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Review of the implementation of the environmental management plan for the Clarion-Clipperton Fracture Zone

Prepared by the secretariat

I. Introduction

1. The International Seabed Authority has far-reaching obligations, responsibilities, rules, regulations and procedures to protect the marine environment. The development of environmental management plans is one of the tools the Authority has to achieve its aims in environmental management. The environmental management plan for the Clarion-Clipperton Fracture Zone is the first, and so far only, environmental management plan created by the Authority ([ISBA/17/LTC/7](#)). It was approved by the Council at its eighteenth session and was to be implemented over an initial period of three years (see [ISBA/18/C/22](#)). The plan included the designation of the network of areas of particular environmental interest.

II. Background and legislative basis of the environmental management plan

2. The environmental management plan for the Clarion-Clipperton Fracture Zone contains an outline of the legal framework related to the powers of the Authority on the protection of the marine environment. A detailed account of the legislative basis for the plan is provided in its paragraphs 1 to 11.

3. The data and assumptions on which the environmental management plan is based were derived from a workshop on the design of marine protected areas for seamounts and the abyssal nodule province in Pacific high seas, held at the University of Hawaii at Manoa, United States of America, from 23 to 26 October 2007 (see [ISBA/14/LTC/2](#)). The workshop produced a scientific case based on sound ecological principles and biogeographic information for a spatial management plan dividing the Clarion-Clipperton Fracture Zone into three east-west and three north-south strata for conservation management. Based on strong



depth and surface ocean productivity-driven gradients, which are two major factors regulating the ecosystem structure and function in the deep ocean, that stratification yielded nine distinct subregions within the Zone, each requiring designation of an area of particular environmental interest.

III. Background of the review

4. In its decision [ISBA/17/C/19](#), the Council requested the Secretary-General to hold, at the earliest possible date before the eighteenth session of the Legal and Technical Commission, the workshop referred to in paragraph 42 of the environmental management plan, with particular attention to the issues indicated in its subparagraphs (a) to (d). In February 2016, the Legal and Technical Commission decided not to pursue the terms of reference that had been provided for the workshop.

5. Pursuant to paragraph 46 of the plan, the plan was to be subject to a periodic external review by the Legal and Technical Commission every two to five years, as required, and updated at least two years in advance of the end of the plan in 2016, coinciding with the end of currently granted exploration licences for six of the contractors in the Clarion-Clipperton Fracture Zone.

6. Furthermore, according to paragraph 25 of the plan, the nine areas of particular environmental interest have been designed to maintain sustainable populations and to capture the full range of habitats and communities by being large enough to maintain minimum viable population sizes for species potentially restricted to a subregion of the Clarion-Clipperton Fracture Zone, without being affected by mining plumes from any activities immediately adjacent to an area.

7. Regarding the review of the nine areas of particular environmental interest, it was stated in paragraph 42 of the plan that:

The Legal and Technical Commission should keep under review the areas of particular environmental interest and determine their suitability or need for amendment. This will involve holding a workshop of scientific/marine reserve/management specialists to peer-review and critique the existing proposal and any new data and information from the contractors. The tasks of the workshop, to be convened as soon as practicable, would be to:

(a) Review the data and assumptions in the original area of particular environmental interest proposal from the 2007 and 2010 workshops;

(b) Determine the scientific validity of the approach;

(c) Assess existing data to define the details of the size, location and number of required areas of particular environmental interest;

(d) Enable the Legal and Technical Commission to make a clear recommendation relating to the area of particular environmental interest to the Council of the International Seabed Authority.

8. Additional workshops were called for in the plan, including:

(a) A series of workshops focused on specific taxa. Those workshops took place annually between 2013 and 2015, in Wilhelmshaven, Germany, Uljin, South Korea and Ghent, Belgium, respectively;

(b) A workshop to develop specific guidelines for contractors to use in the establishment of impact reference zones and preservation reference zones, to be held at least one year prior to the first licence expiration date. In July 2015, the Legal and Technical Commission decided not to pursue the terms of reference provided for the workshop.

9. The impact reference zones and preservation reference zones are clearly defined as areas to be set aside and used exclusively as such. Impact reference zones are areas to be used for assessing the effect of activities in the Area on the marine environment and which are representative of the environmental characteristics of the Area. Preservation reference zones are areas in which no mining shall occur to ensure representative and stable biota of the seabed in order to assess any changes in the biodiversity of the marine environment (see [ISBA/19/C/17](#), regulation 31, para. 6). Therefore, the delineation of the preservation reference zones needs to rely on detailed knowledge of the biodiversity and the collection of baseline data to ensure the protection of zones with biodiversity comparable with that of the impact reference zones.

IV. Other measures in the environmental management plan

10. While areas of particular environmental interest, impact reference zones and preservation reference zones are prominent features of the environmental management plan, there also needs to be a review of progress in the implementation of the other management measures required in the plan, including the following specific actions listed in the plan for the secretariat and contractors:

For the secretariat:

(a) Undertaking cumulative environmental impact assessments, as necessary, based on exploitation proposals, to consider the cumulative impacts of mining and other human activities;

(b) Assembling the environmental data collected by contractors for the purposes of impact assessment and disseminating them through publicly available and easily accessible databases;

(c) As a recommended priority action, setting up a working group to facilitate the establishment of environmental databases using data from contractors and selected external sources. That task was to be initiated as soon as possible and before the end of 2011;

(d) Retaining a set of expert consultants to facilitate data standardization, including taxonomic intercalibration, across contractor datasets and the Clarion-Clipperton Fracture Zone;

(e) Aiming to issue periodically (for example, every 5 to 10 years) a publicly available environmental quality status report of the region.

For contractors:

(f) Developing plans to ensure responsible environmental management to enhance the recovery of habitats and faunal communities;

(g) Applying the principles of ISO 14001 to the development of their site-specific environmental management plans;

(h) Providing in their environmental management plans the designation of the required impact and preservation reference zones for the primary purpose of ensuring preservation and facilitating monitoring of biological communities affected by mining activities;

(i) Including in their environmental management plans specific measures that will maximize the potential for the recovery of biota affected by their activities in the Clarion-Clipperton Fracture Zone.

11. The recognized need to work with other international organizations and the adherence to the six guiding principles of the environmental management plan had a strong impact upon the scientific design of the areas of particular environmental interest. The support in the plan for the approaches of the Convention on Biological Diversity and the Food and Agriculture Organization of the United Nations should lead to international collaboration to develop the areas of particular environmental interest into internationally accepted marine protected areas beyond national jurisdiction.

12. The amount of environmental baseline information from the areas of particular environmental interest is continuously growing and may soon meet the internationally accepted criteria for marine protected area status as detailed, for example, in the 12 guidelines of the International Union for Conservation of Nature or the seven criteria for ecologically or biologically significant areas of the Convention on Biological Diversity.

V. Current status of implementation

13. The status of the implementation of the measures recommended in the environmental management plan are as follows:

<i>Action recommended in the environmental management plan</i>	<i>Progress between 2012 and 2016 (i.e., since the adoption of decision ISBA/18/C/22)</i>	<i>Progress expected by 2021, in time for the next review</i>
A workshop relating exclusively to the nine areas of particular environmental interest	Yet to be implemented	The secretariat will organize the workshop in 2017
International collaboration to develop the areas of particular environmental interest into internationally accepted marine protected areas beyond national jurisdiction	Yet to be implemented	The secretariat of the Authority will organize a workshop with representatives from the secretariat of the Convention on Biological Diversity, the International Maritime Organization, the Food and Agriculture Organization of the United Nations and other stakeholders in 2018
A series of workshops focused on specific taxa	Implemented through the workshops on megafauna in Wilhelmshaven (2013), on macrofauna in Uljin (2014) and on meiofauna in Ghent (2015)	The secretariat will publish a technical study with the amalgamated recommendations of the three workshops

<i>Action recommended in the environmental management plan</i>	<i>Progress between 2012 and 2016 (i.e., since the adoption of decision ISBA/18/C/22)</i>	<i>Progress expected by 2021, in time for the next review</i>
A workshop to develop specific guidelines for contractors to use in the establishment of impact and preservation reference zones	Yet to be implemented	The secretariat will organize the workshop in 2016
The designation by contractors of the required impact and preservation reference zones	To be implemented after the holding of a workshop to develop specific guidelines for contractors to use in the establishment of impact and preservation reference zones	The secretariat will organize a workshop in 2016 on the proper application by contractors of guidance from the Legal and Technical Commission as soon as possible
Setting up a working group to facilitate the establishment of environmental databases using data from contractors and selected external sources	Yet to be implemented	The working group will be set up by the secretariat by 2017
Retaining a set of expert consultants to facilitate data standardization, including taxonomic intercalibration, across contractor datasets	Yet to be implemented	The set of expert consultants will be retained by the secretariat by 2017
Undertaking cumulative environmental impact assessments	Yet to be implemented	The secretariat will attempt to do so as soon as sufficient environmental baseline data of sufficient quality have been submitted by contractors
Assembling the environmental baseline data collected by contractors and disseminating them through publicly available and easily accessible databases	To be implemented after the creation of a data management strategy and a web-based central data repository	A data management strategy will be implemented and a central data repository will be created by the secretariat by 2017 and first databases will be made public by 2018
Issuing periodically a publicly available environmental quality status report of the region	Yet to be implemented	A data management strategy will be implemented and a central data repository will be created by the secretariat by 2017 and the first environmental quality status report of the region will be published by 2018
The development by contractors of plans to ensure responsible environmental management to enhance the recovery of habitats and faunal communities	Yet to be implemented	Contractors will provide plans before applying for an exploitation permit or submitting a new 5-year work plan

<i>Action recommended in the environmental management plan</i>	<i>Progress between 2012 and 2016 (i.e., since the adoption of decision ISBA/18/C/22)</i>	<i>Progress expected by 2021, in time for the next review</i>
The inclusion by contractors in their environmental management plans of specific measures that will maximize the potential for the recovery of biota impacted by their activities	Yet to be implemented	Contractors will provide plans before applying for an exploitation permit or submitting a new 5-year work plan
The application by contractors to apply ISO 14001 principles to the development of their site-specific environmental management plans	Yet to be implemented	Contractors will apply the ISO 14001 principles before applying for an exploitation permit or an extension

14. In summary, four years after the adoption of the environmental management plan, the implementation of the measures, apart from the creation of the areas of particular environmental interest and the convening of the three workshops on taxonomy, appears to be limited.

VI. Actions needed to advance the implementation of the environmental management plan

15. The review of the areas of particular environmental interest, as mentioned in paragraph 7, requires an evaluation of: (a) the available data; (b) the scientific validity of the approach; and (c) the size, location and number of the areas.

16. Data have been collected from some of the nine areas of particular environmental interest in recent years. So far, no data are available from three of the areas. The areas and related contractors are as follows:

Area No. 1: China Ocean Mineral Resources Research and Development Association (COMRA) (2013)

Area No. 2: No data available

Area No. 3: European Joint Programming Initiative for Healthy and Productive Seas and Oceans (JPI-Oceans) (2015)

Area No. 4: COMRA (2013)

Area No. 5: No data available

Area No. 6: Global Sea Minerals Resources NV (GSR) (2015), European Union managing impacts of deep-sea resource exploitation project (MIDAS) (2015), UK Seabed Resources Ltd. (UKSRL) (2015); (the latter two misidentified it as area No. 4)

Area No. 7: COMRA (2013)

Area No. 8: the Government of the Republic of Korea (in seven years between 1998 and 2013)

Area No. 9: No data available

17. The scientific validity of the approach to areas of particular environmental interest of maintaining sustainable populations and capturing the full range of habitats and communities by being large enough to maintain minimum viable population sizes for species potentially restricted to a subregion of the Clarion-Clipperton Fracture Zone, without being affected by mining plumes from any activities immediately adjacent to an area, is essentially based on the biogeography of the fauna occurring over a wide area in waters of similar depth and of similar primary productivity at the sea surface.

18. Analyses of several datasets by European research groups have provided information on the distributional ranges of some species (from morphological taxonomic studies) or molecular operational taxonomic units (their genetic equivalent) over distances of 60 to 1,300 km. A number of polychaeta species were found over a distance of 1,300 km, whereas isopoda (crustaceans) had a more restricted distribution over only a few hundred kilometres. Some species, such as those in the bivalvia class, may have much smaller ranges. That information strongly supports a distance between areas of particular environmental interest of less than 1,000 km.

19. With regard to the assessment of existing data to define the details of the size, location and number of areas of particular environmental interest, it remains unclear at this point whether or not the 100 km buffer zone of the areas would be sufficient to avoid plume impacts on the 200x200 km core zone. The location of the existing nine areas, however, may not be optimal in some cases, for example, when they lie predominantly outside the Clarion-Clipperton Fracture Zone. That may have also led to some of the areas having a considerably rougher bottom topography, which is not representative for the areas intended for mining and contains a rather different biocoenosis (i.e., ecological community). Nevertheless, it appears advisable to retain the nine areas at their current location. There are, however, two areas that are currently not well covered and for which the distance to the nearest area exceeds 1,000 km. To remedy that shortcoming, two additional areas should be introduced on the Clarion-Clipperton Fracture Zone at 15° N and 145° W (No. 10) and the other at the eastern end of the Zone (No. 11, avoiding the Clipperton Island exclusive economic zone and the exclusive economic zone of Mexico). A chart with suggested locations for the two new areas is attached (see annex).

20. With the recent increase in independent data on the areas of particular environmental interest, it appears timely to organize a workshop relating exclusively to the nine areas, which could be organized by the Secretariat in 2017. The advancement of the areas towards cross-sectoral marine protected area status could also be promoted during the workshop, involving all other stakeholders as indicated in paragraph 11.

21. The second major item, as mentioned in paragraphs 8 and 9, concerns the development of specific guidelines for contractors to use in the establishment of impact reference zones and preservation reference zones. As indicated in annex I to [ISBA/19/LTC/8](#), the plan of work for exploration should include activities that provide data for an environmental impact assessment required for an exploitation contract for marine minerals in the Area, including the designation of impact reference zones and preservation reference zones.

Furthermore, paragraph 53 of [ISBA/19/LTC/8](#) states:

During the mining tests, the notification of proposed impact reference zones and preservation reference zones is recommended. The impact reference zone should be selected based on the area being representative of the environmental characteristics, including the biota, of the site where test mining will take place. The preservation reference zone should be carefully located and be large enough so as not to be affected by the natural variations of local environmental conditions. The zone should have species composition comparable to that of the test area. The preservation reference zone should be outside the test area and areas influenced by the plume.

22. The designation of impact reference zones and preservation reference zones needs to take place during the exploration phase and is required in order to proceed to exploitation. A special workshop will thus be required to develop specific guidelines for contractors to use in the establishment of impact and preservation reference zones and could be organized by the Secretariat as early as the end of 2016.

23. The workshop should lead to the creation of a list of deliverables, including maps, tables of indicators and values, multivariate analyses and models, which are expected from contractors and which will be assessed by the Authority. Additional aims for the workshop include:

(a) Defining the selection and monitoring criteria (indicators) for impact reference zones. These zones should be a representative sample of the area where exploitation will occur, where impacts are to be monitored along the gradient from source to far-field, both horizontal and vertical monitoring throughout the mined sites and beyond the potential impact zone;

(b) Defining the selection and monitoring criteria (indicators) for preservation reference zones. These zones need to be representative of the area where exploitation will occur, but unaffected by the mining impacts, and inside the claim area of the respective contractor;

(c) Tools available for the selection of areas. The selection of impact reference zones and preservation reference zones will be helped by decision-support tools and predictive habitat modelling, especially with respect to the total area, number and distribution of such zones;

(d) Standardization (with respect to quality, quantity and frequency) of monitoring and assessment methods, coverage, reporting timelines and management response timelines. This basic requirement of environmental management plans establishes common environmental thresholds and comparative controls across claim areas;

(e) Procedures for reporting, ensuring transparency and adjusting impact reference zones and preservation reference zones during operations and in response to monitoring indicators;

(f) As an option, defining indicators for ecosystem health (e.g., a multivariate ecosystem structure and function index, a pollution index or some other measure, such as benthic habitat quality).

24. For the implementation of the other measures of the environmental management plan, the following steps are suggested. Once the Secretariat has the

financial capacity to set up a working group of expert consultants, it will be able to commence cumulative environmental impact assessments and the dissemination of the environmental data, as well as the production of environmental quality status reports for the region.

25. The four deliverables by contractors rely on their site-specific environmental management plans. These plans by contractors are expected to include also the delineation of their impact reference zones and preservation reference zones, for which guidelines are still missing.

26. In summary, the implementation of the environmental management plan for the Clarion-Clipperton Fracture Zone requires the creation of two additional areas of particular environmental interest, the organization of two workshops on areas effectiveness and future development and on guidelines for impact reference zones and preservation reference zones, and, last but not least, the implementation of a working group of expert consultants, all within the next 18 to 24 months.

Annex

