



## Legal and Technical Commission

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### **Proposal for the designation of certain geographical areas in the Clarion-Clipperton Fracture Zone**

#### **Note by the Secretariat**

#### **I. Introduction**

1. At its meeting during the fourteenth session of the International Seabed Authority the Legal and Technical Commission considered a preliminary proposal for the establishment of preservation reference areas for nodule mining in the Clarion-Clipperton Zone (ISBA/14/LTC/2). The initial proposal had been developed at a scientific workshop on the design of marine protected areas for seamounts and the abyssal nodule province in the Pacific Ocean, held at the University of Hawaii at Manoa, Hawaii, United States of America, from 23 to 26 October 2007.<sup>1</sup> The Commission also heard a presentation by Dr. Craig Smith, the principal researcher and convenor of the workshop. In his presentation, Dr. Smith explained the underlying assumptions and rationale for the proposal and explained the general guidelines and criteria for the possible establishment of a network of preservation reference zones in the Clarion-Clipperton Zone. In addition, the Commission had available to it a document prepared by the Secretariat in response to a request by the Commission at the thirteenth session, on considerations for 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).

2. The Commission discussed the proposal in general and also 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 a network of ecologically related areas within the Clarion-Clipperton Zone where no exploration or mining activity should take place. These areas should not overlap with existing contract areas. It was also noted that several legal mechanisms were available under the United Nations

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<sup>1</sup> Papers for the Pew Workshop on the design of Marine Protected Areas for Seamounts and the Abyssal Nodule Province in Pacific High Seas, held at Honolulu, 23-26 October 2007, East West Center, University of Hawaii are available at the website [http://www.soest.hawaii.edu/oceanography/faculty/csmith/MPA\\_webpage/MPAindex.html](http://www.soest.hawaii.edu/oceanography/faculty/csmith/MPA_webpage/MPAindex.html).

Convention on the Law of the Sea and the 1994 Agreement which could be used to designate such areas, including the power under article 162 (2) (x) of the Convention to disapprove areas for exploitation based on certain environmental considerations. However, a number of complex issues 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.

3. The Commission agreed to request a subgroup of ecological and legal experts from the Commission 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 the fifteenth session. The present document has been prepared by the Secretariat in consultation with the subgroup. It is intended to provide the Commission with an overview of the environmental, legal and governance considerations related to the proposal and to identify some of the possible options for implementing the recommendations of the 2007 workshop.

## **II. Review of the available knowledge on the marine environment of the Clarion-Clipperton Zone and the work carried out by the Authority**

4. An international scientific workshop convened by the 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 (then) registered 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 to identify critical issues suitable for international collaboration. The experts noted that, while the general quality of the nodule ecosystems in the Clarion-Clipperton Zone is known, the actual community resistance, resilience and pattern of biodiversity are very poorly understood. This lack of knowledge makes the prediction and sound management of potential impacts from mining very difficult.

5. The discussions led to the decision to convene a further international scientific workshop in 2002 on the prospects for international collaboration in marine scientific research. The workshop focused on the following 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 sea floor 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);
- (d) Natural variability in nodule province ecosystems.

6. One of the collaborative projects undertaken by the Authority as a result of the workshop was the Kaplan Project, which began in 2002 and concluded in 2007.<sup>2</sup> The aim of the project was to assess levels of biodiversity, species range and gene flow in the abyssal nodule provinces in order to assist efforts to better evaluate the potential threats to biodiversity from nodule mining. Scientists participating in the Kaplan Project used state-of-the-art molecular and morphological methods to evaluate biodiversity and geographic ranges of three key faunal groups in the abyssal nodule province of the Pacific Ocean: 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.

7. The final report of the Kaplan Project, including a full list of scientific references, has been published by the Authority<sup>3</sup> and the project outcomes have also been reported in the peer-reviewed scientific literature and at international scientific meetings and workshops. In extreme summary, the results indicated high, unanticipated, and still poorly sampled levels of species diversity for all three sediment-dwelling faunal components at the individual study sites that were selected. Cryptic speciation (i.e., the presence of multiple species previously identified as 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 Clarion-Clipperton Zone could easily exceed 1,000 species. Results from all faunal components suggested that there is a characteristic fauna of the abyss, that is that 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 km across the Clarion-Clipperton Zone. These findings suggested to the researchers involved that appropriate measures should be taken to safeguard biodiversity in the Clarion-Clipperton Zone in the face of anticipated future mining of nodules.

8. Following the successful conclusion of the Kaplan Project, a group of scientists, including some of the principal researchers involved in the Project, met in October 2007 to develop a preliminary set of recommendations on criteria for determining the size and location of a network of representative preservation areas in the Clarion-Clipperton Zone. In developing those criteria, the workshop participants noted the need to proceed on the basis of sound scientific principles, while acting in a manner consistent with the existing legal framework and environmental guidelines established by the Authority for managing deep-sea nodule mining and protecting the deep-sea environment. The full rationale used by the workshop in recommending the establishment of the proposed zones is described in document ISBA/14/LTC/2, and may be summarized as follows:

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<sup>2</sup> The project was funded mainly by the J. M. Kaplan Fund, with additional contributions from the Authority.

<sup>3</sup> International Seabed Authority (ISA) Technical Study No. 3: Biodiversity, Species Range and Gene Flow in the Abyssal Pacific Nodule Province (Kingston, Jamaica 2008). See also the annual report of the Secretary-General for 2008 (ISBA/14/A/2) and a summary report of the Kaplan Project prepared for the Council in 2008 (ISBA/14/C/2). ISA Technical Study No. 3 also includes a full list of bibliographic references and sources.

(a) The design and implementation of the zones should fit into the existing legal framework of the 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 Clarion-Clipperton 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 Clarion-Clipperton Zone, each requiring a preservation zone;

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

(g) The core area of each 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 Clarion-Clipperton Zone;

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

(i) The core area in each 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 (a 200 x 200-km core area surrounded by a 100-km buffer zone).

Based on the above guidelines and rationales, the zones as recommended by the workshop are shown in figure 1 in the annex to the present document.<sup>4</sup>

9. The workshop also recommended that the zones should be situated so as to protect as many seamounts within a subregion as possible and to avoid or minimize overlap with current mining exploration areas. It was noted that the erection of nine such zones, with a total area of 1,440,000 km<sup>2</sup>, would place roughly 25 per cent of the total Clarion-Clipperton Zone management area 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>5</sup>

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<sup>4</sup> The annex is on file with the secretariat of the International Seabed Authority in Kingston and is available for consultation.

<sup>5</sup> See, for example, Botsford, L. W., A. Hastings, S. Gaines. 2001. Dependence of sustainability on the configuration of marine reserves and larval dispersal distance, *Ecology Letters* 4 (2): 144-150.

### III. Relationship with the existing regulatory regime

10. 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 document ISBA/14/LTC/5. In that document, it was also recalled that the General Assembly of the United Nations has called upon States and relevant international organizations at all levels to urgently consider ways to integrate and improve, on a scientific basis, including the application of precaution as set out in principle 15 of the Rio Declaration on Environment and Development, 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>6</sup> Within this global context, the establishment of a network of areas as proposed by the 2007 workshop could contribute in a number of important ways to the general objectives of the environmental regime established by the Authority. Furthermore, the scientific information that such zones in the Clarion-Clipperton Zone could generate would be useful for the adoption of rules, regulations and procedures incorporating applicable standards for the protection and preservation of the marine environment and would also greatly facilitate the periodic review of environmental regulations and recommendations.

11. In its discussions during the fourteenth session, the Commission considered the relationship of the proposal with the existing regulatory regime for the Clarion-Clipperton Zone. Members of the Commission noted that there was considerable confusion in the terminology used. In particular, the use of the terms “preservation reference area” or “preservation reference zone” as suggested by the 2007 workshop could be confused with the requirement in regulation 31 (7) of the Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area for contractors to propose areas to be set aside as “preservation reference zones”. Preservation reference zones in this context are zones in which no mining shall occur to ensure representative and stable biota of the seabed in order to assess any changes in the flora and fauna of the marine environment. While some of the conservation objectives were similar, there were a number of legal and practical differences which needed to be taken into account. In particular it was noted that:

(a) The obligation under regulation 31 (7) would only take effect if a contractor applied for exploitation rights, which may not happen for a number of years;

(b) The size of future exploitation areas is not known, but cannot exceed 75,000 km<sup>2</sup>. In comparison, the scientific recommendation is that each area to be set aside measure 400 km x 400 km (160,000 km<sup>2</sup>). Regulation 31 (7) contains no details as to the size of areas to be nominated by contractors, but it is unlikely to be large and, on the basis of current scientific advice, would fail to meet the ecological objectives of the present proposal;

(c) The areas selected by contractors will not necessarily be representative and will not form part of an ecologically representative network for conservation

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<sup>6</sup> General Assembly resolutions 58/240 (para. 52), 59/24 (paras. 70 and 72), and 60/30 (paras. 71-77), 61/222 (paras. 96-101 and 119), 62/215 (paras. 99 and 109-112) and 63/111 (paras. 117 and 132-135).

purposes, but are more likely to be self-selected by contractors on the basis of lack of resource potential;

(d) Areas selected from within active mine sites will be difficult for contractors to manage and run the risk of incidental impact from mining, making them non-effective.

12. These factors suggested to the members of the Commission that regulation 31 (7) would not provide a satisfactory legal basis for implementation of the proposal to establish preservation areas to ensure effective conservation of the biodiversity of the Clarion-Clipperton Zone. The Commission noted that an alternative legal mechanism existed in article 162 (2) (x) of the Convention, whereby the Council of the International Seabed Authority was empowered to disapprove areas for exploitation in cases where “substantial evidence indicates the risk of serious harm to the marine environment”. In accordance with regulation 21 (6), the Commission would be prohibited from approving a plan of work for exploration in any area so designated by the Council. It was observed that, while the application of this provision by the Council would facilitate long-term and effective preservation of the marine environment in such areas, the provision was really aimed at protecting against exploitation and also required the existence of “substantial evidence” indicating the risk of serious harm to the marine environment to justify its use. The scientific basis for the application of article 162 (2) (x) was thus quite different to the scientific basis for the establishment of the proposed areas.

13. One possibility discussed by the Commission was to use a different terminology to reflect the difference of emphasis between the provisions of the Convention and the Regulations and the broader ecological and conservation goals of the scientific proposal. In this context, the idea of “environmental sanctuary zones” was discussed, where a sanctuary is defined as a place of refuge and protection and the proposed zones constitute regional environmental refuges from seabed mining activity.<sup>7</sup>

#### **IV. Analysis of the proposal and recommendations**

14. The conclusions of the Kaplan Project and the 2007 workshop, as well as the review of the proposal by the members of the Commission, indicate that there is a strong scientific basis for appropriate measures to be taken to enhance the protection of the biodiversity of the Clarion-Clipperton Zone. The scale at which such measures needed to be taken, and the conservation objectives of those measures, are not compatible with the provisions in regulation 31 which require individual contractors at the exploitation phase to set aside preservation reference areas for the specific purpose of measuring the environmental impact from exploitation. In contrast, the conservation objective of the current proposal is to safeguard the environment at a regional scale.

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<sup>7</sup> The term sanctuary is used in this form in The National Marine Sanctuaries Act (NMSA) of the United States which authorizes the Secretary of Commerce to designate and protect areas of the marine environment with special national significance due to their conservation, recreational, ecological, historical, scientific, cultural, archaeological, education, or esthetic qualities as national marine sanctuaries.

15. Article 162 (2) (x) of the Convention provides a possible legal basis for setting aside specific areas, but it is not clear that there currently exists “substantial evidence” to indicate the risk of serious harm to the marine environment in the areas proposed. Furthermore, it is not clear that the Council would wish at this stage to institute a permanent closure of such areas to exploitation. Noting, however, that the Commission has broad powers under article 165, of the Convention (specifically article 165 (2) (d), (e) and (h)) to prepare assessments of the environmental implications of activities in the Area, make recommendations to the Council on the protection of the marine environment and make recommendations on the establishment of an environmental monitoring programme, it is suggested that the Commission could give effect to the current proposal in a practical way by designating a network of areas within the Clarion-Clipperton Zone as being of particular environmental interest.

16. The advantage of this approach would be that potentially confusing issues of terminology and legal status would be avoided while at the same time providing for a substantial measure of immediate and practical protection. As the only body with a mandate to recommend approval of exploration activities in the designated areas, the Commission would be able to decide, on a scientific basis, whether or not to permit exploration to take place in such areas in the future. This would also be consistent with the precautionary approach and would allow for adjustments to be made in the light of increased scientific knowledge. In this regard, it is important to recognize that the current proposal, while well justified, is based on a limited, albeit rapidly growing, database on biodiversity and species ranges in the Clarion-Clipperton Zone. In order to ensure more comprehensive protection, where appropriate, the Council could draw the attention of other competent bodies (e.g. relevant regional fisheries management organizations) to the designation of such areas in order to promote effective and coordinated protection of the seabed and water column.

17. While the proposed areas for designation are based on sound scientific assessments of the Clarion-Clipperton Zone region, the practical issue for consideration by the Commission concerns the spatial distribution of the areas. It is evident that the orientation of the proposed areas along the axis of the Clarion and Clipperton fracture zones rather than parallel to lines of latitude and longitude complicates the management of these areas with respect to contractor areas, both current and future. One possible suggestion to resolve this problem is to rotate the proposed areas around their centre point so that the borders are parallel to lines of latitude and longitude. The rotation of the areas results in virtually no impact on the 100-km<sup>2</sup> buffer zone of the original core, as shown in figure 2 in the annex to the present document.

18. However, figure 2 shows a further difficulty in that some of the proposed areas impinge on areas that are currently under contract, are reserved for the Authority or are subject to pending applications for exploration. Figure 3 shows the effect of moving the proposed areas the minimum distance necessary so that they do not conflict with these contract and reserved areas. More significant alterations would be required to areas 5 and 6 in order to remove potential conflicts. Although area 5 overlaps with reserved areas, there is no conflict with the current activities. Potential options for area 6 are shown in figure 4.

19. The following ways forward are suggested for the consideration of the Commission:

(a) The Commission could designate a network of nine areas (geographical location to be determined) within the Clarion-Clipperton Zone as being of particular environmental interest using the criteria outlined in the present document;

(b) The Commission would review the status of the designated areas on a regular basis in the light of increased scientific knowledge. To this end, the Commission may wish to recommend that an international workshop be convened in due course to review and assess the status of the designated areas;

(c) The Commission may recommend to the Council that the location and purpose of the network of designated areas is made known to all members of the Authority and competent subregional, regional and global organizations;

(d) The Commission may further recommend that members of the Authority promote and encourage the conduct of marine scientific research in the designated areas and disseminate the results of that research for the benefit of all members of the Authority.

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