

First Meeting of the Southern Indian Ocean Fisheries Agreement (SIOFA)  
Scientific Committee Protected Areas and Ecosystems Working Group (PAEWG)  
18–19 March 2019, Yokohama, Japan

REPORT  
of the  
Protected Areas and Ecosystems Working Group

Light version without annex E to K

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## Agenda item 1 – Opening

### Agenda item 1.1 Opening statement from the Chair

1. The first meeting of the SIOFA SC Protected Areas and Ecosystems (PAEWG1) was opened by Mr Patrice Pruvost, Chairperson of the PAEWG at 10:00 am on 18 March 2019.
2. The Chair welcomed participants from Contracting Parties, SIOFA Observers and External experts.
3. The Japanese delegation was thanked for hosting this meeting and for all the efforts invested into assuring delegates had all the information and guidance necessary to ensure all participants found their way safely to the venue.
4. Gratitude was also expressed to the FAO ABNJ Deep Seas Project for organising the VME workshop and for financing the venue costs and the participation of several invited VME experts.

### Agenda item 1.2 Introduction of participants

5. Participants introduced themselves and noted their affiliations. A list of participants in attendance is included at **Annex A**.

## Agenda item 2 – Administrative arrangements

### Agenda item 2.1 Adoption of the agenda

6. The agenda (Rev 2) was adopted (**Annex B**).

### Agenda item 2.2 Confirmation of meeting documents

7. The meeting documents were confirmed with some necessary adjustments associating some papers with the most relevant agenda items as at **Annex C** (List of meeting documents) and **Annex D** (Table of agenda items and related papers).

### Agenda item 2.3 Appointment of rapporteurs

8. SIOFA Executive Secretary Mr Jon Lansley was appointed as meeting rapporteur, with agreed assistance from participants.

### Agenda item 2.4 Review of terms of reference

9. No comments on the PAEWG ToR.

## Agenda item 3 – FAO sponsored workshop on Vulnerable Marine Ecosystems (VME)

### Background and introduction

10. Mr Anthony Thompson (FAO Consultant) gave an introductory presentation (**Annex E**) of the international instruments and supporting tools that inform and guide States and R(F)MOs in developing measures to achieve sustainable deep-sea fisheries and the protection of VMEs. It was emphasised that the FAO International Guidelines for the management of deep-sea fisheries in the high seas (FAO DSF

Guidelines) has been used extensively to guide this work. The FAO VME DataBase provides easy access to measures that have been taken globally. The presentation concluded with six slides detailing the SIOFA bottom fisheries impact assessments and that these provide important information that will assist SIOFA in further developing their measures.

11. The SIODFA delegation raised several issues in relation to the issue of 'vulnerable marine ecosystems' (**Annex D**).
12. It was noted that the presentations of the invited experts and subsequent discussion would address questions raised.

### Agenda item 3.1 Mapping VMEs

13. This session was introduced by Anthony Thompson (FAO Consultant) with a presentation of slides 6-8 of **Annex E**. Guidance on the mapping of VMEs is given in the FAO DSF Guidelines paragraph 21ii and supported by other paragraphs. The VME DataBase provides a map of the measures associated with the protection of VMEs, including closed areas, the bottom fishing footprints, and other with other access regulations. It was noted that SIOFA SC were requested to map VMEs in the southern Indian Ocean by 2017 (CMM 2018/01). SC in 2018 reported to MoP5 that it was unable to complete this task, and that the work is ongoing and would be assisted by information from observers, a benthic data collection framework and a benthos database.
14. Dr Ashley Rowden (FAO Invited Expert) provided a presentation on mapping VMEs as at **Annex G** summarised as follows. To avoid significant adverse impacts to vulnerable marine ecosystems (VMEs), the FAO guidelines for deep-sea fisheries (FAO, 2009) stipulate that it is necessary to "identify areas where VMEs are known or likely to occur". To map VMEs, the guidelines indicate that RFMOs should use data from stock assessment surveys, independent surveys, fisheries bycatch, as well as use methods to infer the distribution of VMEs where such data are lacking. The FAO guidelines do not provide any methodological detail on how to map VMEs.
15. The presentation by Ashley Rowden provided examples from NAFO and SPRFMO of how to map VMEs. In data-rich areas of NAFO, biomass data from trawl bycatch and stock assessment surveys was used in a Kernel Density approach to map the locations of sites of significant concentrations of VME indicator taxa (sponges, corals, seapens) (Kenchington et al. 2015). In the data-limited area of SPRFMO, habitat suitability models (also known as species distribution models) were used to make predictive maps of 10 VME indicator taxa. Multiple model types were used in this approach and combined to produce an Ensemble model prediction map, and the uncertainty of the model predictions was also mapped (Georgian et al. 2019).
16. The presentation also highlighted mapping issues, and recent methodological developments in mapping VMEs to address these issues which aim to assist in the design of spatial management measures to protect VMEs from SAIs. These included methods to determine an understanding of connectivity amount mapped VMEs (Kenchington et al. 2019), and predictive maps of VMEs based on the identification of VMEs according to ecologically/functional-defined thresholds of the abundance/concentration of VME indicator taxa (e.g., Rowden et al., 2017, Rowden et al. in prep).
17. It was further recommended that future mapping of VMEs should include attempts to: improve the mismatch between scale of environmental predictors and biological records/response variables; incorporate uncertainty in environmental predictor variables in habitat suitability models; model and map recovery potential of VMEs;

and predict and map the effect of future climate change on the habitat suitability for VMEs.

18. The PAEWG thanked NIWA for their presentation on modelling approaches for mapping VME habitat suitability and agreed that such methods should be explored in SIOFA.
19. **RECOMMENDATION:** Despite a probable paucity of data, the PAEWG recommends that attempts are made to model habitat suitability to investigate their use in providing maps of VME habitat.
20. **NOTE:** The PAEWG noted that a VME indicator taxa list could be used in conjunction with information on physico-chemical and geological features (such as vents and cold water seeps) to inform protection of potential VMEs in SIOFA.
21. **NOTE:** In relation to the definition of VMEs, the PAEWG discussed that paragraph 3a of the bottom fishing measure defines VMEs in accordance with paragraph 42 of the deep sea fishing guidelines. However, it was noted that these criteria were inadequate to inform the requirement to map VMEs and that this task required the formulation of a SIOFA-specific list of VME indicator taxa.
22. SIOFA Data Manager gave a short presentation (**Annex G**) recapping references to VMEs in SIOFA CMM 2018/01 Interim Management of Bottom Fishing and SIOFA CMM 2018/02 Data Standards. With reference to CMM 2018.02 Annex B – observer data, it was noted that providing an option for estimating VME taxa quantity as either weight (kg) or volume (m<sup>3</sup>) may lead to incompatibility of data sets. Following brief discussion it was recommended for estimating VME Taxa quantity to consider recording by weight only and provide guidance to observer how to convert volume to weight (kg). It was suggested that CCAMLR practice may provide guidance.
23. **RECOMMENDATION:** For estimating VME Taxa quantity to consider recording by weight only and provide guidance to observer how to convert volume to weight (kg).

### Agenda item 3.2 VME indicator taxa

24. This session was introduced by Anthony Thompson (FAO Consultant) with a presentation of slides 9 - 13 of **Annex E**. Guidance on the use of VME indicators and thresholds is given in the FAO DSF Guidelines paragraph 38 and supported by other paragraphs. R(F)MOs have selected indicator taxa that meet their adopted VME criteria (typically referring to the characteristics provided in para 42 of the FAO DSF Guidelines. Most R(F)MOs have identification guides that assist vessel masters and observers in the recording of catches of VME Indicators. Catches above a threshold value indicate that the vessel may be fishing in an area containing a VME. Encounter threshold values are typically based on an analysis of historical catch data and are sufficiently high to indicate the presence of a possible VME. Actual selected thresholds vary among regions, though typical ranges for trawl catches are 30-60 kg for corals, 50-600 kg for sponges, and 1-7 kg for sea pens. Thresholds for other groups exist in some regions. Some members of SIOFA have existing thresholds applied to their vessels fishing in the Southern Indian Ocean.
25. Dr. Ellen Kenchington (FAO Invited Expert) provided a presentation on VME Indicators outlining the various indicators used by different RFMOs (**Annex H**). At the family level and higher, there are many consistencies across RFMOs among the VME indicator taxa. It was suggested that these could be used as a proxy in the absence of more detailed information at that level of taxonomic resolution as it is likely that the species are present in the SIOFA area. She also included VME elements which are geomorphologic features that have been shown to host VMEs. Those were seamounts, knolls, hydrothermal vents, cold seeps, canyons, steep

flanks (slopes) and carbonate mounds amongst others. Some of these are directly mentioned in UNGA resolutions or the FAO guidelines. It was noted that many RFMOs have closed areas over such features without the need to collect further data. Seamount closures were amongst the first to be implemented by the RFMOs. Where some of these features extend over large geographic distances, such as the mid-Atlantic ridge or seamounts in the SEAFO area, RFMOs have selected areas in different parts of the spatial extent to ensure regional representation of the fauna. It was further noted that in many RFMOs (e.g., NAFO, NEAFC) annual updates on VMEs are made by their scientific working groups and that there is a complete re-examination of the information every 5 years ahead of UNGA reporting. This means that there is opportunity to add new information as it becomes available and to make changes as warranted. Review of the FAO VME database illustrates how RFMOs have implemented closures incrementally over the last decade.

26. Discussion followed and the group suggested that SC4 consider as a first step to apply the VME indicators used by CCAMLR as they share a common border and make note of indicator taxa that are not likely to occur outside of the Antarctic waters.
27. Mr Alexis Martin (FR 0.T.) presented the CCAMLR VME Taxa Classification Guide 2009 (<https://www.ccamlr.org/en/system/files/VME-guide.pdf>) and GBIF VME Taxa list. The CCAMLR list is considered relevant to SIOFA with the exception of one taxon (*Adamussium colbecki*).
28. In relation to the requirement to formulate a list of VME indicator taxa for SIOFA, the PAEWG agreed to use the CCAMLR list as the foundation for this list. This list was considered in the context of SIOFA and was checked against the VME indicator taxa present in the GBIF database.
29. **RECOMMENDATION:** The WG agreed to propose that SC4 consider adopting a VME Indicator taxa list adapted from the CCAMLR VME Taxa Classification guide 2009 comprising the following taxa;
  - Chemosynthetic organisms (CXV), no taxa specified
  - Cnidaria (CNI) including: Gorgonacea (GGW) (Order), Anthoathecatae (AZN) (Order), Stylasteridae (AXT) (Family), Scleractinia (CSS) (Order), Antipatharia (AQZ) (Order), Zoantharia (ZOT) (Order), Actinaria (ATX) (Order), Alcyonacea (AJZ) (Order), Pennatulacea (NTW) (Order)
  - Porifera (PFR) including Hexactinellida (HXY) (Class), Demospongiae (DMO) (Class)
  - Chordata (CZR) including Ascidiacea (SSX) (Class)
  - Bryozoans (BZN) (Phylum)
  - Brachiopoda (BRQ) (Phylum)
  - Hemichordata (HET) including Pterobranchia (Class)
  - Annelida (NHE) including Serpulidae (SZS) (Family)
  - Xenophyophora (XEF) (Phylum)
  - Arthropoda (AXX) including Bathylasmatidae (BWY) (Family)
  - Echinodermata (ECH) including Stalked crinoid (CWD) (Order), Euryalida (OEQ) (Order), Cidaroida (CVD) (Order)
30. **NOTE:** That the criteria used to define VMEs can be applied on a case by case basis according to regional circumstances.

31. **RECOMMENDATION:** SIOFA SC should review the locations of hydrothermal vents, seamounts and other VME elements and identify areas where VMEs are "likely to occur".
32. **NOTE:** The PAEWG discussed that the setting of thresholds needs to be commensurate with the intended management response and as such, recommendation of thresholds was not entirely a scientific question.
33. **RECOMMENDATION:** In relation to the requirement to advise on thresholds for VME indicator taxa interactions, which could be used to inform the management response if triggered, the PAEWG advised that the thresholds (**Annex I**) for longline gears used by CCAMLR would be an appropriate consistent threshold for SIOFA longline gear. However, the PAEWG noted that CCAMLR has 100% observer coverage for longline gears and requests that the SC consider whether this threshold is suitable for adoption for longline gears in SIOFA.
34. Consensus could not be reached on thresholds for trawl gears. It was decided that this matter could be further discussed at SC4 and/or interested parties could work intersessionally to identify suitable threshold.

### Agenda item 3.3 Encounter protocols

35. Anthony Thompson (FAO Consultant) provided guidance on encounter protocols as given in the FAO DSF Guidelines paragraph 67, 70 and 71 and supported by other paragraphs, that requires appropriate protocols for how vessels respond to encounters with VME indicator taxa. Typically this involves a move-on rule, reporting requirements, and temporary closures as appropriate. Other conservation and management measures can include gear modifications and operational procedures designed to reduce the risks of impacts. Further information on encounter protocols and impact assessments can be found in a recent FAO workshop (<http://www.fao.org/3/a-i6452e.pdf>). SIOFA (CMM 2018/01 paragraphs 6, 12) has already adopted an interim set of encounter protocols upon which advice is being sought from the SC.
36. FAO Invited Expert Dr Keith Reid (CCAMLR) provided a presentation on mapping CCAMLR VME Encounter Protocols as at **Annex J**.
37. Dr Keith Reid described the encounter protocols used by CCAMLR to identify VMEs based on research surveys and fishing data that reflect the difference in the type of data available from those different sources. VMEs identified from research data are published on CCAMLR's VME registry. When the quantity of VME indicator units from demersal longline fisheries exceed a defined trigger level the vessel is required to report this to the CCAMLR Secretariat and a VME Risk Area is declared. This VME Risk Area is closed to fishing until a review is undertaken to determine appropriate management action. The VME Risk Area would not be closed for research surveys as such research may provide an important element of the review process.
38. Dr Reid clarified that all vessels operating in fisheries to which CCAMLR's VME measures apply are required to carry independent scientific observers who also collect data on the occurrence of VME indicator taxa. The data collected requirements for the flag State and for the Observers are independent but complementary and anecdotal reports indicate that the positive relationship between the crew and the observers enhances the overall provision of data on the occurrence of VME indicator taxa.

39. In their absence, the Chairperson briefly introduced 'PAEWG-01-16-VME measures' submitted by the EU. It was noted that SIOFA could consider other measures adopted by other RFMOs.

#### Agenda item 3.4 Protected area protocols

40. Dr Thompson presented slides 17-20 of **Annex E** providing guidance on protected area protocols that help to identify areas as VMEs are given in the FAO DSF Guidelines paragraph 14-19, 42, Annex 1, and other supporting paragraphs. VMEs are typically benthic communities comprised of structure-forming sessile organisms that provide ecosystem services and are vulnerable to significant adverse impacts fishing gears that contact the sea floor. The FAO DSF Guidelines list five characteristics that VMEs possess that may be applied individuals or collectively. SIOFA have a set of criteria (SIOFA Interim standard protocol for future protected areas designation (MoP5 Annex K and SC3 Annex H)) and MoP5 have asked SC to clarify the application and use of these criteria.
41. Martin Cryer (FAO Invited Expert, New Zealand) presented a summary (**Annex K**) of the procedures and protocols used by a range of RFMO/As to determine when an area should be closed to fishing to avoid significant adverse impacts on VMEs. Almost all such protocols were reactive, being designed to respond to VME encounters by fishing vessels (bycatch of VME indicator species specified in the RFMO/As respective protocols). Most were defined in published management measures. Less common among these protocols was specific guidance on how an RFMO/A would designate a closed area designed to avoid significant adverse impacts on VMEs based on other types of information such as research surveys, predictive models (including habitat suitability models), or anecdotal information. Aspects of these decision-making processes are set out in the Bottom Fishery Impact Assessments required by SPRFMO and SIOFA and in NPFC's science-based standards and criteria for identification of VMEs and assessment of significant adverse impacts, and other RFMO/As have made such decisions. However, no comprehensive protocols covering all decision-making approaches to designating protected areas were available.
42. Mr Alexis Martin (FR 0.T.) presented paper PAEWG-01-13-Methodological approach to complement Siofa area-2.
43. SIODFA noted that aimed trawling can be used as a precise method of sampling bottom fauna, subject to its selectivity characteristics. If fishing, commercial or otherwise, were to be permitted as a means of scientific sampling then aimed-trawling could be a candidate method. However, the strong preference of SIODFA was that no fishing be permitted in SIOFA Protected Areas.
44. Mr Alexis Martin (FR 0.T.) presented paper PAEWG-01-12 Spatial and biophysical analysis of the SIOFA area as a background to complement the Benthic Protected Areas Designation Protocol. This was considered very good work and although good progress achieved it was felt additional work was required.
45. **RECOMMENDATION:** The WG agreed to propose that SC4 consider that the approach be further developed intersessionally within the PAEWG.
46. Mr Alexis Martin (FR 0.T.) presented paper PAEWG-01-14-Management\_Plan\_Framework-4. Framework supported in principle but needs further discussion in other WGs and SC to consider how management plans relate to this framework.



### Agenda item 3.5 Selection of protected areas

47. Anthony Thompson (FAO Consultant) presented slides 21-22 of **Annex E**. The actual selection of protected areas is undertaken at the regional level by the R(F)MO management body (MoP for SIOFA) based on advice provided by the scientific committee and its working groups (SC and PAEWG for SIOFA). SIOFA adopted five areas in the Southern Indian Ocean for the protection of benthic ecosystems based mainly on their bioregional and biodiversity representation value.
48. Ashley Rowden and Martin Cryer (FAO Invited Experts, New Zealand) presented a summary of the process used by New Zealand and Australia to develop a spatial management regime for SPRFMO bottom fisheries (**Annex L**). The spatial decision-support tool Zonation was used to integrate spatial layers representing the predicted distribution of key VME indicator taxa (habitat suitability models), the estimated “naturalness” of benthic communities, and the value of given locations to the fishing industry. Using these input layers, Zonation generates a new spatial layer of priority for protection from fishing impacts; this layer can be used as a starting point to design spatial closures. Use of the spatial decision-support tool provided a focus for engagement with stakeholders and made explicit the trade-offs between protection of VMEs and access to space for the fishery. The new spatial management regime introduced by SPRFMO in 2019 increased the protection of VME taxa from 65% to almost 85% of their predicted distribution while providing slightly better access to valuable fishing grounds. However, the process is resource-intensive and requires substantial time and engagement with stakeholders to develop understanding and trust.

### Agenda item 4 – Implementation of CMM 2018/01 on Interim of Bottom Fishing Annex 2 – Interim Protected Areas

49. Mr Lee Georgeson (AUS) gave background to the following five research and management plans: PAEWG-01-07-MOW-research-management-plan; PAEWG-01-08-WALTERS-SHOAL-research-management-plan; PAEWG-01-09-ATLANTIS-research-management-plan; PAEWG-01-10-CORAL-research-management-plan; and PAEWG-01-11-FOOLS-FLAT-research-management-plan. Explanation was provided regarding what he has done for each research and management plan which included improved objectives and the inclusion of references to management measures with SIOFA CMMs.
50. **RECOMMENDATION:** SC to support the proposed research and management plans and the PAEWG requests the SC to consider whether research monitoring is needed in these areas, and if so, how this monitoring could be undertaken.
51. **RECOMMENDATION:** SC to clarify the SC3 advice to MoP5 on the fishing impacts on the protected areas, in relation to MoP5’s decision on non-trawl gears.

### Agenda item 5 – Advice to the Scientific Committee

52. Provided within the text above

**Agenda item 6 – Future meeting arrangements**

53. To be discussed at SC4 following review of the SC Work Plan and work allocated to the PAEWG.

**Agenda item 7 – Other business**

54. No other business

**Agenda item 8 – Adoption of the meeting report**

55. This report was adopted at 20:11 on 19 March 2019.

**Agenda item 9 – Close of the meeting**

56. This meeting was closed at 20:12 on 19 March 2019.

## Annex A List of Participants

Delegation	Title	Name	Function	ContactEmail
Chair	Mr	Patrice Pruvost	PAEWG1 Chair	pruvost@mnhn.fr
<b>SIOFA Contracting Parties</b>				
Australia	Mr	Lee Georgeson	Head of Delegation	lee.georgeson@agriculture.gov.au
Cook Is.	Ms	Chloe-Ane Wragg	Head of Delegation	c.wragg@mmr.gov.ck
Cook Is.	Mr	Tim Costelloe	Adviser	t.costelloe@mmr.gov.ck
France O.T.	Mr	Alexis Martin	Alternate	alexis.martin@mnhn.fr
France O.T.	Mr	Marc Eleaume	Expert	marc.eleaume@mnhn.fr
Japan	Dr	Tsutomu Nishida	Head of Delegation	aco20320@par.odn.ne.jp
Japan	Dr	Takehiro Okuda	Alternate	okudy@affrc.go.jp
Korea	Mr	Taebin Jung	Advisor	tbjung@swfishery.com
Korea	Mr	Hyunjoong Choi	Advisor	hjchoi@swfishery.com
Korea	Mr	Kunwoong Ji	Advisor	kunwoong.ji@insungnet.co.kr
Thailand	Mr	Aekkarat Wongkeaw	FAO Invited VME Expert	aekfish@hotmail.com
Thailand	Mr	Pavarot Noranarttragoon	FAO Invited VME Expert	pavarotn@gmail.com
<b>Observers</b>				
DSCC	Ms	Lyn Goldsworthy	Representative	lyn.goldsworthy@ozemail.com.au
FAO	Ms	Jessica Fuller	ABNJ Project Assistant	jessica.fuller@fao.org
FAO	Dr	Anthony Thompson	ABNJ Project Consultant	anthony.thompson@fao.org
FAO	Dr	Ashley Rowden	Invited VME Expert	a.rowden@niwa.co.nz
FAO	Dr	Ellen Kenchington	Invited VME Expert	Ellen.Kenchington@dfo-mpo.gc.ca
FAO	Dr	Martin Cryer	Invited VME Expert	martin.cryer@mpi.govt.nz
FAO/CCAMLR	Dr	Keith Reid	VME Expert (remote)	keith.reid@ccamlr.org
SIOFDA	Dr	Ross Shotton	Head of Delegation	r_shotton@hotmail.com
SIOFDA	Mr	Charles Heaphy	Alternate	charles.heaphy@sealord.co.nz
FAO		Naoko Takemoto	FAO liaison officer	naoko.takemoto@fao.org
<b>SIOFA Secretariat</b>				
SIOFA	Dr	Ilona Stobutzki	SC Chair	ilona.stobutzki@agriculture.gov.au
SIOFA	Mr	Jon Lansley	Executive Secretary	jon@siofa.org
SIOFA	Mr	Pierre Périès	Data Manager	pierre@siofa.org
<b>Assistants</b>				
Japan	Ms	Kanna Young	Assistant	
Japan	Ms	Narumi Saito	Assistant	

# Agenda

## First Meeting of the Protected Areas and Ecosystems Working Group (PAEWG1)

18-19 March 2019

National Research Institute of Fisheries Science, Yokohama,

Japan

Chair: Dr Patrice Pruvost

*Registration will be open from 09:30 on the 18<sup>th</sup> March and the meeting will run 10:00 to 18:00 each day*

**NOTE:** Following this meeting the following two SIOFA SC meetings will convene;

- First Meeting of the Stock and Ecological Risk Assessment Working Group (SERAWG1), 20-22 March
- Fourth Meeting of the Southern Indian Ocean Fisheries Agreement (SIOFA) Scientific Committee, 25-29 March

1. Opening
  - 1.2 Opening statement from the Chair
  - 1.2 Introduction of participants
2. Administrative arrangements
  - 2.1 Adoption of the Agenda
  - 2.2 Confirmation of meeting documents
  - 2.3 Appointment of rapporteurs
  - 2.4 Review of functions and terms of reference
3. FAO sponsored workshop on Vulnerable Marine Ecosystems (VME)
 

FAO has been invited by the SIOFA Secretariat to present information to the PAEWG on comparisons of processes adopted in other regions by RFMOs. A separate agenda for this workshop is provided at Annex I
4. Implementation of CMM 2018/01 on Interim Management of Bottom, Fishing Annex 2 – Interim Protected Areas
5. Advice to the Scientific Committee

6. Future meeting arrangements
7. Other business
8. Adoption of the meeting report
9. Close of meeting

## Annex C List of documents

Document Reference N°	Document	Relevant agenda items
SC-04-01	Meeting notice – available on SC3 page of website	
PAEWG-01-01 Rev2	Provisional agenda for the SIOFA Scientific Committee meeting	2.1
PAEWG-01-02	Provisional agenda for Heads of Delegation meeting - tbc	
PAEWG-01-03	List of Meeting Documents	2.2
PAEWG-01-04	Table of agenda items and related papers	2.2
PAEWG-01-05	PAEWG1 Terms of Reference	
PAEWG-01-06	PAEWG1 List of Participants	
PAEWG-01-07	Proposal for a Research and Management Plan for the 'Middle of What' protected area	4
PAEWG-01-08	Proposal for a Research and Management Plan for the 'Walters Shoal' protected area	4
PAEWG-01-09	Proposal for a Research and Management Plan for the 'Atlantis' protected area	4
PAEWG-01-10	Proposal for a Research and Management Plan for the 'CORAL' protected area	4
PAEWG-01-11	Proposal for a Research and Management Plan for the 'FOOLS FLAT' protected area	4
PAEWG-01-12	Spatial and biophysical analysis of the SIOFA area as a background to complement the Benthic Protected Areas Designation Protocol	3.3
PAEWG-01-13	A proposal of methodological approach to complement the SIOFA's Benthic Protected Areas Designation Protocol	3.4
PAEWG-01-14	A proposal of framework to design research and management plans for SIOFA's areas	3.3
PAEWG-01-15	CCAMLR's Vulnerable Marine Ecosystems bioindicator taxa: a relevant tool for benthic ecoregionalisation	3.2
PAEWG-01-16	Summary of VME related management measures adopted by adjacent Regional Management Bodies in the context of SIOFA	3
PAEWG-INFO-01	Expert review of SIODFA proposed Benthic Protected Areas	4
PAEWG-INFO-02	Laying the Foundations for Management of a Seamount Beyond National Jurisdiction	4
PAEWG-INFO-03	Approaches for Assessment and Management of DSF and Ecosystems in RFMOs and RFBs	3.4

### Annex D Table of agenda items and related papers

Agenda Item	Related Papers
10. Opening 1.1 Opening statement from the Chair 1.2 Introduction of participants	<i>No papers provided for this item.</i>
11. Administrative Arrangements 2.1 Adoption of the agenda 2.2 Confirmation of meeting documents 2.3 Appointment of rapporteurs 2.4 Review of functions and terms of reference	PAEWG-01-01 Provisional Agenda Rev2  PAEWG-01-03 List of meeting Documents  PAEWG-01-04 Table of agenda items and related papers  PAEWG-01-05 PAEWG ToR  PAEWG-01-06 PAEWG List of participants
12. FAO sponsored workshop on Vulnerable Marine Ecosystems 3.1 Mapping VMEs  3.2 VME indicator taxa  3.3 Encounter protocols  3.4 Protected area protocols          3.5 Selection of protected areas	PAEWG-01-15 CCAMLR's Vulnerable Marine Ecosystems bioindicator taxa: a relevant tool for benthic ecoregionalisation  PAEWG-01-16 Summary of VME related management measures adopted by adjacent Regional Management Bodies in the context of SIOFA  PAEWG-01-14 A proposal of framework to design research and management plans for SIOFA's areas  PAEWG-01-13 A proposal of methodological approach to complement the SIOFA's Benthic Protected Areas Designation Protocol  PAEWG-01-12 Spatial and biophysical analysis of the SIOFA area as a background to complement the Benthic Protected Areas Designation Protocol
13. Implementation of CMM 2018/01 on Interim Management of Bottom Fishing Annex 2 – Interim Protected Areas	PAEWG-01-07 Proposal for a Research and Management Plan for the 'Middle of What' protected area

	<p>PAEWG-01-08 Proposal for a Research and Management Plan for the 'Walters Shoal' protected area</p> <p>PAEWG-01-09 Proposal for a Research and Management Plan for the 'Atlantis' protected area</p> <p>PAEWG-01-10 Proposal for a Research and Management Plan for the 'CORAL' protected area</p> <p>PAEWG-01-11 Proposal for a Research and Management Plan for the 'FOOLS FLAT' protected area</p> <p>PAEWG-INFO-01 Expert review of SIODFA proposed Benthic Protected Areas</p> <p>PAEWG-INFO-02 Laying the Foundations for Management of a Seamount Beyond National Jurisdiction</p>
14. Advice to the Scientific Committee	<i>To date no papers provided for this item</i>
15. Future meeting arrangements	<i>To date no papers provided for this item</i>
16. Other business	<i>To date no papers provided for this item</i>
17. Adoption of the meeting report	<i>To date no papers provided for this item</i>
18. Close of meeting	<i>To date no papers provided for this item</i>



**Annex D SIODFA Statement****SIODFA STATEMENT**

The SIODFA delegation raised several issues in relation to the issue of 'vulnerable marine ecosystems'. It was questioned what it was that was vulnerable: the community, the population or the ecosystem. In the case of the 'ecosystem' there was no clarity to what exactly was the harm the ecosystem was exposed to. This was particularly the case given that the deepwater fishery had been estimated to traverse around 2% of the fishable area. It was noted that this would not render a benthic ecosystem great harm and scarcely render it vulnerable. Concern was expressed about the use of vague poorly defined terms in what should be a scientific context. For example, frequent reference was made to 'likely' events, though logic indicated that this could only mean the probability of uncertain events must be  $> 0.5$ . Another vague term often used was that of 'likelihood' though this term had a different specific statistical/mathematical meaning. Use of terms that had one context in a scientific context had a different interpretation in non-scientific contexts, such as meetings of the parties.

It was pointed out again that the fishery for deepwater species was conducted on well-defined fishing tow lines. Any fragile benthic fauna on these lines had probably been long removed and if the fishery was to continue to be sustained there could and would be no recovery of the benthos on the tow lines. In this context it was stressed that any fishery would affect the marine ecosystem of which it was part, whether it be by removal of target species biomass, probably a major effect on the marine ecosystem, or by impact upon benthic sedentary animals.

It was pointed out in this regard that fisheries, as with any food production in society, affected the marine environment.

It was noted that trawls provided a poor method of indicating the presence (or absence) of fragile sedentary benthos and that the amounts of bycatch that occurred would likely follow some form of stochastic process given the unpredictable way in which a trawl footrope was in contact with the bottom as it traversed the seafloor and the stochastic nature of the distribution of benthic sedentary animals. It was noted that only two cases of bycatches in excess of threshold values had apparently occurred in fisheries prosecuted by SIODFA vessels during the recent period of the fishery – following entry into force of the agreement.

In one case it was known that unusual currents had moved the trawl of a well-established tow line. In the second case, what was deemed to be a vulnerable marine ecosystem, and thus required to vessel to move off the fish because of the move-on rule, was in fact either a large rock or inorganic material that did not appear to be living. This trivial number of threshold events provided a relevant context to the day's discussions.

It was SIODFA's view that when such thresholds of benthic bycatch were exceeded, the appropriate response would be to undertake a second tow to gain specific insight into the nature of the benthos at that point and so demonstrate if indeed the threshold catch was a random incident, which may always happen or if it did in fact demonstrate the presence of high densities of fragile benthos.

It was pointed out that fish too are constituents of the marine ecosystems and that the removals of large amounts of species biomass would have ecosystem effects that may be considerably in excess of that resulting from the impact of benthos taken as bycatch from trawl tow lines. It seemed to SIODFA that there was a considerable asymmetry in the concern directed to that of fragile benthos, relative to non-sedentary species comprising relevant adjacent ecosystems.