



## Legal and Technical Commission

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## Proposal for an environmental management plan for the Clarion-Clipperton Zone

### Note by the Secretariat

1. The present paper provides an introduction to the draft environmental management plan prepared by the experts participating in the 2010 workshop convened by the Authority (ISBA/17/LTC/WP.1) and invites the Legal and Technical Commission to review the proposal and to make such recommendations as may be necessary for its implementation.

### I. Status of knowledge on the biodiversity of the Clarion-Clipperton Zone

2. The international scientific workshop on the theme “Deep seabed polymetallic exploration: development of environmental guidelines”, convened by the International Seabed Authority in Sanya, China, in 1998, recommended that the Authority prepare an environmental studies model that would encourage cooperation among States, national scientific institutions and the pioneer investors in areas of environmental study and research. In the light of that recommendation, the Secretariat convened, in March 1999, a small group of internationally recognized scientific experts for the purpose of identifying critical issues suitable for international collaboration. The experts noted that, while the general quality of the nodule ecosystems in the Zone is known, the actual community resistance, resilience and pattern of biodiversity were very poorly understood. This lack of knowledge makes the prediction and sound management of mining impacts difficult.

3. The above-mentioned discussions led to the decision to convene a further international workshop in 2002 to consider the prospects for international collaboration in marine scientific research. The workshop focused on four key scientific issues considered appropriate for international collaboration: (a) levels of biodiversity, species range and gene flow in abyssal nodule provinces; (b) disturbance and recolonization processes at the seafloor following mining track



creation and plume resedimentation; (c) mining plume impacts on the water column ecosystems (nutrient enrichment, enhanced turbidity, heavy-metal toxicity, enhanced oxygen demand); and (d) natural variability in nodule province ecosystems.

4. One initiative launched as a result of the 2002 workshop was the Kaplan project, the aim of which was to assess levels of biodiversity, species range and gene flow in abyssal nodule provinces. The Kaplan project was initiated in 2002 and concluded in 2007. It was funded mainly by the J. M. Kaplan Fund with additional contributions from the Authority. Collaborators in the project included the University of Hawaii at Manoa (United States of America), the Natural History Museum (United Kingdom of Great Britain and Northern Ireland), the Zoological Society of London (United Kingdom), the National Oceanography Centre, Southampton (United Kingdom), the Japan Agency for Marine-Earth Science and Technology (JAMSTEC) and the French Research Institute for the Exploitation of the Sea IFREMER (France).

5. In the Kaplan project, scientists used state-of-the-art molecular and morphological methods to evaluate the biodiversity and geographical ranges of three key faunal groups in the abyssal Pacific nodule province: polychaete worms, nematode worms and protozoan foraminifera. Together, these groups constitute more than 50 per cent of faunal abundance and species richness in abyssal sediments, and represent a broad range of ecological and life-history types.

6. The results indicated high, unanticipated and still poorly sampled levels of species diversity for all three sediment-dwelling faunal components (foraminifera, nematodes and polychaetes) at the individual study sites. Cryptic speciation (i.e., the presence of multiple species previously identified as a single species) appeared to be very common in the polychaetes and nematodes. Habitat heterogeneity also appeared to be higher than previously appreciated. The researchers speculated that the total species richness of sediment-dwelling foraminifera, nematodes and polychaetes (a subset of the total fauna) at a single site in the Zone could easily exceed 1,000 species. Results from all faunal components suggested that there was a characteristic fauna of the abyss, that is, abyssal habitats have sustained species radiations and are not merely sinks of non-reproducing individuals transported from ocean margins. In addition, there was significant evidence that the community structure of the foraminifera and polychaetes differs substantially over scales of 1,000 to 3,000 across the Zone. The findings of the researchers suggested that protected areas should be established to safeguard biodiversity in the Clarion-Clipperton Zone in view of the anticipated nodule mining.<sup>1</sup>

## **II. Recommendations to establish preservation areas**

7. At the fourteenth session of the Authority in 2008, the Legal and Technical Commission had before it a document on the rationale and recommendations for the establishment of preservation reference areas for nodule mining in the Clarion-Clipperton Zone (ISBA/14/LTC/2), which contained a summary of the outcomes of

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<sup>1</sup> Full details of the Kaplan project and its results can be found in International Seabed Authority, *Biodiversity, Species Ranges, and Gene Flow in the Abyssal Pacific Nodule Province: Predicting and Managing the Impacts of Deep Seabed Mining*, International Seabed Authority Technical Study No. 3 (Kingston, 2008).

a workshop held at the University of Hawaii at Manoa, Hawaii, United States of America, from 23 to 26 October 2007. Participants included some of the principal researchers involved in the Kaplan project. In addition, the Commission had available to it a document on considerations relating to an economic assessment of the marine environment in the Area and the use of area-based management tools to conserve biodiversity (ISBA/14/LTC/5), prepared by the Secretariat in response to a request by the Commission at its thirteenth session.

8. The goal of the 2007 workshop was to design a set of representative zones to safeguard biodiversity and ecosystem function in the abyssal Pacific region targeted for nodule mining (the Zone). The system of zones was designed (a) on the basis of sound scientific principles; (b) to be consistent with the legal framework and environmental guidelines of the Authority for managing deep sea nodule mining and protecting the deep-sea environment; and (c) to incorporate the interests of mining claim holders and other stakeholders in the Area.

9. The full rationale used by the workshop for the proposed zones is contained in document ISBA/14/LTC/2 but is summarized below:

(a) The design and implementation of the zones should fit into the existing legal framework of the International Seabed Authority for managing seabed mining and protecting the marine environment;

(b) The interests of all stakeholders should be incorporated into the design process;

(c) The zones should be established as soon as possible so that sound, ecosystem-based management principles can be incorporated into mining strategies and into the positioning of future claim areas;

(d) The zone system should be designed with the following conservation goals:

(i) To preserve representative and unique marine habitats;

(ii) To preserve and conserve marine biodiversity and ecosystem structure and function;

(iii) To facilitate the management of mining activities to maintain sustainable, intact and healthy marine ecosystems;

(e) The Zone should be divided into three east-west and three north-south strata for conservation management because of strong productivity-driven gradients in ecosystem structure from east to west and south to north. This stratification yields nine distinct subregions within the Zone, each requiring a preservation zone;

(f) The boundaries of preservation zones should be straight lines in order to facilitate rapid recognition by all stakeholders;

(g) The core area of each preservation zone should be at least 200 km in length and width in order to maintain minimum viable population sizes for species potentially restricted to a subregion of the Zone;

(h) Each preservation zone should contain the full range of habitat types found within its subregion;

(i) The core area in each preservation zone should be surrounded by a buffer zone 100 km wide to ensure that the core is not affected by mining plumes created outside the zone. Thus, the dimensions of each zone should be 400 x 400 km (including a 200 x 200 km core area surrounded by a 100 km buffer zone).

10. Based on the above guidelines and rationales, the scientists at the workshop recommended that a system of nine zones, each 400 x 400 km in size, be established within the Zone.

11. The workshop concluded that the zones should be situated so as to protect as many seamounts as possible within a subregion and to avoid or minimize overlap with current mining exploration claim areas. Establishment of nine such zones, with a total area of 1.44 million km<sup>2</sup>, would place approximately 25 per cent of the total management area of the Zone under protection. This approaches the general conservation guidelines of protecting from 30 to 50 per cent of available habitat to prevent losses of biodiversity.<sup>2</sup> It also approaches, in principle, the Millennium Development Goal of placing 30 per cent of the total ocean in reserves.

12. The workshop participants recommended that this system of protected zones should be adopted by the International Seabed Authority as soon as possible, so that scientifically sound conservation principles would be incorporated into the granting and management of nodule-mining claim areas. The establishment of a region-wide system of protected zones would facilitate conservation and management of the Zone as a whole, an approach necessitated by the spatial and temporal characteristics of expected nodule mining impacts. It would also establish the Authority as a leader in sustainable development through the application of modern conservation management principles to the Area. Finally, it would set a precedent for protecting seabed biodiversity prior to the initiation of commercial exploitation.

### **III. Consideration by the Legal and Technical Commission**

13. During its fourteenth session, the Commission discussed the proposal in general and established a working group to consider the issues in more detail. It was noted that the basic proposal was for the Authority to set aside within the Zone a network of ecologically related areas in which no exploration or mining activity should take place. This would allow marine scientific research to be carried out in order to obtain a better understanding of the marine environment in the region, with a view to reducing the potential impacts of polymetallic nodule mining. It was understood that these areas should not overlap with existing contract areas. It was noted that several legal mechanisms which could be used to designate such areas were available under the United Nations Convention on the Law of the Sea and the 1994 Agreement. A number of complex issues, however, needed to be considered in detail. These included the size and location of areas, criteria for their establishment and the coordination of such areas with the existing obligations of contractors, at the exploitation phase, to propose impact reference zones and preservation reference zones.

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<sup>2</sup> For example, L. W. Botsford, A. Hastings and S. D. Gaines, "Dependence of sustainability on the configuration of marine reserves and larval dispersal distances", in *Ecology Letters*, vol. 4, No. 2 (Oxford, Blackwell Science, 2001), pp. 144-150.

14. Some of the general considerations relating to the use of area-based management tools for the conservation of biodiversity both within and beyond areas of national jurisdiction were described in a note by the Secretariat (ISBA/14/LTC/5), submitted to the Legal and Technical Commission at its fourteenth session. In that document, it was recalled that the General Assembly had called upon States and relevant international organizations at all levels urgently to consider ways in which to integrate and improve, on a scientific basis, including the application of the principle of precaution set forth in the Rio Declaration on Environment and Development (principle 15), the management of risks to vulnerable marine biodiversity within the framework of the United Nations Convention on the Law of the Sea, consistent with international law and the principles of integrated ecosystem-based management.<sup>3</sup>

15. The Commission agreed to request a subgroup of ecological and legal experts from among its members to continue to work on the proposal, with the assistance of the Secretariat, with a view to formulating a more complete proposal for consideration by the Commission at its fifteenth session in 2009.

16. At its fifteenth session, the Commission had before it a note by the Secretariat (ISBA/15/LTC/4) providing updated information on the progress made with regard to the proposal and the work carried out since its fourteenth session.

17. The Commission noted that the proposal contained in ISBA/15/LTC/4 identified a network of nine areas of particular environmental interest that were placed in nine different regions of the Clarion-Clipperton Fracture Zone and configured in such a way as to protect the natural ecosystem structure and function and allow for recolonization of impacted areas, while at the same time avoiding any conflict with existing uses of the Fracture Zone. For that reason, the Commission proposed minor adjustments to the locations and orientation of the nine proposed areas of particular environmental interest presented previously (see para. 9 above).

18. While noting that the design of the proposed network was based on existing scientific work, the Commission considered it premature to propose to the Council of the Authority that it use its powers under the Convention to institute a permanent closure of the areas concerned. Nevertheless, to prevent future irreversible damage, and taking into account its mandate under article 165, paragraphs (d), (e) and (h), of the Convention, as well as regulation 31, paragraph 2, of the Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area, the Commission considered that the development of polymetallic nodule resources in the Clarion-Clipperton Fracture Zone demanded a rational and comprehensive environmental management plan for the Zone as a whole, based on the best available scientific knowledge. Such a plan should include a clear definition of the conservation objectives for the Fracture Zone, as well as a comprehensive environmental monitoring programme and the definition of a network of representative areas for environmental purposes.

19. Furthermore, the Commission considered that such a plan should be fully consistent with the precautionary principle, but should be flexible in order to allow changes as and when new scientific information were gathered. The plan should

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<sup>3</sup> See General Assembly resolutions 58/240 (para. 52), 59/24 (paras. 70 and 72), 60/30 (paras. 71-77), 61/222 (paras. 96-101), 62/215 (paras. 99 and 109-112), 63/111 (paras. 117 and 132-135), 64/71 (paras. 134 and 150-156) and 65/37 A (paras. 153 and 173-180).

have regard for the best available scientific knowledge of the Fracture Zone and, in general, the major environmental factors that were known to regulate the distribution of species on a regional scale, including the depth of the seabed, the size and variety of topographic features and the bio-geochemistry of the overlying water column. Using this knowledge and scientific criteria, it would be possible to design a network of areas of particular environmental interest without having complete knowledge of the distributions of all species.

20. The Commission noted that information on the distribution of species in the Clarion-Clipperton Fracture Zone was limited. The only study of species change across the breadth of the Fracture Zone was the Kaplan project. Sampling by individual contractors would eventually be used to supplement the data arising from the study, but there were considerable difficulties to overcome in the standardization of sampling methods and in achieving a consistent taxonomy.

21. To better inform both its work and that of the Council, the Commission recommended that the Authority convene, as a priority activity, an international workshop, including members of the Commission with relevant expertise, as well as representatives of contractors and other experts, to review further the current proposal for the establishment of a network of areas of particular environmental interest and to advise on the formulation of an environmental management plan at the regional scale for the Fracture Zone. The Commission also wished to encourage further scientific research in the proposed areas of particular environmental interest and recommended that any data collected from such research should be compared with information collected by the existing contractors with the Authority in order to better assess how representative the proposed areas of particular environmental interest were, whether all of them were necessary, or whether the size and location of the areas should be adjusted.

22. In the meantime, in order to better achieve the objectives of protecting the natural ecosystem structure and function whilst avoiding any conflict with existing uses of the Zone, the Commission agreed on minor adjustments, as mentioned in paragraph 17 above.<sup>4</sup>

#### **IV. International workshop for the establishment of a regional environmental management plan for the Clarion-Clipperton Zone in the central Pacific**

23. Owing to timing and budgetary constraints, it was not possible to convene the international workshop to develop an environmental management plan for the Clarion-Clipperton Zone until November 2010. There were 35 participants in the workshop, including seven members of the Commission, as well as members of the Authority, representatives of contractors, the Census of Marine Life, the OSPAR Commission and WWF (World Wide Fund for Nature/World Wildlife Fund). After a series of presentations, the participants met in small working groups, each tasked with a specific section of an environmental management plan. The participants then met in plenary session to discuss the individual sections and combine the text into the draft environmental management plan for the Zone (see ISBA/17/LTC/WP.1).

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<sup>4</sup> The locations of the revised areas under consideration, as suggested by the Commission, appear in ISBA/17/LTC/WP.1, annex I.

24. The draft plan addresses all of the issues that need to be considered for environmental management, specifically in the Clarion-Clipperton Zone. It contains a summary of the legal regime associated with the management plan, the locations of proposed areas of potential environmental interest, and associated suggestions regarding the management and review process for these areas.

25. As part of the draft plan, one of the recommendations was that the Commission review the existing proposal concerning areas of potential environmental interest and make a clear recommendation to the Council in that regard.

## V. Recommendations

26. The Legal and Technical Commission is invited to review the draft environmental management plan prepared by the experts participating in the 2010 workshop (ISBA/17/LTC/WP.1) and to make such recommendations as may be necessary for its implementation.

27. Both the Commission and the Council, under, respectively, articles 165 and 162 of the Convention, have broad powers to take measures for the protection of the marine environment with a view to fulfilling the broad objectives of the Convention and the 1994 Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982 (General Assembly resolution 48/263, annex). For example, article 165, paragraph 2 (e), of the Convention requires the Commission to make recommendations to the Council on the protection of the marine environment, taking into account the views of recognized experts in that field. Such a recommendation may well be general in nature, but could include a recommendation to establish a representative network of proactively protected areas in the Clarion-Clipperton Zone.

28. The Council in turn, as the executive organ of the Authority, has broad powers under article 162 to establish the specific policies to be pursued by the Authority on any question or matter within the competence of the Authority. In particular, it shall supervise and coordinate the implementation of the provisions of part XI of the Convention on all questions and matters within the competence of the Authority (art. 162, para. 2 (a)) and make recommendations to the Assembly concerning policies on any question or matter within the competence of the Authority (art. 162, para. 2 (s)). Since the taking of measures necessary to ensure effective protection for the marine environment from harmful effects which may arise from deep seabed mining is not only a matter within the competence of the Authority but a requirement under article 145 of the Convention, it may be interpreted that the Council's power extends to the establishment of a representative network of protected areas in the Zone as one of those measures.

29. The most flexible way in which this could be done is through the adoption of a resolution or decision by the Council. This was the approach taken by the OSPAR Commission in relation to the establishment of a protected area in the Charlie-Gibbs Fracture Zone on the Mid-Atlantic Ridge. In that case, the OSPAR Contracting Parties decided to establish a marine protected area in the waters superjacent to the Charlie-Gibbs Fracture Zone (OSPAR decision 2010/2) and at the same time adopted decision 2010/13 on the management of the Charlie-Gibbs South Marine Protected Area, setting out the conservation objectives, the understanding of the

Parties relating to the conduct of human activities in the protected area, the need for environmental impact assessments to be conducted prior to any activity and a framework for monitoring its implementation.

30. Such a resolution or decision might, for example, designate the nine areas identified by the 2010 workshop as provisional protected areas for a period of, say, five years, during which time certain specific actions would be carried out by the Commission, the Secretariat and contractors.<sup>5</sup> Such actions could include a temporary moratorium on the allocation of such areas for exploration or exploitation contracts, which would give effect to the precautionary approach called for by the Regulations. In addition to a review and renewal cycle, the resolution or decision could include a provision whereby any new applicant wishing to utilize one of the provisional protected areas would have the burden of establishing to the satisfaction of the Commission and the Council that such utilization was compatible with the overall objective of protecting and preserving the marine environment.

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<sup>5</sup> Many of these actions are identified in the draft environmental management plan (see ISBA/17/LTC/WP.1).