

Vulnerable Marine Ecosystems

-

Global overview to Indian Ocean

by

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International instruments

1982

United Nations Convention on the Law of the Sea	
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SECTION 2. LIMITS OF THE TERRITORIAL SEA	

1995

UNITED NATIONS	A
	General Assembly
	Distr. GENERAL
	A/CONF.164/37 8 September 1995
	ORIGINAL: ENGLISH
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UNITED NATIONS CONFERENCE ON STRADDLING FISH STOCKS AND HIGHLY MIGRATORY FISH STOCKS Sixth session New York, 24 July-4 August 1995	

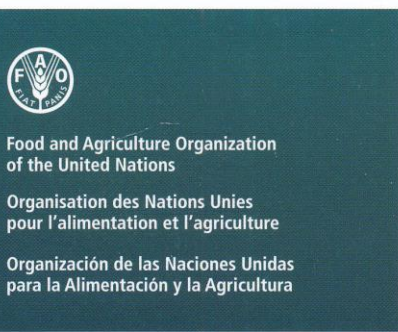
2006

Resolution adopted by the General Assembly

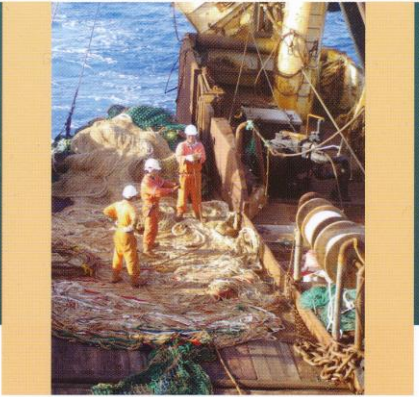
[without reference to a Main Committee (A/61/L.38 and Add.1)]

61/105. Sustainable fisheries, including through the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, and related instruments

Supporting tools



Food and Agriculture Organization of the United Nations
Organisation des Nations Unies pour l'alimentation et l'agriculture
Organización de las Naciones Unidas para la Alimentación y la Agricultura

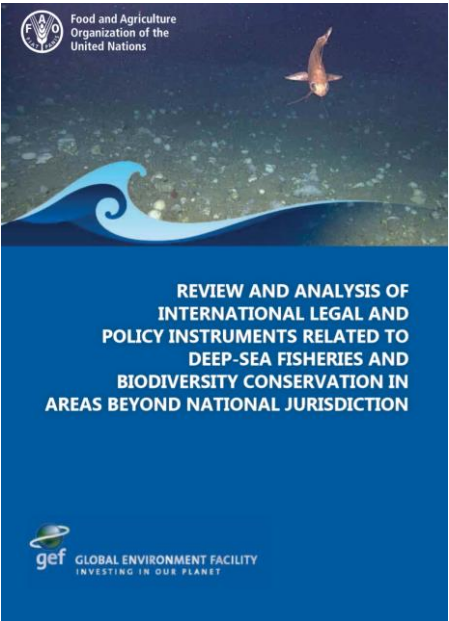


INTERNATIONAL GUIDELINES FOR THE MANAGEMENT OF DEEP-SEA FISHERIES IN THE HIGH SEAS

DIRECTIVES INTERNATIONALES SUR LA GESTION DE LA PÊCHE PROFONDE EN HAUTE MER

DIRECTRICES INTERNACIONALES PARA LA ORDENACIÓN DE LAS PESQUERÍAS DE AGUAS PROFUNDAS EN ALTA MAR

<http://www.fao.org/3/i0816t/i0816t00.htm>

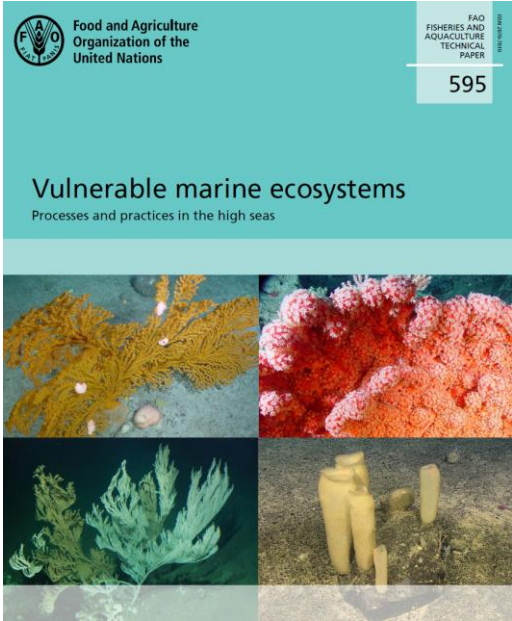


Food and Agriculture Organization of the United Nations

REVIEW AND ANALYSIS OF INTERNATIONAL LEGAL AND POLICY INSTRUMENTS RELATED TO DEEP-SEA FISHERIES AND BIODIVERSITY CONSERVATION IN AREAS BEYOND NATIONAL JURISDICTION

gef GLOBAL ENVIRONMENT FACILITY INVESTING IN OUR PLANET

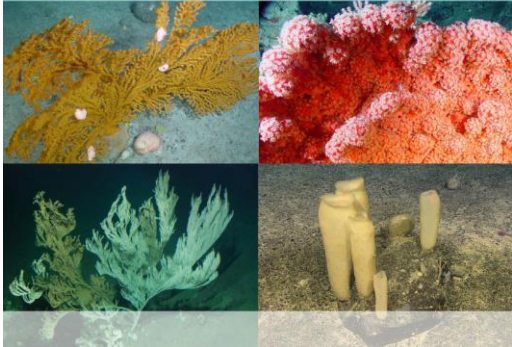
<http://www.fao.org/3/a-i7009e.pdf>



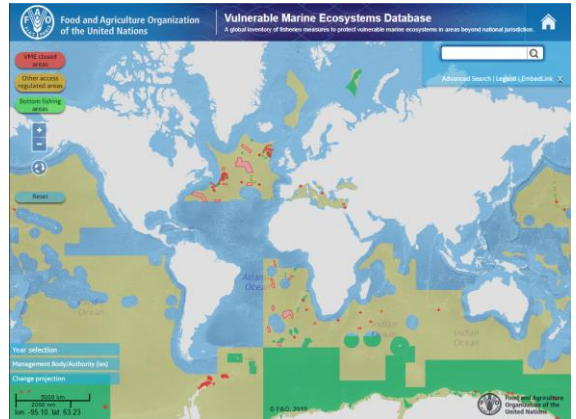
Food and Agriculture Organization of the United Nations

FAO FISHERIES AND AQUACULTURE TECHNICAL PAPER 595

Vulnerable marine ecosystems
Processes and practices in the high seas

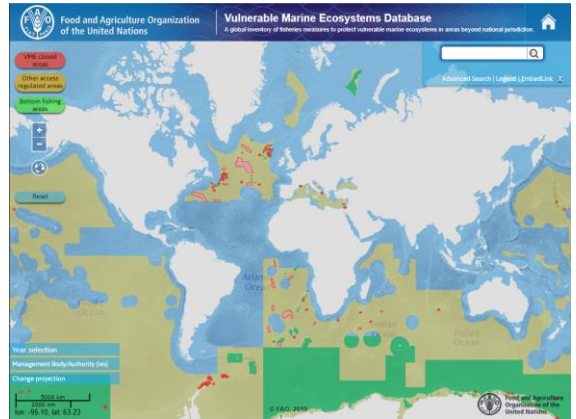


<http://www.fao.org/3/a-i5952e.pdf>



Food and Agriculture Organization of the United Nations

Vulnerable Marine Ecosystems Database
A global inventory of fisheries resources to protect vulnerable marine ecosystems in areas beyond national jurisdiction.



<http://www.fao.org/in-action/vulnerable-marine-ecosystems/vme-database/en/vme.html>

Outline of presentation - by agenda item

11:35 – 12:05	Coffee
12:05 – 13:00	1 - Mapping VMEs
13:00 - 14:00	Lunch
14:00 – 14:25	1 - Mapping VMEs continued
14:25 – 15:45	2 - VME indicator taxa (+ thresholds)
15:45 – 16:15	Coffee
16:15 – 17:35	3 - Encounter protocols
17:35 – 18:00	4 - Protected area protocols
Day 2	
10:00 – 10:55	4 - Protected area protocols continued
10:55 – 11:30	5 - Selection of protected areas
11:30 – 12:00	Coffee
12:00 – 12:45	5 - Selection of protected areas continued
12:45 – 13:00	Further discussion and drafting recommendations
13:00 – 14:00	Lunch
14:00 – 14:45	Further discussion and drafting recommendations

How do these topics relate to the FAO DSF Guidelines?

What did the SIOFA 5th Meeting of the Parties (MoP5) say?

SIOFA Bottom fisheries impact assessments (BFIA)



There are 6 slides at the end of the presentation that I do not plan to present.

They can be presented on demand should it be necessary

Australia BFIA

High levels (generally 28 kg of coral and sponges)

Impact on VME is considered low, on detection of abundance of VME, a temporary closure of a 2 km radius

Operational measures to evaluate sector impacts for key operations report the following operational factors to mitigate the impacts of fishing on VME: **Abundance-based closures**. The operational control by **depth and location** is implemented by **angling** and **trawling** vessels.

Norfolk (sponges), Subantarctic (fish coral), Kerguelen (sponges), Phoenix (hydrozoa), Tokelau (sponges)

National Research Institute of Fisheries Science, Tokushima, Japan | SIOFA PAEWG1 | 18-19 March 2019

Cook Islands BFIA

Small area, actually closed

Impact on VME is considered low, on detection of abundance of VME, a temporary closure of a 2 km radius

Operational measures to evaluate sector impacts for key operations report the following operational factors to mitigate the impacts of fishing on VME: **Abundance-based closures**. The operational control by **depth and location** is implemented by **angling** and **trawling** vessels.

National Research Institute of Fisheries Science, Tokushima, Japan | SIOFA PAEWG1 | 18-19 March 2019

EU BFIA

Impact on VME is considered low. This potentially impacted Sponges, Coral, Echinoderms

Impacts on potential vulnerable marine ecosystems (VME) to the fisheries have been reduced through decisions of using the longline method instead of bottom trawling and to move away from deep areas to favor of integrated weighted longlines.

National Research Institute of Fisheries Science, Tokushima, Japan | SIOFA PAEWG1 | 18-19 March 2019

French Territories BFIA

Only one VME indicator taxa caught (Demersals in 2017)

Impact assessment percentage of fished areas

Year	2014	2015	2016	2017	2018
Impact assessment percentage of fished areas	100%	100%	100%	100%	100%

VME reporting system
Data acquisition protocol (same as CCAWLR)
Conservation rules (same as CCAWLR QVM 22-06 and 22-07)
Reporting above 5 units
Closure above 10 units
No bottom fishing <500 m

National Research Institute of Fisheries Science, Tokushima, Japan | SIOFA PAEWG1 | 18-19 March 2019

Japan BFIA - longlines

There is no information collected by Japanese longline fishery on evaluating actual impacts on vulnerable ecosystems including VME.

By catch of coral was observed in 10 boats during 2-year night observations, but there is no by-catch of sponges. The catch by each single trap was 600-1000 kg.

No VME by-catch

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Thailand BFIA

Restrictions

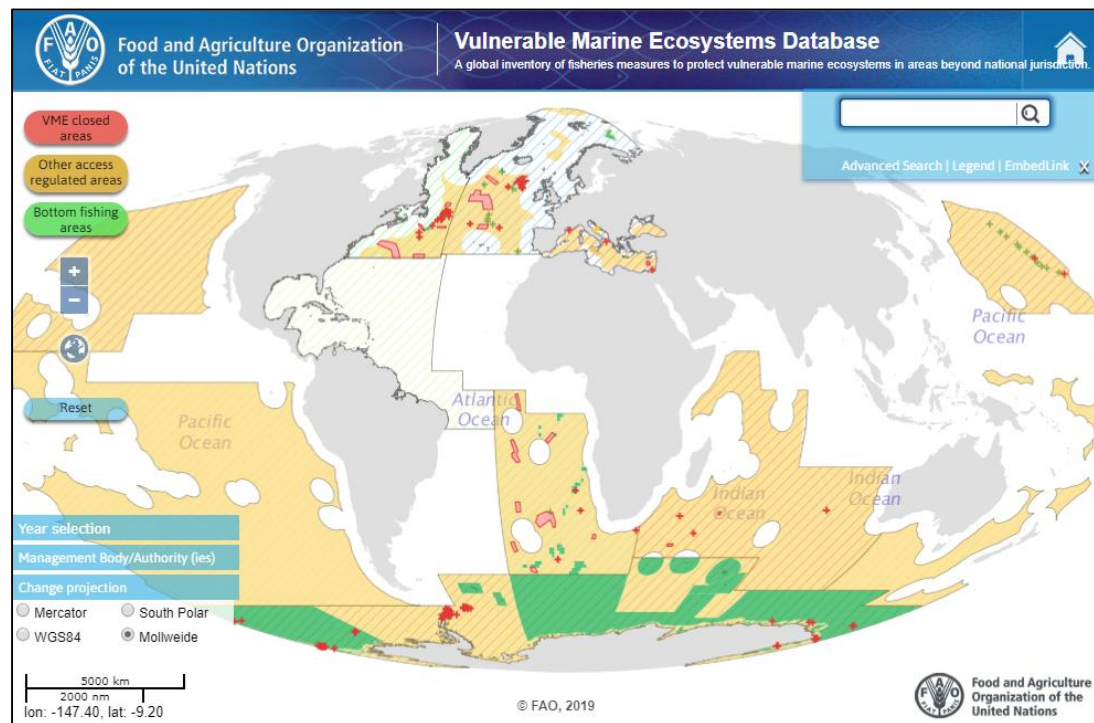
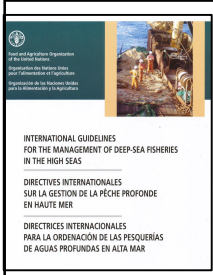
- Restricted to footprint
- Thailand prohibits 1/3 vessels to fish in BFIA
- VME threshold: coral 60 kg and sponges 600 kg (trawler)
- 20 kg per 1000 hooks or 1200 rs
- 20 kg per trap
- Reporting, on-board and on-land fishing

High sea of Saya de Malha Bank, June 2016 to February 2017

National Research Institute of Fisheries Science, Tokushima, Japan | SIOFA PAEWG1 | 18-19 March 2019

Mapping VMEs

DSF Guidelines Para 21ii: identify areas or features where VMEs are known or likely to occur, and the location of fisheries in relation to these areas and features;



Map shows mapped VMEs in red

Mapping VMEs



SC3 reporting to MoP5

Annex J

3. Vulnerable marine ecosystems - Mapping

CMM 2017/01, para 5b tasked the SC to develop maps of where VMEs are known to occur, or likely to occur, by SC 2017

- Mapping VMEs requires a common definition of VMEs. Other RFMOs and CCAMLR have developed definitions
- In absence of SIOFA definition of VME concept:
 - **Agreed** a common definition of VMEs is required
 - **Agreed** a common data collection protocol should be adopted by CPs. Benthos data collection framework presented by France (Territories) could be a source to build this
 - **Noted** data sharing could be done through the Protected Areas and Ecosystems WG (PAEWG) and a common database

Mapping VMEs



MoP5

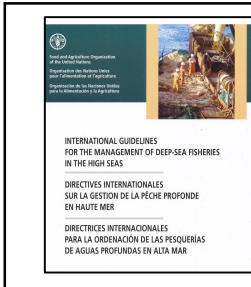
MoP5 (para 32)

- SC not able to map VMEs at its 3rd meeting (2018)
- SC asked to map VMEs by 2017 (CMM 2018/01 paragraph 5b)

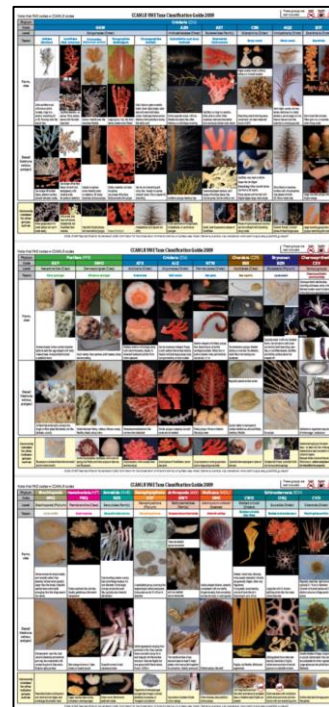
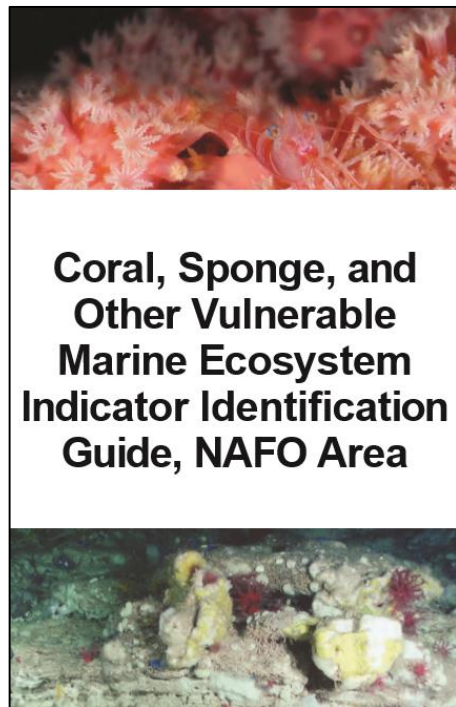
assisted by

- Observer coverage (CMM 2018/01 paragraph 31, 33)
- Benthos data collection framework (e.g. France (Territories) for Southern Ocean)
- Benthos database and data sharing

VME Indicator taxa (+ thresholds)



DSF Guidelines Para 38. States and RFMO/As should specify, obtain and apply the information required for adaptive management to prevent significant adverse impacts on VMEs, including the use of indicators and benchmarks, where appropriate.



Recommendation 19 2014: Protection of VMEs in NEAFC Regulatory Areas as Amended by Recommendation 09-2015

Annex 5

VME INDICATOR SPECIES

The following is a list of seven habitat types as well as physical elements for the NEAFC Regulatory Area, with the taxa most likely to be found in these habitats, which shall be considered as VME indicators.

VME Habitat type	Representative Taxa
1. Cold-water coral reef	
a. <i>Lophelia pertusa</i> reef	<i>Lophelia pertusa</i>
b. <i>Solenastrea variabilis</i> reef	<i>Solenastrea variabilis</i>
2. Coral garden	
a. Hard bottom garden	
i. Hard bottom gorgonian and black coral gardens	<i>Anthothelidae</i> <i>Chrysogorgiidae</i> <i>Isididae</i> , <i>Keratosisdinae</i> <i>Plexauridae</i> <i>Acanthogorgiidae</i> <i>Coralillidae</i> <i>Paragorgiidae</i> <i>Primnoidae</i> <i>Schizopathidae</i>
ii. Colonial scleractinians on rocky outcrops	<i>Lophelia pertusa</i> <i>Solenastrea variabilis</i>
iii. Non-reefal scleractinian aggregations	<i>Enallopsammia rostrata</i> <i>Madrepora oculata</i>
b. Soft-bottom coral gardens	
i. Soft-bottom gorgonian and black coral gardens	<i>Chrysogorgiidae</i>
ii. Cup-coral fields	<i>Caryophyllitidae</i> <i>Flabellidae</i> <i>Nephtheidae</i>
iii. Cauliflower coral fields	
3. Deep-sea sponge aggregations	
a. Other sponge aggregations	<i>Geodidae</i> <i>Ancorinidae</i> <i>Pachastrellidae</i>
b. Hard-bottom sponge gardens	<i>Actinellidae</i> <i>Mycalidae</i>

Cold water corals include: *Alcyonacea*, *Antipatharia*, *Gorgonacea*, and *Scleractinia*.

NAFO

CCAMLR

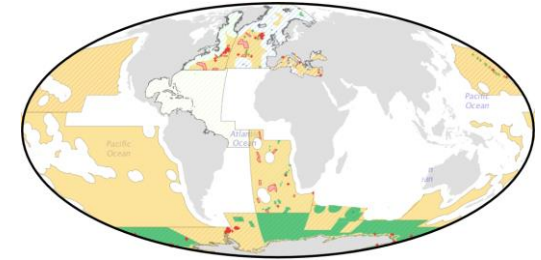
NEAFC

NPFC

VME Encounter Thresholds

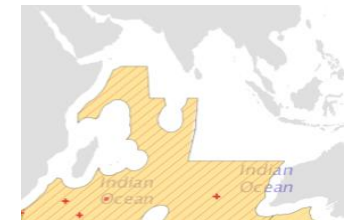
Current Thresholds (2018) (kg) – other regions

		Corals	Sponges	Sea pens
NPFC	All gear	50	-	-
SIOFA			-	
NAFO		60	300	7
NEAFC	Trawl, etc	30	400	
	Longlines	VME Indicators on 10 hooks per 1000 hooks (1200 m)		
CCAMLR	Longline/pots	10 VME Indicator units per 1000 hooks (1200 m)		
SPRFMO		1-250	5-50	1
SEAFO	Trawl (in/out)	600/400	60/60	-
	Longline/pots	10 VME Indicator units per 1000 hooks (1200 m)		



Current Thresholds (2018) (kg) – Indian Ocean Contracting Parties, CNCPs and PFEs

		Corals	Sponges	Sea pens
Australia	All gear	50	50	-
Cook Is.	Trawl	60 (30)	400 (200)	-
French T	Longline/pots	10 VME Indicator units per 1000 hooks (1200 m)		
Thailand	Trawl	60	600	
	Longlines	10 kg per 1000 hooks (1200 m)		
	Pots	10kg		





CMM 03-2019
Bottom Fishing

ANNEX 6A: Weight threshold for triggering VME encounter protocol in any one tow for a single VME indicator taxa

Taxonomic Level	Common Name	Weight Threshold (kg)
Vulnerable taxa		
Phylum Porifera	Sponges	50
Phylum Cnidaria		
Class Anthozoa		
Order Scleractinia	Stony corals	250
Order Antipatharia	Black Corals	5
Order Alcyonacea	True soft corals	60
Informal group Gorgonacea	Seafan octocorals	15
Order Actiniaria	Anemones	40

ANNEX 6B: Weight threshold for triggering VME encounter protocol in any one tow for three or more different VME indicator taxa

Taxonomic Level	Common Name	Weight Threshold (kg)
Vulnerable taxa		
Phylum Porifera	Sponges	5
Phylum Cnidaria		
Class Anthozoa		
Order Scleractinia	Stony corals	5
Order Antipatharia	Black corals	1
Order Alcyonacea	True soft corals	1
Informal group Gorgonacea	Seafan octocorals	1
Order Pennatulacea	Sea pens	1
Order Actiniaria	Anemones	5
Class Hydrozoa		
Order Anthoathecatae		
Family Stylasteridae	Hydrocorals	1
Phylum Echinodermata		
Class Asteroidea		
Order Brisingida	Armless stars	1
Class Crinoidea	Sea lillies	1

SPRFMO VME Indicator Thresholds



CMM 03-2019

Conservation and Management Measure for the Management of Bottom Fishing in the SPRFMO Convention Area
(Supersedes CMM 03-2018)

VME Encounter Thresholds

CMM 2017/01 - 6. SC in 2019 develop ...(b) criteria for what constitutes evidence of an encounter with a VME, in particular threshold levels and indicator species;

SC3 reporting to MoP5

1. Overview of SIOFA fisheries

Annex J

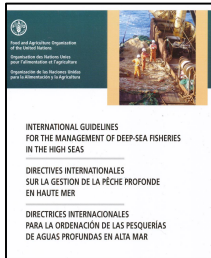
Thresholds of VME indicators

- Threshold weight for coral and sponge vary across parties even where the same gear is used
- Some not described

CMM 2018/01 - 6. SC in 2019 develop ...(b) criteria for what constitutes evidence of an encounter with a VME, in particular threshold levels and indicator species;

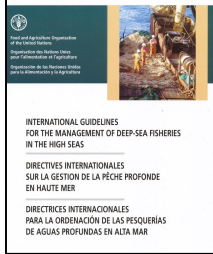
Encounter protocols

DSF Guidelines



67. States and RFMO/As should have an appropriate protocol identified in advance for how fishing vessels in DSFs should respond to encounters in the course of fishing operations with a VME, including defining what constitutes evidence of an encounter. Such protocol should ensure that States require vessels flying their flag to cease DSFs fishing activities at the site and report the encounter, including the location and any available information on the type of ecosystem encountered, to the relevant RFMO/A and flag State.

Encounter protocols



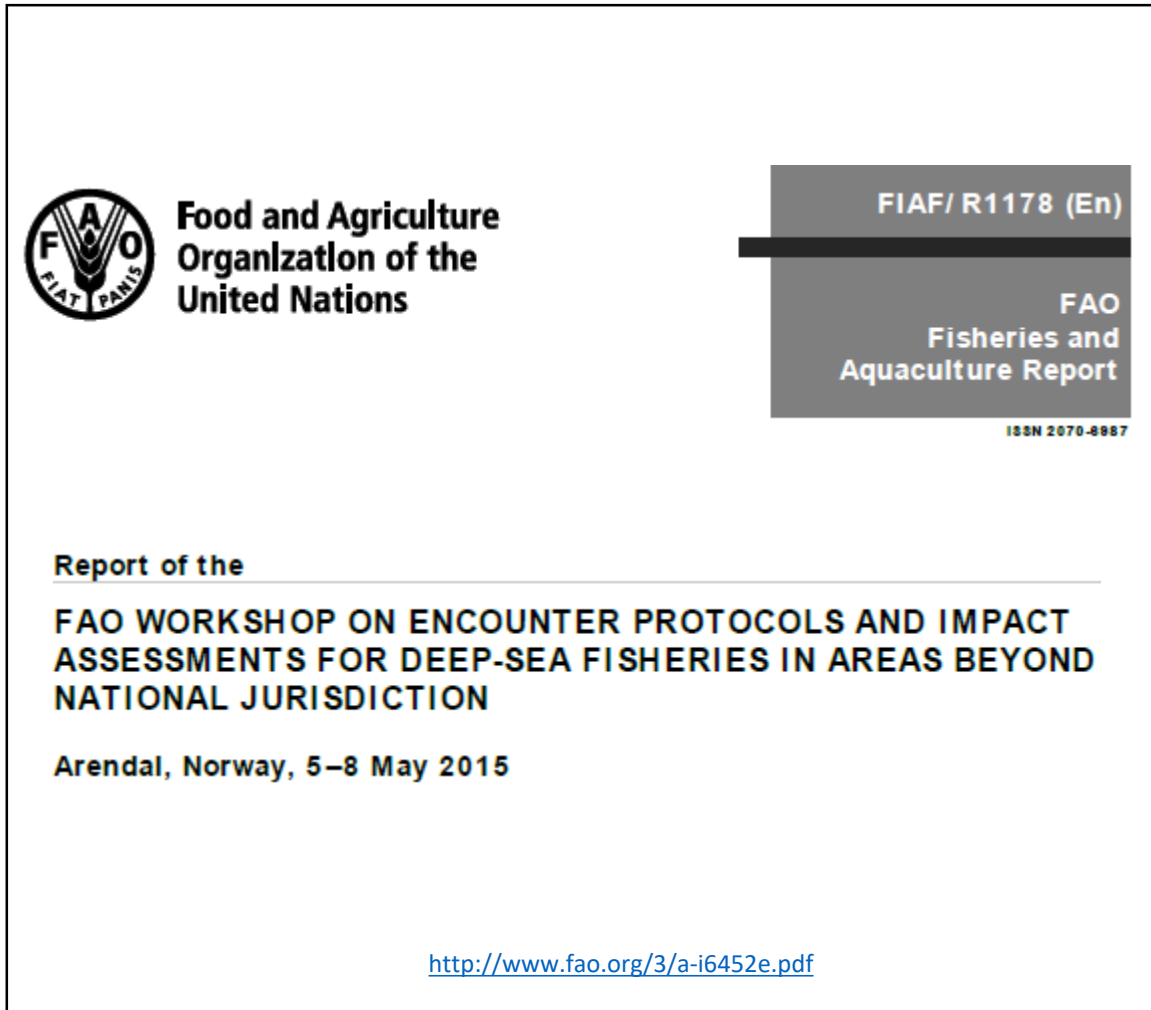
70. States and RFMO/As should, based on the results of assessments carried out pursuant to Section 5.2, adopt conservation and management measures to achieve long-term conservation and sustainable use of deep-sea fish stocks, ensure adequate protection and prevent significant adverse impacts on VMEs. These measures should be developed on a case-by-case basis and take into account the distribution ranges of the ecosystems concerned.

DSF Guidelines

71. Conservation and management measures pursuant to paragraph 70, may include:

- i. effort controls and/or catch controls;
- ii. temporal and spatial restrictions or closures;
- iii. changes in gear design and/or deployment or operational measures (as discussed in the 2006 Bangkok Expert Consultation), including:
 - reduction of contact between the fishing gear and the seabed,
 - use of effective bycatch reduction devices, and
 - use of technical measures to eliminate or minimize ghost fishing; or
- iv. other relevant measures necessary to achieve the objective of paragraph 70.

FAO Workshop on encounter protocols



- Interim or supplementary measure
- Threshold levels challenging
- Identification guides required
- Move-on rules (temporary closures) consistent with conservation objectives
- Report all encounters with VME indicators

Encounter protocols

CMM2018/01

6. SC advise on (c) the most appropriate response to a VME encounter, including inter alia closing particular areas to a particular gear type or types;

12. ... CCPs shall require any vessel flying their flag to cease bottom fishing activities within:

(a) For bottom or mid water trawling, or fishing with any other net - two (2) nautical miles either side of a trawl track extended by two (2) nautical miles at each end;

(b) For longline and trap activities - a radius of one (1) nautical mile from the midpoint of the line segment;

(c) For all other bottom fishing gear types - a radius of one (1) nautical mile from the midpoint of the operation

where evidence of a VME is encountered above threshold levels established under paragraph 11 in the course of fishing operations.

CCPs shall report any such encounter in their National Reports to the Scientific Committee in accordance with the guidelines at Annex 1, including any action taken by that CCP in respect of the relevant site.



Annex 1 - Guidelines for the Preparation and Submission of Notifications of Encounters with VMEs

1. General Information

Include contact information, nationality, vessel name(s) and dates of data collection.

2. VME location

Start and end positions of all gear deployments and/or observations.

Maps of fishing locations, underlying bathymetry or habitat and spatial scale of fishing. Depth(s) fished.

3. Fishing gear

Indicate fishing gears used at each location.

4. Additional data collected

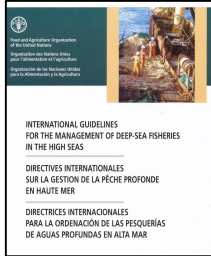
Indicate additional data collected at or near the locations fished, if possible.

Data such as multibeam bathymetry, oceanographic data such as CTD profiles, current profiles, water chemistry, substrate types recorded at or near those locations, other fauna observed, video recordings, acoustic profiles etc.

5. VME taxa

For each station fished, provide details of VME taxa observed, including but not limited to their relative density, absolute density, or weight and/or number of taxa.

Protected area protocols



14-19. VMEs are vulnerable to SAI, recovery longer than 5-20 years, risk (vulnerability, threat, mitigation)

5.2 Identifying vulnerable marine ecosystems and assessing significant adverse impacts

42. A marine ecosystem should be classified as vulnerable based on the characteristics that it possesses:

- i. Uniqueness or rarity
 - endemic species;
 - rare, threatened or endangered species that occur only in discrete areas;
 - nurseries or discrete feeding, breeding, or spawning areas.
- ii. Functional significance of the habitat
- iii. Fragility
- iv. Life-history traits of component species that make recovery difficult
- v. Structural complexity

DSF Guidelines

Protected area protocols

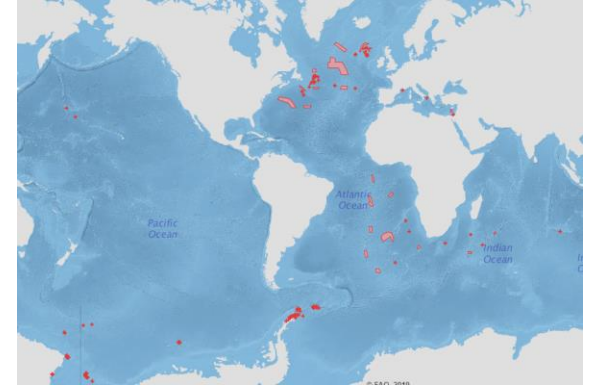
VME “definitions” used by RFMOs

NAFO, NEAFC, NPFC, SEAFO, SPRFMO

para 42, 43 and/or Annex 1 of FAO DSF Guidelines

CCAMLR

VME indicator organism and VME indicator unit



Is it useful to try to find a practical definition from VME areas adopted elsewhere?

Not really – only some well surveyed (NAFO, NEAFC, CCAMLR), many poorly surveyed or topography only, huge variety.

VMEs are benthic, delineated, vulnerable, under real or potential threat.

Protected area protocols



CMM2018/01 Para 6

(d) the interim SIOFA *Standard Protocol for Future Protected Areas Designation* adopted by the Meeting of the Parties in 2018 [next slide]

MoP5, para 34-40

- Revised protocol to the Meeting of the Parties adopted (Annex K).
- EU proposed that the Scientific Committee revise the protocol to further elaborate the application of criteria, how the Meeting of the Parties should use the criteria, which criteria may warrant closure and to provide guidance on management options.
- Scientific Committee is requested to clarify the use of the criteria and provide in particular a ranking and a key for using these criteria in view to developing appropriate management plans/measures.

Protected area protocols

MoP5 Annex K SIOFA Interim standard protocol for future protected areas designation (and SC3 Annex H)



ANNEX K	
SIOFA Interim standard protocol for future protected areas designation	
PROCESSES FOR PROPOSAL AND REVIEW	
As described in the terms of reference for the Protected Areas and Ecosystems working group (PAEWG, SC3 Report Annex K)	
CRITERIA FOR EVALUATING PROTECTED AREA PROPOSALS	
1. The objectives for the protected area is clearly stated and the proposal clearly demonstrates which of the criteria are met.	
The proposal should then state which of the following criteria meet the objectives with "the best before having no particular ranking of importance".	
1. VMEs are known to occur and/or triggering of VME indicator thresholds reported for the area proposed.	
a. Closure may be warranted if there are known or consistent triggering of VME indicator thresholds of CPA, indicating potential VME.	
2. Bioregional representation	
a. Area is known to contain unique, rare or distinct, habitats or ecosystems that fishing operations will disturb.	
b. Area with a comparatively higher degree of naturalness due to zero or a low level of human-induced disturbance or degradation from, for example, historical fishing activity.	
3. Geographic and/or geomorphological representation	
A. The area provides for important or desirable geographic representation within the SIOFA area.	
B. The area proposed is known to contain unique or unusual geomorphological features that fishing operations may damage.	
4. Biodiversity representation	
a. The area is known to contain unique or rare (occurring in only a few locations) species, populations or communities.	
b. The area is known to contain a high diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.	
c. The area is known to contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.	
5. Scientific interest	
A. The area has scientific research interest associated with understanding ecosystems, biological, geological and biodiversity processes in the SIOFA region.	
7. Areas of special significance for threatened or important species or ecosystem processes	
a. There is evidence that the area is of special importance for the historic stages of species and/or threatened species.	

ANNEX K	
1. Where this is unavailable, protected area proposal and designation may consider synergies with adjacent protected areas, or research from other oceans to inform references on biology of species of patterns.	
2. Boundary lines should be simple, as much as possible following straight (latitudinal/longitudinal) lines and, where possible, coinciding with existing regulatory boundaries.	
a. The size and shape of an area should be set to minimise socio-economic costs.	
GUIDANCE FOR SC RECOMMENDATIONS TO THE MEETING OF THE PARTIES	
The SC should make a recommendation to the MoP based on how the proposal satisfies one or more of the criteria of the protocol.	
If the scientific evidence to support protecting area using the protocol is uncertain or insufficient, more data may be required.	
If the proposal documents the necessary data and scientific information to support a protected area using protocol, different measures could be applied, such as management, measures, technical measures, closures.	
In case of an area becoming protected, a management and research plan shall be developed to be on the way to come. It will include:	
- The measures to place in the protected area.	
- The time of review of the protected area.	
- If needed, the research that should be undertaken in the area. To this end, the parties should consider to ask for international funds.	

ANNEX K	
b. There is evidence that the area contains habitat for the survival and recovery of endangered, threatened, declining species or is an area with significant ecosystem(s) of such species.	
Other principles to be considered in formulating recommendations for protected areas	
8. Best available information should be used to support protected area proposals and designation. The information should be sufficiently substantiated and/or verified (and preferably provided), for example through the referencing of available literature/research. Mechanisms such as statements and observations made by skippers and crew could be used as supporting information to scientifically validated data. In the absence of information, a precautionary approach should be applied.	
a. Recommendations must be informed by the available information. Best available information should include ecological, environmental, social, cultural and economic aspects of the marine environment that is available without unreasonable cost, effort or loss of time/lives.	
b. Recommendations to implement spatial management measures should not be proffered because of a lack of full scientific certainty, especially where significant or irreversible damage to ecosystems could occur or indigenous species are at risk of extinction.	
9. Adverse impacts on existing users should be evaluated.	
a. Where there is a choice of several sites, which if protected would add a similar ecosystem or habitat to the closure network, and only one, or some of the sites are to be closed, the study recommended should minimise adverse impacts on existing users. Where there is a choice to be made among minimum impact sites, selection may also be guided by:	
i. area of management and socio-economic and	
ii. if there are other benefits such as education or eco-tourism.	
10. The rationale used to recommend spatial management measures should be consistent and transparent.	
11. There should be an evaluation of existing closures when making recommendations and exploration as to how a new management measure will assist in achieving MoP objectives.	
a. An enumeration of spatial management measures should be prepared to assist progress towards achieving the policies.	
Considerations for determining boundaries of protected areas	
12. Dimensions of the area	
a. The recommended area should, as far as practicable, include continuous and contiguous depth.	
b. Area designation should be based on seafloor features such as geomorphic features.	
c. Size and shape should be orientated to account for inclusion of connectivity corridors and biological dispersal patterns within and across closures.	

ANNEX K	
SIOFA PROTECTED AREAS PROPOSALS AND DESIGNATION TEMPLATE	
Name	This field will contain the name of the proposed protected area
Details of the proposal	This field should contain details of the proposal
Geographic description	This field should contain the coordinates of the proposed area's spatial boundaries. It may also contain maps showing the spatial area and/or bathymetry, or other spatial information of relevance to the proposal.
Objectives	This field will explicitly detail the objective/s that designation of the proposed protected area would address (i.e., the primary reason/s for protection).
Criteria that the protected area meets	This field would contain the specific criteria that the protected area meets, structured against the SIOFA Standard protocol for protected areas designation. This field will also contain evidence in support of each criteria that the area meets. This evidence may include, but is not limited to: <ul style="list-style-type: none"> Information from scientific or other surveys References to peer-reviewed literature Photographs, graphs and figures supporting the proposal Fishing data analysis to support the proposal Agreements, substantiated reports and/or statements from skippers or observers to justify the proposal.
Social, cultural and economic interests	This section would consider existing fisheries interests and possible adverse impacts of protected area designation on those interests. This section may also consider potential future interests. Any social or cultural interests or values should also be included. This section should be backed up by data, formal statements and references in the literature.
Risks to the proposed area	This section should contain detailed information on the scope of the protected area designation in terms of what activities would be restricted or prohibited, if the proposal is that some activities are restricted. This section should contain information on how these activities will be monitored.
Review periods	This section should contain an anticipated review period to review whether the Protected Area is achieving its objectives, including consideration of whether any new information has become available that may enhance or degrade the justification for protection.
Outline of monitoring and/or research needed	This section will contain an outline of monitoring and/or research needed to monitor, update or revise the Protected Area.

Criteria for evaluating Protected Area Proposals

The protocol (left) lists 7 criteria:

- 1: clear objectives for protected area
- 2: Closure if VME present
- 3,4,5: Bioregional, geographic, biodiversity representation
- 6: Scientific interest
- 7: Important life-history stages

4b and 5c mention potential SAI concern

Selection of protected areas



MoP5: Australia proposed 5 areas for closure and 7 for VME encounter proposals (para 79)

The information on catch and fishing effort in the proposed areas had been provided by the Secretariat (MoP5-INFO-03, classified as restricted in accordance with CMM 2016/03 on Data Confidentiality). (41)

EU: need to establish better frameworks, and no trawl activity in proposed areas (43)

CPPs: Need for management and research plans (44) [provided at this meeting]

EU: The criterion on the presence of VMEs was not fulfilled. No immediate risks. (82)

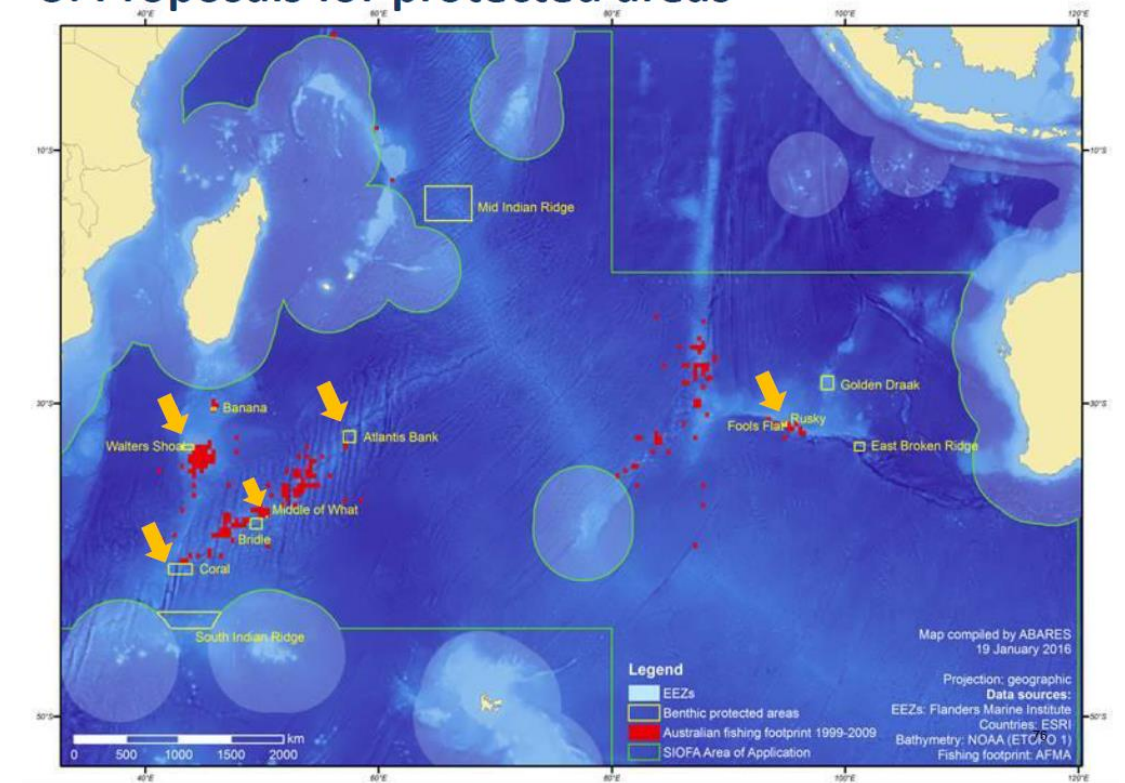
Aus: Forecast and prevent (82)

Selection of protected areas

Feature SC noted evidence that satisfied criteria
(MoP5, annex J, p. 75)

Feature	SC noted evidence that satisfied criteria
Atlantis bank	5b Biodiversity representation 6a Scientific interest
Coral	3b Bioregional representation 5b Biodiversity representation 6a Scientific interest
Fool's flat	3b Biodiversity representation 4a Geographic and/or unique representation 5b Biodiversity representation
Walter's Shoal	3b Bioregional representation 5b Biodiversity representation 6a Scientific interest
Middle of What	3b Bioregional representation

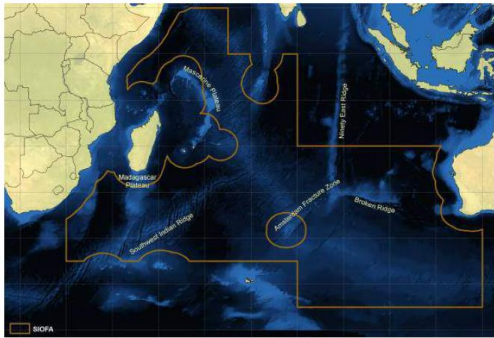
5. Proposals for protected areas



Australia BFIA



Bottom Fishery Impacts Assessment



Australian report for the Southern Indian Ocean Fisheries Agreement (SIOFA)

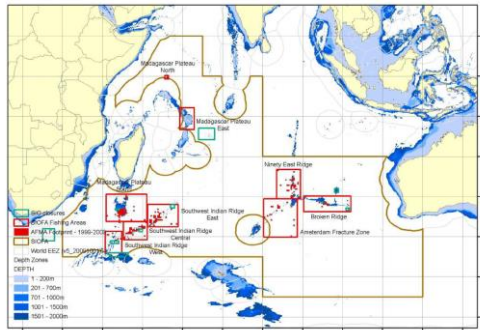


Figure 3.1.3.1 Fishing regions ('fishing grounds') within the SIOFA Area based on the Australian footprint (combined trawl and line fisheries effort distribution 1999-2009). Note: for ease of definition and mapping, the fishing grounds are defined as rectangular boxes, some of which overlay adjacent EEZs; analyses only consider fishing effort within the SIOFA Area.

Marine ecosystem: a dynamic complex of plant, animal and microorganism communities and their nonliving environment interacting as a functional unit.

Vulnerable marine ecosystem: any marine ecosystem whose integrity is threatened by significant adverse impacts resulting from physical contact with bottom gears in the normal course of fishing operations, including, inter alia, reefs, seamounts, hydrothermal vents, cold water corals or cold water sponge beds. The most vulnerable ecosystems are those that are easily disturbed and in addition are very slow to recover, or may never recover.

Significant adverse impacts: impacts which compromise ecosystem integrity in a manner that impairs the ability of affected populations to replace themselves and that degrades the long-term natural productivity of habitats, or causes on more than a temporary basis significant loss of species richness, habitat or community types.

Council Regulation (EC) No 734/2008 of 15 July 2008



Figure 3.1.4.1 Voluntary BPAs implemented by the SIOFA. Note: 'Rusky' (not labelled) is a small area attached to 'Fools Flat'

- Porifera (sponges)
- Scleractinia (stony corals)
- Gorgonacea (octocorals)
- Stylasteridae (hydrocorals)
- stalked crinoids (sea lilies)

trigger limits (currently 50 kg of coral and sponges)

move-on rule is enforced where, on detection of 'evidence of a VME', a temporary closure of 5 n.m. radius

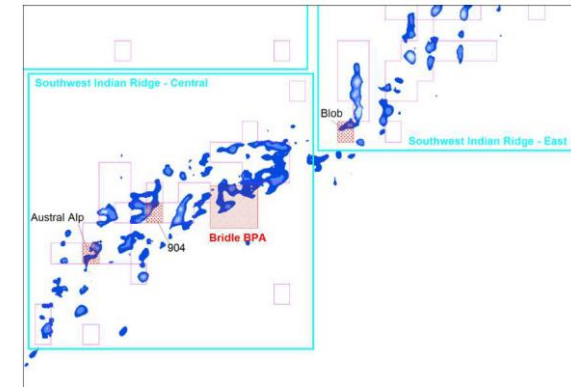


Figure 4.1.5.1 Reported locations (as 20' blocks - red dotted) of catches with VME fauna >100 kg in 2009 resulting in the implementation of the move-on rule; Australian footprint: pink outlines, fishing grounds: light blue outlines; BPA: red hashed.

Operational measures to minimise benthic impacts

Fishing operators report the following operational actions to mitigate the impacts of fishing on VMEs:

- demersal trawl operators minimise bottom contact by ...
- auto-longline operators minimise impact by 'peeling' the ...
- mid-water trawlers use trawl nets with weak links that break ...

Cook Islands BFIA

Figure 20 Fished Area Footprint for one Walters Shoal knoll.

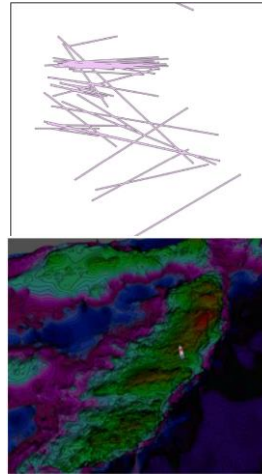


Figure 18 Dissolved trawl tracks on the Southwest Indian Ridge

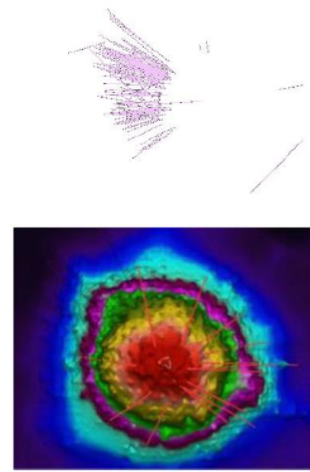


Figure 15 Rusky Knoll with towlines marked in red

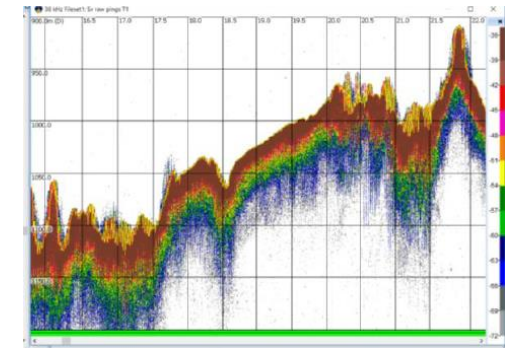
Small areas actually towed

6.1 VME Risk Assessment

Intensity, Duration, Spatial extent, Cumulative impact

SC (2017), “move-on rules provide a rapid response to evidence of VMEs ... early stages of a fishery when information is scarce. once objectively-designed spatial management measures have been implemented to prevent significant adverse impacts on VMEs, move-on rules provide little additional benefit for VMEs and they have significant costs in terms of monitoring requirements and operational uncertainty for fishers.”

SIOFA PAEWG1



Simrad ES60 sonar showed clearly that the “fish school” observed with an early Furuno Color Sounder was actually a coldwater coral reef (Figure 16).

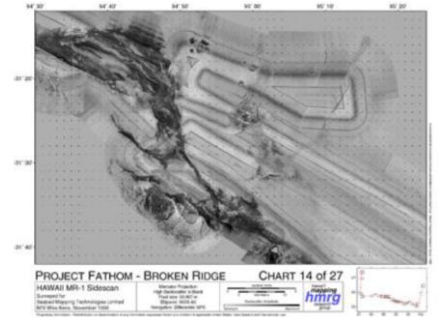


Figure 23 Broken Ridge Sidescan Sonar image including Fool's Flat and Rusky

Sidescan sonar imagery cannot identify VME structures that may occur on hard rock substrate.



Camera on trawl 18-19 March 2019

Figure 14 Cook Islands Bottom Fishing Footprint 1996-2016

Rusky	31° 20'	94° 55'	31° 30'	95° 00'
Fools - Flat	31° 30'	94° 40'	31° 40'	95° 00'
Atlantis Bank	32° 00'	57° 00'	32° 50'	58° 00'
Walters Shoal	33° 00'	43° 10'	33° 20'	44° 10'
Coral	41° 00'	42° 00'	41° 40'	44° 00'
Banana	30° 20'	45° 40'	30° 30'	46° 00'
Middle of What (MoW)	37° 54'	50° 23'	37° 56.5. 5'	50° 27'

Table 3 Known VMEs in SIOFA

7.4 VME Reporting

Corals Bycatch spreadsheet used on every tow. 52 indicator species including various coral types, sponges, and volcanic rock.

VME Threshold

60 (30*) kg of live coral and/or 400 (200*) kg of live sponge. 2nd encounter within 1 nm and move-away 5 nm.

National Research Institute of Fisheries Science, Yokohama, Japan

EU BFIA

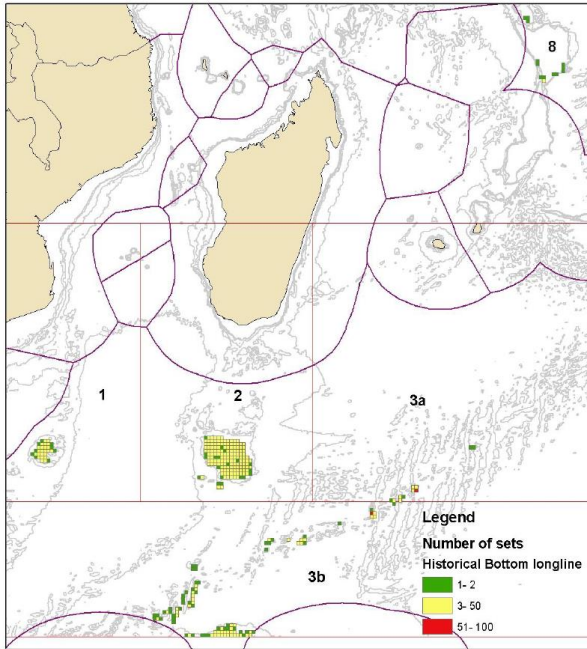


Figure 2.- Historical EU-Spain bottom longline footprint.

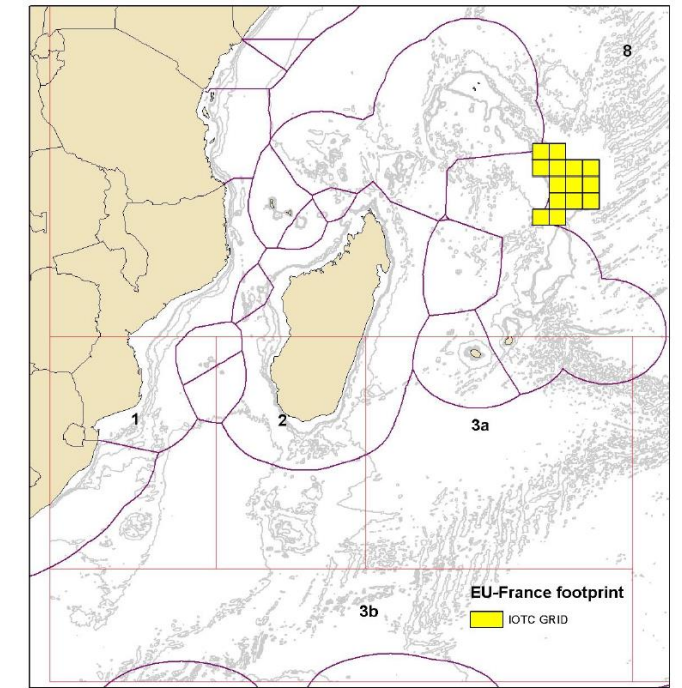
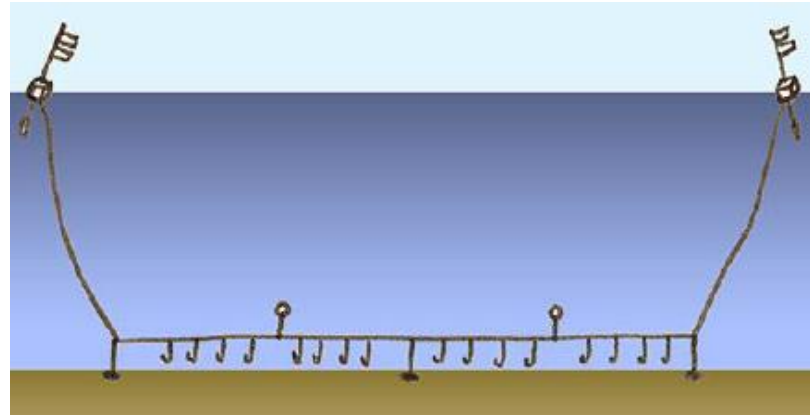


Figure 2: EU-France fishing footprint from IOTC gridding (1°x1°)

Table 2. Overlap of EU-Spain fishing footprint with fishable seabed.

Years	Footprint area (km ²)	Total SIOFA area ¹ (km ²)	Overlap ¹ (%)	SIOFA area ² <2000m (km ²)	Overlap ² (%)
2003-2017	105,301	26,880,647	0.39	466,050	22.59
2017	43,904	26,880,647	0.16	466,050	9.42

- (1) Total SIOFA seabed
(2) SIOFA seabed <2000 m

Footprint index: mean = 6.67×10^{-3} ; median = 5.26×10^{-3} ; 95% quantile = 12.1×10^{-3} (km₂ of seabed area per km of longline deployed)

Impact index: mean = 5.07×10^{-3} ; median = 4.70×10^{-3} ; 95% quantile = 9.04×10^{-3}

Impact on VME taxa is considered low. Taxa potentially impacted Sponges, Corals, Echinoderms

Impacts on potential vulnerable marine ecosystems (VMEs) in the fisheries have been reduced through decisions of using the longline method instead of bottom trawling and to move away from clip on weights in favor of integrated weighted longlines.

French Territories BFIA

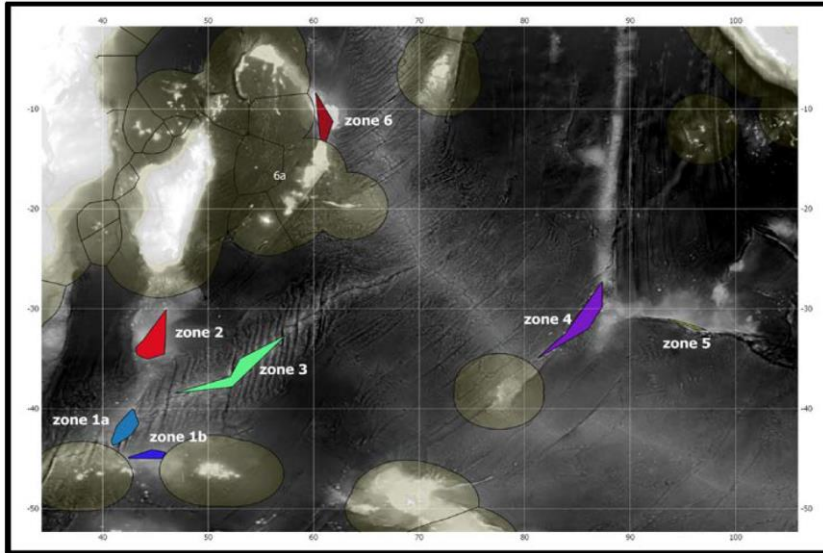


FIGURE 6: MAP OF THE PROPOSED FISHING AREA

Impact assessment percentage of fished areas

TABLE 10: FRENCH THEORETICAL MAXIMUM FISHING FOOTPRINT AND REAL FOOTPRINT IN THE 2013-2017 PERIOD IN SIOFA AREA

Bathomes (m)	0-200	201-700	701-1000	1001-1500	1501-2000	>2000	Total
Area (km ²) per bathome of zones	20376	16124	14103	40102	62091	221221	374020
Percentage per bathome of zones in SIOFA	54,47 %	50,23 %	56,12 %	36,20 %	23,82 %	0,82 %	1,39 %
French fishable areas (500-2000 m): 59305 km ²							
French theoretical fishing footprint comparing to SIOFA area: 0,22 %							
French fished area in the 2013-2017 period: 2679 km ²							
French real footprint in the 2013-2017 period: 0.0099 %							



FIGURE 9: WEIGHING OF A SET OF BENTHOS BYCATCH SPECIMENS COLLECTED DURING THE HAULING OBSERVATION OF A LONGLINE IN KERGUELEN; PICTURE BY FISHERY OBSERVER HUGUES VERMANDE (2015)

Only one VME bioindicator taxa caught (Demospongiae in 2017)

VME reporting systems

Data acquisition protocol (same as CCAMLR)

Conservation rules (same as CCAMLR CMM 22-06 and 22-07))

Reporting above 5 units

Closure above 10 units

No bottom fishing <500 m

Japan BFIA - longlines

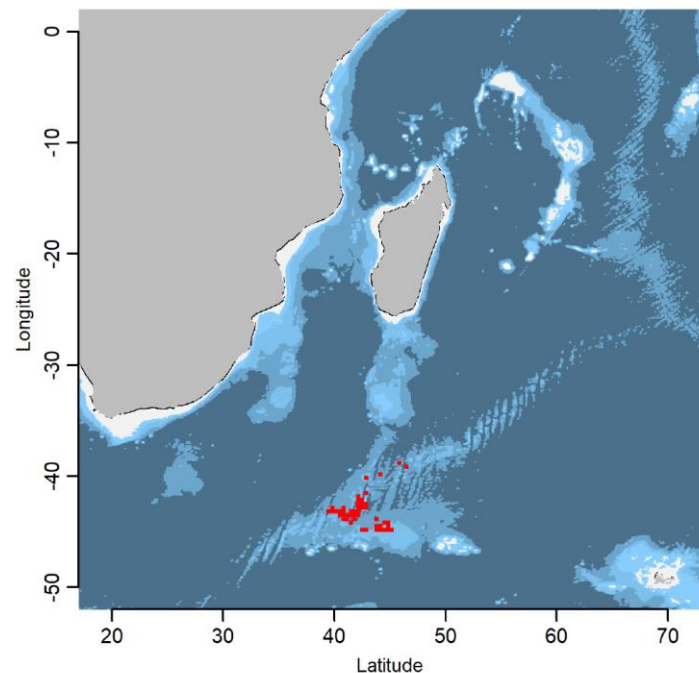


Fig. 1 The footprints of Japanese bottom longline fishery for 9 years (2004-2010, 2013 and 2017). Red squares indicate the foot prints which are described as grid blocks of 20 minutes resolution.

There is no information collected by Japanese bottom longline fishery to evaluate any actual impacts on seabed ecosystems including VMEs.

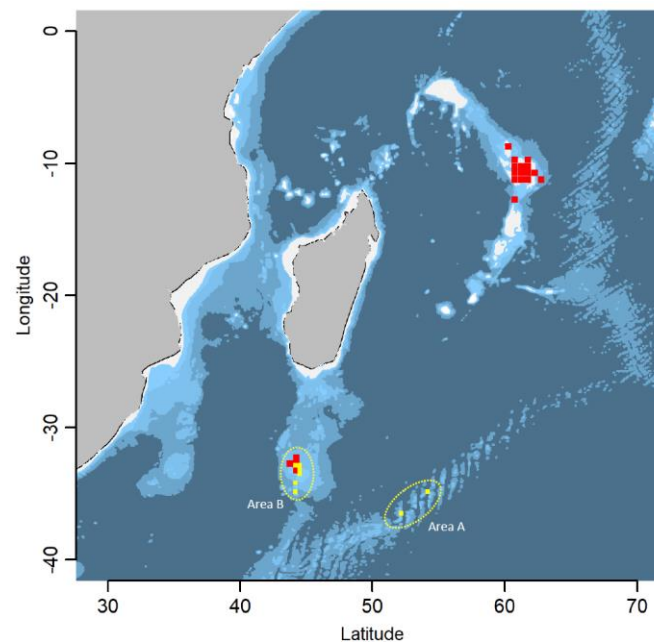


Fig. 1 The footprints of Japanese exploratory bottom trawl fisheries in 1977, 1978, and 2012. Red squares indicate the foot prints in 1977 and 1978 which are described as grid blocks of 30 minutes resolution according to spatial resolution of fishing log book as data sources. Yellow squares represent the foot prints in 2012 which are described as grid blocks of 20 minutes resolution.

By-catch of corals were observed in six hauls during these eight observations, but there is no by-catch of sponges. The coral by-catch weight range 0.01–1.68 kg.

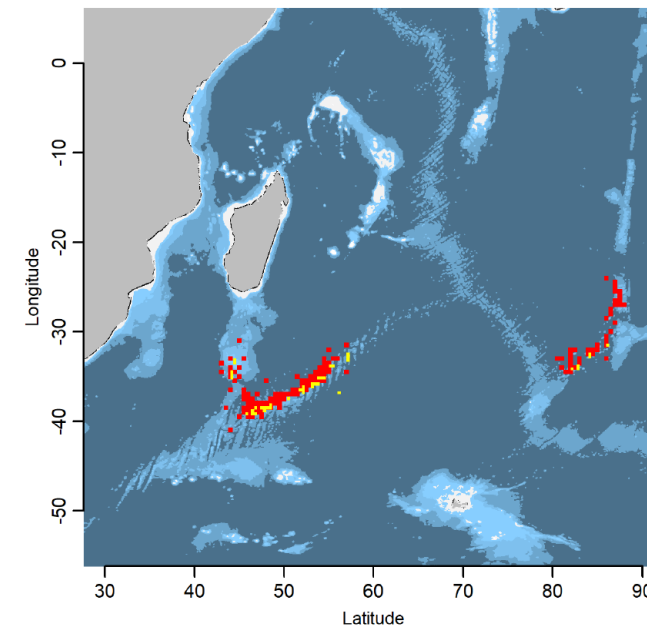
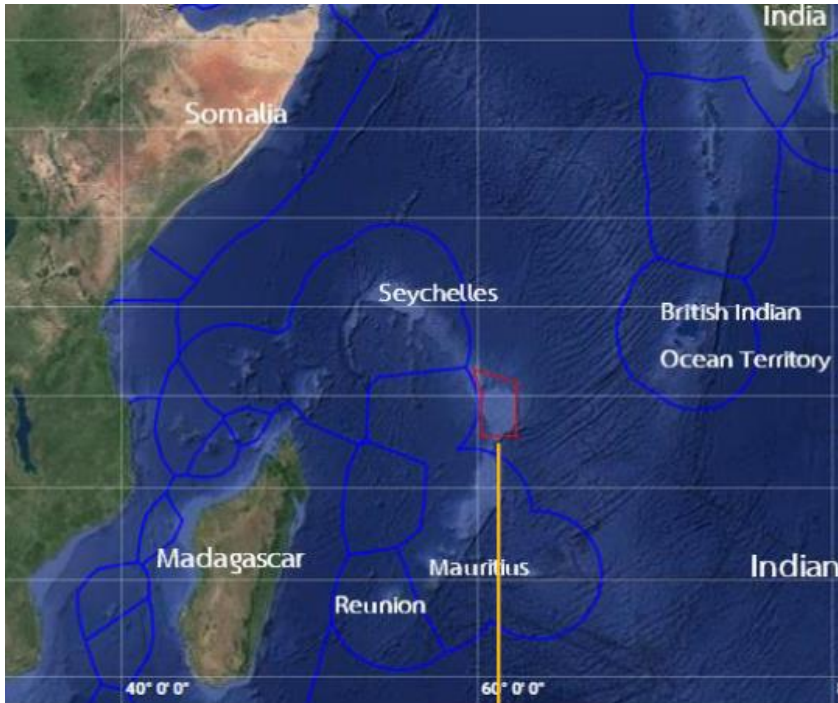


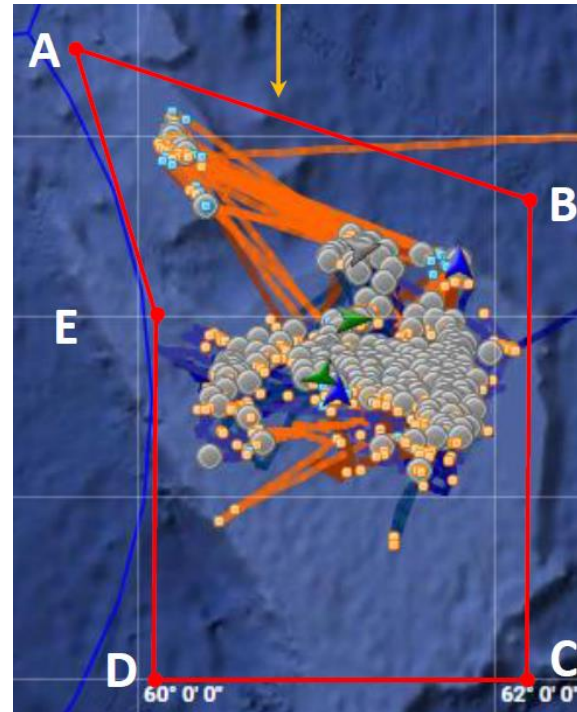
Fig. 1 The footprints of Japanese midwater fisheries with type-T trawling in 2001–2002, 2009–2013, and 2015–2017. Red squares indicate the foot prints in 2001–2002, part of 2010, 2011–2013, and 2015–2016 which are described as grid blocks of 30 minutes resolution according to spatial resolution of fishing log book as data sources. Yellow squares represent the foot prints in 2009, part of 2010, and 2017 which are described as grid blocks of 20 minutes resolution.

No VME by-catch.

Thailand BFIA



High sea of Saya de Malha Bank.



June 2016 to February 2017.

Restrictions

- Restricted to footprint
- Thailand prohibits its vessels to fish in BPAs
- VME threshold corals 60 kg and sponges 600 kg (trawler).
- 10 kg per 1000 hooks or 1200 m.
- 10 kg per trap.
- Reporting, move-on and cease fishing.