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The Deep Sea Conservation Coalition (DSCC) is a coalition of over 60 organizations worldwide promoting fisheries conservation and the protection of biodiversity on the high seas.

The DSCC has been actively involved in the international debate and negotiations concerning the adverse impacts on deep-sea biodiversity in areas beyond national jurisdiction from bottom trawling and other methods of bottom fishing on the high seas since 2003/2004.

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EXECUTIVE SUMMARY



The Implementation of UNGA Resolutions 61/105 and 64/72 in the Management of Deep-Sea Fisheries on the High Seas

A report from the International Programme on the State of the Ocean

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The Implementation of UNGA Resolutions 61/105 and 64/72 in the Management of Deep-Sea Fisheries on the High Seas

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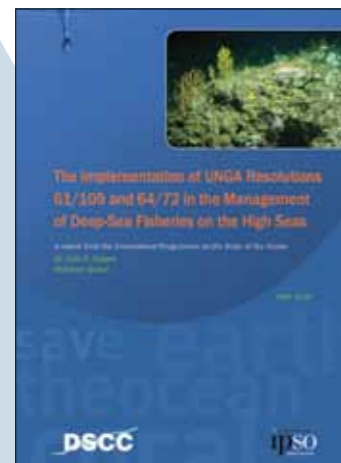
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Mediterranean roughy (*Hoplostethus mediterraneus*), over coral garden habitat mainly comprising *Acanthogorgia hirsuta*, Faial Island, Azores, North Atlantic, 350m depth (© A.D. Rogers and Rebikoff Foundation).

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About this report:

This report was prepared for the Deep-Sea Conservation Coalition by the International Programme on the State of the Ocean.

Summary

For the past eight years, the issue of protecting biodiversity in the deep sea in areas beyond national jurisdiction – the high seas – has been extensively debated by the United Nations General Assembly (UNGA) and in other international fora. The UNGA adopted a series of resolutions, beginning with Resolution 59/25 in 2004, which called on high seas fishing nations and regional fisheries management organisations (RFMOs) to take urgent action to protect vulnerable marine ecosystems (VMEs) from destructive fishing practices, including bottom trawl fishing, in areas beyond national jurisdiction (UNGA, 2004).

A report from the United Nations (UN) Secretary General in 2006 on progress on the implementation of the 2004 resolution concluded that little action had been taken to protect deep-sea ecosystems on the high seas from the adverse impacts of bottom fisheries despite the fact that “deep-sea habitats in these areas are extremely vulnerable and require protection”. (UNSG, 2006)¹

As a result of a review by the UNGA regarding the effectiveness of the measures called for in Resolution 59/25, the UNGA called for a series of specific actions to be taken by states and RFMOs in UNGA Resolution 61/105, adopted by consensus in December 2006 (UNGA, 2007). Resolution 61/105 committed nations that authorise their vessels to engage in bottom fisheries on the high seas to take a series

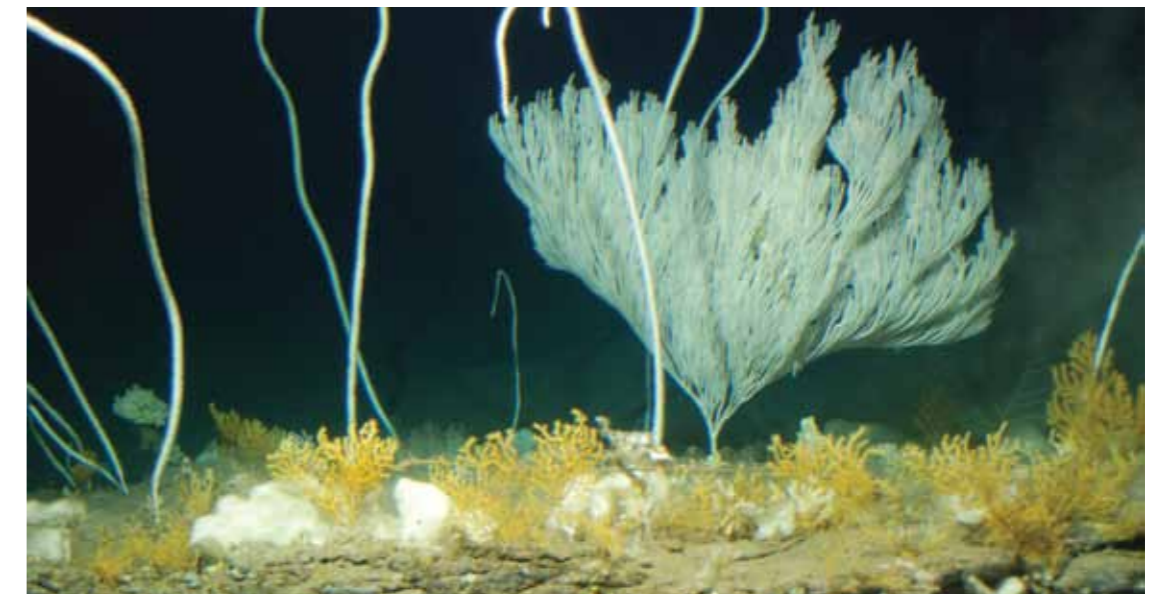
of actions, outlined in Paragraph 83 of the resolution (see Annex I of this report).

The four main action points are summarised as follows.

- Conduct assessments of whether bottom fishing activities have significant adverse impacts (SAIs) on VMEs.
- To ensure that if fishing activities have significant adverse impacts they are managed to prevent such impacts, including through closing areas to bottom fishing where VMEs are known or likely to occur, or they are not authorised to proceed.
- To establish and implement protocols to cease fishing where an encounter with VMEs occurs during fishing activities, and to report such encounters so that appropriate measures can be adopted with respect to that site.
- To implement measures in accordance with the precautionary approach, ecosystems approaches and international law, and to sustainably manage deep-sea fish stocks.

¹ Paragraph 204: “Some States have undertaken, or are in the process of undertaking, extensive efforts to protect some fishery habitat areas within their national jurisdiction, in particular through the establishment of protected areas. However, this is not the case on the high seas, though deep-sea habitats in these areas are extremely vulnerable and require protection.”

Coral garden habitat from the slope of Faial Island, Azores, depth ~350m. Species include: *Acanthogorgia hirsuta*, *Viminella flagellum*, and *Narella* sp. Note the lost long line along the top of the rock outcrop (© A.D. Rogers and the Rebikoff Foundation).



Argos Georgia in Port Stanley, the Falkland Islands. U.K. vessel involved in fishing for toothfish (*Dissostichus* spp.) in the Ross Sea, 2008/2009 (© A.D. Rogers).



A set of *International Guidelines for the Management of Deep-Sea Fisheries in the High Seas* (FAO Guidelines) were then negotiated under the auspices of the United Nations Food and Agriculture Organization (UN FAO) to, *inter alia*, further define and agree to criteria for the conduct of impact assessments of high seas bottom fisheries; identify VMEs; and then assess whether deep-sea fisheries would have “significant adverse impacts” on VMEs. The FAO Guidelines were adopted in August 2008. Key elements of the Guidelines are contained in Annex II of this report (FAO, 2009a).

In 2009, the UNGA determined that Resolution 61/105 had not been implemented sufficiently. As a result the General Assembly adopted additional provisions in Resolution 64/72 (UNGA, 2009). This resolution reaffirmed the 2006 resolution and made it clear that the measures called for in Resolution 61/105 should be implemented, consistent with the FAO Guidelines, by flag states and RFMOs prior to allowing, or authorising, bottom fishing on the high seas to proceed. Resolution 64/72 placed particular emphasis on conducting impact assessments of bottom fisheries on the high seas and called on states and RFMOs to “ensure that vessels do not engage in bottom fishing until such assessments have been carried out”. Resolution 64/72 further called for stock assessments and conservation measures to ensure the long-term sustainability of deep-sea fish stocks and non-target species, and the rebuilding of depleted fish stocks (UNGA, 2009: Paras 119–120). Key paragraphs of both resolutions are contained in Annexes I and III of this report.

A comprehensive review of the extent to which RFMOs and states have been implementing the relevant UNGA resolutions has not previously been conducted. This report assesses the measures and regulations adopted with regards to the four key actions in the 2006 UNGA Resolution 61/105 and reinforced by Resolution 64/72 by the following RFMOs: North East Atlantic Fisheries Commission (NEAFC); Northwest Atlantic Fisheries Organization (NAFO); General Fisheries Commission for the Mediterranean (GFCM); South East Atlantic Fisheries Organisation (SEAFO); and Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR). The report also reviews the interim measures adopted by the states participating in the negotiation of the new North Pacific Fisheries Commission (NPFC), the South Pacific Regional Fisheries Management Organisation (SPRFMO), and in the Southern Indian Ocean. The review covers the measures adopted both prior to and in response to the 2006 UNGA resolution. The key findings of the report include the following.

CONDUCTING IMPACT ASSESSMENTS OF INDIVIDUAL BOTTOM FISHING ACTIVITIES

The degree to which nations conducted impact assessments varied widely. Despite the call from the UNGA for impact assessments for all bottom fisheries in the high seas, some RFMOs have had no Contracting Parties conduct impact assessments (e.g. NEAFC, NAFO), while in other areas all Contracting Parties have submitted impact assessments (e.g. CCAMLR, NPFC), or some Contracting Parties have conducted

impact assessments (e.g. SPRFMO). The impact assessments undertaken also varied in their scope. In some cases, Contracting Parties conducted full risk assessments that included details of fishing history, intended fishing operations, gear to be used, a full definition of VMEs likely to be encountered, and a full ecological risk assessment in consultation with scientists, managers and industry to assess the potential impacts of the proposed fishing operations. Other impact assessments lacked sufficient information to assess the impacts of proposed fishing operations or were based on incorrect assumptions about the presence or lack of presence of VMEs. In addition, several RFMOs have not required impact assessments for exploratory fisheries in new areas and/or existing fishing areas, despite the UNGA resolutions and FAO Guidelines (FAO, 2009a) that call for all deep-sea bottom fisheries to be assessed.

PREVENTING IMPACTS ON VULNERABLE MARINE ECOSYSTEMS

RFMOs have undertaken a variety of measures to protect known or suspected VMEs within their Regulatory Areas. In some cases, technical measures were adopted, such as the banning of gillnets below a certain depth or from the entire region because of the high risk of by-catch and ghost fishing (e.g. NEAFC, SEAFO, SPRFMO) or

prohibiting of bottom trawling (CCAMLR). Most RFMOs have adopted spatial conservation measures to protect VMEs, although the extent and type of closures implemented by the RFMOs varied (e.g. NEAFC, NAFO, SEAFO, GFCM and, most recently, CCAMLR). Some have not closed all areas despite strong evidence of the presence of VMEs (e.g. NEAFC) and some have closed very few areas despite evidence of wide-ranging destruction of VMEs by bottom fishing and potential ecological consequences, not only in terms of ecosystem function but also in terms of loss of essential habitat for species targeted by fisheries (e.g. GFCM). In most cases, closures have not been implemented because the lack of information on deep-sea ecosystems has prevented RFMOs from identifying where VMEs exist and scientific information on where some VME types (e.g. stony corals) are likely to occur has not been used. There is also evidence that some RFMOs have limited their interpretation of which species can form VMEs (e.g. only corals or sponges; NEAFC, NPFC) or what structurally constitutes a VME (e.g. only areas where a very high density of individuals on the seabed are recognised as VMEs; NPFC). In most cases, this likely reflects the use of the few example VMEs referred to in the UNGA resolutions and FAO Guidelines rather than being based on a scientific assessment of the full range of types of VMEs that may be found within a specific geographic area (FAO, 2009a).

Mediterranean roughy (*Hoplostethus mediterraneus*), over coral garden habitat mainly comprising *Acanthogorgia hirsuta*, Faial Island, Azores, North Atlantic, 350m depth (© A.D. Rogers and Rebikoff Foundation).



SUSTAINABLY MANAGING DEEP-SEA FISH STOCKS

For most of the target and by-catch species taken in deep-sea bottom fisheries on the high seas, there is insufficient information on the biology, life history, fishing mortality and geographic range of stocks of these species. This information is crucial for evaluating stock status, sustainable harvest levels and biological reference points for each population. In the absence of such data it is important that the precautionary principle is applied in the management of deep-sea fish stocks. Instead, the report found evidence that many deep-sea fish stocks were not subject to assessment or long-term management plans. Furthermore, where specific management advice was provided by scientists or scientific bodies (e.g. the International Council for Exploration of the Sea [ICES]), total allowable catches (TACs) set by RFMOs or states often exceeded advice, even where there was a significant possibility of overfishing or collapse of a fish stock. The high biodiversity of high seas fish communities means that by-catch in many high seas fisheries forms a significant proportion of overall catch. In some cases, populations of by-catch species have collapsed to the point where they have

become threatened with local extirpation or extinction under IUCN Red List criteria. In many cases, little action has been taken to manage by-catch species with a low productivity, although exceptions include skates, rays and grenadiers in Antarctica and the banning of gillnets by several RFMOs, which are associated with high by-catch of species like sharks. For several of the RFMOs reviewed, there was evidence from observer information and catch data from scientific advisory bodies to RFMOs, of significant levels of misreporting, under-reporting or non-reporting of catch, particularly of by-catch species, in the deep-sea fisheries. For the other RFMOs the extent of reporting of catches is unknown. Accurate reporting of catches of target and by-catch species is required to assess fishing mortality on populations and, without such data, formulation of management plans that ensure sustainable levels of exploitation are extremely difficult.

most of these deep-sea fisheries are not regulated sufficiently to ensure sustainable levels of exploitation of target species

For most areas, with the possible exception of the Southern Ocean, most of these deep-sea fisheries are also not regulated sufficiently to ensure sustainable levels of exploitation of target species or mortality of non-target by-catch species. Fishery management plans for deep-sea fisheries in high seas areas and the establishment of biological reference points aimed at ensuring the long-term sustainability of deep-sea fisheries are rare.

ENCOUNTER RULES

The requirement to establish rules to ensure that fishing ceases when potential VMEs are encountered is a complex area of the UNGA resolutions. Implementation of these rules is particularly problematic for deep-water regions of the high seas where there are few data available on benthic ecosystems and the interactions between bottom fishing gear and VMEs. Encounter protocols have been generally implemented as move-on rules, whereby, at a threshold weight of by-catch of VME-associated species in a single trawl tow or set of static fishing gear, a vessel moves away from the area and reports the encounter. In some cases, the diversity of VME-associated species is also taken into account.

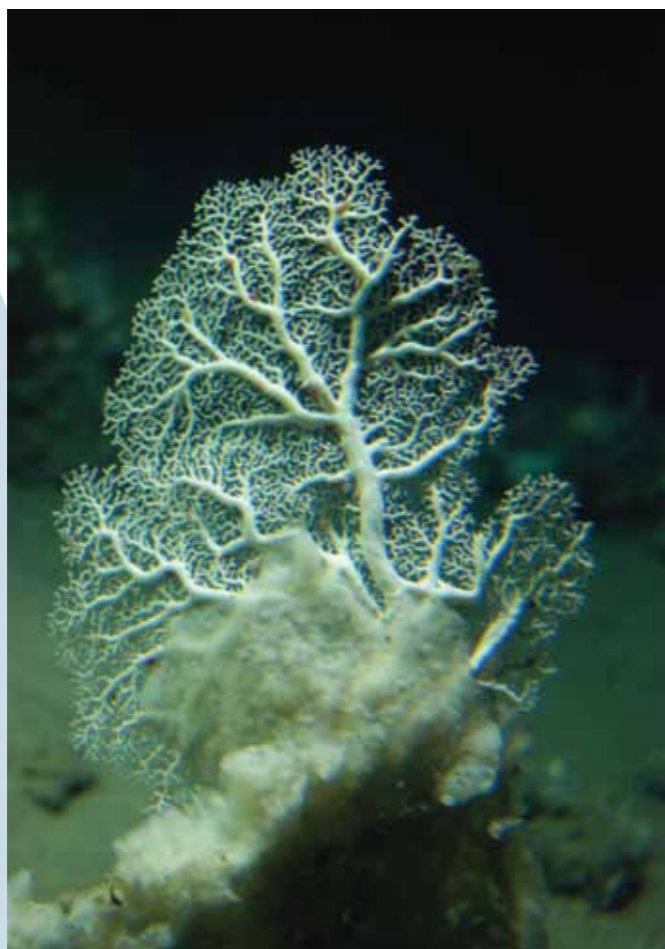
A number of significant problems with move-on rules were identified in the present report. For many RFMOs, move-on rules for VME encounters apply to only a limited number of VME-related species, despite scientific evidence of and, sometimes, specific advice by scientific bodies on the presence of, various types of VMEs within RFMO Regulatory Areas. This has resulted from RFMOs using only the example VMEs mentioned in UNGA Resolution 61/105 and the FAO Guidelines or from simply using move-on rules developed by other RFMOs without considering the specific biogeography or biodiversity within a region. Further, the threshold by-catch weights that trigger move-on rules are set at such a high level by many RFMOs that they are unlikely to result in triggering the action to cease fishing in the vicinity of a VME, nor to report the presence of a VME to the responsible management authority. Many RFMOs are also using the same threshold levels for different kinds of fishing gear and for different kinds of organisms. These practices fail to take into account the different impacts of active and passive fishing gear, nor the different vulnerability and likelihood of retention of different VME species when impacted by fishing gear. In most cases, this is likely to lead to underestimation of VME encounters. Many RFMO encounter rules require a vessel to move two nautical miles (nm) when a threshold weight of VME organisms is caught as by-catch. This is likely to be ineffective as a conservation measure for mobile fishing gears with long tow times as it is impossible to identify where a VME encounter occurs along a tow using commercial bottom trawl gear (commercial trawl tows are up to 20nm long). In this case the mid-point of the tow, usually the point used as the centre of the 2nm temporary

exclusion zone for the fishing vessel, could be as far as 10nm from the actual VME. It is also questionable whether a 2nm move-on rule is effective for passive fishing gears, such as long-lines, where the gear may be up to 20km long, although a better idea of encounter position can be attained by recording which VME species were caught on which segments of the gear and then estimating the area of encounter on the seabed from the position of deployment. Several RFMOs (e.g. NEAFC, NAFO) also use move-on rules that differentiate between fished and non-fished areas. This is inconsistent with Paragraph 23 of the FAO Guidelines, which requires that deep-sea fisheries should be rigorously managed throughout all stages of their development, including experimental, exploratory and established phases.

The following table provides an overview of actions taken, or not taken, by existing and incipient RFMOs in relation to the key actions called for in the 2006 UNGA Resolution 61/105 and reinforced by Resolution 64/72.

SUMMARY OF THE FINDINGS OF THE REPORT ON THE IMPLEMENTATION OF UNGA RESOLUTIONS AND FAO GUIDELINES BY RFMOs

The table shows a selection of managed and unmanaged stocks of target and by-catch species (the list is not necessarily complete for unmanaged stocks). It also shows whether scientific recommendations have been followed by RFMOs in setting sustainable harvest levels of target and by-catch species, whether or not there is evidence of non-reporting or misreporting of catches and information on closed areas, and the application of the move-on rule. Whether or not Contracting Parties have submitted environmental impact assessments for fisheries has also been included. Note: A managed fishery is one where reliable catch data have been collected in recent years (last 5 years) and preferably where there has been fisheries-independent scientific assessment of stock status. On the basis of these data, harvest and management plans have been developed by fisheries scientists to determine TACs appropriate to maintain the long term sustainability of the fishery. In some cases where data are not available precautionary TACs have been set. These cases are denoted with a '*' symbol.



Stylasterid or hydrocoral, Faial Island, Azores, 350-500m depth (© A.D. Rogers and the Rebikoff Foundation).

	Deep-water species managed	Deep-water species not managed	TACs fall within scientific recommendations	Evidence of misreporting of catches or catches being unreported
NEAFC	<i>Hoplostethus atlanticus</i> ; <i>Micromesistius poutassou</i> ; <i>Sebastes mentella</i>	<i>Alepocephalus bairdii</i> ; <i>A. rostratus</i> ; <i>Argentina silus</i> ; <i>Beryx</i> spp.; <i>Brosme brosme</i> ; <i>Chaceon affinis</i> ; <i>Chimaera monstrosa</i> ; <i>Coryphaenoides rupestris</i> ; <i>Epigonus telescopus</i> ; <i>Helicolenus dactylopterus</i> ; <i>Hydrolagus</i> spp.; <i>Lepidopus caudatus</i> ; <i>Macrourus berglax</i> ; <i>Molva molva</i> ; <i>Phycis blennoides</i> ; <i>Polyprion americanus</i> ; sharks ²	No. Examples: <i>Hoplostethus atlanticus</i> ; <i>Sebastes mentella</i>	Yes
NAFO	<i>Pandalus</i> spp.; <i>Penaeus</i> spp.; Rajidae; <i>Reinhardtius hippoglossoides</i> ; <i>Sebastes</i> spp.; <i>Urophycis tenuis</i>	<i>Anarhichas lupus</i> ; <i>Anarhichas minor</i> ; <i>Anarhichas denticulatus</i> ; <i>Antimora rostrata</i> ; Chimaeridae; <i>Coryphaenoides rupestris</i> ; <i>Macrourus berglax</i> ; sharks	No. Examples: <i>Sebastes</i> spp. and skates	Yes
GFCM	<i>Aristeus antennatus</i> ; <i>Merluccius merluccius</i> ; <i>Nephrops norvegicus</i> ; <i>Parapenaeus longirostris</i>	Sharks; others not known	Not identified in current report	Unknown
SEAFO	<i>Beryx</i> spp.*; <i>Chaceon</i> spp.*; <i>Dissostichus eleginoides</i> *; <i>Hoplostethus atlanticus</i> *; <i>Pseudopentaceros richardsoni</i> *; sharks*	Not Known	Unknown	Unknown
NPFC	None	<i>Allocyttus verrucosus</i> ; <i>Beryx decadactylus</i> ; <i>Beryx splendens</i> ; <i>Chaceon</i> spp.; <i>Chioniocetes tanneri</i> ; <i>Corallium</i> spp.; <i>Coryphaenoides</i> spp.; <i>Epigonus denticulatus</i> ; <i>Erilepis zonifera</i> ; <i>Helicolenus</i> spp.; <i>Lepidocybium flavobrunneum</i> ; <i>Paralomis</i> spp.; <i>Physiculus</i> spp.; <i>Pseudopentaceros wheeleri</i> ; sharks; <i>Zenopsis nebulosa</i> ; and many other species	No. Example: <i>Beryx splendens</i>	Yes
SPRFMO	None	<i>Allocyttus niger</i> ; <i>Allocyttus verrucosus</i> ; <i>Beryx</i> spp.; <i>Caprodon longimanus</i> ; <i>Centroberyx affinis</i> ; <i>Dissostichus eleginoides</i> ; <i>Epigonus</i> spp.; <i>Etelis carbunculus</i> ; <i>Etelis coruscans</i> ; <i>Helicolenus</i> spp.; <i>Hoplostethus atlanticus</i> ; <i>Jasus</i> spp.; Macrouridae; <i>Micromesistius australis</i> ; <i>Mora moro</i> ; <i>Nemadactylus</i> spp.; <i>Neocyttus rhomboidalis</i> ; <i>Paristiopeterus labiosus</i> ; <i>Pentaceros richardsoni</i> ; <i>Pentaceros japonica</i> ; <i>Polyprion oxygeneios</i> ; <i>Polyprion americanus</i> ; <i>Pseudocyttus maculatus</i> ; <i>Rexea</i> spp.; <i>Seriola lalandi</i> ; sharks	Not identified in current report	Unknown
SIOFA (South Indian Ocean Fisheries Agreement)	None	<i>Beryx decadactylus</i> ; <i>Beryx splendens</i> ; <i>Epigonus</i> spp.; <i>Hoplostethus atlanticus</i> ; <i>Pseudopentaceros richardsoni</i> ; <i>Plagiogeneion rubiginosum</i> . All other low-productivity deep-sea species taken as catch or by-catch	N/A	Unknown
CCAMLR	<i>Champscephalus gunnari</i> ; <i>Dissostichus eleginoides</i> ; <i>Dissostichus mawsoni</i> ; Macrouridae; Rajiformes	<i>Antimora rostrata</i> and other species	Yes	No

² Note that many of these species are listed as "regulated" by NEAFC but are only covered by general measures to reduce effort on deep-sea fisheries (NEAFC, 2010a). These measures have not been effective at reducing catches of deep-sea species collectively and do not represent effective management of individual species (see main report).

	Closure of areas to protect VMEs	Closures for other reasons	Move-on rule	Threshold		Environmental impact assessments of fisheries
				Coral (kg)	Sponge (kg)	
NEAFC	Yes >10	Yes	Yes	60	800	No
NAFO	Yes >10	No	Yes	60	800	No
GFCM	Yes <5 but fishing banned below 1000m depth	No	No	N/A	N/A	No
SEAFO	Yes >10	No	Yes	60	800	No
NPFC	No	Yes. (Spatial measures for alfonsino)	Yes	50	N/A	Yes
SPRFMO	No, but note that New Zealand has closed areas to its vessels	No	Yes	30 (New Zealand) 100 (Spain)	50 (New Zealand) 1000 (Spain)	Yes
SWIO	Yes	Yes	No	N/A	N/A	No
CCAMLR	Yes	Yes	Yes	10	10	Yes

Recommendations

The following are a set of recommendations for improving the implementation of UNGA Resolutions 61/105 and 64/72 by RFMOs and flag states, including in regions where RFMOs are under negotiation or have not yet been established. These are organised to reflect the four key requirements of the resolutions.

Conduct assessments of whether bottom fishing activities have significant adverse impacts on VMEs

- A standard for assessments of deep-sea bottom fisheries on the high seas should be developed with participation of fisheries managers, the industry and scientists. Examples of comprehensive assessments exist (e.g. New Zealand assessments for CCAMLR and SPRFMO) and can be built upon.
- Part of any assessment should include consideration of which VMEs are present within the geographic region in which fishing activities occur or will occur, in accordance with the FAO Guidelines. These should include fragile habitats with a low resilience to fishing impacts and biologically significant areas, such as spawning grounds and threatened or endangered species. Such data are often unavailable for deep-sea ecosystems so this may require investment in new research and/or synthesis of existing data.
- States whose vessels engage in bottom fisheries on the high seas should perform impact assessments consistent with the criteria agreed in the FAO Guidelines (paragraphs 47, 42, 17–20) as a *precondition* to further authorising bottom fishing in areas that have been historically fished as well as those where exploratory fishing activities are proposed.

To ensure that if fishing activities have significant adverse impacts they are managed to prevent such impacts, including through closing areas to bottom fishing where VMEs are known or likely to occur, or they are not authorised to proceed

- Where impact assessments cannot make a clear determination that bottom fishing

will not produce SAIs on VMEs, fishing should be prohibited, particularly in respect of bottom trawl fisheries, in accordance with the precautionary approach, especially where knowledge of deep-sea ecosystems is deficient.

- All areas where VMEs are known or likely to occur should be closed to bottom fishing with immediate effect, unless or until an assessment has determined that management measures for fisheries in these areas would not result in SAIs to VMEs.
- States should implement measures sufficient to protect VMEs, even where an RFMO fails to adopt sufficient measures, e.g. if the decision-making structure of an RFMO has allowed one or more Contracting Parties to block the adoption of measures necessary to effectively implement UNGA Resolutions 61/105 and 64/72, the other Contracting Parties should nonetheless establish measures to regulate their high seas fleets to ensure the full and effective implementation of the UNGA resolutions.
- The widespread deep-sea bottom fisheries on the high seas in the 1960s to 1990s have impacted on a large area of the seabed likely to be suitable for the occurrence of VMEs. The species diversity of many such ecosystems is unknown, as is the capacity for recovery. Where there is a history of bottom fishing on the high seas then, at a minimum, states and RFMOs should establish closures of representative sites in historically fished areas where VMEs are likely to have previously occurred, to allow for recovery or regeneration of degraded areas.
- All closures of areas of seabed to bottom fishing should be considered within the framework of a network of protected areas, with clear objectives in terms of conservation and/or fisheries management.

To establish and implement protocols to cease fishing where an encounter with VMEs occurs during fishing activities, and to report such encounters so that appropriate measures can be adopted with respect to that site

- The trigger thresholds for encounter rules should be based on rigorous scientific analyses of relationships between by-catch and the presence of VMEs within the geographic region in which bottom fishing activities take place. Such analyses can be undertaken on fisheries-independent catch data or on fisheries data in combination with scientific surveys or other information. Thresholds should be specific to particular groups or size-classes of organisms and to the fishing gear and methods used.
- Evidence of by-catches of VME indicator species at levels indicated by scientists to represent a likely encounter with a VME should trigger an immediate (and at least temporary) cessation of fishing and closure of the area until an assessment of the area has been conducted and a determination has been made as to whether fishing can be resumed in the area without SAIs on VMEs.
- Move-on rules should ensure that subsequent to an encounter there is no risk of SAIs occurring on identified VMEs as a result of continuing fishing activities. Move-on distances should reflect the accuracy with which the location of a VME has been identified.

To implement measures in accordance with the precautionary approach, ecosystems approaches and international law, and to sustainably manage deep-sea fish stocks

- The fish stocks targeted by deep-sea bottom fisheries should be subject to scientific assessment of status at a minimum of every five years or more frequently where scientists and managers consider it appropriate. Based on such assessments, TACs should be determined that ensure long-term sustainability.
- The impact of fishing mortality on by-catch

species should be assessed to determine whether there are SAIs on population viability. Where such impacts take place, management measures should be applied to ensure the long-term sustainability of populations of non-target species.

- Scientific recommendations on annual catches and other measures to ensure the sustainability of target and by-catch species should be adopted by RFMOs and states unless a clear case can be made that the information on which such decisions were based is inaccurate. This is likely to occur when new information becomes available. In situations where there is a dispute over scientific information or advice, the precautionary approach should be adopted when making management recommendations for a stock.
- High seas fisheries taking low-productivity species (either as targeted catch or as by-catch), where the long-term sustainability of the target species or viability of populations of non-target species cannot be ensured through management plans based on sound scientific assessment of the state of stocks or populations, should be closed. Such fisheries should remain closed until management plans are in place and can ensure, with a high degree of confidence and taking into account any uncertainties with regard to data or other information, that such fisheries are sustainable and consistent with ecosystem-based and precautionary approaches.
- All deep-sea bottom fisheries operating on the high seas should ensure that data on catches, utilised by-catch and discards are collected accurately and to the species level. Where there are issues of species identification then by-catch should be retained for expert identification on land or observers with the expertise to accurately evaluate catch should be carried.
- Where misreporting is suspected, systems that ensure correct reporting of catches should be implemented.
- In regions where there are few data, collaborative programmes between managers, scientists and industry should be established to help with identification of catch and by-catch species.