

SPATIAL MANAGEMENT OF IMPACTS ON THE ANTARCTIC ECOSYSTEM

Bottom fishing and vulnerable marine ecosystems

5.1 The Scientific Committee reviewed discussion and received advice regarding bottom fishing and VMEs from WG-SAM (Annex 4, paragraphs 4.1 to 4.9), WG-EMM (Annex 6, paragraphs 3.1 to 3.58) and WG-FSA (Annex 8, paragraphs 9.1 to 9.37 and Appendix E). Substantive aspects of work conducted by WG-EMM were extended by WG-FSA and, therefore, discussions summarised below reference paragraphs from both groups.

Glossary

5.2 Recognising the need for a glossary of terms relevant to the consideration and management of VMEs in the CCAMLR area, the Scientific Committee endorsed definitions for the following terms: fragility, resilience, vulnerability, threat, instantaneous impact, cumulative impact, fishing footprint, ecological consequence and risk. The definitions for these terms are provided in the Report on Bottom Fisheries and Vulnerable Marine Ecosystems (Annex 8, Appendix E, Attachment A); this report also includes a diagram that provides a useful illustration of the conceptual relationships between terms in the glossary (Annex 8, Figure 3).

5.3 The Scientific Committee also considered alternative ways of defining the term 'Vulnerable Marine Ecosystem'. Two approaches were considered by WG-FSA (Annex 8, paragraphs 9.9 to 9.11), and discussion is ongoing to reach an agreed definition. The Conveners of WG-EMM and WG-FSA were requested to correspond with Members intersessionally to reach a conclusion on this issue.

5.4 Acknowledging that (i) available estimates of the cumulative impact of bottom fishing on benthic communities are not dependent on defining the term VME, and (ii) that substantial progress has been made to address a suite of topics relevant to bottom fishing, and using the agreed glossary, the Scientific Committee agreed that it could provide advice on precautionary management actions that can be taken to mitigate immediate risks to VMEs without the definition of a VME.

Impact assessments

5.5 The Scientific Committee noted WG-FSA's review of preliminary impact assessments provided in conjunction with Members' notifications to participate in new and exploratory fisheries (Annex 8, paragraph 9.15 and Appendix E, Table 2). The preliminary impact assessments submitted in 2010 were much more complete compared to those submitted in 2009. Most of these preliminary assessments provided detailed information and diagrams of gear configuration, proposed effort and anticipated impacts, but direct comparisons of these assessments were not considered appropriate (Annex 8, paragraph 9.17). Further review of the information requested in CM 22-06, Annex A, indicated that the pro forma used to facilitate Members' preliminary impact assessments could facilitate comparisons if it was made more succinct and streamlined (Annex 8, paragraph 9.18).

5.6 The Scientific Committee recommended that the revised Annex 22-06/A pro forma developed by WG-FSA (Annex 8, Appendix D) be adopted by the Commission. Submission of information in this pro forma will facilitate the work of WG-FSA to estimate the spatial footprint and potential impact of notified fishing activities in forthcoming fishing seasons.

5.7 The Scientific Committee reviewed results from work by WG-FSA to provide combined, cumulative fine-scale bottom fishing impact assessments for all bottom fishing methods in all subareas and divisions included under CMs 22-06 and 22-07. During the course of this review, the Scientific Committee recognised relevant points made by both WG-FSA and WG-EMM.

- (i) WG-FSA noted that results from the combined impact assessment for longlining, a full description of which is included in the Report on Bottom Fisheries and Vulnerable Marine Ecosystems (Annex 8, Appendix E), ‘demonstrate that within the fished areas of each subarea or division, fishing effort is distributed unevenly, with most fished pixels experiencing impacts less than 0.4%, and with higher impacts concentrated in a few pixels. Applying the mean impact index estimate, 41 of 10 155 fished pixels in all the subareas included within CM 22-06 are estimated to have experienced greater than 3% longline impact for the most fragile VME taxa. The single-highest fine-scale pixel-specific longline impact estimate is 10.07%’ (Annex 8, paragraph 9.25).
- (ii) WG-EMM agreed ‘that there are currently data available to inform estimates of impact, but that the functional form of the relationship between impact and ecological consequence is currently unknown, and that various hypothetical forms of the relationship between impact and ecological consequence may be plausible, including linear, non-linear, stepwise or a variety of other forms; any of which may be taxon or assemblage specific’ (Annex 6, paragraph 3.6; Annex 8, Figure 3).

5.8 To develop combined cumulative impact assessments for all bottom fishing methods that can be updated annually, the Scientific Committee requested Members to complete method assessments for Spanish longlines, trotlines, pots and trawls comparable to the method assessment that has been done for autolines (see e.g. WG-SAM-10/20).

Notifications under CM 22-06 and Risk Areas under CM 22-07

5.9 The Scientific Committee considered advice from WG-EMM regarding two notifications of encounters with potential VMEs during a fishery-independent trawl survey in Subarea 48.2 (Annex 6, paragraphs 3.42 and 3.43). These notifications were submitted on the basis of observing anomalously high densities of two indicator taxa at two survey stations, and it was agreed that these high densities were not likely to be artefacts of the survey sampling design. Thus, the Scientific Committee advised that the two sites should be entered into the VME Register (Annex 8, Appendix E, Attachment B).

5.10 Recognising that a number of approaches could be used to justify notification of a potential VME under CM 22-06, including (but not limited to): (i) anomalously high densities of VME taxa; (ii) observed rare or unique benthic communities; (iii) high diversity of VME

taxa; (iv) benthic communities likely to be of particular importance for ecosystem function or species' life cycles; or (v) benthic communities with other characteristics likely to be vulnerable to bottom fisheries activities (Annex 6, paragraph 3.48), the Scientific Committee agreed that notifications of encounters with VMEs during fishery-independent research activities should not be constrained by the format of CM 22-06, Annex B. Members were encouraged to provide additional supplemental information to support notifications under CM 22-06, and it was noted that each notification should be considered on its own merits.

5.11 During further consideration of approaches to justify notification of potential VMEs, it was noted that compact autonomous camera systems can allow rapid, efficient and inexpensive collection of data about benthic habitats. Members were encouraged to use such camera systems to map the distribution of vulnerable habitats and establish links between catch rates of bottom fisheries and organism density on the seafloor (Annex 6, paragraph 3.41).

5.12 Recognising that a process to review Risk Areas is required by CM 22-07, the Scientific Committee endorsed advice from WG-EMM that such a process should reference all available information on the nature, abundance and ecological importance of VME taxa and benthic organisms in each Risk Area under review. A listing of such information is provided in the Report on Bottom Fisheries and Vulnerable Marine Ecosystems (Annex 8, Appendix E, paragraph 15).

Progress on the Scientific Committee's work plan on bottom fisheries

5.13 The Scientific Committee agreed that Members, WG-EMM and WG-FSA had made substantial progress on a variety of elements in its work plan related to bottom fisheries. Progress on the work plan is summarised in the Report on Bottom Fisheries and Vulnerable Marine Ecosystems (Annex 8, Appendix E, paragraph 62).

Marine Protected Areas

5.14 The Scientific Committee endorsed the advice of WG-EMM regarding terminology relevant to bioregionalisation and systematic conservation planning (Annex 6, paragraphs 3.105 and 3.106). The Scientific Committee recalled its advice in 2005 (SC-CAMLR-XXIV, paragraph 3.54) that: (i) the whole Convention Area is equivalent to an IUCN Category IV MPA, but there are areas within the Convention Area that require further special consideration in a representative system; and (ii) the ideas, concepts and terminology used by CCAMLR were to fulfil the objectives specified in Article II of the Convention and may not be related to terminology used elsewhere.

5.15 The Scientific Committee also endorsed the advice of WG-EMM which referred to ecological terminology in systematic conservation planning (Annex 6, paragraph 3.108). The Scientific Committee recognised that it was currently not feasible to develop a single set of terms that would adequately and accurately describe the classification of ecosystem components, processes and properties across all scales for all MPAs. However, the Scientific Committee agreed that it would help increase understanding amongst the CCAMLR community if practitioners of such planning could, to the extent possible, explain how they

have implemented the systematic conservation planning principles. It was agreed that different analytical methods may be used to develop proposals for MPAs, based on systematic conservation planning.

5.16 The Scientific Committee reviewed approaches to bioregionalisation and agreed that Members planning to undertake bioregionalisation and systematic conservation planning in the Convention Area should (Annex 6, paragraph 3.110):

- (i) where biological data are lacking, use bathymetric, oceanographic or climatological data indicative of biogeographic boundaries to define large-scale biogeographic provinces within which spatial planning will occur separately;
- (ii) where biological and other spatial data are available, use appropriate datasets to locate areas containing ecosystem processes that may constitute conservation objectives in their own right and represent these areas as separate spatial overlays;
- (iii) generate separate pelagic and benthic bioregionalisations;
- (iv) for pelagic bioregionalisations, consider the selection of the following large-scale environmental drivers: (a) depth, (b) water mass characteristics, and (c) dynamic ice behaviour.

Rational use

5.17 The Scientific Committee agreed that it was important for both the Scientific Committee and Commission to provide guidance on how to address the topic of rational use in the development of a Representative System of Marine Protected Areas (RSMPAs) (Annex 6, paragraph 3.117). In response to a recommendation by WG-EMM (Annex 6, paragraph 3.118), Dr Constable had coordinated an informal intersessional discussion which resulted in a paper focusing on how scientific issues related to rational use may be considered in the development of MPA proposals (SC-CAMLR-XXIX/BG/9); he noted that this paper represented a point in time at which comments in an ongoing discussion were compiled. There was no attempt to weigh the merits of various points of view nor to consolidate a single view. The discussion included a number of topics, such as data needs, data availability and how to further progress on MPAs in the absence of comprehensive ecological data.

5.18 Members acknowledged that a discussion of how rational use can best be incorporated into MPA planning has relevance to the Scientific Committee, but that discussions of what types of activities constitute rational use and how to measure success in balancing rational use and conservation was primarily a Commission issue.

5.19 The Scientific Committee observed that a discussion on the balance between conservation and rational use would benefit from scientific understanding of the marine ecosystem. It was noted that the selection of methodologies to assess the goals of rational use and conservation goals was a complex matter, which would benefit from further discussion by the Scientific Committee.

5.20 The Scientific Committee recalled that it had agreed that it should, as a priority, continue the process of consolidating scientific views to maintain a common basis for the development of MPAs (SC-CAMLR-XXVII, paragraph 3.55(iv)). The Scientific Committee noted that it was important to create a transparent process by which multiple objectives for spatial protection could be considered in balance with rational use. It agreed that the discussions would best proceed with a focus on individual MPA proposals, rather than at a broad overarching scale. This is due to the expectation that different MPAs could have a different combination of objectives as agreed by CCAMLR-XXIV, paragraph 4.14, i.e. protection of ecosystem processes, habitats and biodiversity, and protection of species, including population and life-history stages. In the development of MPA proposals there is a need to clearly identify how achievement of the objectives will be assessed, while taking account of uncertainty.

MPA Workshop

5.21 The Convener of WG-EMM noted that there was agreement on a set of milestones to progress the development of MPAs (SC-CAMLR-XXVIII, paragraph 3.28). To achieve the second milestone, the Scientific Committee agreed to convene a workshop in 2011 to review progress, share experience on different approaches to the selection of candidate sites for protection, to review draft proposals for MPAs in the CAMLR Convention Area, and to determine a work program for the identification of MPAs in as many of the priority regions as possible (and other regions as appropriate).

5.22 The Scientific Committee endorsed the following terms of reference, based on advice provided by the MPA Special Fund Correspondence Group (Annex 6, paragraph 3.126):

- (i) To review progress on the development of a Representative System of Marine Protected Areas (RSMMPAs) in the Convention Area, including consideration of:
 - (a) recently designated MPAs and other spatial protection/management measures;
 - (b) proposals for new MPAs and other spatial protection/management measures.
- (ii) To share experience on different approaches to the selection of candidate marine sites for protection, including consideration of:
 - (a) types of scientific information that could be used for the identification of areas of conservation importance;
 - (b) use of bioregionalisation and other data compilations, e.g. characterisations of priority regions in terms of biodiversity patterns and ecosystem processes, physical environmental features and human activities, and representation of particular biological distributions and ecosystem processes as separate overlays;

- (c) identification of conservation objectives appropriate to different regions; with reference to particular data layers and metrics against which achievement of objectives might be assessed;
 - (d) identification of the value of particular areas for rational use;
 - (e) methods for identifying and prioritising candidate sites for protection, including the means by which conservation and rational use objectives might be addressed;
 - (f) use of decision-support tools or approaches.
- (iii) To review draft proposals for MPAs or an RSMMPA in the CAMLR Convention Area, submitted for this purpose, such that Members developing proposals can incorporate feedback from the workshop and revise their proposals accordingly in advance of SC-CAMLR in 2011.
 - (iv) To develop a work program for further developing an RSMMPA in each statistical area, including consideration of:
 - (a) regions in which further work to identify MPAs is now required, based on current progress and considering the 11 priority regions and other regions as appropriate;
 - (b) collaboration with the Committee on Environmental Protection towards a harmonised approach to the development of RSMMPAs south of 60°S.

5.23 The Scientific Committee also recommended a list of workshop outputs (Annex 6, paragraph 3.127):

- (i) Summary of progress on developing an RSMMPA, which could include:
 - (a) the current status of existing and proposed MPAs in the Convention Area;
 - (b) updated consideration of priority regions in which further work to identify MPAs could be focused;
 - (c) recommendations on draft MPA proposals.
- (ii) Work program for finalising recommendations on an RSMMPA for the Commission meeting in 2012.

5.24 The Scientific Committee noted that practical aspects of the 2011 workshop included the selection of a time and venue for the workshop, as well as planning to ensure that technical experts (e.g. representatives from SCAR, CEP and IUCN) were invited, subject to the Scientific Committee's Rules of Procedure.

5.25 France's offer to host the 2011 MPA Workshop was welcomed by the Scientific Committee.

Proposals

5.26 The Scientific Committee endorsed the revised management plan for ASPA No. 149, Cape Shirreff and San Telmo Islands (WG-EMM-10/21) (Annex 6, paragraph 3.134), and forwarded the plan to the Commission for consideration. Members were reminded that, in an effort to harmonise protection of the site within the ATS and avoid duplication of effort, CCAMLR's protection of Cape Shirreff was rescinded with the lapse of CM 91-02.

5.27 Dr Constable presented SC-CAMLR-XXIX/11 which described a process to elaborate RSMPAs in data-poor regions, using the bioregionalisation process, available ecological and biodiversity data and outcomes in a systematic conservation planning framework for a region in East Antarctica.

5.28 The Scientific Committee agreed that this process could be applied to other data-poor areas, while different approaches may be more appropriate in regions where sufficient datasets exist, such as the Ross Sea and the South Orkney Islands.

5.29 In an example from East Antarctica, Australia applied the Comprehensiveness, Adequacy and Representativeness (CAR) principles (Annex 6, paragraph 3.123), resulting in a proposal for seven separate MPAs in the East Antarctica RSMPA. It was noted that these areas were designed to be sufficiently large to protect conservation values during a period in which further data will be collected. Such data could be used in a review process at a later date to refine and reduce the size of the areas if warranted.

5.30 Members acknowledged the challenges involved in designating MPAs in data-poor areas, with some Members noting the advantages of the transparent approach used in the development of this proposal. Some Members noted that it was important to have clear objectives for individual areas and in some cases, no-harvesting protected areas might need to be established as reference areas while other areas could potentially have some harvesting that would not impact their objectives.

5.31 The Scientific Committee recalled that in 2005 it endorsed the advice of the Workshop on Marine Protected Areas (SC-CAMLR-XXIV, paragraph 3.54) which stated that the Convention Area as a whole would qualify as Category IV in the IUCN System of Protected Areas. Prof. Koubbi suggested that it could be useful to examine criteria and standards for protected areas according to Ecologically and Biologically Significant Areas (EBSAs) of the Convention on Biodiversity (CBD) and to the international Global Ocean Biodiversity Initiative (GOBI).

5.32 The large size and the number of MPAs in the East Antarctic RSMPA was a subject of concern to some Members, particularly given the lack of ecological data in the region. Dr Constable noted that there were different objectives for the various areas, with some being designated for benthic values, others for conservation of pelagic biodiversity or as reference areas for studies of the impacts of climate change or harvesting. He indicated that they had been developed together as a system in order to identify the important areas for representing different biogeographic provinces, combined with some areas that would be useful as reference areas for monitoring climate change impacts without interference from fishing. As above in paragraph 5.29, he noted that further knowledge would be needed to refine the areas needed to achieve the objectives.

5.33 Some Members supported application of the above approach for East Antarctica due to the paucity of ecological data in the region, but noted that in other areas where there is more ecological data, analysis could go further than bioregionalisation for purposes of demonstrating representativeness, in the process of identifying a system of MPAs. It was recommended that the identification of MPAs could also be based on consideration of biological or ecological data to achieve other possible objectives for MPAs identified by the Scientific Committee, i.e. protection of ecosystem processes, habitats and biodiversity, and protection of species (including population and life-history stages) (CCAMLR-XXIV, paragraph 4.14).

5.34 It was noted that spatially explicit representations of the distribution of harvestable resources (e.g. modelled species distributions or catch effort histories) could be used in the design of a system of MPAs, to evaluate potential costs to rational use. Members noted that the systematic conservation planning approach is designed to address multiple spatial protection objectives, and to achieve a balance between protection and rational use, and has been endorsed by the Scientific Committee as an appropriate method for designing a system of MPAs in the CCAMLR area (SC-CAMLR-XXVII, paragraph 3.55(iii)).

5.35 The Scientific Committee expressed concern about the process and timetable for a review of MPAs. Some Members suggested that the Scientific Committee develop guidelines for the process. Some Members noted that establishment of RSMPAs should be grounded on the best available scientific data.

5.36 The Scientific Committee agreed that the process for establishing each MPA should include the development of a research and monitoring program to be conducted within a specified timetable (e.g. 3 to 5 years). The results of these research and monitoring programs should be submitted to the Scientific Committee for review and a possible recommendation for revision of the status and boundaries of particular MPAs.

5.37 Some Members noted that the processes for the designation of MPAs and the development of a monitoring and review plan may best proceed in a step-wise fashion. Other Members suggested that both processes may occur simultaneously.

5.38 Some Members stressed the importance of data derived from harvesting activities and noted that this could be the main source of information about marine ecosystems. These Members felt that limiting fishing within a system of MPAs could result in insufficient data for monitoring purposes. Other Members noted that national and international collaborative research programs could be a valuable source of monitoring and process study data on marine ecosystems.

5.39 Prof. Koubbi presented France's strategy for designating MPAs in the Crozet and Kerguelen Archipelago and East Antarctica (SC-CAMLR-XXIX/13). The scientific framework to be applied by France is in accordance with research conducted in East Antarctica regarding regionalisation and to the studies in the Ross Sea for the ecological approaches. A multiple-category approach according to different IUCN categories will be used by France and should be encouraged when vast areas or RSMPAs are considered. Some Members strongly supported the French strategy, noting in particular the use of biological distributions and ecological data to locate pelagic and benthic habitats at smaller spatial scales, or areas of particular importance to fish life cycles and top predators.

Statements by Observers

5.40 IUCN, noting CM 91-03 which afforded protection of the southern shelf of the South Orkney Islands, encouraged progress to develop and implement RSMPAs in the Southern Ocean by 2012. The Ross Sea shelf and slope ecosystem was identified as an important region for further work. Of particular concern are climate change and ocean acidification. They are expected to have pronounced effects in the coming decades on marine life.

5.41 ASOC encouraged further work to identify candidate areas and develop proposals for those areas where work is not under way in order to meet the 2012 goal to establish an RSMPA in the Convention Area (CCAMLR-XXIX/BG/23). The Ross Sea shelf and slope ecosystem was identified as a priority area for work as it fulfils many criteria for designation as an MPA because of its biodiversity, value as a refuge, unique benthos, full complement of top predators and status as the largest marine system untouched on earth (CCAMLR-XXIX/BG/26).