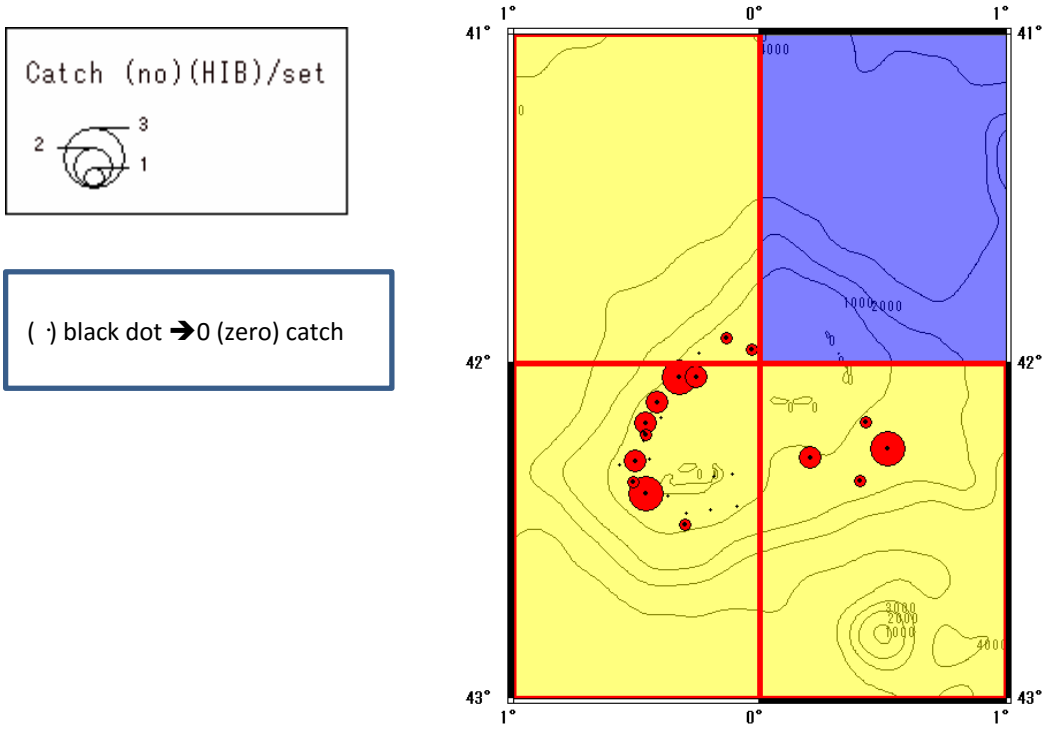
Map 5 Catch (no of fish) (ANT) Blue antimora



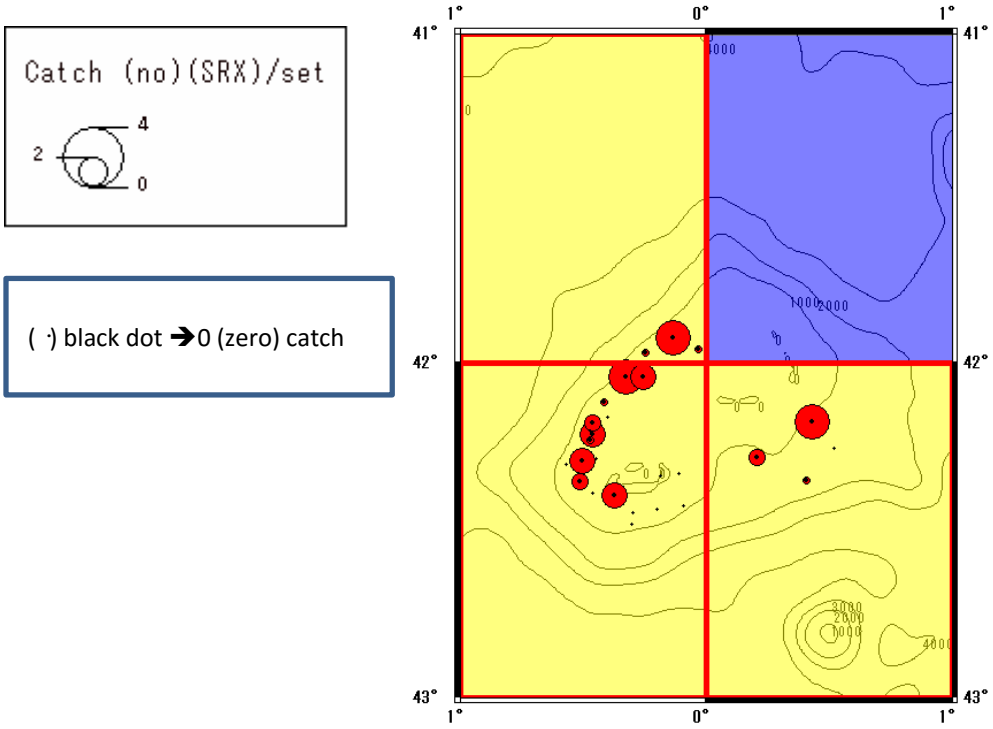
Map 6 Catch (number) (GSK) Greenland Shark



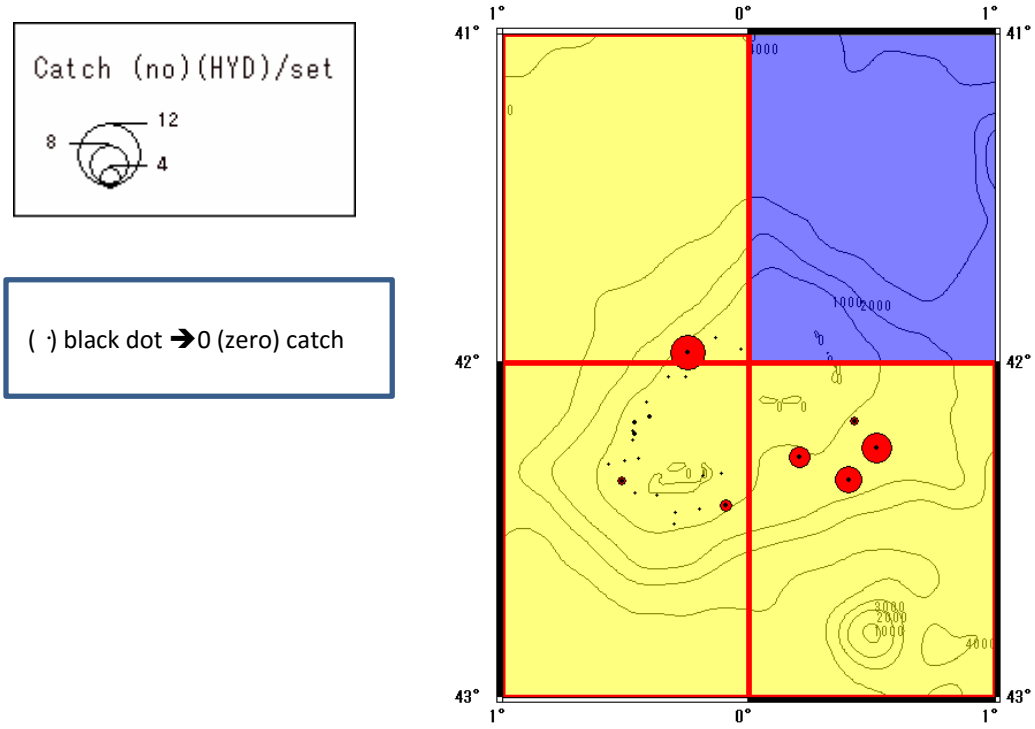
Map 7 Catch (number) (KCX) Crab species



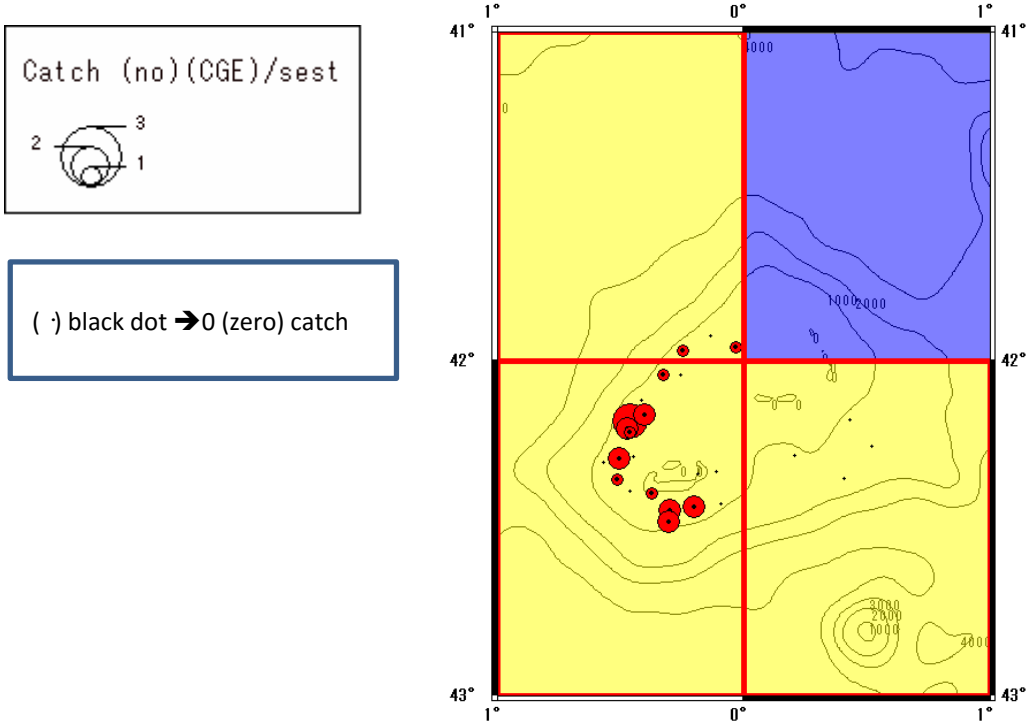
Map 8 Catch (number) (HIB) Deepwater arrow tooth eel



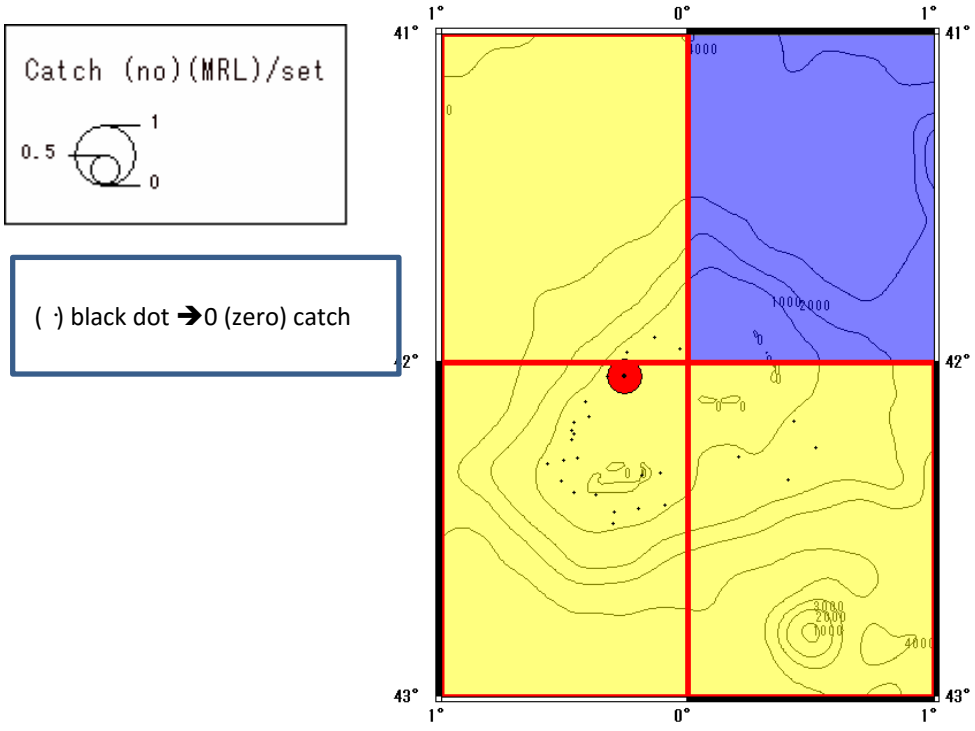
Map 9 Catch (number) (SRX) Skates and rays



Map 10 Catch (number) (HYD) Chimaeras ghost sharks



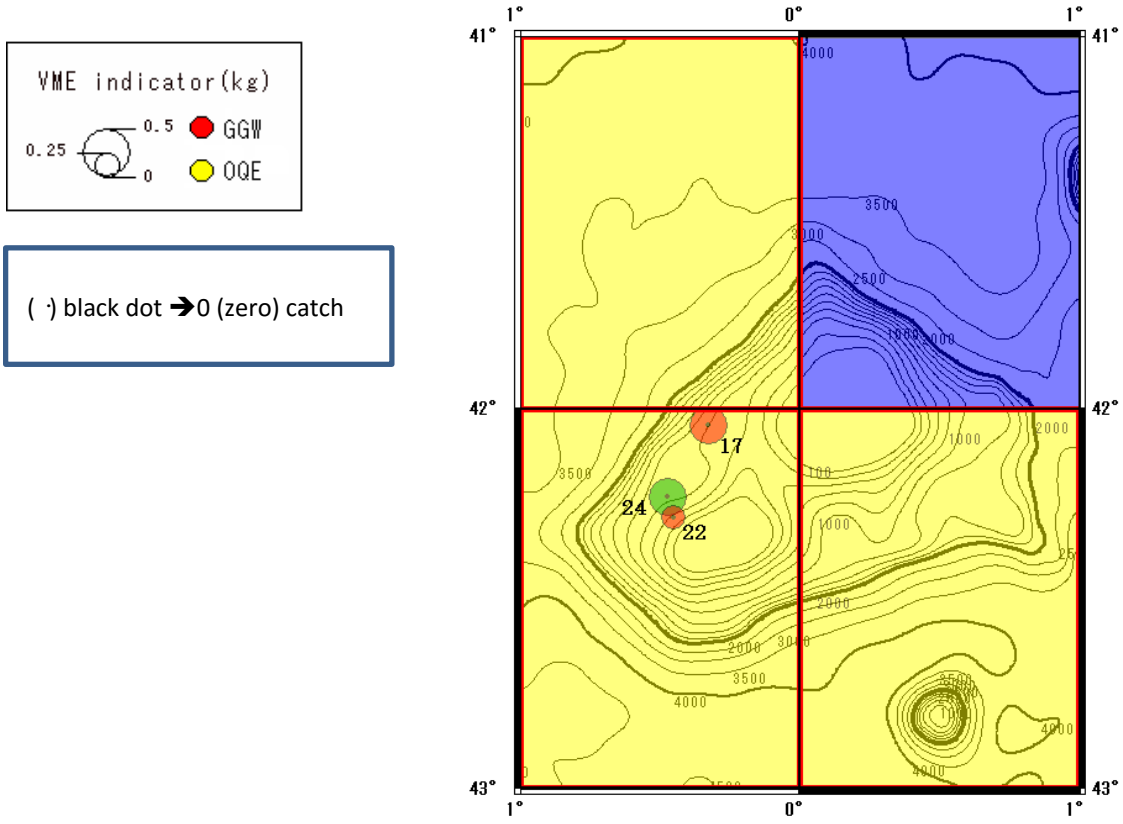
Map 11 Catch (no of fish) (CGE) Deep sea red crab



Map 12 Catch (no of fish) (MRL) Moray cods

3.5 VME

During the exploratory fishing, 2 VME species (GGW and OEQ) were incidentally caught in 3 separate locations (Map 13). Their weights were 0.52 kg and 0.35 kg (GGW) and 0.10 kg (OQE) less than the threshold levels (10 VME-indicator units, i.e., 10kg/1000 hooks).



Map 13 Locations and weights of VME species caught by the exploratory fishing

Set number	Date (March)	Code	Scientific name	English name	Weight (kg)
17	24	GGW	Gorgoniidae	Gorgonian	0.52
22	27				0.35
24		OEQ	Euryalida	Basket stars	0.10

3.6 Biological information (Patagonian toothfish) (Table 3)

Table 3 (1) Biological data collected

Set number	Date	Observer ID	Serial No.	Species Code	Scale/Otolith/ Both/Thorns	Total Length (cm)	Weight (kg)	Sex	Maturity Stage	Gonad Weight (g)	Comments
13	19-Mar-14	2	1	TOP	O	169	59	F	2	250	Stomach = 0%
13	19-Mar-14	2	2	TOP	O	113	20	F	1	50	Stomach = 0%
13	19-Mar-14	2	3	TOP	O	142	37	F	1	60	Stomach = 0%
13	19-Mar-14	2	4	TOP	O	124	26	M	1	10	Stomach = 0%
13	19-Mar-14	2	5	TOP	O	96	10	F	1	300	Stomach = 0%
13	19-Mar-14	2	6	TOP		150	48	F	2	250	Stomach = 75% (RTX)
13	19-Mar-14	2	7	TOP		134	38	F	2	300	Stomach = 25% (ANT)
13	19-Mar-14	2	8	TOP		150	47	F	2	20	Stomach = 0%
13	19-Mar-14	2	9	TOP		135	28	M	1	40	Stomach = 0%
13	19-Mar-14	2	10	TOP		115	18	F	1		Stomach = 0%
14	19-Mar-14	1	1	TOP	O	132	29	F	2	150	Stomach = 0%
14	19-Mar-14	1	2	TOP	O	93	8.4	M	1	10	Stomach = 0%
14	19-Mar-14	1	3	TOP	O	123	25	F	1	30	Stomach = 0%
14	19-Mar-14	1	4	TOP	O	111	15	F	1	20	Stomach = 0%
14	19-Mar-14	1	5	TOP	O	141	46	M	1	50	Stomach = 0%
14	19-Mar-14	1	6	TOP		117	26	F	1	100	Stomach = 0%
16	20-Mar-14	2	1	TOP	O	115	19	M	1	20	Stomach = 0%
16	20-Mar-14	2	2	TOP	O	146	45	F	2	350	Stomach = 0%
16	20-Mar-14	2	3	TOP	O	112	16	F	1	30	Stomach = 0%
16	20-Mar-14	2	4	TOP	O	114	19	F	1	80	Stomach = 0%
16	20-Mar-14	2	5	TOP	O	99	11	F	1	20	Stomach = 0%
16	20-Mar-14	2	6	TOP		118	20	F	1	40	Stomach = 0%
16	20-Mar-14	2	7	TOP		136	39	F	2	250	Stomach = 0%
16	20-Mar-14	2	8	TOP		103	12	F	1	20	Stomach = 0%
16	20-Mar-14	2	9	TOP		134	33	F	1	50	Stomach = 0%
16	20-Mar-14	2	10	TOP		135	33	F	1	20	Stomach = 0%
16	20-Mar-14	2	11	TOP		115	21	F	1	30	Stomach = 0%
16	20-Mar-14	2	12	TOP		103	13	F	1	10	Stomach = 0%
16	20-Mar-14	2	13	TOP		113	15	M	1	10	Stomach = 0%
16	20-Mar-14	2	14	TOP		133	34	F	1	60	Stomach = 0%
16	20-Mar-14	2	15	TOP		104	12	F	1	10	Stomach = 0%
16	20-Mar-14	2	16	TOP		118	20	M	1	20	Stomach = 0%
16	20-Mar-14	2	17	TOP		122	17	F	1	50	Stomach = 0%
16	20-Mar-14	2	18	TOP		115	19	M	1	20	Stomach = 0%
16	20-Mar-14	2	19	TOP		111	16	M	1	20	Stomach = 0%
16	20-Mar-14	2	20	TOP		168	54	F	2	150	Stomach = 0%
17	20-Mar-14	1	1	TOP	O	98	11	F	1	20	Stomach = 0%
17	20-Mar-14	1	2	TOP	O	91	9.5	M	1	10	Stomach = 0%
17	20-Mar-14	1	3	TOP	O	113	18	F	1	40	Stomach = 0%
17	20-Mar-14	1	4	TOP	O	88	8.6	F	1	10	Stomach = 0%
17	20-Mar-14	1	5	TOP	O	89	7.4	M	1	20	Stomach = 0%
17	20-Mar-14	1	6	TOP		112	17	F	1	30	Stomach = 0%
17	20-Mar-14	1	7	TOP		117	18	M	1	10	Stomach = 0%
17	20-Mar-14	2	8	TOP		95	11	F	1	20	Stomach = 0%
17	20-Mar-14	2	9	TOP		155	64	F	2	350	Stomach = 0%
17	20-Mar-14	2	10	TOP		107	15	M	1	10	Stomach = 0%
17	20-Mar-14	1	1	CGE			0.98	F	0		
17	20-Mar-14	1	2	CGE			1.58	F	0		
18	21-Mar-14	2	1	TOP	O	147	40	M	1	50	Stomach = 0%
18	21-Mar-14	2	2	TOP	O	115	21	F	1	30	Stomach = 0%
18	21-Mar-14	2	3	TOP	O	126	25	M	1	20	Stomach = 0%
18	21-Mar-14	2	4	TOP	O	97	11	F	1	10	Stomach = 0%
18	21-Mar-14	2	5	TOP	O	99	12	F	1	10	Stomach = 0%
18	21-Mar-14	2	6	TOP		130	28	F	1	60	Stomach = 0%
18	21-Mar-14	2	7	TOP		92	9.3	M	1	5	Stomach = 0%
18	21-Mar-14	2	8	TOP		84	9	F	1	5	Stomach = 0%
18	21-Mar-14	2	9	TOP		100	11	F	1	10	Stomach = 0%
18	21-Mar-14	2	10	TOP		133	27	F	1	50	Stomach = 0%
18	21-Mar-14	2	11	TOP		133	27	F	1	50	Stomach = 0%
18	21-Mar-14	2	12	TOP		95	9.2	M	1	5	Stomach = 0%
19	21-Mar-14	1	1	TOP	O	104	13	M	1	10	Stomach = 0%
19	21-Mar-14	1	2	TOP	O	144	42	F	2	300	Stomach = 0%
19	21-Mar-14	1	3	TOP	O	77	5	F	1	10	Stomach = 0%
19	21-Mar-14	1	4	TOP	O	92	8.6	F	1	10	Stomach = 0%
19	21-Mar-14	1	5	TOP	O	87	7.7	F	1	10	Stomach = 0%
19	21-Mar-14	1	6	TOP		113	18	F	1	20	Stomach = 0%
19	21-Mar-14	1	7	TOP		69	3.2	M	1	5	Stomach = 0%
19	21-Mar-14	1	8	TOP		76	4.6	F	1	10	Stomach = 0%
19	21-Mar-14	1	9	TOP		86	7	F	1	10	Stomach = 0%
19	21-Mar-14	1	10	TOP		100	11	F	1	10	Stomach = 0%
20	22-Mar-14	1	1	TOP	O	78	4.5	F	1	10	Stomach = 0%
20	22-Mar-14	1	2	TOP	O	117	24	F	1	120	Stomach = 0%
20	22-Mar-14	1	3	TOP	O	99	10	F	1	20	Stomach = 0%
20	22-Mar-14	1	1	CGE			2.3	F	0		
20	22-Mar-14	1	2	CGE			1.5	F	0		
21	22-Mar-14	1	1	TOP	O	144	47	F	2	280	Stomach = 0%
21	22-Mar-14	2	2	TOP	O	105	12	M	1	10	Stomach = 0%
21	22-Mar-14	2	3	TOP	O	114	18	F	1	40	Stomach = 0%
21	22-Mar-14	2	4	TOP	O	109	15	F	1	20	Stomach = 0%
21	22-Mar-14	2	5	TOP	O	112	12	M	1	10	Stomach = 0%
21	22-Mar-14	2	6	TOP		112	17	M	1	10	Stomach = 0%
21	22-Mar-14	2	7	TOP		145	47	F	2	300	Stomach = 0%
21	22-Mar-14	2	8	TOP		144	46	F	2	250	Stomach = 0%
21	22-Mar-14	2	9	TOP		130	27	F	1	50	Stomach = 0%
21	22-Mar-14	2	10	TOP		150	57	F	2	250	Stomach = 0%
21	22-Mar-14	2	11	TOP		140	41	F	2	220	Stomach = 0%
21	22-Mar-14	2	12	TOP		124	22	F	1	100	Stomach = 0%
21	22-Mar-14	2	13	TOP		96	11	F	1	10	Stomach = 0%
21	22-Mar-14	2	14	TOP		133	36	F	2	200	Stomach = 0%
21	22-Mar-14	2	15	TOP		120	26	F	1	60	Stomach = 0%
21	22-Mar-14	2	16	TOP		118	19	M	1	10	Stomach = 0%
21	22-Mar-14	2	17	TOP		103	14	F	1	20	Stomach = 0%

Table 3 (2) Biological data collected

Set number	Date	Observer ID	Serial No.	Species Code	Scale/Otolith/ Both/Thorns	Total Length (cm)	Weight (kg)	Sex	Maturity Stage	Gonad Weight (g)	Comments
22	23-Mar-14	2	1	TOP	O	142	50	F	2	280	Stomach = 0%
22	23-Mar-14	2	2	TOP	O	144	42	F	2	200	Stomach = 0%
22	23-Mar-14	2	3	TOP	O	112	22	M	1	20	Stomach = 0%
22	23-Mar-14	2	4	TOP	O	153	49	F	2	250	Stomach = 0%
22	23-Mar-14	2	5	TOP	O	156	57	F	2	300	Stomach = 0%
22	23-Mar-14	2	6	TOP		137	37	F	2	250	Stomach = 0%
22	23-Mar-14	2	7	TOP		144	38	F	1	60	Stomach = 0%
22	23-Mar-14	2	8	TOP		93	9.9	M	1	10	Stomach = 0%
22	23-Mar-14	2	9	TOP		134	32	F	1	50	Stomach = 0%
22	23-Mar-14	2	10	TOP		124	28	F	1	40	Stomach = 0%
22	23-Mar-14	2	11	TOP		81	5.8	M	1	10	Stomach = 0%
22	23-Mar-14	2	12	TOP		102	12	F	1	20	Stomach = 0%
22	23-Mar-14	2	13	TOP		78	4.8	F	1	10	Stomach = 0%
22	23-Mar-14	2	14	TOP		134	31	F	1	50	Stomach = 0%
22	23-Mar-14	2	1	CGE			1.1	M			
23	23-Mar-14	1	1	TOP	O	112	20	F	1	30	Stomach = 0%
23	23-Mar-14	1	2	TOP	O	98	10	M	1	5	Stomach = 0%
23	23-Mar-14	1	3	TOP	O	110	15	F	1	10	Stomach = 0%
23	23-Mar-14	1	4	TOP	O	106	13	F	1	10	Stomach = 0%
23	23-Mar-14	1	5	TOP	O	114	19	F	1	100	Stomach = 0%
23	23-Mar-14	1	6	TOP		102	12	F	1	20	Stomach = 0%
23	23-Mar-14	1	7	TOP		138	38	F	2	200	Stomach = 0%
23	23-Mar-14	1	8	TOP		136	39	M	1	50	Stomach = 0%
23	23-Mar-14	1	1	CGE			1.5	F	0		
23	23-Mar-14	1	2	CGE			1.05	F	0		
23	23-Mar-14	1	3	CGE			0.45	F	3		
23	23-Mar-14	1	4	CGE			0.95	F	0		
24	24-Mar-14	2	1	TOP	O	139	33	F	1	50	Stomach = 0%
24	24-Mar-14	2	2	TOP	O	151	38	F	2	250	Stomach = 0%
24	24-Mar-14	2	3	TOP	O	124	22	F	1	60	Stomach = 0%
24	24-Mar-14	2	4	TOP	O	100	11	M	1	5	Stomach = 0%
24	24-Mar-14	2	5	TOP	O	134	32	F	1	60	Stomach = 0%
24	24-Mar-14	2	6	TOP		135	33	F	2	150	Stomach = 0%
24	24-Mar-14	2	7	TOP		133	31	M	1	30	Stomach = 0%
24	24-Mar-14	2	8	TOP		112	17	M	1	50	Stomach = 0%
24	24-Mar-14	2	9	TOP		104	14	F	1	10	Stomach = 0%
24	24-Mar-14	2	10	TOP		122	22	F	1	50	Stomach = 0%
24	24-Mar-14	2	11	TOP		96	9.7	M	1	5	Stomach = 0%
24	24-Mar-14	2	12	TOP		96	10	M	1	10	Stomach = 0%
24	24-Mar-14	2	13	TOP		149	53	F	2	200	Stomach = 0%
24	24-Mar-14	2	14	TOP		118	26	M	1	20	Stomach = 0%
24	24-Mar-14	2	15	TOP		135	37	F	2	250	Stomach = 0%
25	24-Mar-14	2	1	TOP	O	104	14	F	1	20	Stomach = 0%
25	24-Mar-14	2	2	TOP	O	85	6.9	M	1	5	Stomach = 0%
25	24-Mar-14	1	3	TOP	O	117	28	F	2	100	Stomach = 0%
25	24-Mar-14	1	4	TOP	O	145	40	F	2	250	Stomach = 0%
25	24-Mar-14	1	5	TOP	O	121	19	F	1	50	Stomach = 0%
25	24-Mar-14	1	6	TOP		122	20	F	1	30	Stomach = 0%
25	24-Mar-14	1	7	TOP		138	34	F	2	150	Stomach = 0%
25	24-Mar-14	1	8	TOP		137	33	F	1	50	Stomach = 0%
25	24-Mar-14	1	9	TOP		118	15	M	1	20	Stomach = 0%
25	24-Mar-14	1	10	TOP		124	25	F	1	50	Stomach = 0%
25	24-Mar-14	1	11	TOP		123	22	F	1	50	Stomach = 0%
25	24-Mar-14	1	12	TOP		124	26	M	1	50	Stomach = 0%
25	24-Mar-14	1	13	TOP		129	28	M	1	50	Stomach = 0%
25	24-Mar-14	1	14	TOP		142	39	F	2	150	Stomach = 0%
25	24-Mar-14	1	15	TOP		146	45	F	2	250	Stomach = 0%
25	24-Mar-14	1	16	TOP		138	43	F	2	200	Stomach = 0%
25	24-Mar-14	1	17	TOP		161	61	F	2	200	Stomach = 0%
25	24-Mar-14	1	18	TOP		142	44	F	2	250	Stomach = 0%
25	24-Mar-14	1	19	TOP		136	32	F	1	50	Stomach = 0%
25	24-Mar-14	1	20	TOP		95	10	F	1	10	Stomach = 0%
25	24-Mar-14	1	1	CGE			0.8	F	0		
26	24-Mar-14	1	1	TOP	O	97	10	F	1	5	Stomach = 0%
26	24-Mar-14	1	2	TOP	O	99	11	F	1	10	Stomach = 0%
26	24-Mar-14	1	3	TOP	O	121	26	M	1	20	Stomach = 0%
26	24-Mar-14	1	4	TOP	O	86	6.7	F	1	10	Stomach = 0%
26	24-Mar-14	2	5	TOP	O	95	8.8	F	1	10	Stomach = 0%
26	24-Mar-14	2	6	TOP		120	24	F	1	50	Stomach = 0%
26	24-Mar-14	2	7	TOP		116	19	F	1	20	Stomach = 0%
26	24-Mar-14	2	8	TOP		107	13	F	1	20	Stomach = 0%
26	24-Mar-14	2	9	TOP		118	20	M	1	5	Stomach = 0%
26	24-Mar-14	2	10	TOP		128	29	F	1	50	Stomach = 0%
26	24-Mar-14	2	11	TOP		158	58	F	2	250	Stomach = 0%
26	24-Mar-14	2	12	TOP		99	10	F	1	10	Stomach = 0%
26	24-Mar-14	2	13	TOP		148	45	F	2	300	Stomach = 0%
26	24-Mar-14	2	14	TOP		119	20	F	1	10	Stomach = 0%
26	24-Mar-14	2	15	TOP		142	35	F	2	200	Stomach = 0%
26	24-Mar-14	2	16	TOP		142	34	F	2	200	Stomach = 0%
26	24-Mar-14	2	17	TOP		104	13	M	1	5	Stomach = 0%
26	24-Mar-14	2	18	TOP		143	38	F	2	210	Stomach = 0%
26	24-Mar-14	2	19	TOP		133	33	F	2	250	Stomach = 0%
26	24-Mar-14	2	20	TOP		115	16	F	1	20	Stomach = 0%
26	24-Mar-14	2	21	CGE			0.8	F	0		
27	25-Mar-14	2	1	TOP	O	78	4.6	M	1	5	Stomach = 0%
27	25-Mar-14	2	2	TOP	O	101	11	M	1	5	Stomach = 0%
27	25-Mar-14	2	3	TOP	O	125	25	F	1	50	Stomach = 0%
27	25-Mar-14	2	4	TOP	O	141	36	F	1	50	Stomach = 0%
27	25-Mar-14	2	5	TOP	O	132	27	F	1	60	Stomach = 0%
27	25-Mar-14	2	6	TOP		112	15	F	1	20	Stomach = 0%
27	25-Mar-14	2	7	TOP		125	24	F	1	50	Stomach = 0%
27	25-Mar-14	2	8	TOP		102	13	F	1	10	Stomach = 0%
27	25-Mar-14	2	9	TOP		126	26	M	1	20	Stomach = 0%
27	25-Mar-14	2	10	TOP		114	17	F	1	30	Stomach = 0%
27	25-Mar-14	2	11	TOP		133	31	F	1	60	Stomach = 0%
27	25-Mar-14	2	12	TOP		132	29	F	1	40	Stomach = 0%
27	25-Mar-14	2	13	TOP		145	41	F	2	250	Stomach = 0%
27	25-Mar-14	2	14	TOP		133	27	F	1	50	Stomach = 0%
27	25-Mar-14	2	15	TOP		130	25	F	1	40	Stomach = 0%
27	25-Mar-14	2	16	TOP		132	28	F	1	50	Stomach = 0%
27	25-Mar-14	2	17	TOP		88	9.9	M	1	5	Stomach = 0%
27	25-Mar-14	2	18	TOP		132	35	M	1	20	Stomach = 0%
27	25-Mar-14	2	1	CGE			1	F	0		
27	25-Mar-14	2	2	CGE			0.7	F	0		
27	25-Mar-14	2	3	CGE			0.9	F	0		

Table 3 (3) Biological data collected

Set number	Date	Observer ID	Serial No.	Species Code	Scale/Otolith/ Both/Thorns	Total Length (cm)	Weight (kg)	Sex	Maturity Stage	Gonad Weight (g)	Comments
28	25-Mar-14	1	1	TOP	O	118	21	F	1	50	Stomach = 0%
28	25-Mar-14	1	2	TOP	O	126	23	F	1	30	Stomach = 0%
28	25-Mar-14	1	3	TOP	O	145	42	F	2	200	Stomach = 0%
28	25-Mar-14	1	4	TOP	O	140	38	F	2	150	Stomach = 0%
28	25-Mar-14	1	5	TOP	O	149	41	F	2	200	Stomach = 0%
28	25-Mar-14	1	6	TOP		130	28	F	1	50	Stomach = 0%
28	25-Mar-14	1	7	TOP		143	44	F	2	350	Stomach = 0%
28	25-Mar-14	1	8	TOP		118	18	F	1	50	Stomach = 0%
28	25-Mar-14	1	9	TOP		135	29	F	1	50	Stomach = 0%
28	25-Mar-14	1	10	TOP		141	34	F	1	120	Stomach = 0%
28	25-Mar-14	1	1	CGE			1	F	0		Stomach = 0%
29	26-Mar-14	2	1	TOP	O	84	5.9	F	1	10	Stomach = 0%
29	26-Mar-14	2	2	TOP	O	135	30	F	1	50	Stomach = 0%
29	26-Mar-14	2	1	CGE			0.8	F	0		
30	26-Mar-14	2	1	TOP	O	101	9.8	F	1	10	Stomach = 0%
30	26-Mar-14	1	2	TOP	O	123	23	F	1	100	Stomach = 0%
30	26-Mar-14	1	1	TOP			1.1	F	0		
31	26-Mar-14	1	1	TOP	O	133	28	F	1	100	Stomach = 0%
31	26-Mar-14	1	2	TOP	O	118	19	F	1	40	Stomach = 0%
31	26-Mar-14	1	3	TOP	O	92	8.4	F	1	10	Stomach = 0%
31	26-Mar-14	1	4	TOP	O	64	2.5	F	1	5	Stomach = 0%
31	26-Mar-14	1	5	TOP	O	104	13	F	1	10	Stomach = 0%
31	26-Mar-14	1	6	TOP		75	4.6	M	1	3	Stomach = 0%
31	26-Mar-14	1	7	TOP		111	15	F	1	20	Stomach = 0%
31	26-Mar-14	1	1	CGE			0.9	F	0		
31	26-Mar-14	1	2	CGE			0.7	F	0		
32	27-Mar-14	2	1	TOP	O	112	15	F	1	20	Stomach = 0%
32	27-Mar-14	2	2	TOP	O	138	36	M	1	30	Stomach = 0%
32	27-Mar-14	2	3	TOP	O	133	33	F	1	50	Stomach = 0%
32	27-Mar-14	2	4	TOP	O	99	10	F	1	10	Stomach = 0%
32	27-Mar-14	2	5	TOP	O	143	36	F	2	180	Stomach = 0%
32	27-Mar-14	2	6	TOP		125	26	M	1	20	Stomach = 0%
32	27-Mar-14	2	7	TOP		93	9.2	F	1	5	Stomach = 0%
32	27-Mar-14	2	8	TOP		134	30	F	1	50	Stomach = 0%
32	27-Mar-14	2	9	TOP		115	22	F	1	30	Stomach = 0%
32	27-Mar-14	2	10	TOP		113	17	F	1	20	Stomach = 0%
32	27-Mar-14	2	11	TOP		116	19	F	1	40	Stomach = 0%
32	27-Mar-14	2	12	TOP		148	55	F	2	300	Stomach = 0%
32	27-Mar-14	2	13	TOP		108	16	M	1	5	Stomach = 0%
32	27-Mar-14	2	14	TOP		110	16	M	1	5	Stomach = 0%
32	27-Mar-14	2	15	TOP		117	21	M	1	10	Stomach = 0%
32	27-Mar-14	2	16	TOP		142	39	F	1	60	Stomach = 0%
32	27-Mar-14	2	17	TOP		125	27	M	1	20	Stomach = 0%
32	27-Mar-14	2	18	TOP		80	5.5	F	1	5	Stomach = 0%
32	27-Mar-14	2	1	CGE			1.1	F	0		
32	27-Mar-14	2	2	CGE			0.8	F	0		
33	27-Mar-14	2	1	TOP	O	89	8.1	F	1	10	Stomach = 0%
33	27-Mar-14	2	2	TOP	O	78	4.6	F	1	10	Stomach = 0%
33	27-Mar-14	2	3	TOP	O	85	8.5	M	1	10	Stomach = 0%
33	27-Mar-14	2	4	TOP	O	74	4.2	F	1	5	Stomach = 0%
33	27-Mar-14	1	5	TOP	O	77	4.7	F	1	5	Stomach = 0%
33	27-Mar-14	1	6	TOP		98	10	F	1	10	Stomach = 0%
33	27-Mar-14	1	7	TOP		100	10	F	1	5	Stomach = 0%
33	27-Mar-14	1	8	TOP		88	6.4	F	1	5	Stomach = 0%
33	27-Mar-14	1	9	TOP		83	6.7	F	1	5	Stomach = 0%
33	27-Mar-14	1	10	TOP		117	22	F	1	50	Stomach = 0%
33	27-Mar-14	1	11	TOP		118	25	F	1	50	Stomach = 0%
33	27-Mar-14	1	12	TOP		121	18	F	1	30	Stomach = 0%
33	27-Mar-14	1	13	TOP		79	4.9	F	1	10	Stomach = 0%
33	27-Mar-14	1	14	TOP		78	5.4	F	1	10	Stomach = 0%
33	27-Mar-14	2	1	CGE			0.9	F	0		
34	28-Mar-14	2	1	TOP	O	129	28	F	1	100	Stomach = 0%
34	28-Mar-14	2	2	TOP	O	135	31	F	1	100	Stomach = 0%
34	28-Mar-14	2	3	TOP	O	115	18	F	1	50	Stomach = 0%
34	28-Mar-14	2	4	TOP	O	115	20	F	1	50	Stomach = 0%
34	28-Mar-14	2	5	TOP	O	99	11	M	1	5	Stomach = 0%
34	28-Mar-14	2	6	TOP		150	62	F	2	300	Stomach = 0%
34	28-Mar-14	2	7	TOP		112	16	M	1	5	Stomach = 0%
34	28-Mar-14	2	8	TOP		149	45	M	1	50	Stomach = 0%
34	28-Mar-14	2	9	TOP		92	8.4	F	1	10	Stomach = 0%
34	28-Mar-14	2	10	TOP		144	42	F	2	250	Stomach = 0%
34	28-Mar-14	2	11	TOP		107	14	F	1	20	Stomach = 0%
34	28-Mar-14	2	12	TOP		132	28	F	1	60	Stomach = 0%
34	28-Mar-14	2	13	TOP		81	5.5	F	1	5	Stomach = 0%
35	28-Mar-14	1	1	TOP	O	112	23	F	1	50	Stomach = 0%
35	28-Mar-14	1	2	TOP	O	121	21	F	1	30	Stomach = 0%
35	28-Mar-14	1	3	TOP	O	139	37	F	2	200	Stomach = 0%
35	28-Mar-14	1	4	TOP	O	98	10	M	1	5	Stomach = 0%
35	28-Mar-14	1	5	TOP	O	116	20	F	1	10	Stomach = 0%
35	28-Mar-14	1	6	TOP		116	20	F	1	30	Stomach = 0%
35	28-Mar-14	1	7	TOP		100	12	F	1	10	Stomach = 0%
35	28-Mar-14	1	8	TOP		110	17	F	1	30	Stomach = 0%
35	28-Mar-14	1	9	TOP		128	29	F	1	50	Stomach = 0%
35	28-Mar-14	1	10	TOP		108	13	F	1	20	Stomach = 0%
35	28-Mar-14	1	11	TOP		111	16	M	1	5	Stomach = 0%
35	28-Mar-14	1	12	TOP		126	24	M	1	10	Stomach = 0%
35	28-Mar-14	1	13	TOP		107	14	F	1	20	Stomach = 0%
35	28-Mar-14	1	14	TOP		129	29	M	1	10	Stomach = 0%
35	28-Mar-14	1	15	TOP		154	51	F	2	250	Stomach = 0%
35	28-Mar-14	1	16	TOP		146	41	F	2	210	Stomach = 0%
35	28-Mar-14	1	17	TOP		126	25	F	1	50	Stomach = 0%
35	28-Mar-14	1	18	TOP		117	19	M	1	5	Stomach = 0%
35	28-Mar-14	1	19	TOP		126	28	M	1	10	Stomach = 0%
35	28-Mar-14	1	20	TOP		135	36	F	2	200	Stomach = 0%
36	28-Mar-14	1	1	TOP	O	133	28	F	1	50	Stomach = 0%
36	28-Mar-14	2	2	TOP	O	108	13	F	1	20	Stomach = 0%
36	28-Mar-14	2	3	TOP	O	131	25	F	1	100	Stomach = 0%
36	28-Mar-14	2	4	TOP	O	131	29	F	1	100	Stomach = 0%
36	28-Mar-14	2	5	TOP	O	136	36	F	1	100	Stomach = 0%
37	29-Mar-14	2	1	TOP	O	138	41	F	2	250	Stomach = 0%
37	29-Mar-14	2	2	TOP	O	108	13	F	1	10	Stomach = 0%
37	29-Mar-14	2	3	TOP	O	92	7.9	F	1	5	Stomach = 0%
37	29-Mar-14	2	4	TOP	O	119	19	F	1	100	Stomach = 0%
37	29-Mar-14	2	5	TOP	O	120	20	F	1	5	Stomach = 0%
37	29-Mar-14	2	6	TOP		129	25	F	1	100	Stomach = 0%
37	29-Mar-14	1	7	TOP		96	9.6	F	1	10	Stomach = 0%
37	29-Mar-14	1	8	TOP		133	34	F	2	30	Stomach = 0%
37	29-Mar-14	2	1	CGE			0.9	F	0		
37	29-Mar-14	2	2	CGE			1.1	F	0		
39	29-Mar-14	1	1	TOP	O	159	44	F	2	250	Stomach = 0%
39	29-Mar-14	1	2	TOP	O	128	26	F	1	50	Stomach = 0%
39	29-Mar-14	1	3	TOP	O	136	30	F	1	30	Stomach = 0%
39	29-Mar-14	1	4	TOP	O	101	16	F	1	20	Stomach = 0%
39	29-Mar-14	1	5	TOP	O	152	42	F	2	300	Stomach = 0%
39	29-Mar-14	1	6	TOP		144	39	M	1	20	Stomach = 0%
39	29-Mar-14	1	7	TOP		123	19	F	1	10	Stomach = 0%
39	29-Mar-14	1	8	TOP		156	62	F	2	300	Stomach = 0%
39	29-Mar-14	1	1	CGE			1.4	F	0		
39	29-Mar-14	1	2	CGE			1.6	F	0		
38	29-Mar-14	1	1	TOP	O	115	24	F	1	50	Stomach = 0%
38	29-Mar-14	1	2	TOP	O	135	35	M	1	10	Stomach = 0%
38	29-Mar-14	1	3	TOP	O	107	12	F	1	20	Stomach = 0%
38	29-Mar-14	1	4	TOP	O	122	25	F	1	30	Stomach = 0%
38	29-Mar-14	1	5	TOP	O	124	27	F	1	50	Stomach = 0%
38	29-Mar-14	1	6	TOP		121	23	F	1	50	Stomach = 0%
38	29-Mar-14	1	7	TOP		134	29	M	1	20	Stomach = 0%
38	29-Mar-14	1	1	CGE			1.5	F	0		
38	29-Mar-14	1	2	CGE			1.4	F	0		

3.7 Sea birds

(1) Observations

One observer on board investigated sea birds around the FV Shinsei Maru No 3 during the exploratory fishing (Table 4).

Table 4 Results of seabird observation during day Settings in exploratory fishing

Date	Set number	Species Code	Scientific name	English name	No. of birds	Distance astern (m)	Foraging method
March 14 2014	17	PRO	Procellaria aequinoctialis	White chinned petrel	12	25	3
	17	PUG	Puffinus gravis	Great Shearwater	75	12	3
	17	PFG	Puffinus griseus	Sooty Shearwater	8	50	6
March 21 2014	21	DIM	Thalassarche melanophris	Southern Black browed albatross	4	100	6
	21	DCR	Thalassarche chlororhynchos	Yellow-nosed Albatross	2	80	6
	21	PRO	Procellaria aequinoctialis	White chinned petrel	4	60	6
	21	PUG	Puffinus gravis	Great Shearwater	200	80	3

Foraging method codes

1 = Not interested
2 = Taking food from surface
3 = Duck diving
4 = Stealing from other birds
5 = Sit on surface and drift away
6 = Interested but not getting anything

(2) Mitigation

FV Shinsei No 3 deployed the stream lines(Fig. 1) requested by SEAFO Sea bird mitigation measure (CM25/12) during the exploratory fishing and also during the normal fishing operations. In addition, FV Shinsei Maru No 3 passed the bottle test before starting the exploratory fishing.

However, FV Shinsei Maru No 3 incidentally caught three sea birds (Table 5), hence the day operation was

stopped and changed to the night operation by following CM25/12.

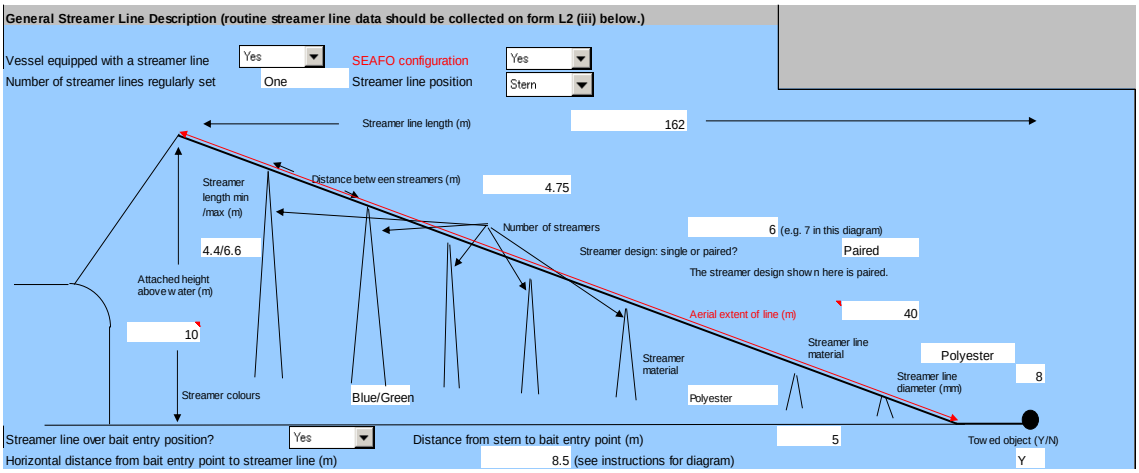


Fig 1 Stream lines deployed by FV Shinsei No 3 during the exploratory fishing

Table 5 Incidental seabird by-catch during the exploratory fishing

Date	Set number	Species Code	Scientific name	English name	Observed (Yes / No)	Caught During	Sample Retained (Yes / No)
March 21 2014	21	DIM	Thalassarche melanophris	Southern Black browed albatross	Y	Setting	N
	21	PUG	Puffinus gravis	Great Shearwater	Y	Setting	N
	22	PUG			Y	Setting	N

3.8 Marine mammals

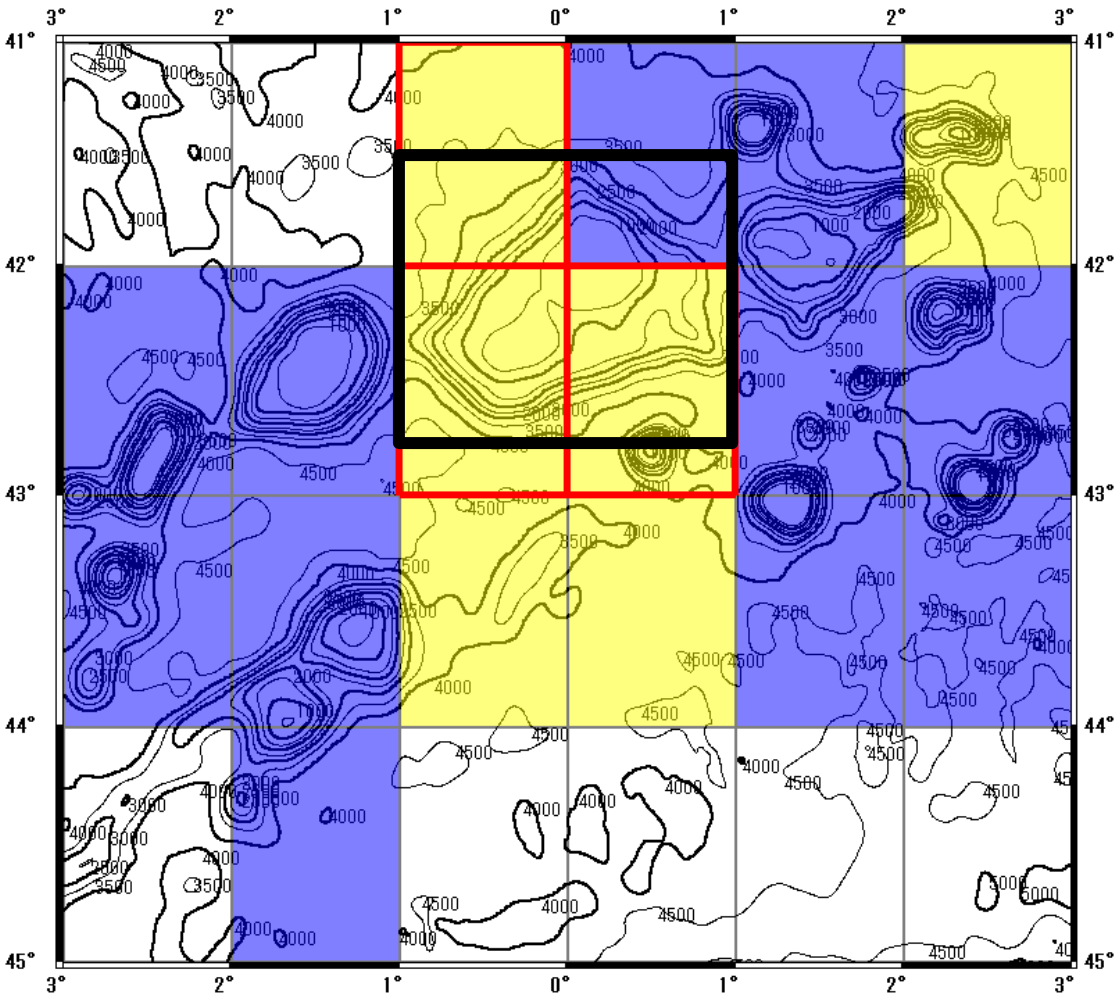
One observer on board also investigated marine mammals around the FV Shinsei Maru No 3 during the exploratory fishing. Three dusky dolphins were observed (Table 6) and there were no incidental catch.

Table 6 Results of marine mammal observation during the exploratory fishing

Date	Set number	Time (hh:mm)	Species Code	Scientific name	English name	Estimated Abundance around the vessel
March 20 2014	18	9:50	DDU	Lagenorhynchus obscurus	Dusky dolphin	50
	19	16:45	DDU			30
March 27 2014	34	9:50	DDU			10

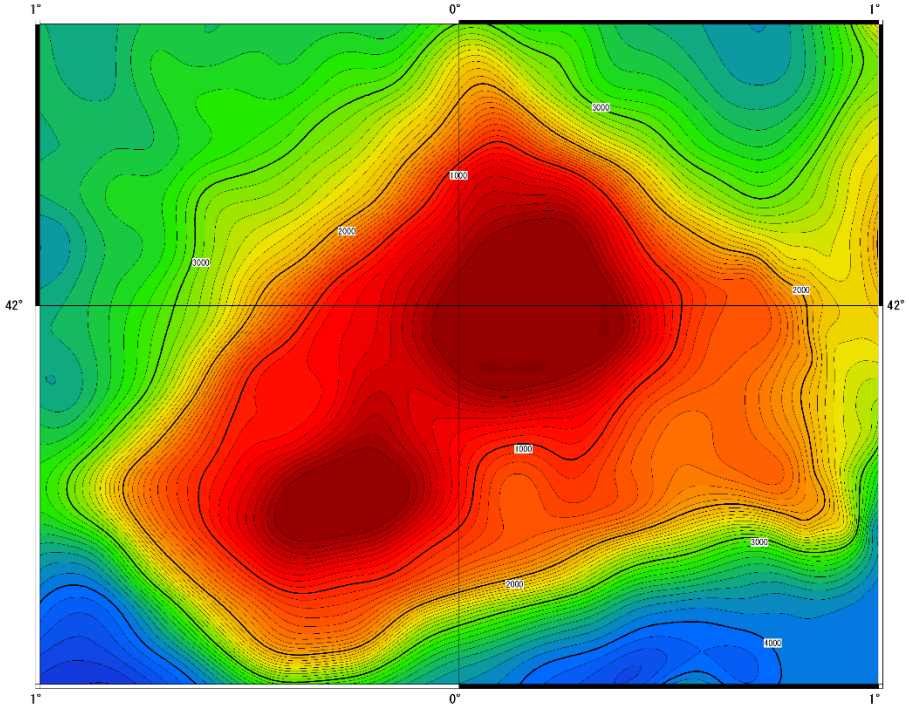
3.9Sea bed mappings

Hybrid bathymetry maps in the good fishing area of the exploratory fishing (Black frame area in Map 14) were created by combining echo sounder data of FV Shinsei Maru No 3and ETOPO1 depth digital data built from numerous global and regional data sets (Maps 15-17).

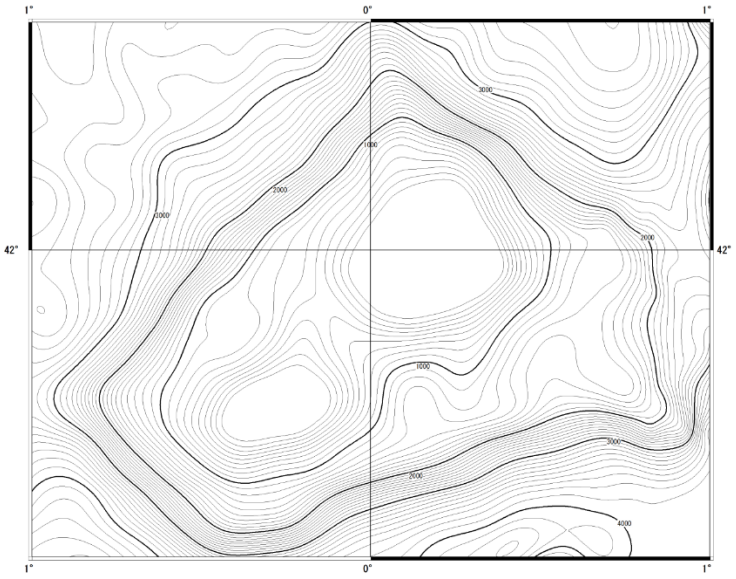


Map 14Sea bed mapping area(Black frame)

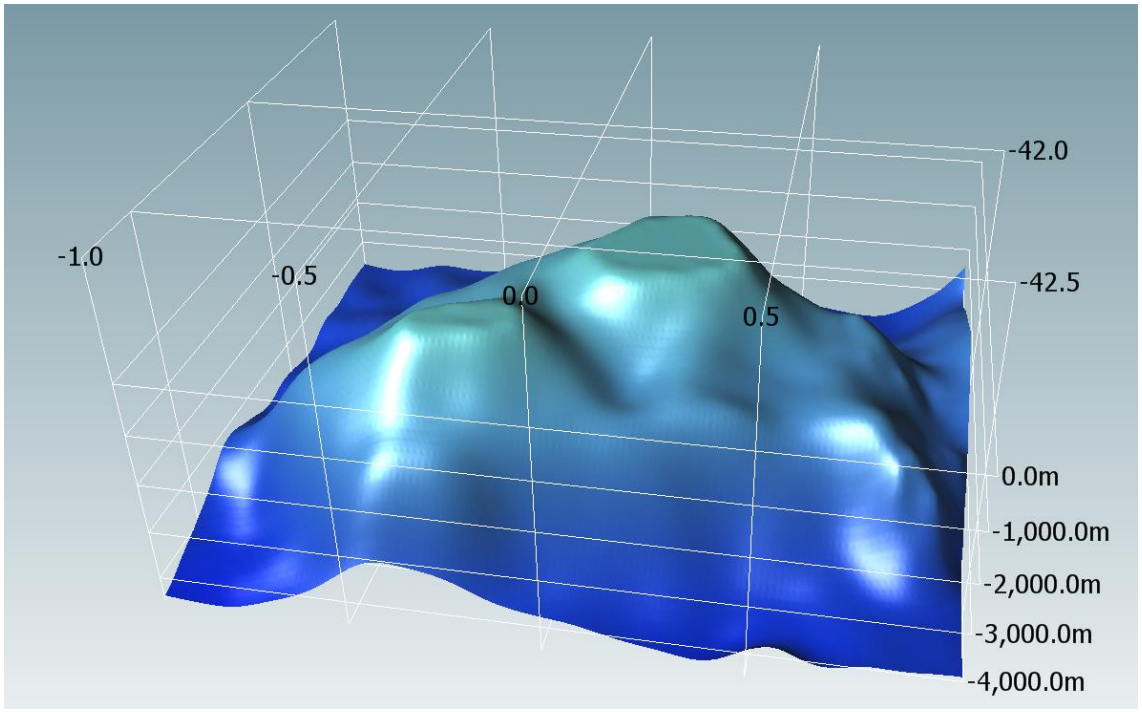
Good fishing ground in the exploratory fishing area

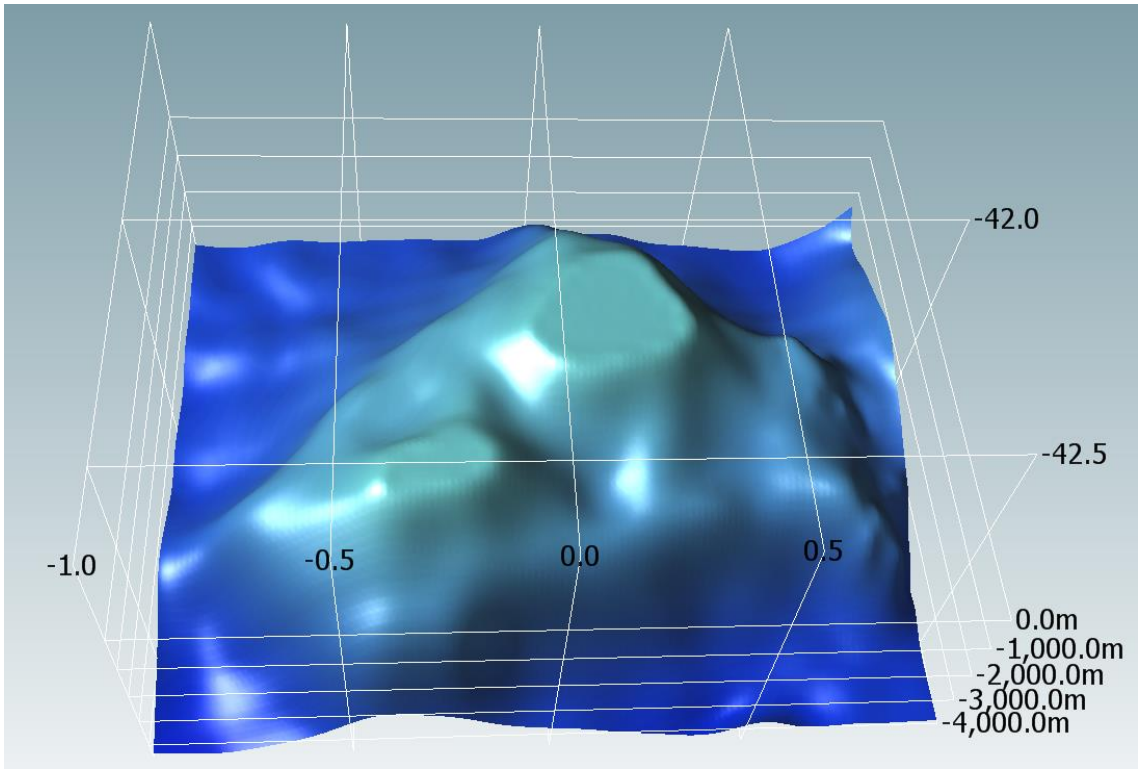


Map 15 Hybrid bathymetry map based on echo sounder data of FV Shinsei Maru No 3 andETOPO1 digitaldepth data (Filled mode).



Map 16 Hybrid bathymetry map based on echo sounder data of FV Shinsei Maru No 3 andETOPO1 digitaldepth data (Filled mode).





Map 17 Hybrid 3D bathymetry map based on echo sounder data of FV Shinsei Maru No 3 andETOPO1 digitaldepth data (Filled mode).

4. Proposal to openthe new fishing area to the existing fishing area

CM29-14 (Box 3) defines Rules and procedures for opening of new fishing areas.

Box 3

Rules and procedures for opening of new fishing areas

1. It is required to have exploratory fishing data within a specified area without reaching the VME threshold to open that area for fishing:

(a) two years of data within 5 year period for an area (<2000m) adjacent to an existing fishing area;

(b) and three-years of data within 5 years for areas (<2000m) not adjacent to an existing fishing area; and

(c) existing fishing records/data that contain VME data may be counted as a first year data set.

2. All 1x1° areas within the exploratory area that contain a VME encounter should be excluded from the proposed new fishing area.

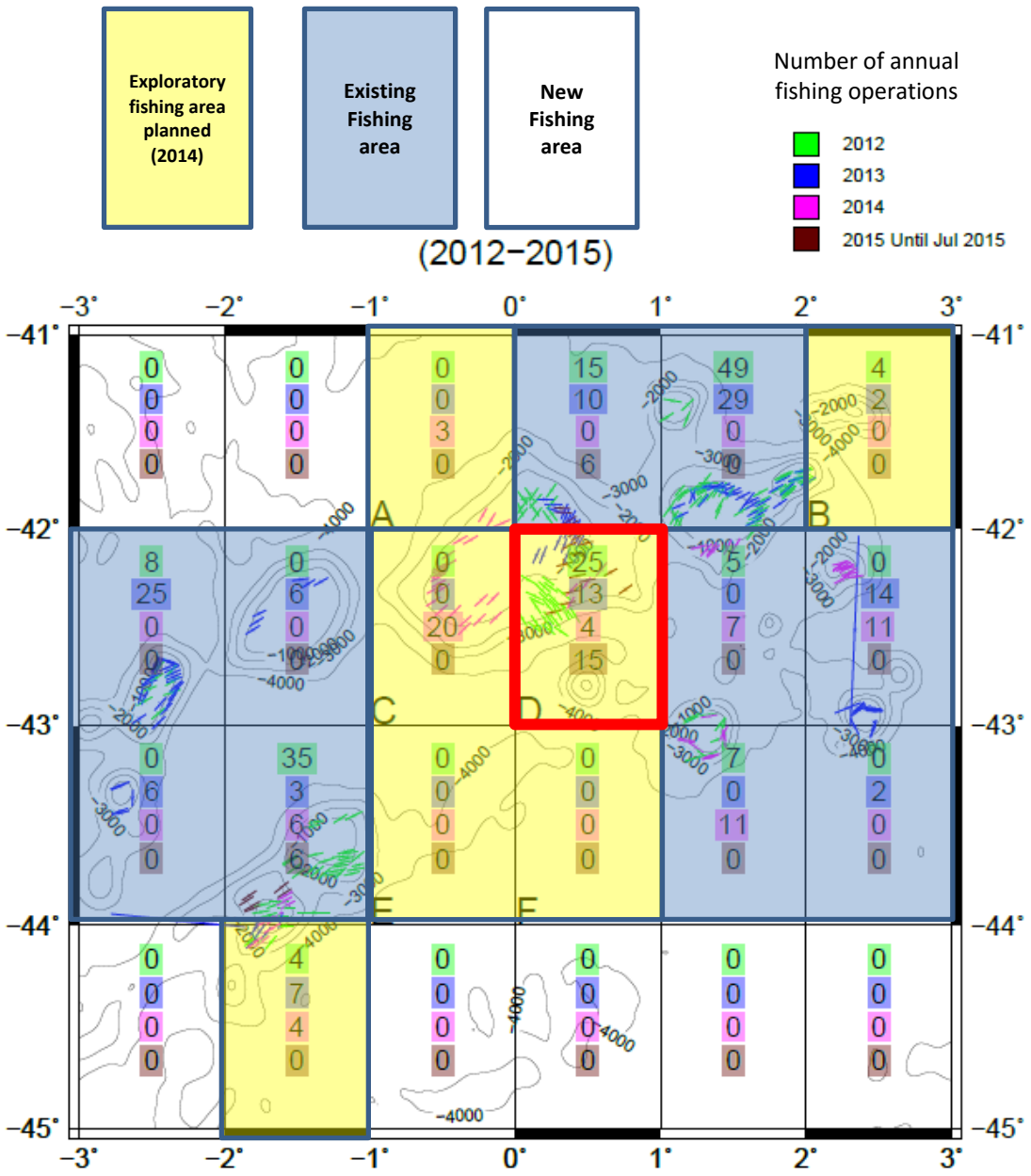
3. Exploratory data stations should be set in such a way that it covers the exploratory area representatively above the 2000m depth isobar.

In 2014, three 1°x1° areas were changed to the existing fishing area from the new fishing as Shinsei Maru No 3 satisfied these conditions. For this time, after investigating the past exploratory fishing area (2012-2014), one 1°x1° area (area D, Map 18) is considered satisfy the above three conditions as explained below:

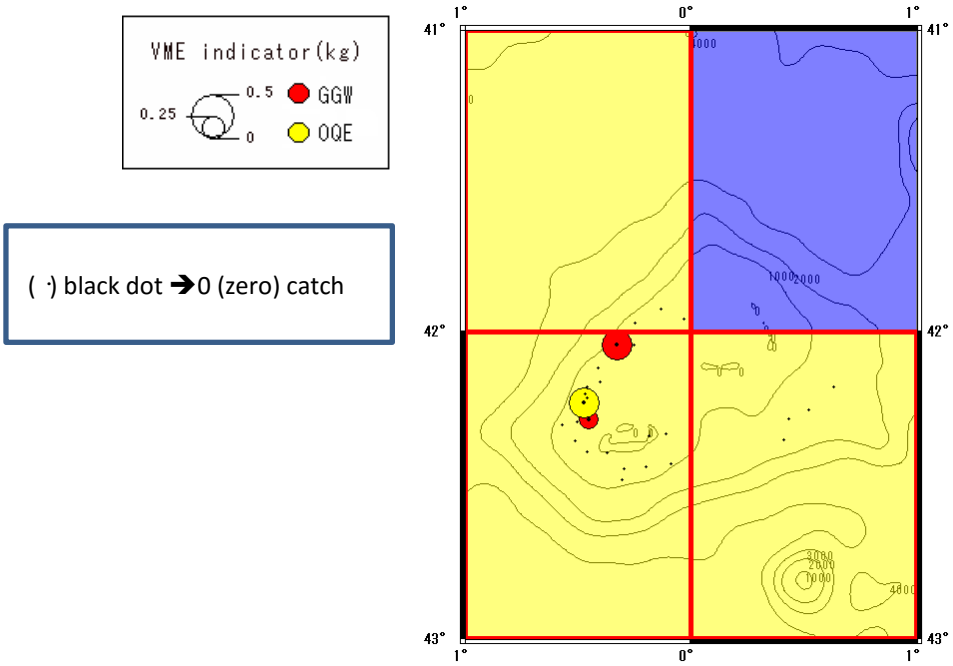
Conditions 1: Three years (2012-2014) of exploratory fishing are completed (Map 18)

Condition 2: There are no SAI on VME (2012-2014) (Map 19)

Condition 3: Exploratory fishing (2012-2014) covers representative areas above 2,000m (Map 20)

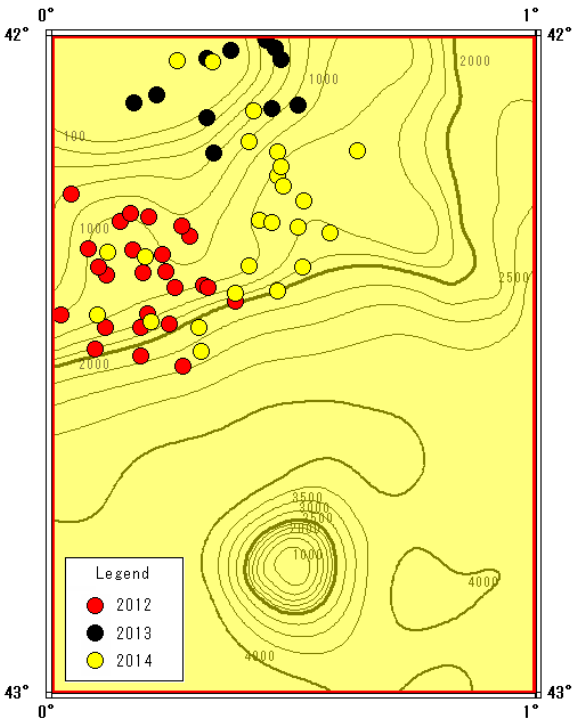


Map 18 Number of annual fishing operation in existing and exploratory fishing areas (2012-2015)



Map 19 Locations of VME species bycatch (2014): all are less than threshold values.

No VME bycatch in 2012-2013



Map 20 Locations of annual fishing operations in the proposed area to open the new fishing area to the existing fishing area (2012-2014).

APPENDIX X – Proposal for exploratory fishing within the SEAFO CA during 2016

SEAFO/SC/WP/16/2015

PLAN OF EXPLORATORY FISHING IN NEW BOTTOM FISHING GROUND IN THE SEAFO CONVENTION AREA IN 2016

Member country: Japan
Date of submission: September, 2015 (Scientific Committee)

1. INTRODUCTION

In 2011, existing bottom fishing areas have been identified in response to 2006 UNGA resolution 61/105. This has resulted to split some of fishable sea mountains shallower than 2,000m such as Discovery Seamounts into existing and new bottom fishing areas.

There is no clear geographical (seafloor-topological) boundary around the Discovery Seamount. Hence it is considered that fish might move across the boundary of existing and new bottom fishing areas. Furthermore VME information, fish distribution, detailed sea bed map, etc. in new bottom fishing areas will never be known unless exploratory fishing activities occur there.

We believe that collecting such primary information in new bottom fishing areas is meaningful and accumulating such information could contribute to achieve the objective of the SEAFO Convention to ensure the long term conservation and sustainable use of fishery resources.

2. OBJECTIVES

Under such circumstances, the primary objectives of this exploratory fishing are to investigate Patagonian toothfish resourcesusing some part of TAC and to evaluate if this exploratory fishing produces Significant Adverse Impact (SAI) on VME species

3. SPECIFICATIONS OF THE EXPLORATORY FISHING

(1) Target Species

***Dissosticus spp*. (Patagonian toothfish)**

(2) Period

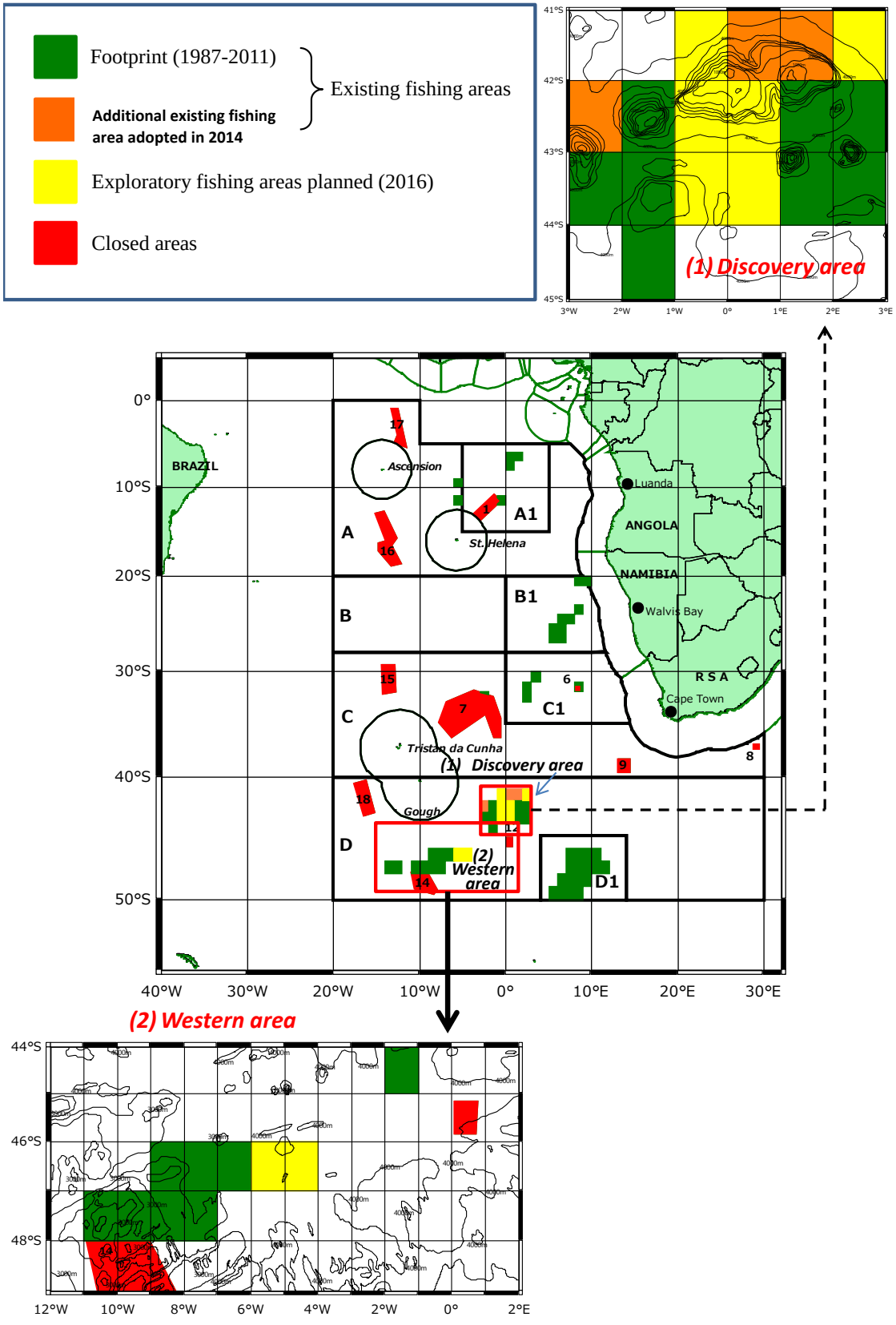
Around March/2016 – August/2016 changeable due to fishing condition/plan

(3) Areas (Box 1)

Area (1) Discovery area (six 1ºx1º areas)
(41:00-42:00°S/ 01:00°W-00:00°), (42:00-43:00°S/ 01:00°W-00:00°),
(42:00-43:00°S/ 00:00°-01:00°E), (43:00-44:00°S/ 00:00°-01:00°E),
(43:00-44:00°S/ 01:00°W-00:00°) and (41:00-42:00°S/ 02:00°-03:00°E)

Area (2) Western area (two 1ºx1º areas)
(46:00-47:00°S/ 06:00W°-05:00°W) and (46:00-47:00°S/ 05:00W°-04:00°W)

BOX 1 Exploratory fishing areas planned (2016)



(4) Exploratory Bottom Fishing Protocol

The exploratory fishing will fully comply relevant Exploratory Bottom Fishing Protocols stipulated in Article 6 (Exploratory bottom fishing) and Article 7 (Assessment Exploratory Bottom Fishing Activities) in Conservation Measure (CM) 29/14.

(5) Coverage (area to be surveyed)

The exploratory fishing will be conducted by following 2 steps, **in order to cover as many as representative areas as possible in the fisherable zone, i.e., 2,000m or shallower waters**.

Step 1

On the first entry of the research area, the first 10 hauls shall be research hauls and must satisfy following criteria.

- Each research haul must be separated by not less than 3 nautical miles (NM) from any other research haul, distance to be measured from the geographical mid-point of each research haul.
- Each haul shall comprise at least 3,500 hooks and no more than 5,000 hooks.
- Each haul shall have a soak time of not less than 6 hours, measured from the time of completion of the setting process to the beginning of the hauling process.

Step 2

On completion of 10 research hauls, the vessel will continue the exploratory fishing in order to cover as many as representative areas as possible in the fisherable zone, i.e., 2,000m or shallower waters.

(6) Observer

One observer will be assigned to collect necessary information described in this proposal, which will be reported to the SEAFO Secretariat and presented in the 2016 Scientific Committee meeting.

(7) Data collection

The observer will collect the following data while the vessel is engaged in exploratory fishing. In the exploratory fishing, more scientific information is collected than in commercial fishing in order to fulfil requirements stipulated in the Exploratory Bottom Fishing Protocol (Article 6 and 7 in CM 29/14) (Table 1).

- Patagonian tooth fish (*Dissosticus eleginoides)*
  - Total catch in weight/line
  - Length measurement / Maximum 50fish/line
  - Weight, sex, maturity, gonad state / Maximum 30fish/line

- Rattail (*Macrourid* spp.)
  - Total catch in weight/line
  - Length and weight measurement / Maximum 10pcs/line

- Other by-catch species
  - Total catch in weight/line by the lowest taxon possible

Table 1 Comparisons of data collection between exploratory fishing and commercial fishing.

Data collection				
Commercial fishng (Existing bottom fishing area)			Exploratory fishing (New bottom fishing area)	
Patagonian toothfish			Patagonian toothfish	
Type	Quatinty		Type	Quatinty
Totalcathch weight / line			Totalcathch weight / line	
Length	20 samples/line		Length	50 samples/line
Gonad stages	20 samples/line		Gonad stages	30 samples/line
Gonad weight	20 samples/line		Gonad weight	30 samples/line
Individualweight	20 samples/line		Individualweight	30 samples/line
Sex	20 samples/line		Sex	30 samples/line
Otoliths	5 samples/line		Otoliths	5 samples/line
Bycatch species			Rat tail	
Number of each speices / line			Totalcathch weight / line	
			Length	10 samples/line
			Individualweight	10 samples/line
			Bycatch species excepted Rat tail	
			Number of each speices / line	

- VME

VME data according to interim VME data collection protocol set out in Annex 4 of Conservation Measure 26/14.

(8) Mitigation plan to prevent significant adverse impact to VME species.

The exploratory fishing will fully comply the encounter protocol stipulated in Article 8 (Encounters with possible VMEs) and Annex 6 (VME Indicators and threshold levels) in CM 29/14.

The vessel has been using Trot line fishing method in the Convention area. During the exploratory fishing in new bottom fishing area, the vessel will employ the same fishing method.

Fishing gear configuration (Fig. 1)

- 201 drop lines per standard main line of 9,000m (one drop line every 45mof the main line).
- One drop line has 5 clusters with 5 snoods and hooks= 25 hooks per drop line.
- Distance between clusters is about 40cm. Snood length is about 50cm.
- Distance between the bottom clusters to concrete weight is about 1m.

Expected behaviour and feature of fishing gear

- Trot line normally sinks vertically since the weight is attached on the bottom of each drop line.
- The line is hauled vertically by using hydraulic driven line hauler.
- Only both end of anchors and concrete weights are on the seabed constantly.
- Bottom section of drop lines, hooks and snoods could be on the seabed occasionally.

Taking above into consideration, **the trot line would have much less impact against VME** in comparison with other fishing method such as Auto-line and Spanish line since the most part of main lines and snoods with hooks are constantly on the seabed with these methods.

4. Reports

The report of the Exploratory fishinge (2016) will be submiited to the Scientific Commiitte (2017) and details of the exploratory fishing activities will be presented including the sea bed maps craeted by the information collected.

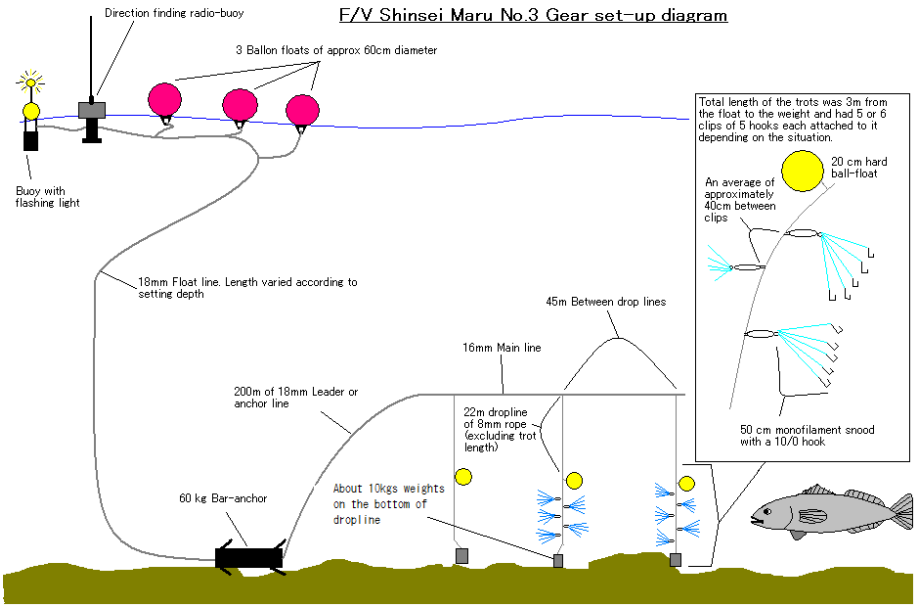


Fig.1 Fishing gear configuration (trot line)

5. Vessel Information

(1)	Name of fishing vessel	Shinsei Maru No.3
	Previous names (if known)	Same as above
	Registration number	128862
	IMO number (if issued)	8520094
	External markings	Vessel marked with name and international radio call sign.White hull and white superstructure
	Port of registry	Yaizu – Japan
(2)	Previous flag (if any)	N/A
(3)	International Radio Call Sign	JAAL
(4)	Name of vessel's owner(s)	TAIYO A&F CO.,LTD.
	Address of vessel owner(s)	4-5,TOYOMI-CHO,CHUO-KU,TOKYO,JAPAN
Beneficial owner(s) if known		Same as above
(5)	Name of licence owner	Same as the owner
Address of licence owner (operator)		
(6)	Type of vessel	Longline fishing vessel
(7)	Where was vessel built	Shimizu, Shizuoka, Japan
When was vessel built		1985
(8)	Vessel length overall LOA (m)	47.2
(9)	Details of the implementation of the tamper-proof requirements of the VMS device installed	The vessel is fitted with MAR-GE Argos VMS system. This is a sealed unit which has own GPS inside to ensure the independence from other acoustic devices and protected with official seals that indicate whether the unit has been accessed or tampered.
(10)	Name of operator	Same as the owner
Address of operator		Same as the owner
(11)	Names and nationality of master and, where relevant, of fishing master	Master: Fuminori Kojima , Japanese Fishing master : Masayuki Matsumura , Japanese
(12)	Type of fishing method(s)	Bottom longline
(13)	Vessel beam (m)	8.7
(14)	Vessel gross registered tonnage	735
(15)	Vessel communication types and numbers (INMARSAT A, B and C)	INMARSAT -FB : 773190498 INMARSAT –C : 432521000@satmailc.com
(16)	Normal crew complement	33
(17)	Power of main engine(s) (kW)	735
(18)	Carrying capacity (tonne)	250M/T
	Number of fish holds	4 holds
Capacity of all holds (m^3)		502.4 m^3
(19)	Any other information in respect of each licensed vessel they consider appropriate (e.g. ice classification) for the purposes of the implementation of the conservation measures adopted by the Commission.	N/A

APPENDIX XI– Conservation Measure XX/15 – Banning of deepwater shark fishing

Conservation Measure xx/15: On banning directed fisheries towards deep-water sharks in the SEAFO Convention Area.

The Parties to the SEAFO Convention:

RECOGNIZING the need to strengthen mechanisms to protect deep-water sharks in the South-East Atlantic Ocean;

FURTHER RECOGNISING that the Food and Agriculture Organization of the United Nations (FAO), in its International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks), requests that Contrating parties, within the framework of their respective competencies and consistent with international law, should strive to cooperate through regional fisheries management organisations with a view to ensuring the sustainability of shark stocks;

TAKING INTO ACCOUNT that most deep-water shark are long-lived, slow growing and have a low fecundity, and as such can only sustain very low levels of fishing;

ACKNOWLEDGING that to date some Contracting Parties have identified the need for, and have either completed or are near finalising their National Plan of Action on the Conservation and Management of Sharks;

Have agreed as follows:

1. Contracting Parties shall ban deep-water shark directed fisheries in the SEAFO Convention Area by fishing vessels, fishing for fisheries resources covered by the SEAFO Convention, flagged to these Contracting Parties; and

2. Each Contracting Party shall collect and provide all available information to the Secretariat on by-catch of deep-water sharks across all fishing areas, seasons, in the SEAFO CA as per observer forms.

3. Any by-catch of shark, especially juveniles and gravid females, taken accidentally in other fisheries, shall, as far as possible, be released alive.

APPENDIX XII – Conservation Measure XX/15 – Banning of gillnet fishing

Conservation Measure xx/15: On banning Deepwater gillnets[2] in the SEAFO Convention Area.

The Parties to the SEAFO Convention:

RECOGNISING that the Convention calls on the Contracting Parties, in giving effect to the objectives of the Convention, to adopt conservation measures that ensure the long-term conservation and sustainable use of the fishery resources in the Convention Area (CA), taking into account the need to conserve marine resources and to evaluate the impact of fishing on the fishery resources and on the marine environment, taking into account the environmental and oceanographic characteristics of the CA (Articles 2);

FURTHER RECOGNISING Article 7 which calls on the Contracting Parties to apply the precautionary approach, whereby the absence of adequate scientific information shall not be used as a reason for postponing or failing to take conservation measures;

NOTING the Resolution 61/105, adopted by the United Nations General Assembly (UNGA) at the 61st Plenary Meeting on 8 December 2006 and subsequent resolutions of UNGA that call on states and regional fisheries management organisations to regulate bottom fisheries and implement measures in accordance with the precautionary approach and ecosystem approaches to fisheries management;

CONCERNED by the possible impact of deepwater gillnets on fishery resources and bycatch species and deep sea habitats, including the impact of lost and/or abandoned gillnets;

Have agreed as follows:

1. Contracting Parties shall require that vessels flying their flag prohibit the use of all deepwater gillnets[1] in the Convention Area.

2. Contracting Parties whose flagged vessels seek to transit the Convention Area with deepwater gillnets onboard shall:

a. Give at least 36 hours advanced notice to the SEAFO Secretariat prior to entering the Convention Area. In particular, Contracting Parties shall report the expected entry and exit dates and length of deepwater gillnets carried onboard;

b. If deepwater gillnets are accidentally lost or fall overboard from the vessel, report the date, time, position (using WGS84) and length (metres) of gillnets lost to the Secretariat (or Acting Secretariat) as soon as possible and within 48 hours of the gear being lost.

[1] 1 'Deepwater gillnets' (trammel net, set nets, anchored nets, sink nets) are defined as strings of single, double or triple netting walls, held vertically, on or near the bottom, in which fish will gill, entangle or enmesh. Deepwater gillnets consist of single or, less commonly, double or triple netting mounted together on the same frame ropes. Several types of nets may be combined in one gear. These nets can be used either alone or, as is more usual, in large numbers placed in line ('fleets' of nets). The gear can be set, anchored to the bottom or left drifting, free or connected with the vessel.

APPENDIX XIII – SEAFO SC Rules of Procedure 2015 Amendment

RULES OF PROCEDURE FOR THE SCIENTIFIC COMMITTEE

PART I REPRESENTATION

1. Each Member of the Commission shall be represented by one representative (or an alternative representative in the case of non-availability) who may be accompanied by other experts or advisers**.** Such representatives/experts/advisers shall have appropriate qualifications or relevant experience to the work of the Scientific Committee. However, at its discretion, the Scientific Committee may restrict its deliberations to CP scientific representatives only, and such other persons that the Scientific Committee may invite.
2. Each Member of the Commission shall notify the Executive Secretary as far as possible in advance of any meeting of the name of its representative and before or at the beginning of the meeting the names of its additional experts and advisers.
3. Representatives shall have primary responsibility for liaison with the Executive Secretary between meetings.

PART II TAKING OF DECISIONS

4. The Chairperson of the Scientific Committee shall put to all Members of the Committee questions and proposals requiring decisions.
5. The Committee shall make every effort to make decisions and adopt its reports by consensus (defined as when there are no objections). If every effort to achieve consensus has failed, the report shall indicate the majority and minority views.
6. In the exercise of its functions, the Committee may, where appropriate, consult any other fisheries management, technical or scientific organization with competence in the subject matter of such consultation and may seek expert advice as required on an ad hoc basis.
7. The Committee may establish such other subsidiary bodies as it deems necessary for the exercise of its functions, including working groups for the purpose of examining technical issues relating to particular species, stocks and ecosystems
8. At a meeting of the Scientific Committee, unless it decides otherwise, the Scientific Committee shall not discuss or take a decision on any item that has not been included in the provisional agenda for the meeting in accordance with Part IV of these Rules.
9. When necessary, the taking of decisions on any proposal made during the period between meetings may be carried out by post or by other means of textual communication.
    a. The Executive Secretary shall distribute copies of the proposal to all Members.
        i. Members shall immediately acknowledge receipt of the Executive Secretary's communication and respond within 60 days of the date of acknowledgment of the proposal, indicating whether they wish to support it, reject it, abstain on it, refrain from participating in the taking of the decision, or whether they require additional time to consider it, or whether they consider that it is not necessary for the decision to be taken during the period between meetings. In the latter case the Chairperson shall direct the Executive Secretary to inform all Members accordingly and the decision shall be remitted to the next meeting.

ii. If there are no rejections and if no Member either seeks additional time or objects to the decision being taken between meetings, the Chairperson shall direct the Executive Secretary to inform all Members that the proposal has been adopted.

iii. If the responses include a rejection of the proposal, the Chairperson shall direct the Executive Secretary to inform all Members that the proposal has been rejected, and provide them with a brief description of all individual responses.

iv. If the initial responses do not include a rejection of the proposal or an objection to the decision being taken between meetings, but a Member requests additional time to consider it, a further 30 days shall be allowed. The Executive Secretary shall inform all Members of the final date by which responses must be lodged. Members who have not responded by that date shall be deemed to be in support of the proposal. After the final date, the Chairperson shall direct the Executive Secretary to proceed in accordance with subparagraphs (ii) or (iii), as the case may be.

v. The Executive Secretary shall distribute to each Member copies of all responses as they are received.

b. A proposal that has been rejected may not be reconsidered by way of postal voting until after the following meeting of the Scientific Committee, but may be considered at that meeting.

PART III CHAIRPERSON, VICE-CHAIRPERSON AND EXECUTIVE SECRETARY

10. The Chairperson shall in succession be a Member of the Scientific Committee in the order of CP names arranged alphabetically in the English language. The position of Vice-Chairperson shall be taken up by the Member of the Scientific Committee that succeeds the Member of the Scientific Committee that provides the Chairperson in the order of CP names arranged alphabetical in the English language. The Chairperson and Vice-Chairperson, each of whom shall serve for a term of three years and shall be eligible for re-election for one additional term.

11. The Chairperson and Vice-Chairperson shall not be members from the same Contracting Party.

12. A person representing a Contracting Party at the Scientific Committee as its Representative who is elected as Chairperson shall cease to act as a Representative upon assuming office and, whilst holding this office, shall not act as Representative. The Contracting Party concerned shall appoint another person to replace the one who was hitherto its Representative.

13. The Chairperson and Vice-Chairperson shall take office at the conclusion of the meeting at which they have been elected, except for the first Chairperson and Vice-Chairperson who shall take office immediately upon their election.

14. The Chairperson shall have the following powers and responsibilities:

    a. convene the regular and extraordinary meetings of the Scientific Committee;

    b. preside at each meeting of the Scientific Committee;

    c. open and close each meeting of the Scientific Committee;

    d. make rulings on points of order raised at meetings of the Scientific Committee, provided that each representative retains the right to request that any such decision be submitted to the Scientific Committee for approval;

    e. put questions and notify the Scientific Committee of the results of deliberations;

    f. approve a provisional Agenda for the meeting after consultation with representatives and the Executive Secretary;

    g. sign, on behalf of the Scientific Committee, the reports of each meeting for transmission to its Members, representatives and other interested persons as official documents of the proceedings; and

h. exercise other powers and responsibilities as provided in these Rules and make such decisions and give such directions to the Executive Secretary as will ensure that the business of the Scientific Committee is carried out effectively and in accordance with its decisions.

15. Whenever the Chairperson of the Scientific Committee is unable to act, the Vice-Chairperson shall assume the powers and responsibilities of the Chairperson. The Vice-Chairperson shall act as Chairperson until the Chairperson resumes his or her duties. Whilst acting as Chairperson, the Vice-Chairperson will not act as a Contracting Party Representative.

16. In the event of the office of Chairperson falling vacant due to resignation or permanent inability to act, the Vice-Chairperson shall act as Chairperson until the Scientific Committee's next meeting on which occasion a new Chairperson shall be elected. Until the election of a new Chairperson, the Vice-Chairperson will not act as Representative.

17. The Scientific Committee shall be assisted by the Secretariat according to such procedures and on such terms and conditions as the Commission may determine.

PART IV PREPARATION FOR MEETINGS

18. The Committee shall meet as often as is required for the efficient exercise of its functions, provided that the Committee shall, in any event, meet prior to the annual meeting of the Commission and shall report to the annual meeting the results of its deliberations.

19. The Executive Secretary shall prepare, in consultation with Chairperson of the Scientific Committee, a preliminary agenda for each meeting of the Scientific Committee and its subsidiary bodies. He or she shall transmit this preliminary agenda to all Members of the Scientific Committee not less than 65 days prior to the beginning of the meeting.

20. Members of the Scientific Committee proposing supplementary items for the preliminary agenda shall inform the Executive Secretary thereof no later than 45 days before the beginning of the meeting and accompany their proposal with an explanatory memorandum.

21. The Executive Secretary shall prepare, in consultation with the Chairperson, a provisional agenda for each meeting of the Scientific Committee. The provisional agenda shall include:

    a. all items which the Scientific Committee has previously decided to include in the provisional agenda;

    b. all items the inclusion of which is requested by any Member of the Scientific Committee;

    c. proposed dates for the next regular annual meeting following the one to which the provisional agenda relates.

22. The Executive Secretary shall transmit to all Members of the Scientific Committee, not less than one month in advance of the Scientific Committee's meeting, the provisional agenda and explanatory memoranda or reports related thereto.

23. The Executive Secretary shall:

    a. make all necessary arrangements for meetings of the Scientific Committee and its subsidiary bodies;

    b. issue invitations to all such meetings to Members of the Scientific Committee and to such states and organisations as are to be invited in accordance with Rule 33;

    c. take all the necessary steps to carry out the instructions and directions given to him by the Chairperson.

PART V CONDUCT OF BUSINESS AT MEETINGS

24. The Chairperson shall exercise his or her powers of office in accordance with customary practice. He/she shall ensure the observance of the Rules of Procedure and the maintenance of proper order. The Chairperson, in the exercise of his or her functions, shall remain under the authority of the meeting.

25. No representative may address the meeting without having previously obtained the permission of the Chairperson. The Chairperson shall call upon speakers in the order in which they signify their desire to speak. The Chairperson may call a speaker to order if his or her remarks are not relevant to the subject under discussion or comprise a repetition of points previously made.

26. The Chairperson or / and Vice-Chairperson of the Scientific Committee may attend all meetings of the Commission. They shall be entitled to present the report of the Scientific Committee to the Commission and to address the Commission with regard to it. The Commission shall take full account of the report of the Scientific Committee.

27. Proposals and amendments shall normally be submitted in writing to the Executive Secretary, who shall circulate copies to all delegations. As a general rule, no proposal shall be discussed at any meeting of the Scientific Committee unless copies have been distributed to all delegations in a reasonable time in advance. The Chairperson may, however, permit the discussion and consideration of proposals even though such proposals have not been circulated.

28. As a general rule proposals which have been rejected may not be reconsidered until the next meeting of the Scientific Committee.

29. A representative may at any time make a point of order and the point of order shall be decided immediately by the Chairperson in accordance with the Rules of Procedure. A representative may appeal against the ruling of the Chairperson. The appeal shall be put to a vote immediately and the Chairperson's ruling shall stand if upheld by a majority of the representatives present and voting. A representative making a point of order shall not speak on the substance of the matter under discussion. A point of order made during voting may concern only the conduct of the vote.

30. A representative may at any time move the suspension or the adjournment of the session. Such motions shall not be debated, but shall be put to the vote immediately. The Chairperson may limit the time to be allowed to each speaker putting such a motion.

31. A representative may at any time move the adjournment of the debate on the item under discussion. In addition to the proposer of the motion, two representatives may speak in favour of, and two against the motion, after which the motion shall be put to the vote immediately. The Chairperson may limit the time to be allowed to speakers.

32. A representative may at any time move the closure of the debate on the item under discussion. In addition to the proposer of the motion, two representatives may speak against the motion, after which the motion shall be put to the vote immediately. If the meeting is in favour of the closure, the Chairperson shall declare the closure of the debate and a decision shall be taken immediately on the item under discussion. The Chairperson may limit the time to be allowed to speakers under this rule.

33. Subject to Rule 27 the following motions shall have precedence in the following order over all other proposals or motions before the session:

    a. to suspend the session;

    b. to adjourn the session;

    c. to adjourn the debate on the item under discussion;

    d. for the closure of the debate on the item under discussion.

34. With the exception of recording devices used by the Secretariat, the use of film, video, sound and any other media devices (including written minutes) to record meeting proceedings shall be prohibited for all participants in Scientific Committee or subsidiary body meetings.

PART VI observers

35. The Scientific Committee may:

    a. extend an invitation to any signatory of the Convention to participate, in accordance with Rules 36, 37 and 38 below, as observers in meetings of the Scientific Committee;

    b. invite as appropriate, any non-Contracting Party to attend, in accordance with Rules 36, 37 and 38 below, as observers in the meetings of the Scientific Committee;

    c. invite, as appropriate, organisations referred to in Article 18(1) and (2) of the Convention to attend, in accordance with Rules 36, 37 and 38 below, as observers in the meetings of the Scientific Committee;

    d. invite, as appropriate, non-governmental organisations referred to in Article 8(8) of the Convention, to attend in accordance with Rules 36, 37 and 38 below, as observers in the meetings of the Scientific Committee unless the majority of the Contracting Parties object. Invitations to these organisations shall be issued in accordance with the procedure set forth in Rule 39 below.

36. The Executive Secretary may, when preparing with the Chairperson the preliminary agenda for a meeting of the Scientific Committee, draw to the attention of Members of the Scientific Committee his or her view that the work of the Scientific Committee would be facilitated by the attendance at its next meeting of an observer referred to in Rule 33, an invitation to which was not considered at the previous meeting. The Executive Secretary shall so inform Members of the Scientific Committee when transmitting to them the preliminary agenda under Rule 17.The Chairperson shall request the Scientific Committee to take a decision on the Executive Secretary's suggestion in accordance with Rule 7 and the Executive Secretary shall so inform Members of the Scientific Committee when transmitting to them the provisional agenda under Rule 19.

37. Observers may be present at public and private sessions of the Scientific Committee. If a Member of the Scientific Committee so requests, sessions of the Scientific Committee at which a particular agenda item is under consideration shall be restricted to its Members and Observers referred to in Rule 33(a) and Rule 33(b). With respect to any session so restricted, the Scientific Committee may also agree to invite Observers referred to in Rule 33(c).

38. The Chairperson may invite observers to address the Scientific Committee unless a Member of the Scientific Committee objects. Observers are not entitled to participate in the taking of decisions.

39. Observers may submit documents to the Secretariat for distribution to Members of the Scientific Committee as information documents. Such documents shall be relevant to matters under consideration in the Scientific Committee. Unless a Member or Members of the Scientific Committee request otherwise such documents shall be available only in the language or languages and in the quantities in which they were submitted. Such documents shall only be considered as Scientific Committee documents if so decided by the Scientific Committee.

40. Observers shall be granted timely access to documents subject to the terms of the confidentiality rules that the Scientific Committee may decide. Invitations to these organisations shall be issued in accordance with the following procedure:

a. Any non-governmental organisation concerned with the stocks found in the Convention area, which desires to participate as an observer in meetings of the Scientific Committee, shall notify an application for observer status to the Executive Secretary at least 60 days in advance of the meeting. This application must include:

b. name, address, telephone, fax number and e-mail address of the organisation and the person(s) proposed to represent the organisation;

c. address of all its national/regional offices;

d. aims and purposes of the organisation and a statement that the organisation generally supports the objectives of the Convention;

e. information on the organisation's total number of members, its decision making process and its funding;

f. a brief history of the organisation and a description of its activities;

g. representative papers and other similar resources produced by or for the organisation on the conservation, management, or science of fishery resources to which the Convention applies;

h. a history of SEAFO observer status granted/revoked, where appropriate;

i. information or input that the organisation plans to present at the meeting in question and that it would wish to be circulated by the Executive Secretary for review by Contracting Parties prior to the meeting, supplied in sufficient quantity for such distribution.

j. The Executive Secretary shall review applications received within the prescribed time and, at least 50 days before the meeting for which the application was received, shall notify the Contracting Parties of the names and qualifications of non-governmental organisations having fulfilled the requirements stipulated this Rule. Contracting Parties shall reply in writing within 20 days of the date at which the notification was sent, stating whether they approve or object to the application and giving reasons thereon. The application shall be considered accepted unless a simple majority of the Contracting Parties that replied objects. An organisation whose application has been rejected may submit a new complete application prior to any subsequent meeting of the Scientific Committee.

k. Any Contracting Party may propose, giving its reasons in writing, that the observer status granted to a non-governmental organisation be revoked. Decisions to revoke observer status shall be taken by a simple majority of the Contracting Parties present and voting. The Scientific Committee may agree that this decision becomes effective at its following meeting.

PART VII SUBSIDIARY BODIES

41. The Scientific Committee may determine the composition and terms of reference of any subsidiary body established by it and submit them to the Commission for approval. Insofar as they are applicable these Rules of Procedure shall apply to any subsidiary body of the Scientific Committee unless the Scientific Committee decides otherwise.

PART VIII LANGUAGES

42. The official and working languages of the Scientific Committee shall be English and Portuguese.

PART IX REPORTS AND NOTIFICATIONS

43. Reports of meetings of the Scientific Committee shall be prepared by the Chairperson. A draft report of such meetings shall be considered by the Scientific Committee before it is adopted at the end of the meeting. The Executive Secretary shall transmit reports of meetings of the Scientific Committee to all Members of the Scientific Committee, and to Observers that have attended the meeting, as soon as possible after the meeting.

44. At its annual meeting the Committee shall review the report text (as drafted and compiled by a designated rapporteur on an ongoing basis throughout the meeting) and sign it off at the end of the meeting as a true and accurate record. The Chairperson and Secretariat may then carry out any minor editorial and formatting revisions as necessary prior to submission to the Commission. The Executive Secretary shall transmit reports of meetings of the Scientific Committee to all Members of the Scientific Committee, and to Observers that have attended the meeting, as soon as possible after the meeting.

APPENDIX XIV – Guideline for scientific investigations in SEAFO CA

Draft proposal for scientific research in SEAFO fishing closures

O.A. Bergstad

Specification of SC task

The following text, extracted from the report of the SEAFO annual meeting 2014, including an SC recommendation and the action taken by the Commission, is the partial background for the SCs consideration of guidelines for re-opening SEAFO fishing closures:

'6.9.10. AP 23: The Scientific Committee recommended that the Commission adopts the provisional guidelines proposed for fisheries research involving sea-going activity in the SEAFO CA. The Commission may consider if there is a need for specific guidelines for fisheries research and other marine science activity in the closed areas, including what research activity is required to consider re-opening of closures.

ACTION: *The Commission adopted the Research Guidelines (Annex 8) developed by the Scientific Committee in order to facilitate data/information submission to the Commission, in addition to the existing measures contained in the SEAFO SYSTEM (Article 30). The Commission noted that these guidelines are adopted as a voluntary measure for non-members, taking into account Article 86 (f) of the United Nations Convention on the Law of the Sea. The Commission requested the Secretariat to make the guidelines available on the SEAFO website.*

The Commission noted that specific guidelines for re-opening of closed areas will be considered at the Scientific Committee in 2015.'

The statement from the Commission is made in the context of guidelines for scientific research that were proposed by the SC in 2014 and adopted by the Commission. It should also be noted that the SC encouraged the Commission to consider the need for specific guidelines for investigations in closures, and more specifically *'...what research activity is required to consider re-opening of closures'*.

The SC has thus only considered the qualitative and quantitative requirements for research activity needed to provide reliable information to assess if closures are appropriate and provide scientific advice. In addition to scientific assessments, re-opening of closures must presumably be based on wider management considerations beyond the mandate of the SC.

The above statements by the SC and Commission are made in the context of guidelines for scientific research, i.e. not exploratory fisheries (and the distinction between these different activities are made in the adopted research guidelines). Thus it must be assumed that it is expected that any guidelines that the SC develops meet standards universally expected from scientific investigations.

Background for establishing SEAFO closures and state of knowledge

The SEAFO fishing closures were established in response to a growing expectation from the international community that fisheries management organizations and states take action to protect vulnerable marine ecosystems (VMEs) against continued significant adverse impacts from fisheries deploying bottom-contact

fishing gear. The international concern was expressed most clearly in the UNGA Resolution 61/105 which strongly encouraged states and regional fisheries management organizations to protect such ecosystem. Guidelines for responding to that resolution, and others that followed, were negotiated in a consultative process amongst states and published by FAO in 2009. All RFMOs, including SEAFO, have committed to these international concerns and guidelines, and one of the responses has been to close subareas of their convention/regulatory areas to fishing practices and gears known or expected to cause significant adverse impact to VMEs.

Despite that the level of knowledge on the actual spatial distribution of VMEs was in many areas lacking or unsatisfactory, several RFMOs closed assumed representative areas likely to be inhabited by VMEs. The decisions were made on the basis of best available scientific information from the specific convention area and/or from general knowledge of the VME indicator species distribution patterns in other areas. Since scientific evidence from direct observations of VME distributions were lacking, the closing of specific areas was thus based on likelihood assessments rather than evidence of presence of VMEs in the areas closed. While it is assumed that correct decisions were made based on best available knowledge, the lack of direct mapping data also creates the uncertainty that some areas may have been closed that do not contain VMEs, and other areas that actually contain VMEs were left open to fishing.

In SEAFO the structural features exploited by fisheries are seamounts and seamount complexes, and such geomorphological features are universally recognized as areas likely to have VMEs. This is also reflected in the UNGA resolutions and the FAO Guidelines (2009). On this basis and SC advice, SEAFO from 2006 onwards closed a selection of seamounts to fishing, without in most cases more than indicative data on VME presence.

Despite that some scientific research efforts were conducted in selected subareas of the SEAFO CA in recent year, the scarcity of scientific information recognized by the SC when the closures were introduced largely persists. This situation continues to prevent the SC from making full and satisfactory assessments of the appropriateness of currently adopted fishing closures. While it is likely that most seamounts have VME indicator presence and many will have VMEs, it should also be recognized that seamounts are diverse features and that it cannot be universally assumed as a fact that all seamounts have VMEs and therefore requires protection against bottom-touching fishing gears.

In view of the shortage of data the SC encourages scientific studies of VMEs and resources in closed areas, but only research which has the potential to provide results and data of value to enhance the quality of scientific assessments and advice.
Start public version here:

Scientific evidence and requirements pertinent to evaluation of appropriateness of SEAFO fishing closures implemented to protect VMEs

Closures were introduced and placed in specific subareas of the Convention Area based on best available science and/or the best scientific judgment of the likelihood of VME occurrence in those specific areas. The guidance was the UNGA resolution 61/105 expression: ‘areas where VMEs occur or are likely to occur’.

On this background, it must be assumed that re-opening of closures can only be considered if and when there is scientifically validated evidence to conclude that VMEs do not occur in the closed area or, at least, that it is likely that such is the case. It must probably also be determined without reasonable doubt that the risk of

significant adverse impacts to VMEs is minimized, even if it is considered unlikely that such ecosystems occur in the area to be opened to fishing.

Quality of scientific research required

It follows from the above requirements that scientific research is required which determines beyond reasonable doubt either: 1) that VMEs do not occur in a closed area (or are unlikely to do so), or as a minimum 2) that VMEs that occur in the closure are unlikely to suffer significant adverse impacts from fishing should the area be re-opened.

Scientific investigations pertinent to VME evaluations therefore have to be relevant but also sufficiently rigorous to generate data of sufficiently high quality and quantity. In view of the size of the SEAFO SC and the characteristics of the geomorphological features and ecosystems actually utilized or potentially exploited by SEAFO fisheries, conducting such rigorous investigations is demanding and expensive.

Some lessons can be learned from international experience in seamount research and specifically some scientific investigations that have been made in recent years in some of the SEAFO closed areas and 'existing fishing areas'. The SC refers specifically to the Spanish-Namibian joint investigations of Valdivia and Ewing Seamounts and the 2015 RV *Dr. Fridtjof Nansen* cruise to several closures as well as Valdivia & Ewing. Data from such investigations provide fisheries-independent information on the occurrence of VME indicators and VMEs, and assists the SC in enhancing the quality of advice statement with regards to the already established fishing closures as well as VME occurrence in areas open to fisheries. Such investigations also provide significant and necessary information on what strategies, methods and technologies are required to determine with sufficient scientific rigor where VMEs occur and where they are likely not to be present.

A key experience is that it is a prerequisite that detailed bathymetry data collected by multibeam echosounders form the basis for further studies of benthic ecosystem features in seamount habitats. Maps generated by multibeam sounders were used to direct sampling by other technologies, in particular video transects up the slopes of seamounts and on the summits and summit knolls. In essence, the experience gained confirmed that satisfactory VME indicator mapping required application of video systems. In the predominantly hard-substrate seamount habitats classical samplers such as grabs and trawls only provide samples for identification. While such samplers may document presence of VME indicators, they are unlikely to provide accurate data on density and spatial distribution patterns of VME taxa needed to determine if a VME is present in the area studied.

From this experience follows that data on VME taxa generated by fishing gear alone cannot be considered more than indicative of VME presence or absence. By-catches on fishing gear are unlikely to reflect abundance in more than a very imprecise and most probably inaccurate manner. Even statistically well designed surveys with fishing gear (or other samplers not specifically designed to provide unbiased samples of VME taxa) will not provide the evidence needed to carry out the necessary assessments. The same shortcomings apply for by-catch data generated by commercial fisheries, even if analysed by scientific methods.

The SC would also remark that data generated by the current encounter provisions incorporated in SEAFO Conservation Measure 29/14 is unlikely to be appropriate for assessing the likelihood of VME presence in closures. Applying the encounter protocol as a tool for mapping of VMEs is not what the protocols were designed for. The encounter provisions, including the VME indicator taxa by-catch thresholds, are designed to be used in 'existing fishing areas' and 'new fishing areas'. And the by-catch thresholds are supposed to

serve as trigger levels for the move-on rules in the unlikely events that VMEs are encountered in areas outside closures, i.e. where such VMEs are unlikely to occur. Thus, it is not appropriate to use the same provisions in closures where per definition the likelihood of VME presence is high, hence also the risk of significant adverse impacts from fishing. Also, it may be argued that absence of encounters does not constitute sufficiently valid scientific evidence of VME absence in an area deemed likely to have VMEs. Such data at most provide indications of VME indicator occurrence and density.

Proposed guidelines and requirements

1. **Scientific research activities in SEAFO closures should adhere to the guidelines for scientific research adopted by the Commission in 2014.**
2. **In order to generate data relevant for evaluation of VME presence, samplers and technologies which generate reliable data on occurrence, density and identity of VME indicator taxa shall be adopted.** Preferred technologies include *in situ* video or photographic samplers that provide visual documentation at the relevant spatial scale of seamounts, taking account of the bathymetry, geomorphology and substrates usually inhabited by VME taxa. If such visual approaches cannot be used, samplers with a documented ability to generate valid data on occurrence, density and identity of VME taxa must be applied. Relevant documentation comprises published validation experiments and design specifications.
3. **Technologies used in conjunction with those described in Pt. 2 to obtain samples for identification and documentation of VME taxa should be designed to minimize adverse impacts to VMEs but at the same time ensure sufficient sample sizes and quality to derive reliable data.** The use of samplers such as fishing gear and other invasive sampler which tend to cover large areas and sample indiscriminantly should be avoided in favor of less invasive and more targeted samplers. If fishing gear has to be used, tow lengths or sample volumes should be minimised to a level deemed sufficient to provide necessary data.
4. **The scientific investigation must be designed in a manner so that accuracy is achieved and precision of the observations is maximized, at the relevant spatial resolution to facilitate assessment of VME presence in the closure.** Distribution and number of sampling units must be based on best available bathymetry data (preferable multibeam data), as well as best practice for statistical sampling designs and replication.
5. **Methods and sampling designs adopted must be documented, and descriptions must be sufficiently rigorous to facilitate repetition of the study by other researchers.**
6. **VME distribution data generated by habitat prediction modelling may be used to guide sampling effort, but such data alone do not constitute sufficient evidence for evaluating actual VME presence or absence and generate management advice.** Models provide valuable input in a planning phase of field investigations and field investigations provide necessary input to test and improve models, but the quality of current models is not sufficient to generate reliable stand-alone data.
7. **Reports from the field campaign(s) associated with the investigation shall be submitted to the SC for consideration, preferably in advance of the first meeting of the committee following the conclusion of the field campaign(s).** The reports shall provide, as a priority, the results most relevant for VME assessments, presented and evaluated in a manner facilitating immediate use by the SC. The

reports and a copy of whatever data are associated with it shall be deposited in the SEAFO data repository. Data for which SEAFO does not have ownership shall not be transferred to third parties, and this restriction should preferably be regulated in an agreement between SEAFO and the data owner.

8. **Open publication of the cruise reports as well as informal outreach activity and formal publication of the results from investigations in closures is strongly encouraged by SEAFO, but these activities are responsibilities of the institution(s) conducting the research.** Co-operative reporting between investigators and SEAFO is encouraged.

APPENDIX XV – Proposed editorial changes to Conservation Measure 29/14

Conservation Measure 29/14 on Bottom Fishing Activities and Vulnerable Marine Ecosystems in the SEAFO Convention Area

The Commission hereby adopts the following conservation measure pursuant to articles 6 and 7 of the Convention:

Article 1. Objective

1. The objective of this Conservation Measure is to ensure the implementation by SEAFO of effective measures to prevent significant adverse impacts of bottom fishing activities on vulnerable marine ecosystems that, based on the best available scientific information, are known or likely to occur in the Convention Area.

2. This Conservation Measure takes into account SEAFO's responsibility as a regional fisheries management organization to adopt measures with regards to bottom fishing activities in the Convention Area which contribute to fulfill the key objectives of the UN General Assembly Resolutions on the protection of vulnerable marine ecosystems.

3. For the purpose of this Conservation Measure, SEAFO will take into account the guidance provided by the FAO in the framework of the Code of Conduct for Responsible Fisheries and any other internationally agreed standards, as appropriate.

Article 2. Use of terms

For the purpose of this Conservation Measure:

(a) 'bottom fishing activities' means fishing activities where the fishing gear is likely to contact the seafloor during the normal course of fishing operations;

(b) "encounter" means a~~ny~~n incidental catch of a VME indicator species above threshold levels as set out in Annex 6. (Any encounter with a VME indicator species or merely detecting its presence is not sufficient to identify a VME. That identification should be made on a case-by-case basis through assessment by the Scientific Committee);

(c) "existing bottom fishing areas" means the portion of the Convention Area where bottom fishing ~~has historically~~ occurred in the period ~~since~~ 1987 July 2011 and any areas added subsequently as set out in Article 4;

(d) "exploratory bottom fishing" means all commercial bottom fishing activities outside area closures and existing bottom fishing areas, or fisheries within existing bottom fishing areas when a new fishing method and/or ~~strategies~~ strategy are attempted to be used;

(e) "significant adverse impact" has the same meaning and characteristics as those described in paragraphs 17-20 of the FAO International Guidelines for the Management of Deep-Sea Fisheries in the High Seas;

(f) "VME indicators" are those species and indicator units included in Annex 6; and

(g) "vulnerable marine ecosystems", hereafter VMEs, has the same meaning and characteristics as those contained in paragraph 42 with its Annex and paragraph 43 of the FAO Guidelines for the Management of Deep-Sea Fisheries in the High Seas.

Article 3. Regulation of bottom fishing activities

The Commission shall, taking account of the advice provided by the Scientific Committee, as well as data and information arising from reports pursuant to Article 8, adopt~~s~~ conservation and management measures to prevent significant adverse impacts on VMEs. Such measures may include:

(a) allowing, prohibiting or restricting bottom fishing activities;

(b) requiring specific mitigation measures for bottom fishing activities;

(c) allowing, prohibiting or restricting bottom fishing activities with certain gear types, or changes in gear design and/or deployment; and/or

(d) any other relevant requirements or restrictions to prevent significant adverse impacts on VMEs.

Article 4. Existing bottom fishing areas

Based on information concerning bottom fishing activities in the period of 1987 to July 2011, there are hereby established existing bottom fishing areas as set out in Annex 1. The Executive Secretary shall update Annex 1 following decisions by the Commission pursuant to Articles 6, paragraph 8.

Article 5. Area closures for the protection of VMEs

1. Fishing activities shall be prohibited in the areas set out and within the coordinates as defined in Annex 2.

2. Within the areas referred to in paragraph 1 Contracting Parties intending to conduct fisheries research and basic marine science activity, which shall exclude exploratory bottom

fishing pursuant to Article 6, shall notify the Executive Secretary of their intended research programmes, taking account of Article 206 of the UN Convention on the Law of the Sea, The Executive Secretary shall forward such notifications to all Contracting Parties as well as to the Scientific Committee.

3. In the case where an existing bottom fishing area square overlaps with a closed area, the existing bottom fishing area square is deemed to be closed.

Article 6. Exploratory bottom fishing

1. Prior to undertakinge exploratory bottom fishing, Contracting Parties shall gather relevant data to facilitate assessments ~~of exploratory bottom fishing~~ by the Scientific Committee. Such data should preferably include data from sea-bed mapping programmes, i.e. data from echo-sounders, if practicable multi-beam sounders, and/or other data relevant to the preliminary assessment of the risk of significant adverse impacts on VMEs.

2. The relevant Contracting Party shall forward to the Executive Secretary a Notice of Intent to undertake exploratory bottom fishing at least 60 days prior to the proposed start of the fishery. The Notice of Intent shall be accompanied by the following information:

(a) harvesting plan, which outlines target species, proposed dates and areas and the type of bottom fishing gear to be used. Area and effort restrictions shall be considered to ensure that fishing occur on a gradual basis in a limited geographical area;

(b) mitigation plan, including measures to prevent significant adverse impact to VMEs that may be encountered during the fishery;

(c) catch monitoring plan, including recording/reporting of all species caught;

(d) a sufficient system for recording/reporting of catch, detailed to conduct an assessment of activity, if required;

(e) data collection plan to facilitate the identification of VMEs in the area fished;

And make every effort to also include the following information:

(f) fine-scale data collection plan on the distribution of intended tows and sets, to the extent practicable on a tow-by-tow and set-by-set basis;

(g) plans for monitoring of bottom fishing activities using gear monitoring technology, including cameras if practicable; and

(h) monitoring data obtained pursuant to paragraph 1 of this Article .

3. The Notice of Intent along with the accompanying information shall be forwarded to the Executive Secretary. Then the Notice of Intent will be evaluated by the Scientific Committee and the Commission during their respective annual meetings. If need be, this process can be done by correspondence allowing Scientific Committee 30 days for scientific evaluation and an additional 30 days for the Commission to approve or reject the proposal.

4. Exploratory bottom fishing shall only commence after having been assessed by the Scientific Committee and approved by the Commission.

5. Preference shall be given by the relevant Contracting Party to exploratory bottom fishing using fishing gear and methods with the least bottom contact, in well-mapped areas and at times when impacts are likely to have the least adverse impacts on organisms other than the target species.

6. The relevant Contracting Party shall ensure that vessels flying their flag conducting exploratory fishing have a scientific observer on board. Observers shall collect data in accordance with a VME Data Collection Protocol set out in Annex 4.

7. The relevant Contracting Party shall provide promptly a report of the results of such activities to the Executive Secretary for circulation to all Contracting Parties. It shall ensure that the data, which derives from exploratory bottom fishing, will be made available to the Scientific Committee.

8. The Commission shall review the assessments undertaken in accordance with Article 7 and the results of the fishing protocols implemented by the participating fleets. The Commission may decide to authorise new bottom fishing activities based upon the results of exploratory bottom fishing, taking due account of the rules and procedures set out in Annex 5. Areas where such new bottom fishing activities are authorised shall be defined as "existing bottom fishing areas" pursuant to Article 4.

Article 7. Assessment of proposed exploratory bottom fishing activities

1. Each Contracting Party proposing to undertake exploratory bottom fishing shall submit to the Executive Secretary, in addition to the Notice of Intent, a preliminary assessment of the known and anticipated impacts of the proposed bottom fishing activity as described in Annex 3.

2. The Executive Secretary shall promptly forward the assessment to all Contracting Parties and the Scientific Committee. The elaboration of the assessment shall be carried out in accordance with guidance developed by the Scientific Committee, or, in the absence of such guidance, to the best of the Contracting Party's ability. The Scientific Committee shall, either at its next session or through correspondence, undertake an evaluation, in accordance with the precautionary approach, of the submitted documentation, taking account of the risks of significant adverse impact on VMEs. Such evaluation shall take place no later than 30 days following the date of submission of the Notice of Intent, including the preliminary assessment.

3. The Scientific Committee shall undertake an evaluation of the impact assessment, according to procedures and standards it develops, and provide advice to the Commission as to whether the proposed bottom fishing activity would have significant adverse impacts on VMEs and, if so, whether mitigation measures would prevent such impacts. The Scientific Committee may use in its evaluation additional information available to it, including information from other fisheries in the region or similar fisheries elsewhere. The Commission shall, within 30 days of receiving this advice, either give or withhold its approval for the proposed bottom fishing activities.

Adopted: 08 December 2014 Enter into Force: 09 February 2015

Article 8. Encounters with possible VMEs

1. Each Contracting Party shall ensure that fishing vessels flying their flag abide by the following rules, where, in the course of bottom fishing activities, evidence of VMEs is encountered:

(a) fishing vessels shall quantify catch of VME indicators;

(b) if the quantity of VME indicators caught in a fishing operation (such as trawl tow or set of a longline) is beyond the thresholds defined in Annex 6, the following shall apply:

(i) if an encounter is discovered the vessel master shall cease fishing and move away at least 2 nautical miles from the end point of the trawl tow in the direction least likely to result in further encounters, defining a buffer area with a 2 nautical mile radius;

(ii) if an encounter is discovered in connection with other bottom fishing gears the fishing vessel shall cease fishing and move away at least 1 nautical miles from the position that the evidence suggests is closest to the exact encounter location, defining a buffer area with a 1 nautical mile radius. The master shall use his or her best judgment based on all available sources of information; and

(iii) the master shall report the incident, including the ~~"track"~~track of the trawl or position determined under sub-paragraphs (i) and (ii), without delay to its flag State, which shall forward the information to the Executive Secretary immediately. Contracting Parties may if they so wish also require their vessels to report the incident directly to the Executive Secretary.

2. The Executive Secretary shall immediately inform all Contracting Parties, and archive the information received pursuant to paragraph 1, and shall, if the encounter happened outside existing fishing areas, at the same time implement a temporary closure ~~outside existing fishing areas~~. The temporary closure shall correspond to the buffer area defined pursuant to paragraph 1 (b) of this article.

3. In order to assess accurately the position and the extent of the possible VME encountered in terms of paragraph 1 of this article, sea bed mapping~~, preferably,~~ should be carried out using echo-sounders, and if practicable, multi-beam sounders. The result of any mapping shall be submitted to the Scientific Committee for its evaluation and advice. This advice shall be forwarded to the Commission and contribute to the basis for a decision by the Commission to reopen or add the temporary closure to the SEAFO fishing closures (ANNEX 2).

4. The Scientific Committee shall examine the temporary closure at its next meeting or by correspondence. If the Scientific Committee advises that the area has sufficient evidence of a VME, the Executive Secretary shall request Contracting Parties to maintain the temporary closure until such time that the Commission has acted upon the advice from the Scientific Committee. If the Scientific Committee evaluation does not conclude that the temporary closed area has sufficient evidence of a VME, the Executive Secretary shall inform Contracting Parties which may re-open the area to their fishing vessels.

Adopted: 08 December 2014 Enter into Force: 09 February 2015

Article 9. Repeals

Conservation Measures 26/13 and Conservation Measure 18/10 are herewith repealed.

Annex 1 - Existing bottom fishing areas

A. All gears

Latitude and longitude of the existing bottom fishing areas:

Division A0

Coordinate	Lat	Long
1	-11	-6
2	-11	-5
3	-12	-5
4	-12	-6

1	-9	-6
2	-9	-5
3	-10	-5
4	-10	-6

Division A1

Coordinate	Lat	Long
1	-11	-1
2	-11	0
3	-12	0
4	-12	-1
5	-11.9	-1
6	-11.58	-0.6667
7	-11.257	-1

1	-7	1
2	-8	1
3	-8	0
4	-6	0
5	-6	2
6	-7	2

Adopted: 08 December 2014 Enter into Force: 09 February 2015

Division B1

Coordinate	Lat	Long
1	-20	8
2	-20	10
3	-21	10
4	-21	8

1	-27	5
2	-25	5
3	-25	6
4	-24	6
5	-24	8
6	-23	8
7	-23	9
8	-24	9
9	-24	8
10	-25	8
11	-25	7
12	-27	7

Division C0

Coordinate	Lat	Long
1	-32	-3
2	-32	-2
3	-32.3	-2
4	-32.04	-3

Division C1

Coordinate	Lat	Long
1	-33	2
2	-31	2
3	-31	3
4	-30	3
5	-30	4
6	-31	4
7	-31	3
8	-33	3

1	-31	8
2	-31	9

3	-32	9
4	-32	8

Division D0

Coordinate	Lat	Long
1	-48	-14
2	-47	-14
3	-47	-12
4	-48	-12

1	-48	-11
2	-47	-11
3	-47	-9
4	-46	-9
5	-46	-6
6	-47	-6
7	-47	-7
8	-48	-7
9	-48	-9

1	-45	-2
2	-44	-2
3	-44	-3
4	-43	-3
5	-43	-2
6	-42	-2
7	-42	-1
8	-45	-1

1	-44	1
2	-42	1
3	-42	3
4	-44	3

Division D1

Coordinate	Lat	Long
1	-50	5
2	-49	5
3	-49	6
4	-48	6
5	-48	7
6	-46	7

7	-46	11
8	-47	11
9	-47	12
10	-48	12
11	-48	10
12	-49	10
13	-49	9
14	-50	9

B. Set longlines

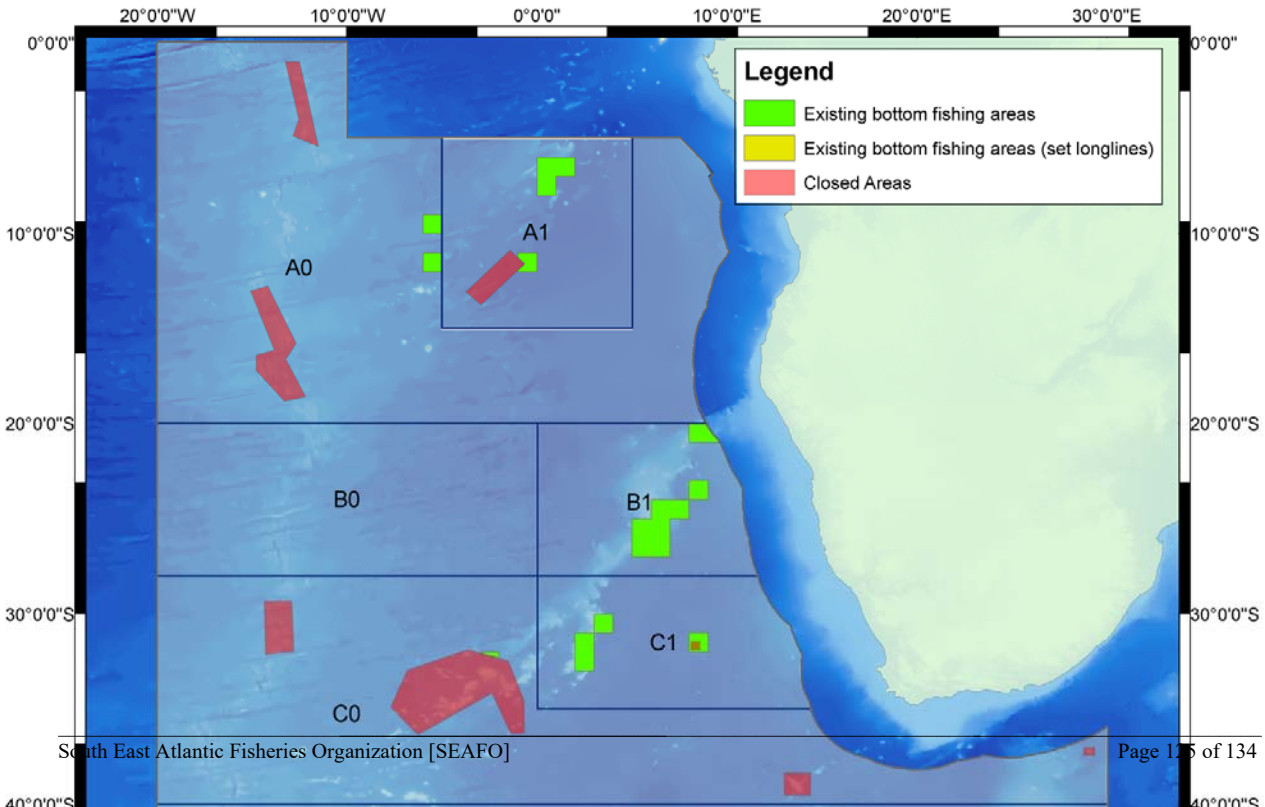
Latitude and longitude of the existing bottom fishing areas for set longlines:

Division D0

Coordinate	Lat	Long
1	-42	-3
2	-42	-2
3	-43	-2
4	-43	-3

1	-41	0
2	-41	2
3	-42	2
4	-42	0

Figure 1 – Composite map of existing bottom fishing areas



Adopted: 08 December 2014 Enter into Force: 09 February 2015

Annex 2
Closed areas and their coordinates

SUB-AREA A

- Area: (Kreps seamount), Number 16 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

- Area: (Unnamed seamount), Number 17 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

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

SUB-AREA 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 29°21'E
37°25'S 28°45'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

DIVISION C1

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

Adopted: 08 December 2014 Enter into Force: 09 February 2015

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

SUB-AREA 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.

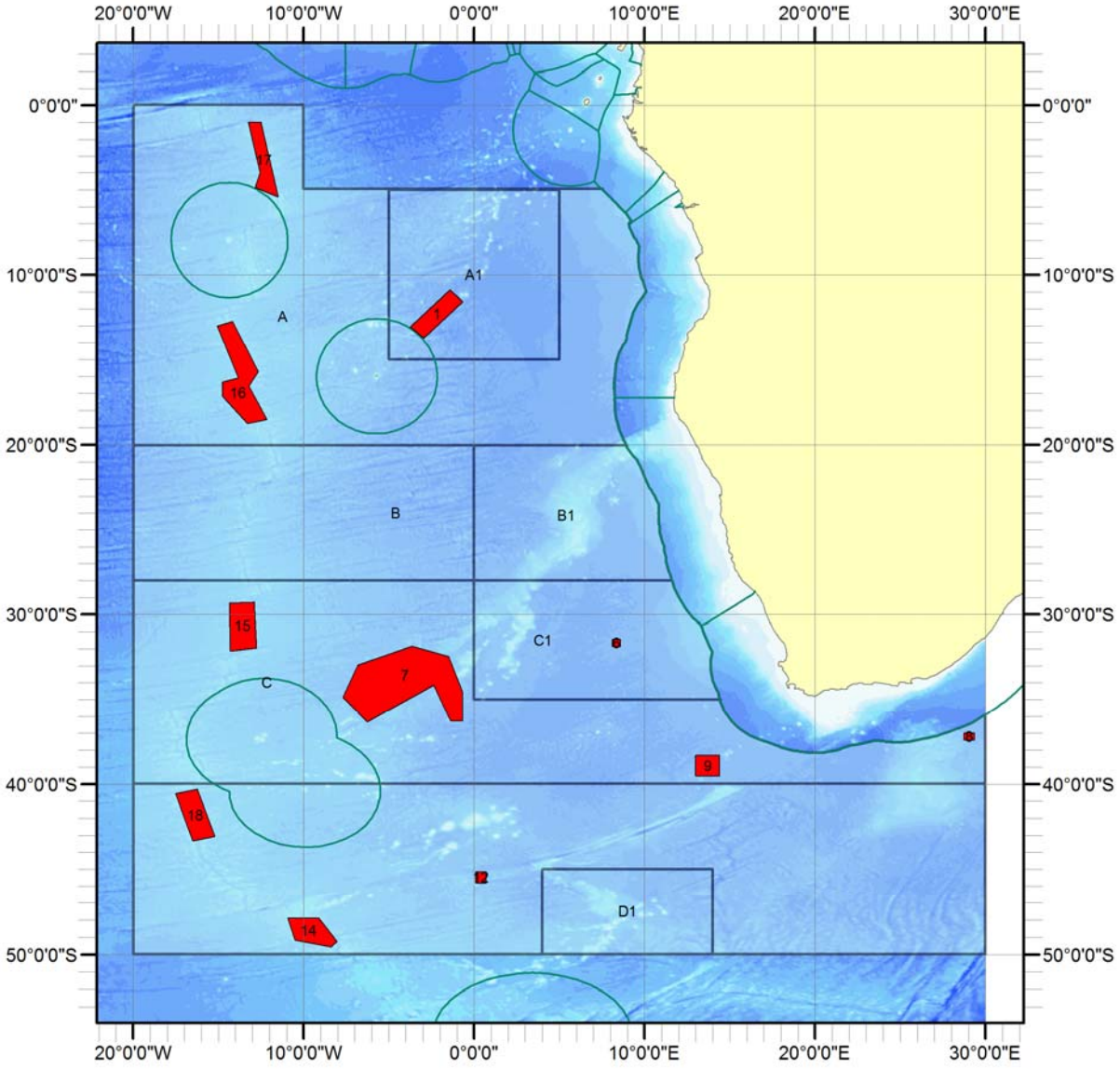
Coordinates: 47°54'S 10°57'W
47°54'S 09°07'W
49°15'S 08°03'W
49°34'S 08°24'W
49°10'S 10°31'W

- 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

Adopted: 08 December 2014 Enter into Force: 09 February 2015

Figure 2 – Area closures



Adopted: 08 December 2014 Enter into Force: 09 February 2015

Annex 3

Assessment of Exploratory Bottom Fishing Activities

Assessments should address, *inter alia*:

(a) type(s) of fishing conducted or contemplated, including vessels and gear types, fishing areas, target and potential by catch species, fishing effort levels and duration of fishing (harvesting plan);

(b) best available scientific and technical information on the current state of fishery resources and baseline information on the ecosystems, habitats and communities in the fishing area, against which future changes are to be compared;

(c) identification, description and mapping (geographical location and extent) of VMEs known or likely to occur in the fishing area;

(d) identification, description and evaluation of the occurrence, character, scale and duration of likely impacts, including cumulative impacts of the proposed fishery on VMEs in the fishing area;

(e) data and methods used to identify, describe and assess the impacts of the activity, the identification of gaps in knowledge, and an evaluation of uncertainties in the information presented in the assessment;

(f) risk assessment of likely impacts by the fishing operations to determine which impacts on VMEs are likely to be significant adverse impacts; and

(g) mitigation and management measures to be used to prevent significant adverse impacts on VMEs and the measures to be used to monitor effects of the fishing operations.

Adopted: 08 December 2014 Enter into Force: 09 February 2015

Annex 4

VME Data Collection Protocol

Observers on fishing vessels in the SEAFO Convention Area who are deployed pursuant to Article 6, paragraph 7 of this Conservation Measure shall:

1. Monitor any set for evidence of presence of VMEs and the identify coral, sponges and other organisms to the lowest level possible.

2. Record the following information for identification of VMEs: vessel name, gear type, date, position (latitude/longitude), depth, species code, trip-number, set-number, and name of the observer on datasheets.

3. Collect representative biological samples from the entire VME catch. (Biological samples shall be collected and frozen when requested by the scientific authority in a Contracting Party). For some coral species that are under the CITES list this will not be possible and for these species photographs should be taken.

4. Provide samples to the scientific authority of a Contracting Party at the end of the fishing trip.

Adopted: 08 December 2014 Enter into Force: 09 February 2015

Annex 5

Rules and procedures for opening of new fishing areas

1. It is required to have exploratory fishing data within a specified area without reaching the VME threshold to open that area for fishing:

(a) two years of data within 5 year period for an area (<2000m) adjacent to an existing fishing area;

(b) and three-years of data within 5 years for areas (<2000m) not adjacent to an existing fishing area; and

(c) ~~existing~~ archived fishing records/data collected prior to exploratory fishing that contain VME data may be counted as a first year data set.

Commen

2. All 1x1° areas within the exploratory area that contain a VME encounter should be excluded from the proposed new fishing area.

3. Exploratory data stations should be set in such a way that it covers the exploratory area representatively above the 2000m depth isobar.

Adopted: 08 December 2014 Enter into Force: 09 February 2015

Annex 6

VME indicators and threshold levels

1. Definition of encounter -

An encounter is defined to be an incidental catch, above threshold levels as set out in paragraph 2, ~~with~~ of ~~VME indicator species of~~ corals and sponges comprising taxa listed as VME indicators by the SEAFO SC. ~~other VME elements.~~ The selected indicators constitute a regionally relevant subset of VME indicator organisms exemplified in the Annex of the FAO International Guidelines for the Management of Deep-sea Fisheries in the High Seas (2009).

2. Threshold levels

An encounter with VME indicator species is defined for each of the following fishing gears as follows:

Trawl tow – more than 600 kg of live sponges and/or 60 kg of live coral in existing fishing areas and more than 400 kg of live sponges and/or 60 kg of live coral in new fishing areas.

Longline set – at least 10 VME-indicator units (1 unit = 1kg or 1 litre of live coral and/or live sponge) in one 1200m section of line or 1000 hooks, whichever is the shorter, in both existing and new fishing areas;

Pot set – at least 10 VME-indicator units (1 unit = 1kg or 1 litre of live coral and/or live sponge) in one 1200m section of line in both existing and new fishing areas.

The definition of VME indicator units for bottom longlines and pots is as follows:

The quantity of VME-indicator organisms (i.e. live corals and/or live sponges) recovered during hauling should be reported for each 1200m section of the longline or potline (in the case of longlines - or 1000 hooks whichever is the shorter) as:

(a) Volume (litre) for VME-indicator organisms which fit into 10-litre container;

(b) Weight (kg) for VME-indicator organisms which do not fit 10-litre container (e.g. branching species); and

(c) VME-indicator units which is the combined total of volume of VME-indicator organisms which fit into 10-litre and weight of VME-indicator organisms which do not fit into containers of 10-litre (i.e. unit = volume + weight).

APPENDIX XV – Proposed editorial changes to Conservation Measure 29/14

Conservation Measure 29/14 on Bottom Fishing Activities and Vulnerable Marine Ecosystems in the SEAFO Convention Area

The Commission hereby adopts the following conservation measure pursuant to articles 6 and 7 of the Convention:

Article 1. Objective

1. The objective of this Conservation Measure is to ensure the implementation by SEAFO of effective measures to prevent significant adverse impacts of bottom fishing activities on vulnerable marine ecosystems that, based on the best available scientific information, are known or likely to occur in the Convention Area.

2. This Conservation Measure takes into account SEAFO's responsibility as a regional fisheries management organization to adopt measures with regards to bottom fishing activities in the Convention Area which contribute to fulfill the key objectives of the UN General Assembly Resolutions on the protection of vulnerable marine ecosystems.

3. For the purpose of this Conservation Measure, SEAFO will take into account the guidance provided by the FAO in the framework of the Code of Conduct for Responsible Fisheries and any other internationally agreed standards, as appropriate.

Article 2. Use of terms

For the purpose of this Conservation Measure:

(a) 'bottom fishing activities' means fishing activities where the fishing gear is likely to contact the seafloor during the normal course of fishing operations;

(b) "encounter" means ~~a~~anyn incidental catch of a VME indicator species above threshold levels as set out in Annex 6. (Any encounter with a VME indicator species or merely detecting its presence is not sufficient to identify a VME. That identification should be made on a case-by-case basis through assessment by the Scientific Committee);

(c) "existing bottom fishing areas" means the portion of the Convention Area where bottom fishing ~~has historically~~ occurred in the period ~~since~~ 1987-July 2011 and any areas added subsequently as set out in Article 4;

(d) "exploratory bottom fishing" means all commercial bottom fishing activities outside area closures and existing bottom fishing areas, or fisheries within existing bottom fishing areas when a new fishing method and/or ~~strategies~~ strategy are attempted to be used;

(e) "significant adverse impact" has the same meaning and characteristics as those described in paragraphs 17-20 of the FAO International Guidelines for the Management of Deep-Sea Fisheries in the High Seas;

(f) "VME indicators" are those species and indicator units included in Annex 6; and

(g) "vulnerable marine ecosystems", hereafter VMEs, has the same meaning and characteristics as those contained in paragraph 42 with its Annex and paragraph 43 of the FAO Guidelines for the Management of Deep-Sea Fisheries in the High Seas.

Article 3. Regulation of bottom fishing activities

The Commission shall, taking account of the advice provided by the Scientific Committee, as well as data and information arising from reports pursuant to Article 8, adopt~~s~~ conservation and management measures to prevent significant adverse impacts on VMEs. Such measures may include:

(a) allowing, prohibiting or restricting bottom fishing activities;

(b) requiring specific mitigation measures for bottom fishing activities;

(c) allowing, prohibiting or restricting bottom fishing activities with certain gear types, or changes in gear design and/or deployment; and/or

(d) any other relevant requirements or restrictions to prevent significant adverse impacts on VMEs.

Article 4. Existing bottom fishing areas

Based on information concerning bottom fishing activities in the period of 1987 to July 2011, there are hereby established existing bottom fishing areas as set out in Annex 1. The Executive Secretary shall update Annex 1 following decisions by the Commission pursuant to Articles 6, paragraph 8.

Article 5. Area closures for the protection of VMEs

1. Fishing activities shall be prohibited in the areas set out and within the coordinates as defined in Annex 2.

2. Within the areas referred to in paragraph 1 Contracting Parties intending to conduct fisheries research and basic marine science activity, which shall exclude exploratory bottom fishing pursuant to Article 6, shall notify the Executive Secretary of their intended research programmes, taking account of Article 206 of the UN Convention on the Law of the Sea, The Executive Secretary shall forward such notifications to all Contracting Parties as well as to the Scientific Committee.

3. In the case where an existing bottom fishing area square overlaps with a closed area, the existing bottom fishing area square is deemed to be closed.

Article 6. Exploratory bottom fishing

1. Prior to undertakinge exploratory bottom fishing, Contracting Parties shall gather relevant data to facilitate assessments ~~of exploratory bottom fishing~~ by the Scientific Committee. Such data should preferably include data from sea-bed mapping programmes, i.e. data from echo-sounders, if practicable multi-beam sounders, and/or other data relevant to the preliminary assessment of the risk of significant adverse impacts on VMEs.

2. The relevant Contracting Party shall forward to the Executive Secretary a Notice of Intent to undertake exploratory bottom fishing at least 60 days prior to the proposed start of the fishery. The Notice of Intent shall be accompanied by the following information:

(a) harvesting plan, which outlines target species, proposed dates and areas and the type of bottom fishing gear to be used. Area and effort restrictions shall be considered to ensure that fishing occur on a gradual basis in a limited geographical area;

(b) mitigation plan, including measures to prevent significant adverse impact to VMEs that may be encountered during the fishery;

(c) catch monitoring plan, including recording/reporting of all species caught;

(d) a sufficient system for recording/reporting of catch, detailed to conduct an assessment of activity, if required;

(e) data collection plan to facilitate the identification of VMEs in the area fished;

And make every effort to also include the following information:

(f) fine-scale data collection plan on the distribution of intended tows and sets, to the extent practicable on a tow-by-tow and set-by-set basis;

(g) plans for monitoring of bottom fishing activities using gear monitoring technology, including cameras if practicable; and

(h) monitoring data obtained pursuant to paragraph 1 of this Article .

3. The Notice of Intent along with the accompanying information shall be forwarded to the Executive Secretary. Then the Notice of Intent will be evaluated by the Scientific Committee and the Commission during their respective annual meetings. If need be, this process can be done by correspondence allowing Scientific Committee 30 days for scientific evaluation and an additional 30 days for the Commission to approve or reject the proposal.

4. Exploratory bottom fishing shall only commence after having been assessed by the Scientific Committee and approved by the Commission.

5. Preference shall be given by the relevant Contracting Party to exploratory bottom fishing using fishing gear and methods with the least bottom contact, in well-mapped areas and at times when impacts are likely to have the least adverse impacts on organisms other than the target species.

6. The relevant Contracting Party shall ensure that vessels flying their flag conducting exploratory fishing have a scientific observer on board. Observers shall collect data in accordance with a VME Data Collection Protocol set out in Annex 4.

7. The relevant Contracting Party shall provide promptly a report of the results of such activities to the Executive Secretary for circulation to all Contracting Parties. It shall ensure that the data, which derives from exploratory bottom fishing, will be made available to the Scientific Committee.

8. The Commission shall review the assessments undertaken in accordance with Article 7 and the results of the fishing protocols implemented by the participating fleets. The Commission may decide to authorise new bottom fishing activities based upon the results of exploratory bottom fishing, taking due account of the rules and procedures set out in Annex 5. Areas where such new bottom fishing activities are authorised shall be defined as "existing bottom fishing areas" pursuant to Article 4.

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1. Each Contracting Party proposing to undertake exploratory bottom fishing shall submit to the Executive Secretary, in addition to the Notice of Intent, a preliminary assessment of the known and anticipated impacts of the proposed bottom fishing activity as described in Annex 3.

2. The Executive Secretary shall promptly forward the assessment to all Contracting Parties and the Scientific Committee. The elaboration of the assessment shall be carried out in accordance with guidance developed by the Scientific Committee, or, in the absence of such guidance, to the best of the Contracting Party's ability. The Scientific Committee shall, either at its next session or through correspondence, undertake an evaluation, in accordance with the precautionary approach, of the submitted documentation, taking account of the risks of significant adverse impact on VMEs. Such evaluation shall take place no later than 30 days following the date of submission of the Notice of Intent, including the preliminary assessment.

3. The Scientific Committee shall undertake an evaluation of the impact assessment, according to procedures and standards it develops, and provide advice to the Commission as to whether the proposed bottom fishing activity would have significant adverse impacts on VMEs and, if so, whether mitigation measures would prevent such impacts. The Scientific Committee may use in its evaluation additional information available to it, including information from other fisheries in the region or similar fisheries elsewhere. The Commission shall, within 30 days of receiving this advice, either give or withhold its approval for the proposed bottom fishing activities.

Article 8. Encounters with possible VMEs

1. Each Contracting Party shall ensure that fishing vessels flying their flag abide by the following rules, where, in the course of bottom fishing activities, evidence of VMEs is encountered:

(a) fishing vessels shall quantify catch of VME indicators;

(b) if the quantity of VME indicators caught in a fishing operation (such as trawl tow or set of a longline) is beyond the thresholds defined in Annex 6, the following shall apply:

(i) if an encounter is discovered the vessel master shall cease fishing and move away at least 2 nautical miles from the end point of the trawl tow in the direction least likely to result in further encounters, defining a buffer area with a 2 nautical mile radius;

(ii) if an encounter is discovered in connection with other bottom fishing gears the fishing vessel shall cease fishing and move away at least 1 nautical miles from the position that the evidence suggests is closest to the exact encounter location, defining a buffer area with a 1 nautical mile radius. The master shall use his or her best judgment based on all available sources of information; and

(iii) the master shall report the incident, including the ~~"track"~~track of the trawl or position determined under sub-paragraphs (i) and (ii), without delay to its flag State, which shall forward the information to the Executive Secretary immediately. Contracting Parties may if they so wish also require their vessels to report the incident directly to the Executive Secretary.

2. The Executive Secretary shall immediately inform all Contracting Parties, and archive the information received pursuant to paragraph 1, and shall, if the encounter happened outside existing fishing areas, at the same time implement a temporary closure ~~outside existing fishing areas~~. The temporary closure shall correspond to the buffer area defined pursuant to paragraph 1 (b) of this article.

3. In order to assess accurately the position and the extent of the possible VME encountered in terms of paragraph 1 of this article, sea bed mapping~~, preferably,~~ should be carried out using echo-sounders, and if practicable, multi-beam sounders. The result of any mapping shall be submitted to the Scientific Committee for its evaluation and advice. This advice shall be forwarded to the Commission and contribute to the basis for a decision by the Commission to reopen or add the temporary closure to the SEAFO fishing closures (ANNEX 2).

4. The Scientific Committee shall examine the temporary closure at its next meeting or by correspondence. If the Scientific Committee advises that the area has sufficient evidence of a VME, the Executive Secretary shall request Contracting Parties to maintain the temporary closure until such time that the Commission has acted upon the advice from the Scientific Committee. If the Scientific Committee evaluation does not conclude that the temporary closed area has sufficient evidence of a VME, the Executive Secretary shall inform Contracting Parties which may re-open the area to their fishing vessels.

Article 9. Repeals

Conservation Measures 26/13 and Conservation Measure 18/10 are herewith repealed.

Annex 1 - Existing bottom fishing areas

A. All gears

Latitude and longitude of the existing bottom fishing areas:

Division A0

Coordinate	Lat	Long
1	-11	-6
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3	-12	-5
4	-12	-6

1	-9	-6
2	-9	-5
3	-10	-5
4	-10	-6

Division A1

Coordinate	Lat	Long
1	-11	-1
2	-11	0
3	-12	0
4	-12	-1
5	-11.9	-1
6	-11.58	-0.6667
7	-11.257	-1

1	-7	1
2	-8	1
3	-8	0
4	-6	0
5	-6	2
6	-7	2

Division B1

Coordinate	Lat	Long
1	-20	8
2	-20	10

3	-21	10
4	-21	8

1	-27	5
2	-25	5
3	-25	6
4	-24	6
5	-24	8
6	-23	8
7	-23	9
8	-24	9
9	-24	8
10	-25	8
11	-25	7
12	-27	7

Division C0

Coordinate	Lat	Long
1	-32	-3
2	-32	-2
3	-32.3	-2
4	-32.04	-3

Division C1

Coordinate	Lat	Long
1	-33	2
2	-31	2
3	-31	3
4	-30	3
5	-30	4
6	-31	4
7	-31	3
8	-33	3

1	-31	8
2	-31	9
3	-32	9
4	-32	8

Division D0

Coordinate	Lat	Long
1	-48	-14
2	-47	-14
3	-47	-12
4	-48	-12

1	-48	-11
2	-47	-11
3	-47	-9
4	-46	-9
5	-46	-6
6	-47	-6
7	-47	-7
8	-48	-7
9	-48	-9

1	-45	-2
2	-44	-2
3	-44	-3
4	-43	-3
5	-43	-2
6	-42	-2
7	-42	-1
8	-45	-1

1	-44	1
2	-42	1
3	-42	3
4	-44	3

Division D1

Coordinate	Lat	Long
1	-50	5
2	-49	5
3	-49	6
4	-48	6
5	-48	7
6	-46	7
7	-46	11
8	-47	11
9	-47	12

10	-48	12
11	-48	10
12	-49	10
13	-49	9
14	-50	9

B. Set longlines

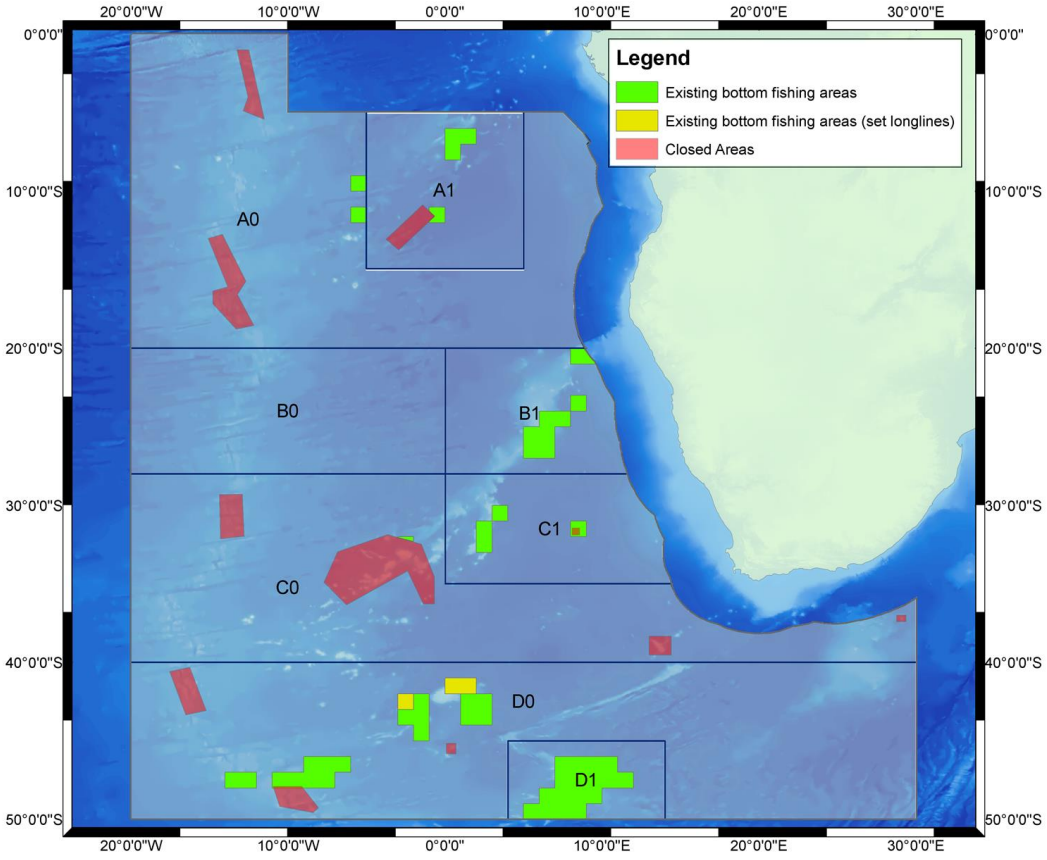
Latitude and longitude of the existing bottom fishing areas for set longlines:

Division D0

Coordinate	Lat	Long
1	-42	-3
2	-42	-2
3	-43	-2
4	-43	-3

1	-41	0
2	-41	2
3	-42	2
4	-42	0

Figure 1 – Composite map of existing bottom fishing areas



Annex 2
Closed areas and their coordinates

SUB-AREA A

- Area: (Kreps seamount), Number 16 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

- Area: (Unnamed seamount), Number 17 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

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

SUB-AREA 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 29°21'E
37°25'S 28°45'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

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

SUB-AREA 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

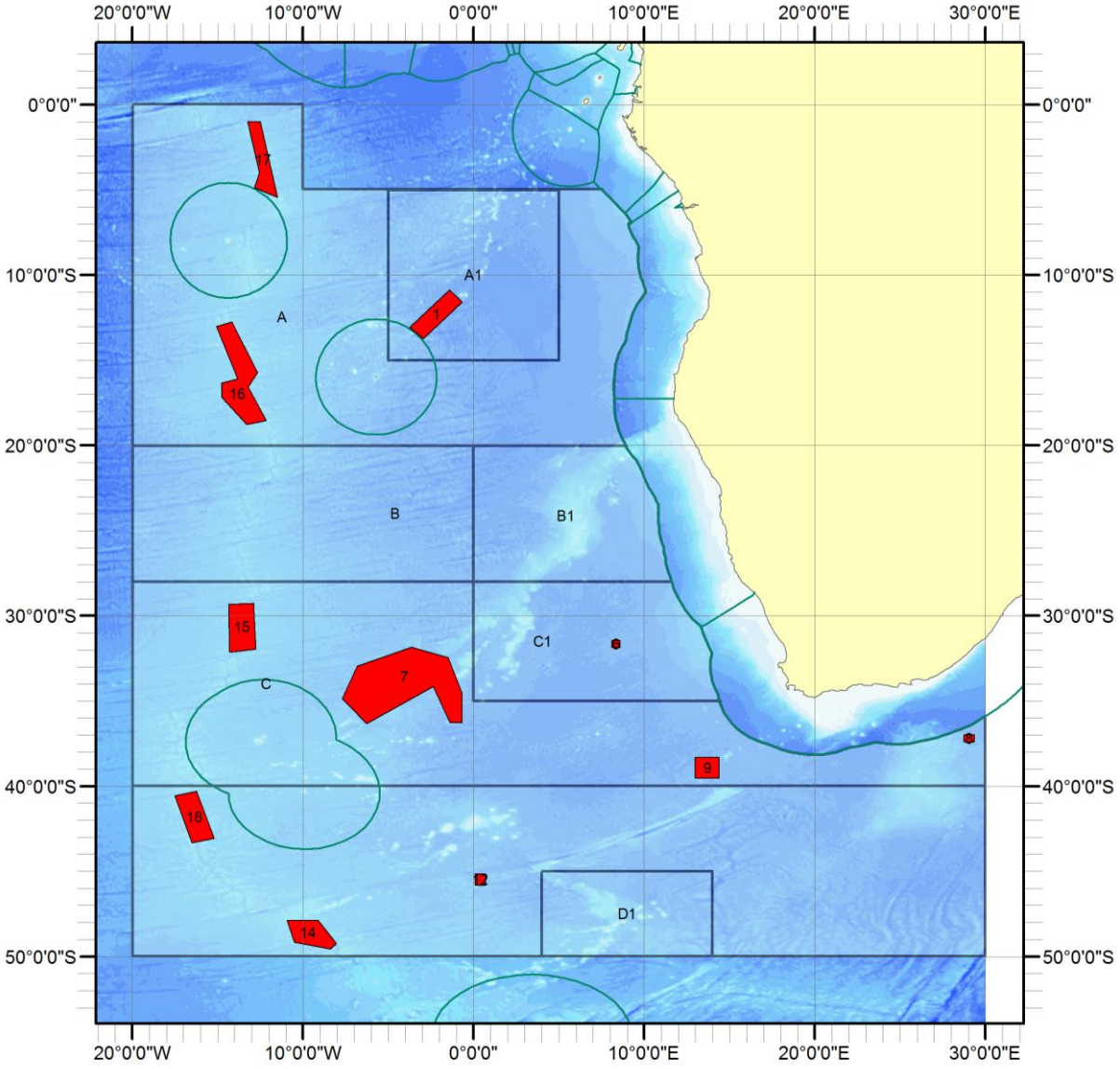
- Area: (Unnamed Seamounts), Number 14 on the attached map – considered to be unexploited.

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

Figure 2 – Area closures



Annex 3

Assessment of Exploratory Bottom Fishing Activities

Assessments should address, *inter alia*:

(a) type(s) of fishing conducted or contemplated, including vessels and gear types, fishing areas, target and potential by catch species, fishing effort levels and duration of fishing (harvesting plan);

(b) best available scientific and technical information on the current state of fishery resources and baseline information on the ecosystems, habitats and communities in the fishing area, against which future changes are to be compared;

(c) identification, description and mapping (geographical location and extent) of VMEs known or likely to occur in the fishing area;

(d) identification, description and evaluation of the occurrence, character, scale and duration of likely impacts, including cumulative impacts of the proposed fishery on VMEs in the fishing area;

(e) data and methods used to identify, describe and assess the impacts of the activity, the identification of gaps in knowledge, and an evaluation of uncertainties in the information presented in the assessment;

(f) risk assessment of likely impacts by the fishing operations to determine which impacts on VMEs are likely to be significant adverse impacts; and

(g) mitigation and management measures to be used to prevent significant adverse impacts on VMEs and the measures to be used to monitor effects of the fishing operations.

Annex 4

VME Data Collection Protocol

Observers on fishing vessels in the SEAFO Convention Area who are deployed pursuant to Article 6, paragraph 7 of this Conservation Measure shall:

1. Monitor any set for evidence of presence of VMEs and the identify coral, sponges and other organisms to the lowest level possible.

2. Record the following information for identification of VMEs: vessel name, gear type, date, position (latitude/longitude), depth, species code, trip-number, set-number, and name of the observer on datasheets.

3. Collect representative biological samples from the entire VME catch. (Biological samples shall be collected and frozen when requested by the scientific authority in a Contracting Party). For some coral species that are under the CITES list this will not be possible and for these species photographs should be taken.

4. Provide samples to the scientific authority of a Contracting Party at the end of the fishing trip.

Annex 5

Rules and procedures for opening of new fishing areas

1. It is required to have exploratory fishing data within a specified area without reaching the VME threshold to open that area for fishing:

(a) two years of data within 5 year period for an area (<2000m) adjacent to an existing fishing area;

(b) and three-years of data within 5 years for areas (<2000m) not adjacent to an existing fishing area; and

(c) ~~existing~~ archived fishing records/data collected prior to exploratory fishing that contain VME data may be counted as a first year data set.

2. All 1x1° areas within the exploratory area that contain a VME encounter should be excluded from the proposed new fishing area.

3. Exploratory data stations should be set in such a way that it covers the exploratory area representatively above the 2000m depth isobar.

Annex 6

VME indicators and threshold levels

1. Definition of encounter -

An encounter is defined to be an incidental catch, above threshold levels as set out in paragraph 2, ~~with~~ of ~~VME indicator species of~~ corals and sponges comprising taxa listed as VME indicators by the SEAFO SC. ~~other VME elements.~~ The selected indicators constitute a regionally relevant subset of VME indicator organisms exemplified in the Annex of the FAO International Guidelines for the Management of Deep-sea Fisheries in the High Seas (2009).

2. Threshold levels

An encounter with VME indicator species is defined for each of the following fishing gears as follows:

Trawl tow – more than 600 kg of live sponges and/or 60 kg of live coral in existing fishing areas and more than 400 kg of live sponges and/or 60 kg of live coral in new fishing areas.

Longline set – at least 10 VME-indicator units (1 unit = 1kg or 1 litre of live coral and/or live sponge) in one 1200m section of line or 1000 hooks, whichever is the shorter, in both existing and new fishing areas;

Pot set – at least 10 VME-indicator units (1 unit = 1kg or 1 litre of live coral and/or live sponge) in one 1200m section of line in both existing and new fishing areas.

The definition of VME indicator units for bottom longlines and pots is as follows:

The quantity of VME-indicator organisms (i.e. live corals and/or live sponges) recovered during hauling should be reported for each 1200m section of the longline or potline (in the case of longlines - or 1000 hooks whichever is the shorter) as:

(a) Volume (litre) for VME-indicator organisms which fit into 10-litre container;

(b) Weight (kg) for VME-indicator organisms which do not fit 10-litre container (e.g. branching species); and

(c) VME-indicator units which is the combined total of volume of VME-indicator organisms which fit into 10-litre and weight of VME-indicator organisms which do not fit into containers of 10-litre (i.e. unit = volume + weight).
