

Distr.: General
14 July 2020

Original: English

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significant adverse impacts, it is generally accepted that habitat structural complexity is an especially important defining characteristic of a deep-sea VME.⁶ VMEs of potential significance for fish and fisheries tend to possess some level of habitat structural complexity, including the presence of “significant concentrations” of individuals (or biomass) supporting a high diversity of organisms, which typically cover an area of seabed habitat greater than the space occupied by the VME indicator species themselves.⁷ However, the mere presence of a VME indicator species or a habitat feature in itself does not necessarily define the presence of a VME.⁸

12. Although advances have been made in the quantitative determination of what constitutes a “significant concentration” of habitat-forming VME indicator species, defining “significant concentrations” of VME indicator species in the context of identifying and delineating the extent of VMEs remains a challenge for many RFMO/As.⁹

13. Determining the location and extent of deep-sea VMEs (or their likely location

between habitats (pelagic and benthic) in space and time, connecting populations and communities of marine organisms.²²

18. An understanding of the ecological connectivity between VMEs (of the same type) is particularly important when establishing management measures to protect VMEs, because the number, extent and location of VME protected areas will underpin the sustainability of populations of VME indicator species at levels that maintain their essential functional processes.²³

19. Biophysical models for replicating the larval dispersion patterns of key taxa are increasingly used to assess the ecological connectivity between spatially discrete habitat areas.²⁴ However, uncertainties with regard to model parameters, especially in relation to VME indicator species' reproductive biology and larval ecology (for example, planktonic larval durations) currently limit their utility in designing appropriate networks of marine protected areas.²⁵

20. Nevertheless, it has been shown for selected deep-sea habitats in the northwest

41. The present section describes actions taken to give effect to the relevant paragraphs of General Assembly resolutions 64/72, 66/68 and 71/123 by RFMO/As with the competence to regulate bottom fisheries:⁶⁶ the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), the General Fisheries Commission for the Mediterranean (GFCM), the Northwest Atlantic Fisheries Organization (NAFO), the North East Atlantic Fisheries Commission (NEAFC), the North Pacific Fisheries Commission (NPFC), the South East Atlantic Fisheries Organization (SEAFO), the South Indian Ocean Fisheries Agreement (SIOFA) and the South Pacific Regional Fisheries Management Organization (SPRFMO).

42. A number of RFMO/As reported on the criteria used for identifying VMEs, applying the FAO Guidelines, and related research activities for identifying VMEs.⁶⁷ Some also reported on related measures for assessing the impact of bottom fisheries on VMEs.⁶⁸

43. CCAMLR reported that it was continuing to implement conservation measures 22-06 (updated and in force since 2019) and 22-07 (updated and in force since 2013), which required preliminary assessment of the impact of planned activities on VMEs. Those measures also provided mechanisms for cataloguing VMEs identified through scientific research or VME risk areas identified through encounters with fishing gear, and prohibited fishing on VMEs or VME risk areas.

44. GFCM reported that, although it had not defined VMEs in its conservation and management measures, it had adopted fisheries restricted areas as a multi-purpose area-based management tool to restrict fishing and protect essential fish habitats and deep-sea sensitive habitats based on the ecosystem approach to fisheries. The criteria for those restricted areas followed those for VMEs under the FAO Guidelines.⁶⁹

45. NAFO reported that its European Union-funded NEREIDA project represented a major multidisciplinary research effort on sensitive habitats and fishing activities in

the NAFO Conservation and Enforcement Measures for 2019, of identifying VMEs and providing the Executive Secretary with the resulting data for circulation to the Contracting Parties.⁷¹

46. SEAFO noted that the definition of VMEs in its conservation measure 30/15, which had come into force in 2016, was derived from paragraphs 42 and 43 of the FAO Guidelines. Basic mapping and identification of VMEs and fisheries resources in a selection of seamounts and seamount complexes had been conducted in research cruises in 2015 and 2019. With support from the EAF (ecosystem approach to fisheries) Nansen Programme, another survey had been proposed for 2020.

47. SIOFA reported that it had used the criteria set forth in paragraph 42 of the FAO Guidelines for the definition of VME in its interim conservation and management measure 2019/01. Its Scientific Committee was required to provide recommendations to the SIOFA Meeting of the Parties on, among other things, a SIOFA bottom fishing impact assessment standard taking into account the latest scientific information and maps indicating where VMEs were known or likely to occur in the SIOFA Agreement Area.

place was prohibited. Under an encounter protocol developed on the basis of existing interim and voluntary measures to safeguard VMEs, members were required to ensure that vessels flying their flags ceased bottom fishing in areas where the threshold had been met and not to resume fishing until they had relocated far enough away to render further encounters with VMEs unlikely.

61. SIOFA reported that its interim measures related to effort limitation, identification of VMEs, move-on rules and the provision of data by the Contracting Parties (conservation and management measure 2019/01). In 2019, SIOFA had adopted conservation and management measures 2019/13 and 2019/15 for demersal stocks in the SIOFA Agreement Area.⁷³

62. SPRFMO reported that in 2020 it had adopted amendments to its conservation and management measures relating to the weight thresholds for triggering the VME encounter protocol with a view to making the bottom fishing framework more precautionary.

63. Following the calls by the General Assembly in paragraph 119 (b) of resolution 64/72, paragraph 132 of resolution 66/68 and paragraph 182 of resolution 71/123, a number of RFMO/As have closed or kept closed areas where VMEs occur or are likely to occur pending the adoption of conservation and management measures.

64. GFCM reported that it had established fisheries restricted areas that, although they might not address the protection of VMEs as a conservation priority, would protect essential and vulnerable fish habitats within the closed areas. Three such restricted areas had been established in the Strait of Sicily in 2016 and one in the Adriatic Sea in 2018, thereby helping to protect essential habitats for demersal stocks such as European hake and Norway lobster.

65. NAFO reported that, on advice from its Scientific Council that VMEs in the NAFO Regulatory Area could best be protected by closing areas with significant concentrations of VME indicator species,⁷⁴ it had identified 21 areas within its Convention Area as vulnerable to bottom contact gear and closed them to bottom fishing.⁷⁵ The closed areas were divided into two categories: seamount closures and sponge, coral and sea pen closures. As reflected in article 17 of its Conservation Enforcement Measures for 2020, no vessel was allowed to engage in bottom fishing in any of the closed areas.⁷⁶

66. NEAFC reported that areas in existing and new bottom fishing areas had been closed to bottom fishing to prevent any significant adverse impact on VMEs. Parts of other existing bottom fishing areas were subject to various measures, including reporting duties and encounter protocols. A reported encounter with a VME would result in a temporary closure of the relevant area.

67. On advice from the International Council for the Exploration of the Sea (ICES) in 2018, NEAFC had renewed to 31 December 2022 closures that had been due to expire by 31 December 2017. Area (I) Hatton–Rockall Basin had been significantly enlarged to take into account new records of deep-sea sponge aggregations found at a depth of 1,200 m.

⁷³ See also the report of the Sixth Meeting of the Parties to the Southern Indian Ocean Fisheries Agreement (SIOFA), held from 1 to 5 July 2019 in Flic en Flac, Mauritius.

⁷⁴ See also [A/71/351](#) (para. 74).

⁷⁵ See www.nafo.int/Fisheries/VME.

⁷⁶ See www.nafo.int/Portals/0/PDFs/COM/2020/CEM-2020-web.pdf.

74. NAFO reported that, under article 24 of its Conservation and Enforcement Measures, it was required to review its VME measures in 2020.

75. NEAFC reported that its binding recommendations were backed up by a comprehensive scheme of control and enforcement, including measures to ensure that all fishing vessels were notified and authorized to fish in the

improvements in conservation and management measures.⁷⁹ The scheme provided for preventive and remedial action to be taken in cases of non-compliance, in accordance with paragraph 16 (a) of conservation and management measure 10-2020.

81. Compliance among SPRFMO members had improved and there had been a decrease in priority non-compliance, as highlighted in the report of its Compliance and Technical Committee. SPRFMO had agreed to all the recommendations proposed by that body, including with regard to the selection of the SPRFMO observer accreditation provider.⁸⁰

82. Some RFMO/As have established ongoing procedures or mechanisms to review and update their conservation and management measures, including with regard to the identification of VMEs and the assessment of the impact of bottom fishing on them (see parag

105. Australia reported that it had submitted its bottom fishing impact assessment in the SIOFA Area in 2018. It had already been developed in 2011 in line with General Assembly resolutions [64/72](#) and [66/68](#). An updated assessment had been submitted to the SIOFA Scientific Committee in 2020.

106. The European Union reported that, under Regulation (EU) 2016/2336 of the European Parliament and of the Council of 14 December 2016 establishing specific conditions for fishing for deep-sea stocks in the north-east Atlantic and provisions for fishing in international waters of the north-east Atlantic and repealing Council Regulation (EC) No 2347/2002, an evaluation of the impact of measures should be carried out by no later than 13 January 2021.

107. In connection with the obligation to carry out an impact study, France reported on its risk analysis for Natura 2000 sites.

108. New Zealand reported that it had conducted impact assessments of all bottom fishing activities by its vessels in the CCAMLR and SPRFMO Convention Areas. As required by SPRFMO, New Zealand and Australia were undertaking a joint cumulative bottom fishing impact assessment in 2020. New Zealand had also contributed to improving procedures within CCAMLR for evaluating, reviewing and revising assessments.

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109. Several respondents reported on a wide range of conservation and eÃ 09.

151. SEAFO reported that assessments conducted by its scientists were compiled in scientific reports and made available on the SEAFO web page. Catch data were submitted to FAO annually.

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central portal for data on the distribution and abundance of VMEs across the north Atlantic and observations of VME indicators and habitats.

173. NPFC reported that it had developed a five-year research plan for the period 2017–2021 to address such VME issues as a review of the encounter protocol and the exploratory fishery protocol, the development of identity guides for VME indicators and a by-catch list, the development of an NPFC VME map, an assessment of significant adverse impact on VMEs indicator species, and a review of the availability of VME-related data.

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bottom fishing in ABNJ and the measures that they had adopted to give effect to the relevant provisions of General Assembly resolutions [61/105](#) and [64/72](#).

196. It had been highlighted in a FAO technical paper, entitled “Deep-ocean climate change impacts on habitat, fish and fisheries”, that information from the deep oceans, although limited, was sufficient to identify changes attributable to climate change at the oceanographic and biological levels. It had been predicted that significant changes would occur in deep oceans in the coming 20 to 30 years.

197. Capacity-building had been incorporated at various levels in the Organization’s activities to support the implementation of the FAO Guidelines. Initiatives included the use of species identification tools, on-the-job training during research surveys, training in the analysis of the resulting information, and training and capacity development in relation to all aspects of the FAO Guidelines.

198. An FAO training workshop on the identification and biological sampling of deep-sea benthic fauna, with a focus on corals and sponges, had been held in Vigo, Spain, from 13 to 15 November 2018. Nine scientists from Mauritania, Mauritius, Mozambique, Namibia, Senegal, the Seychelles and Sierra Leone had been trained on the taxonomy of deep-sea invertebrates and had acquired basic skills in on-board sampling, preservation techniques and the storage of specimens.

199. In the 2030 Agenda for Sustainable Development, States made a commitment to end destructive fishing practices and sustainably manage and protect marine and coastal ecosystems in order to avoid significant adverse impact, including by strengthening their resilience, and to work to restore them in order to achieve healthy and productive oceans by 2030.

200. Since the adoption of General Assembly resolution [61/105](#), Sta

