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PROTECTED AREAS: CONSIDERATION OF THE RECOMMENDATIONS OF THE AD HOC OPEN-ENDED WORKING GROUP ON PROTECTED AREAS

Summary of existing ecological criteria for identification of potential marine areas for protection and biogeographical classification systems

Note by the Executive Secretary

I. BACKGROUND

1. The Conference of the Parties to the Convention on Biological Diversity, in paragraph 29 of decision VII/28, established an Ad Hoc Open-ended Working Group on Protected Areas, and suggested that, as part of its mandate, the Working Group should explore options for cooperation for the establishment of marine protected areas in marine areas beyond the limits of national jurisdiction, consistent with international law, including the United Nations Convention on the Law of the Sea, and based on scientific information. The first meeting of the Ad Hoc Open-Ended Working Group on Protected Areas, which took place in Montecatini, Italy, from 13 to 17 June 2005, invited the Executive Secretary to compile a list of existing ecological criteria for identification of potential marine areas for protection and biogeographical classification systems based on submissions received from the Parties, other governments and organizations. The Working Group also requested the Executive Secretary to synthesize the information received, for reference by the Parties.

2. In addition, the Working Group expressed its appreciation to the Government of Canada for its initiative to host a scientific experts workshop to review and assess existing ecological criteria and biogeographical classification systems and to initiate work on the development of a set of scientifically rigorous ecological criteria that could be used to identify potential sites for marine protected areas beyond the limits of national jurisdiction; and invites the Executive Secretary to transmit the results of the workshop to the Parties, in advance of the next meeting of the Ad Hoc Open-ended Working Group on Protected Areas for its consideration. These results, which were not available at the time of the writing of

* UNEP/CBD/COP/8/1.

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this document, will be transmitted to the Parties following their submission by the Government of Canada.

3. In order to initiate the work relating to ecological criteria, the Executive Secretary, on 26 July 2005, sent out a notification requesting Parties to submit such criteria by 31 August, 2005. As a result, a number of submissions were received from Parties and international and regional organizations. The submissions included a total of 19 sets of criteria, including 9 sets of national criteria, 5 sets of regional criteria, and 5 sets of criteria from conventions and organizations. The latter were generally global in nature, except for one submission relating to a specific marine park. The criteria received are available in annex I to this document.

4. The present document provides a summary of the submissions received. A synthesis of the existing ecological criteria is provided in section III to this document, while a list of the individual criteria can be found in annex I. In addition, section II discusses some general considerations relating to the establishment of marine protected areas that were brought up in the submissions received by the Secretariat. This section also includes a discussion of biogeographical classification systems.

II. GENERAL CONSIDERATIONS REGARDING THE ESTABLISHMENT OF MARINE PROTECTED AREAS

A. Defining the objectives of the marine protected area(s) or network

5. Some of the responses stressed that in order to establish ecological criteria for the identification of potential marine areas for protection, the objectives of such MPAs should be properly defined in advance. Only once the particularly objective was articulated, could science-based criteria to identify suitable areas be established. For example, “iconic” or high conservation value marine areas may require different ecological criteria to those applied when developing a system of “comprehensive, adequate and representative” marine areas.

6. Objectives can relate, for example, to protecting ecosystems, habitats and species with special ecological and economic values; protecting a representative range of marine habitats; protecting the special needs of threatened, endangered, endemic or migratory species; protecting important breeding areas for marine life; and reducing the impacts of fishing, or some other activity, on the marine environment. In general, a network of marine protected areas may be designed to fulfil several such objectives.

7. Regarding marine protected areas beyond the limits of national jurisdiction, some guidance on possible objectives can be found in the decisions of the seventh meeting of the Conference of the Parties. In accordance with decision VII/5, appendix 3, the overall marine and coastal biodiversity management framework should (i) fulfil the three objectives of the Convention; (ii) play a precautionary approach role to help halt losses in biodiversity and encourage recovery, notwithstanding our imperfect knowledge of the marine environment; (iii) address all elements of biodiversity, as reflected in annex I to the Convention, including the genetic, species and ecosystem levels; and (iv) address connectivity. In addition, the Conference of the Parties, as well as the United Nations General Assembly have expressed their concern about the serious threats to biodiversity beyond national jurisdiction, and stressed the need for rapid action to address these threat on the basis of the precautionary approach and the ecosystem approach, in particular in areas with seamounts, hydrothermal vents, and cold-water corals, other vulnerable ecosystems and certain other underwater features (decision VII/5, paragraph 60). Given the mandate in decision VII/5, and in the resolutions of the General Assembly, addressing threats to these ecosystems should also be part of any objectives of possible MPAs beyond national jurisdiction.

B. Identifying and designating possible sites

8. Several submissions highlighted the difference between the processes of identifying possible sites and designating those sites. The identification process uses ecological criteria and considerations to identify a number of possible sites that meet the established objectives. This stage is essentially a science-led process, although local and traditional knowledge may also be incorporated as appropriate. The second stage in this process would be to prioritize the identified sites for designation. This prioritization process will include both ecological and practical considerations, including socio-economic values. For example, an area having comparatively higher biodiversity values, or higher support of stakeholders and political acceptability, would receive a higher priority in the designation process. The designation would have to take place in the context of international law, including UNCLOS.

C. The need for scientific information

9. The identification of potential marine areas for protection should be supported by the best available scientific data. These data may include, but are not limited to, the location of ecosystems and habitats, the range of species of interest, human uses and activities, as well as location and extent of existing marine protected areas. Commercial fishing biological data should also be included. It should be noted that information sources may be clustered in space, resulting in areas that are comparatively well studied appearing more important than areas that are relatively poorly studied.

10. For these data to be useful in the identification of potential MPA sites, they would need to be in spatial format, providing for analysis using Geographic Information Systems. For marine areas beyond the limits of national jurisdiction, a Geographic Information Systems database has been established as part of the scientific study presented in document UNEP/CBD/WG-PA/1/INF/1. Most of the data presented in this study is available at www.seaaroundus.org. Other noteworthy work in this regard includes the Ocean Biogeographic Data System (OBIS), available at http://www.iobis.org/Welcome.htm, and the recent work by Boris Worm and colleagues (Boris Worm, Marcel Sandow, Andreas Oschlies, Heike K. Lotze, and Ransom A. Myers: Global Patterns of Predator Diversity in the Open Oceans. Science 309:1365-1369, 2005). On the regional level, Greenpeace has created maps of the North Sea and Baltic, which include information on spawning grounds, threatened species, the distributions of whales and porpoises, as well as commercial activities. Priority areas for marine reserves are proposed based on these data.

D. Biogeographical classification systems

11. Biogeographical classification systems are of importance in identifying potential MPA sites. In particular, a biogeographical classification system is essential in cases where the main objective of a MPA network is to protect a representative range of marine habitats/ecosystems. For this purpose, an ecological inventory for a given biogeographical region and a classification system distinguishing different habitat types on a broad scale is needed.

12. Although no detailed global biogeographical classification for marine areas currently exists, one is under development. WWF in collaboration with the Nature Conservancy and a number of other partners in undertaking a project titled Marine Ecoregions Of the World (MEOW). Once finalized, this project may provide a useful classification system for the entire ocean. Further information about this initiative and the proposed classification system is provided in a separate information document (UNEP/CBD/COP/8/INF/?). On a coarser scale, large marine ecosystems (LMEs) and the WWF Global 200 ecoregions provide a basis for bioregional classification.

13. In addition, many regions and countries have developed their own biogeographical classification systems. For example, New Zealand is evaluating several biogeographical classification systems for use in establishing MPAs, including the recently completed Marine Environments Classification for use in the

offshore. Australia has developed the Interim Marine and Coastal Regionalization of Australia (see www.deh.gov.au/coasts/mpa/nrsmpa/imcra.html), which aims to provide a comprehensive, integrated and hierarchical spatial planning framework for conservation and sustainable resource use in marine and coastal environments. It contains two provincial level regionalizations: demersal and pelagic. The demersal regionalization is based on a classification of demersal fish species diversity and richness, and defines 17 continental shelf provinces and biotones that are grouped according to climate characteristics in tropical to temperate waters. The pelagic regionalization describes four continental shelf provinces and biotones based on pelagic fish species diversity and richness, as well as nine classes of water mass types in deep water beyond continental shelf. The Australian Government is currently finalizing the regionalization to cover the continental slope and abyssal waters of the EEZ. This bioregionalization will consist of two parts:

(i) A benthic bioregionalization that will describe three spatial scales of bioregions for the seabed beyond the shelf break. The benthic bioregionalization will use bathymetry, data on demersal fish, sponges and sediments, and oceanographic data to define bioregions; and

(ii) A pelagic regionalization that will describe structure in the water column. The pelagic regionalization will be based on the physical properties of the water, using satellite imagery to provide information on primary productivity in the ocean.

14. On the regional level, the Nature Conservancy has delineated coastal biogeographic provinces and regions (marine ecoregions) in Latin America and the Caribbean. A ranking of ecoregions within provinces to establish priorities for conservation was also undertaken.

15. In developing this type of bioregionalization, the scale of mapping diversity should take into account the following considerations:

(i) What is the realistic scale at which habitats can change markedly?

(ii) What is the scale at which the relevant information is available?

(iii) What is a meaningful scale at which zoning can be best delineated and management best applied?

16. Once a biogeographical classification has been undertaken, conservation planning tools, such as MARXAN can be used to deliver decision support for the design of a network of marine protected areas. MARXAN was originally designed for the rezoning of the Great Barrier Reef Marine Park, but has been subsequently applied in many other parts of the world.

E. Integration of MPAs with other measures

17. Several submissions stressed the need to take into account the impact of activities taking in place adjacent to the MPAs, and therefore the importance of an integrated approach in establishing and managing MPAs. The importance of pollution control measures was stressed. These considerations are consistent with the advice in decision VII5, which recognizes that marine protected areas need to be incorporated in a framework of sustainable management practices and actions to protect biodiversity over the wider marine and coastal environment (see paragraph 21). This approach is also consistent with the ecosystem approach, which is the primary framework for implementation of the Convention.

III. SYNTHESIS OF EXISTING CRITERIA

18. Most of the submitted criteria considered not only ecological factors, but also integrated socio-economic, cultural, and in some cases, national defense considerations. In accordance with the mandate received from the Ad Hoc Open-Ended Working Group on Protected Areas, only the ecological component of these criteria is included in the present synthesis.

19. Within these ecological criteria there were many similarities. The table below summarizes the received criteria by indicating how often particular criteria were utilized. An explanation for each criteria is provided, and is directly derived or amalgamated from the submissions received. It should be noted that the criteria vary depending on the objectives of particular marine protected area systems or networks. For example, under the World Heritage Convention, only areas that are outstanding or unique are considered. In contrast, many national and regional systems focus on protecting representative samples of biodiversity, areas of high biodiversity, and areas of importance for threatened species. Therefore, it should be kept in mind that a synthesis of this type may be somewhat misleading, and that the final selection of criteria will need to be directly connected to the objectives of a network of marine protected areas.

Table 1: A summary of criteria used to select priority marine areas for protection, based on submissions from countries, regional bodies, conventions and organizations. Criteria area ranked according to how frequently they present in the submissions received.

Criteria	**Explanation**	**National**	**Regional**	**Convention/ Organization**	**TOTAL**
Representativeness	Area includes physiographic features, populations of species, habitats and ecosystem types or ecological processes, which are representative of the region or ecoregion.	8	5	4	17
Importance for threatened, endangered, declining, rare or endemic species and/or habitats	Area containing habitat of critical importance for survival or recovery of endangered, threatened, rare or endemic species; or area with significant assemblages of such species.	9	5	3	17
High diversity	Area contains high diversity of ecosystems, habitats, communities, or species, or has high genetic diversity.	9	4	3	16
Uniqueness/rarity/ endemism	Area contains either (i) unique ("the only one of its kind"), rare (occurs only in few locations, or has been seriously depleted across its range), distinct and/or endemic species, populations, communities, habitats or ecosystems; and/or (ii) unique or unusual geographic features	9	3	3	15
Importance for life history stages of species, or for migratory species	Area containing (i) breeding grounds, spawning areas, nursery areas, juvenile habitat or other areas important for life history stages of species; or (ii) habitats of migratory species (feeding or rest areas,	9	2	3	14

	breeding, moulting, wintering or resting areas, migratory routes).				
Naturalness	Area has a high degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.	6	5	2	13
Integrity of the area in surrounding landscape/seascape	The area is a biologically functional unit, an effective, self-sustaining ecological entity.	5		4	9
Connectivity/ coherence	(i) Area provides for ecosystem linkages, and/or contributes to the maintenance of essential ecological processes or life-support systems. (ii) Area contributes to a network: protected areas that are adjacent, transboundary or ecologically connected	5	1	3	9
Biogeographic importance	An area that either contains rare biogeographic qualities or is representative of a biogeographic "type" or types, or contains unique or unusual biological, chemical, physical, geological or geomorphological structures or features.	4	1	3	8
High biological productivity	Area containing species, populations or communities with high natural biological productivity.	5	1	1	7
Vulnerability/ fragility/ sensitivity	The area contains a high proportion of sensitive habitats/biotopes or species, or is fragile (highly susceptible to degradation by natural events or by the activities of people).	4	1	1	6
International or national importance	Area containing habitats or species of importance locally or globally (existing or potential value).	4	1	1	6
Size	Area is of sufficient size to fulfill its objectives	1	3	1	5
Comprehensiveness	Area adds to the coverage of the full range of ecosystems recognized at an appropriate scale within and across each bioregion; or adds to national/regional or global system of marine protected areas.	2		1	3

Resilience	The area may contain components of biodiversity that have the ability to recover from disturbances in a reasonable timeframe, or are naturally resistant to threats, such as climate change, and the protection of such areas could enhance the recovery of damaged ecosystems elsewhere in the ecoregion by providing a source of larvae and juveniles.	1	1	1	3
Dependency	An area where ecological processes are highly dependent on biotically structured systems.	2		1	3

20. As can be seen from table 1 above, the most often used ecological criteria include:

(i) Representativeness
(ii) Importance for threatened, endangered, declining, rare or endemic species and/or habitats
(iii) High diversity
(iv) Uniqueness/rarity/endemism
(v) Importance for life history stages of species, or for migratory species
(vi) Naturalness

21. It is likely that these criteria would prove to be important for selecting any priority areas for protection in marine areas beyond the limits of national jurisdiction. However, depending on the objectives of such marine protected areas, many of the other criteria listed here would also be extremely important. Some of the lesser-used criteria, for example resilience, still rely on concepts that are relatively new. Therefore, the fact that they have not been frequently used may have less to do with their relative importance, and more with the lack of knowledge about how to use them. In addition, if the ultimate aim is to move from single marine protected areas to a network of marine protected areas beyond the limits of national jurisdiction, then criteria relevant to networks, such as connectivity, coherence and comprehensiveness also become very important.

22. In addition, many of the submissions contained criteria, which are not purely ecological in nature, but whose application will require taking into account ecological information. These considerations may be incorporated into the site selection or designation processes, either as part of guidance for application of the ecological criteria, or as part of any practical and/or socio-economic criteria. Such criteria include:

- Replication (as a way to decrease the risk of losing species and habitat types to unexpected natural or man-made disasters);
- Threats and risks to the area, for example from pollution and other human activities;
- The level of existing protection;
- The importance of an area to research and/or monitoring;
- Potential of an area for restoration;
- Aesthetic importance and natural beauty values of the area.

Annex I

EXISTING CRITERIA

23. The following criteria were submitted to the Secretariat of the Convention on Biological Diversity. Please note that only ecological criteria are included in this annex, although most of the submitted criteria also incorporated other factors, such as socio-economic and cultural considerations.

COUNTRY CRITERIA

NEW ZEALAND

- The objective is to protect the **full range of marine habitats and ecosystems**. This is irrespective of whether there is a risk or threat to the habitat or ecosystem in question. The full range also means that the New Zealand MPA network is not just focussed on biodiversity hot spots or special or unique areas but will also cover more typical or common habitats and ecosystems
- The MPA network is focussed on **protection of habitats and ecosystems** – not species
- The MPA policy will need to **integrate with other controls and measures** that can also help protect habitats and ecosystems.

Australia and New Zealand joint criteria:

Representativeness

Will the area:

- represent one more ecosystems within an IMCRA bioregion, and to what degree;
- add to the representativeness of the NRSMPA, and to what degree.

Comprehensiveness

Does the area:

- add to the coverage of the full range of ecosystems recognized at an appropriate scale within and across each bioregion;
- add to the comprehensiveness of the National Representative System of Marine Protected Areas.

Ecological importance

Does the area:

- contribute to the maintenance of essential ecological processes or life-support systems;
- contain habitat for rare or endangered species;
- preserve genetic diversity ie is diverse or abundant in species;
- contain areas on which species or other systems are dependent, eg contain nursery or juvenile areas or feeding, breeding or resting areas for migratory species;
- contain one or more areas which are a biologically functional, self-sustaining ecological unit.

International or national importance

- Is the area rated, or have the potential to be listed, on the world or a national heritage list subject to an international or national conservation agreement.

Uniqueness

Does the area:

- contain unique species, populations, communities or ecosystems;
- contain unique or unusual geographic features.

Productivity

- Do the species, populations, or communities of the area have a high natural biological productivity

Vulnerability assessment

- Are the ecosystems and/or communities vulnerable to natural processes.

Biogeographic importance

- Does the area capture important biogeographic qualities.

Naturalness

- How much has the area been protected from, or not been subjected to, human induced change.

INDIA

1. MPAs are selected based on the **representative** marine environment viz. coral reef areas, lagoons, mangroves and nesting areas of birds, turtles and salt water crocodiles. Such selection of habitat diversity will support more species diversity and species assemblages. Preference given to choose areas with wide spectrum of habitats will maximize species conservation in a minimum area.
2. Protection can also be given to **rare, endemic and threatened species**. In addition to this, the key stone species concept will provide us with options to improve the ecosystem or habitat.
3. MPA sites can be also selected based on the **biogeographic regions**. This will help preserve the **representative biota** including the coastal and marine biodiversity of the region. If a biogeographic region is inadequately conserved, then preference is given to that region to establish new MPAs. Presence of rare biogeographic 'type' or types can be considered as MPA site. The unique or unusual geological features can also be potential MPAs.
4. The range of ecological criteria include

    - Areas having **vulnerable/ fragile habitats** like coral reefs and mangroves
    - Areas that provide protection to **various life history stages** of commercially important and other species
    - **Integrity of the area with the surrounding landscape** to form a gamut of ecosystem like proximity to mangrove ecosystem.
    - **Variety of habitats** including habitats for rare, endangered species
    - Breeding grounds or juvenile areas for the species like whales
    - Feeding or rest areas, migratory routes of important species of turtles which are provided maximum protection under CITES and national legislations
    - Genetic diversity areas

5. **Degraded areas which can be restored** to an acceptable natural condition and which can serve the purpose of conservation of species can be considered for PAs.
6. The **naturalness** of the area, i. e. the extent to which the areas has been protected from, or has not been subjected to human-induced change.
7. The **areas of importance locally or globally** for reasons such as **existing or potential value** to the local, national or international communities because of its heritage, historical, cultural, traditional, aesthetic, educational, recreational qualities, biosphere reserves.
8. The area **important for research and monitoring**.
9. **Size of the MPAs** is another important aspect to be considered for setting up of PAs. The damages that can be caused by specific pressures often depend on the size and ecological vulnerability of the area. Smaller sites will be less stable to withstand much pressures and threats.
10. **Level of threat and protection status**: Sites already enjoying some kind of legal or social protections like sacred sites have more conservation feasibility value. It is also important to consider the level and

type of threat posed to particular area. Demographic pressures emanating from the legitimate needs of the local population might be far more difficult to control than those from elite tourist activities.

11. Integrated approach in establishing MPAs: It is important to know the **impact of activities taking place adjacent to the MPAs**. Benefits of MPAs covered by the legislations can be deprived of by the destructive activities taking place in the adjacent land and upland areas. Hence, it is always better to have an integrated approach in establishing and conservating marine protected areas. This will help reduce the pressures exerted on the marine MPAs from the land-based sources.

IRAN

Ecological criteria for the identification and selection sensitivity seascape as protected areas in Iran

1. Uniqueness
2. Rarity
3. Critical Habitat
4. Dependency
5. Representative ness
6. Diversity
7. Productivity
8. Spawning or Breeding Ground
9. Naturalness
10. Integrity
11. Vulnerability
12. Bio-geographic importance

Ecological criteria for the identification and selection seas protected areas in Iran

1. Diversity
2. Naturalness
3. Uniqueness
4. Dependency
5. Representative ness
6. Productivity
7. Vulnerability
8. Integrity

CANADA

Identification of Ecologically and Biologically Significant Areas:

At the conceptual level, there are three main dimensions along which specific areas can be evaluated with regard to their ecological and biological significance:

a. Uniqueness – ranked from areas whose characteristics are unique, rare, distinct, and for which alternatives do not exist to areas whose characteristics are widespread with many areas which are similar in most important features. Uniqueness may be considered in regional, national and global context, with increased importance at each scale. In some cases, this is equivalent to the term “rarity”.

b. Aggregation – ranked from areas where:

i. most individuals of a species are aggregated for some part of the year; OR

ii. most individuals use the area for some important function in their life history; OR

iii. some structural feature or ecological process occurs with exceptionally high density

to areas where:

iv. individuals of a species are widespread and even areas of comparatively high density do not contain a substantial portion of the total population; OR

v. individuals may congregate to perform a life-history function, but the areas in which they perform the function varies substantially over time; OR

vi. structural property or ecological process occurs in many alternative areas.

c. Fitness consequences – Ranked from areas where the life history activity(ies) undertaken make a major contribution to the fitness of a population or species present to areas where the life history activity(ies) undertaken make only marginal contribution to fitness.

The two additional dimensions to be considered when evaluating sites on the three major dimensions are:

a. Resilience – from areas where the habitat structures or species are highly sensitive, easily perturbed, and slow to recover to areas where the habitat structures or species are robust, resistant to perturbation, or readily return to the pre-perturbation state.

b. Naturalness – from areas which are pristine and characterized by native species to areas which are highly perturbed by anthropogenic activities and/or with high abundances of introduced or cultured species.

Areas should be evaluated on all five dimensions. Areas located in several different parts of the multidimensional space can be Ecologically and Biologically Significant. Two tables have been prepared so that areas can be evaluated in multidimensional space. Areas which rank highly for one of the first three dimensions (ie. highly unique, highly concentrated or an activity with very high fitness consequences) may be considered Ecologically and Biologically Significant Areas.

Evaluations should also consider cumulative importance for wide range of attributes. Areas which rank relatively lower may also be considered Ecologically and Biologically Significant Areas, but only if a large number of species are at or above average (in abundance or in terms of performing an important function in the area) on the dimension of relevance.

ECUADOR

Algunos criterios propuestos:

- Debe sustentar comunidades ecológicas amenazadas.
- Debe sustentar poblaciones de especies vegetales y/o animales importantes para mantener la diversidad biológica.
- Debe sustentar especies vegetales y/o animales cuando se encuentran en una etapa crítica de su ciclo biológico.
- Debe sustentar una proporción significativa de subespecies, especies o familias de peces, etapas del ciclo biológico, interacciones de especies y/o poblaciones que benefician a comunidades locales.
- Debe ser una fuente de alimentación importante para peces, es una zona de desove, un área de desarrollo y crecimiento y/o una ruta migratoria de la que dependen las existencias de peces.

MADAGASCAR

Criteres par rapport aux buts de gestion des sites de conservation

1- Compléter la représentativité du réseau national des APs (But de gestion)

- L'écosystème est-il non représenté dans le réseau national d'AP ?
- Le site apporte t-il une extension pour la protection des espèces représentées dans les AP (viabilité des espèces)?

- L'écosystème est-il insuffisamment (au moins 10% de la surface totale à Madagascar) représenté dans le réseau national d'AP ?
- Le site contribue t-il aux objectifs de la conservation biologique (processus écologiques) ?

2- Protéger les espèces menacées en dehors du réseau national des APs

- Le site non protégé possède-t-il des espèces localement endémiques ?
- Le site non protégé possède-t-il des espèces qui existent uniquement en dehors des AP ?
- Le site non protégé a- t-il de l'importance biologique : Haute diversité spécifique (au-delà de 25%) connue ?
- Le site non protégé a- t-il de l'importance biologique : Haute diversité spécifique pressentie?
- Le site contient-il des espèces menacées (UICN) mais exploitées ?

3- Conserver les populations viables des espèces clés de voûte (keystone species)

- Les sites hébergent-ils des espèces grégaires et clés de voûte ?
- Les sites hébergent-ils des espèces clés de voûte menacées ?
- Les sites hébergent-ils des espèces clés de voûte à distribution restreinte ?
- Le site contient-il des espèces clés de voûte exploitées ou dont l'habitat est en voie de destruction?

4- Conserver les écosystèmes et les habitats importants et leur fonction écologique

- Le site contient-il des habitats /écosystèmes uniques et des concentrations de biodiversité plus élevées que d'autres ?
- La région contient-elle un ou des habitats menacés, de valeur pour le maintien et la restauration des fonctions écologiques et génétiques ?
- Le site est-il un habitat obligatoire pour les espèces migratrices (oiseaux, baleines, tortues)?
- Le site est-il un habitat obligatoire pour les espèces à haute valeur économiques (accomplissement d'un stade du cycle biologique?
- Est-ce que le site est menacé par les espèces envahissantes ?

5- Contribuer au maintien du pont génétique (connectivité) et de l'interdépendance des écosystèmes

- Est-ce que le pont génétique est menacé de fragmentation?
- Est-ce qu'il y a des phénomènes d'érosion dans la région ?
- Est-ce qu'il y a des phénomènes de pollution dans la région ?
- Le site contribue-t-il à maintenir la connectivite entre deux ou plusieurs parties d'un écosystème ou le maintien des processus écologiques (écosystème marin)?
- Est-ce qu'il existe des activités humaines qui menacent le pont génétique ?

6- Assurer les services écologiques importants

- Est-ce que le site permet un important piégeage de carbone ?
- Est-ce que le site contribue à la protection contre l'érosion?
- Est-ce que le site contribue au maintien des services hydrologiques ?
- Est-ce que le site peut contribuer à la lutte contre la désertification ?

ARGENTINA

1. Existencia de especies. ambientes y/o funciones ecológicas esenciales o en riesgo de disminución. La importancia de conseniar especies, ambientes y/o funciones ecológicas esenciales debe entenderse desde una optica precautoria.

2. Presencia de ecosistemas singulares, unicos y/o raros; presencia de especies raras, endémicas y/o carismáticas; existencia de gran diversidad de especies, comunidades, habitats o ecosistemas; presencia de

un alto grado de naturalidad como resultado de la falta o de un menor nivel de degradación y perturbación inducida por el ser humano.

3. Papel que juega el área en la alimentación, reproduccion y refugio de las especies que lo habitan; la productividad actual y potencial y la integracion vertical de la trama trófica.

4. Representatividad de las especies y fenómenos naturales que se espera conservar; la sensibilidad de los ecosistemas locales a la continuidad de la vida en el entorno del área protegida.

5. Grado potencial de restauración del área.

MAURITIUS

To designate a Marine Protected Areas, the following list is adopted and the site should generally:
1. be free from disturbance or degradation and should have a high degree of naturalness.
2. support rich marine biodiversity and demonstrate close ecological relationships.
3. has the potential to be listed as a MPA of international importance/marine coastal wetland (shallow marine waters, coral reefs, inter tidal mud flats, mangrove swamps)
4. be representative of marine endemic species.
5. be habitat for rare/protected species
6. be nursery ground for juvenile fish, breeding ground for a variety of species.
7. be a productive area that can sustain ecosystems.
8. be of touristic value on account of the ecological assets (popular among divers, high recreational usage)
9. be of educational importance (ideal for education on ecosystems/marine life)
10. be of scientific/research importance.
11. have a potential ecological contribution to socio-economic benefits.
12 If vulnerable to biodiversity loss on account of anthropogenic impacts/pressure be preserved and conserved for sustainable use.

TRINIDAD AND TOBAGO

Principles of Environmentally Sensitive Area (ESA) Rules of 2001 are used in selection of marine areas for protection.

- Uniqueness, rarity or important biological features
- Good representation of naturally-occurring ecological system or type
- Particularly good representative of an ecosystem characteristic of one, or common to more than one biogeographical region
- Critical importance to the survival or recovery of endangered, endemic or vulnerable species/communities of plants and animals
- An appreciable or significant assemblage of endangered, or threatened species of plants or animals
- Special value as a habitat for plants or animals at a critical stage of their biological cycle
- Provision of appreciable social, recreational or economic benefit to local communities or to wider areas
- High in aesthetic value
- Regarded by the scientific community as having significant value for non-destructive research
- Potential for fostering environmental awareness, appreciation or education
- Performing an integral role in the functioning of the wider ecosystem
- Representative example of all coastal and marine ecosystems
- Representative example of all wetland types

REGIONAL CRITERIA

PROTOCOL CONCERNING SPECIALLY PROTECTED AREAS AND WILDLIFE (SPAW) IN THE WIDER CARIBBEAN REGION

Ecological criteria:

a) **Representativeness** – the area **should** include physiographic features, populations of species, habitats and ecosystems types or ecological processes, which are representative of the region or ecoregion.

b) **Size** – The area **must** be of sufficient size to ensure the conservation of the elements for which it is listed.

c) **Species -** The area **must** help prevent species from becoming endangered or threatened.

d) **Rarity** – The area **should** contain unique or rare species, habitats, or ecosystems. An area or ecosystem is rare if it is among the few of its kind in the country or Wider Caribbean Region or has been seriously depleted across its range. The area may contain habitats that occur in a limited area, or rare, endemic, threatened or endangered species that are geographically restricted in their distribution.

e) **Naturalness** – The area **should** have a high degree of naturalness as a result of the lack of or low level of human-induced disturbance and degradation.

f) **Critical habitats** – The area **should** contain habitats or ecosystems that are critical to the survival and recovery of endangered, threatened or endemic species, or to species listed in Annex I, II or III of the Protocol.

g) **Diversity** – The area **should** contain the variety or richness of species, communities, ecosystems, landscapes, seascapes and genetic diversity necessary for its long term viability and integrity, especially where there are endangered, threatened, endemic and/or migratory species, and those listed in the Annexes to the Protocol.

h) **Connectivity/coherence** – Protected areas that are adjacent, transboundary or ecologically connected and thus contribute to the regional network are valued components of the regional network and **should** be considered if nominated by the Parties which have jurisdiction over these areas.

i) **Resilience** – The area **may** contain biological components (habitats, populations of species) that have the ability to recover from disturbances in a reasonable timeframe, or are naturally resistant to threats, such as climate change, and the protection of such areas **could** be able to enhance the recovery of damaged ecosystems elsewhere in the ecoregion by providing a source of larvae and juveniles.

BALTIC SEA PROTECTED AREAS (HELCOM)

A coastal or marine area of the Baltic Sea Region can be designated as a BSPA if it meets the following criteria and if its proposed protection status corresponds with the afore mentioned protection categories:

1. Aim of protection

In a BSPA particular protection should be given to the species and natural habitats and nature types of the marine and coastal ecosystems of the Baltic Sea Area to conserve biological and genetic diversity and to protect ecological processes.

2. Objects of protection

- Areas with high biodiversity,

- habitats of endemic, rare or threatened species and communities of fauna and flora,
- habitats of migratory species,
- nursery and spawning areas,
- rare or unique or representative geological or geomorphological structures or processes.

3. Size:

The minimum size of a BSPA should be preferably 1000 ha for terrestrial parts and/or 3000 ha for marine/lagoon parts.

4. Naturalness:

The landscape/seascape of a BSPA should be not - or only little - disturbed by man. Ongoing economic activities should follow the principles of sustainable use. An appropriate protection status should be chosen according to the afore mentioned protection categories.

5. Pollution:

The environment of a BSPA should be to a large extend free of pollution. If polluted, activities should be started as soon as possible to distinctly improve the environmental situation through, e.g., technical measures, such as sewage treatment plants etc. Integrated Coastal Management Plans may help to meet these requirements.

6. Representativeness:

A BSPA should be a representative ecological functional entity for a Baltic Sea Region or Sub-Region (see attachment to document EC NAT 3/7) or for a Baltic Sea State.

THE CONVENTION FOR THE PROTECTION OF THE MARINE ENVIRONMENT OF THE NORTH-EAST ATLANTIC (OSPAR CONVENTION)

Ecological criteria/considerations
An area qualifies for selection as an MPA if it meets several but not necessarily all of the following criteria. The consideration and assessment of these criteria should be based on best available scientific expertise and knowledge.

1. Threatened or declining species and habitats/biotopes

The area is important for species, habitats/biotopes and ecological processes that appear to be under immediate threat or subject to rapid decline as identified by the ongoing OSPAR (Texel-Faial) selection process.

2. Important species and habitats/biotopes

The area is important for other species and habitats/biotopes as identified by the ongoing OSPAR (Texel-Faial) selection process.

3. Ecological significance

The area has:

- a high proportion of a habitat/biotope type or a biogeographic population of a species at any stage in its life cycle;
- important feeding, breeding, moulting, wintering or resting areas;
- important nursery, juvenile or spawning areas; or

- a high natural biological productivity of the species or features being represented.

4. High natural biological diversity

The area has a naturally high variety of species (in comparison to similar habitat/biotope features elsewhere) or includes a wide variety of habitats/biotopes (in comparison to similar habitat/biotope complexes elsewhere).

5. Representativity

The area contains a number of habitat/biotope types, habitat/biotope complexes, species, ecological processes or other natural characteristics that are representative for the OSPAR maritime area as a whole or for its different biogeographic regions and sub-regions.

6. Sensitivity

The area contains a high proportion of very sensitive or sensitive habitats/biotopes or species.

7. Naturalness

The area has a high degree of naturalness, with species and habitats/biotope types still in a very natural state as a result of the lack of human-induced disturbance or degradation.

PROTOCOL CONCERNING SPECIALLY PROTECTED AREAS AND BIOLOGICAL DIVERSITY IN THE MEDITERRANEAN

Regional value is a basic requirement of an area for being included in the SPAMI List. The following criteria should be used when evaluating the Mediterranean interest of an area:

a) **Uniqueness**
The area contains unique or rare ecosystems, or rare or endemic species.

b) **Natural representativeness**
The area has highly representative ecological processes, or community or habitat types or other natural characteristics. Representativeness is the degree to which an area represents a habitat type, ecological process, biological community, physiographic feature or other natural characteristic.

c) **Diversity**
The area has a high diversity of species, communities, habitats or ecosystems.

d) **Naturalness**
The area has a high degree of naturalness as a result of the lack or low level of human-induced disturbance and degradation.

e) Presence of habitats that are critical to endangered, threatened or endemic species.

f) **Cultural representativeness**
The area has a high representative value with respect to the cultural heritage, due to the existence of environmentally sound traditional activities integrated with nature which support the well-being of local populations.

EUROPEAN UNION (EU) HABITATS DIRECTIVE

The EU Habitats Directive provides for a two-level process. Stage 1 in this process assesses, on the national level, the relative importance of sites for each natural habitat type and species. Stage 2 provides for assessment of Community importance of the sites included on the national lists.

STAGE 1:

A. Site assessment criteria for a given natural habitat type in Annex 1

(a) Degree of representativity of the natural habitat
(b) Area of the site covered by the natural habitat type in relation to the total area covered by that natural habitat type within national territory.
(c) Degree of conservation of the structure and functions of the natural habitat type concerned and restoration possibilities.
(d) Global assessment of the value of the site for conservation of the natural habitat type concerned

B. Site assessment criteria for a given species in Annex II

(a) Size and density of the population of the species present on the site in relation to the populations present within national territory.
(b) Degree of conservation of the features of the habitat which are important for the species concerned and restoration possibilities.
(c) Degree of isolation of the population present on the site in relation to the natural range of the species.
(d) Global assessment of the value of the site for conservation of the species concerned.

On the basis of these criteria, Member States will classify the sites which they propose on the national list as sites eligible for identification as sites of Community importance according to their relative value for the conservation of each natural habitat type in Annex I or each species in Annex II.

That list will show the sites containing the priority natural habitat types and priority species selected by the Member States on the basis of the criteria in A and B above.

STAGE 2:
All the sites identified by the Member States in Stage 1 which contain priority natural habitat types and/or species will be considered as sites of Community importance. The following criteria will be taken into account in assessment of community importance of the sites included on national lists:

(a) Relative value of the site at national level;
(b) Geographical situation of the site in relation to migration routes of species in Annex II and whether it belongs to a continuous ecosystem situated on both sides of one or more internal Community frontiers;
(c) Total area of the site;
(d) Number of natural habitat types in Annex I and species in Annex II present on the site;
(e) Global ecological value of the site for the biogeographical regions concerned and/or for the whole of the territory referred to in Article 2, as regards both ►C1 the characteristic or unique ◄ aspect of its features and the way they are combined.

CONVENTION/ORGANIZATION SUMMARIES

INTERNATIONAL MARITIME ORGANIZATION (IMO)

Ecological criteria for Particularly Sensitive Sea Areas (PSSAs):

- **Uniqueness or rarity** - An area or ecosystem is unique if it is "the only one of its kind". Habitats of rare, threatened, or endangered species that occur only in one area are an example. An area or ecosystem is rare if it only occurs in a few locations or has been seriously depleted across its range. An ecosystem may extend beyond country borders, assuming regional or international significance. Nurseries or certain feeding, breeding, or spawning areas may also be rare or unique.
- **Critical habitat** - A sea area that may be essential for the survival, function, or recovery of fish stocks or rare or endangered marine species, or for the support of large marine ecosystems.

- **Dependency** - An area where ecological processes are highly dependent on biotically structured systems (e.g. coral reefs, kelp forests, mangrove forests, seagrass beds). Such ecosystems often have high diversity, which is dependent on the structuring organisms. Dependency also embraces the migratory routes of fish, reptiles, birds, mammals, and invertebrates.
- **Representativeness** - An area that is an outstanding and illustrative example of specific biodiversity, ecosystems, ecological or physiographic processes, or community or habitat types or other natural characteristics.
- **Diversity** - An area that may have an exceptional variety of species or genetic diversity or includes highly varied ecosystems, habitats, and communities.
- **Productivity** - An area that has a particularly high rate of natural biological production. Such productivity is the net result of biological and physical processes which result in an increase in biomass in areas such as oceanic fronts, upwelling areas and some gyres.
- **Spawning or breeding grounds** - An area that may be a critical spawning or breeding ground or nursery area for marine species which may spend the rest of their life-cycle elsewhere, or is recognized as migratory routes for fish, reptiles, birds, mammals, or invertebrates.
- **Naturalness** - An area that has experienced a relative lack of human-induced disturbance or degradation.
- **Integrity** - An area that is a biologically functional unit, an effective, self-sustaining ecological entity.
- **Fragility** - An area that is highly susceptible to degradation by natural events or by the activities of people. Biotic communities associated with coastal habitats may have a low tolerance to changes in environmental conditions, or they may exist close to the limits of their tolerance (e.g., water temperature, salinity, turbidity or depth). Such communities may suffer natural stresses such as storms or other natural conditions (e.g., circulation patterns) that concentrate harmful substances in water or sediments, low flushing rates, and/or oxygen depletion. Additional stress may be caused by human influences such as pollution and changes in salinity. Thus, an area already subject to stress from natural and/or human factors may be in need of special protection from further stress, including that arising from international shipping activities.
- **Bio-geographic importance** - An area that either contains rare biogeographic qualities or is representative of a biogeographic "type" or types, or contains unique or unusual biological, chemical, physical, or geological features.

UNESCO WORLD HERITAGE CONVENTION

Natural heritage site criteria:

- Contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance;
- Be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features;
- Be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals;
- Contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.

IUCN

Criteria for selection of priority areas:

Biogeographic criteria:

- Presence of rare biogeographic qualities or representative of biogeographic "type" or types
- Unique or unusual geological features

Ecological criteria:

- An essential part of ecological processes or life-support systems (for example, is a source for larvae for downstream areas)
- Area's integrity, or the degree to which the area either by itself or in association with other protected areas, encompasses a complete ecosystem
- The variety of habitats
- Presence of habitat for rare or endangered species
- Nursery or juvenile areas
- Feeding, breeding or rest areas
- Rare or unique habitat for any species
- Genetic diversity (is diverse or abundant in species terms)

Naturalness:

- Extent to which the area has been protected from, or has been subject to, human-induced change

In addition to the above, the IUCN also elaborates specific criteria for economic importance, social importance, scientific importance, international or national significance and practicality/or feasibility.

GREAT BARRIER REEF MARINE PARK

The Great Barrier Reef Marine Park Authority used two sets of criteria in implementing the Representative Areas Program. These were (i) Biophysical Operational Principles and (ii) Social, Economic, Cultural and Management Feasibility Operational Principles. The Biophysical Operational Principles, which should be treated as a package to underpin the choice of what number, size and location of no-take areas (Green Zones) to implement, are reproduced here.

1. Have no-take areas the minimum size of which is 20km along the smallest dimension (except for coastal bioregions, refer to Principle 6). Explanation: While no-take areas may be of various shapes and sizes, 20km should be the minimum distance across any no-take area in order to ensure that the size of each area is adequate to provide for the maintenance of populations of plants and animals within Green Zones and to insure against edge effects resulting form use of the surrounding areas.

2. Have larger (versus smaller) no-take areas. For the same amount of area to be protected, protect fewer, larger areas rather than more smaller areas, particularly to minimize 'edge effects' resulting from use of the surrounding areas. The principle must be implemented in conjunction with principle 3.

3. Have sufficient no-take areas to insure against negative impacts on some part of a bioregion. "Sufficient" refers to the amount and configuration of no-take areas and may be different for each bioregion depending on its characteristics. For most bioregions, 3-4 no-take areas are recommended to spread the risk against negative human impacts affecting all Green Zones within a bioregion. For some very small bioregions fewer areas are recommended, whilst for some very large or long bioregions, more no-take areas are recommended.

4. Where a reef is incorporated into no-take zones, the whole reef should be included. Reefs are relatively integral biological units with a high level of connectivity among habitats within them. Accordingly, reefs should not be subject to 'split zoning' so that parts of a reef are 'no-take' and other parts are not.

5. Represent a minimum amount of each reef bioregion in no-take areas. In each reef bioregion, protect at least 3 reefs with at least 20% of reef area and reef perimeter included in no-take areas. The number and distribution of no-take areas is described in principle 3.

6. Represent a minimum amount of each non-reef bioregion in no-take areas. In each non-reef bioregion, protect at least 20% of area. Two coastal bioregions, which contain finer scale patterns of diversity due to bays, adjacent terrestrial habitat and rivers require special provisions. The number and distribution of no-take areas is described in principle 3.

7. Represent cross-shelf and latitudinal diversity in the network of no-take areas. Many processes create latitudinal and longitudinal (cross-shelf) differences in habitats and communities within the GBR World Heritage Area. This diversity is reflected partly in the distribution of the bioregions, but care should be taken to choose no-take areas that include difference in community types and habitats that cover wide latitudinal or cross-shelf ranges (see principle 8).

8. Represent a minimum amount of each community type and physical environment type in the overall network taking into account principle 7. This principle is to ensure that all known communities and habitats that exist within bioregions are included in the network of no-take areas. Communities and habitats were identified for protection in no-take areas based upon the reliability and comprehensiveness of available data.

9. Maximize use of environmental information to determine the configuration of no-take areas to form viable networks. The network of areas should accommodate what is known about migration patterns, currents and connectivity among habitats. The spatial configurations required to accommodate these processes are not well known and expert review of candidate networks of areas will be required to implement this principle.

10. Include biophysically special/unique places. These places might not otherwise be included in the network but will help ensure that the network is comprehensive and adequate to protect biodiversity and the known special or unique areas in the GBRMP. Aim to capture as many biophysically special or unique places as possible.

11. Include consideration of sea and adjacent land uses in determining no-take areas. Past and present uses may have influenced the integrity of the biological communities and the GBRMPA should consider these effects, where known, when choosing the location of no-take areas. For example, existing no-take areas and areas adjacent to terrestrial National parks are likely to have greater biological integrity than areas that have been used heavily for resource exploitation.

GREENPEACE

The following four guiding principles are commonly applied by scientists and experts and seem best suited for the identification of potential fully protected marine reserves:i ii

1. **Representativeness:** to conserve the whole spectrum of marine biodiversity, it is vital that all biogeographic regions are represented, and that within each region all major habitats should be represented.

   Efforts to create MPAs and marine reserves have thus far been mainly concentrated in the coastal zone – and even they cover less than 1% of the marine area. This process must be continued, expanded and hastened to ensure that a representative network of marine reserves is established to meet the 2012 target. However, it is crucial that a globally representative network of marine reserves are also established beyond countries EEZs in order to protect the full range of species and habitats found in the high seas including vulnerable deep-sea ecosystems. In the past, the fact that much of the ocean could not be exploited by humans meant that large swaths of oceans were *de facto* marine reserves, where species and habitats could develop or find refuge from exploitation. This is no longer the case as ever more sophisticated technology enables us to exploit the marine environment and its resources in ways that were previously unavailable.

2. **Replication:** by replicating each habitat in two or more spatially separated marine reserves within one network, there is a decrease in the risk of losing species and habitat types to unexpected natural or man-made disasters (e.g. storm damage, pollution incidents or climate

change) and disease. Moreover, replication also ensures that a wider range of natural variation found in species and habitats is protected. Where it is not possible to secure the protection of several locations of the same habitat or species, it is necessary to consider other design principles such as protecting a larger proportion of or the entire habitat or species in question.

3. **Self-sustaining:** individual marine reserves should be, as far as possible, ecologically self-sustaining. For this to be the case, the marine reserve has to be large enough to allow most ecological processes to operate and be sustained within the area. This may not always be possible to achieve in the case of marine species, which as adults, or during their larval and spawning phases disperse over vast distances. For these species single marine reserves will not be sufficient to sustain populations, but a network of reserves may go some way towards offering the protection they need. Any spatial protection efforts must in any case go hand in hand with measures to minimize or control damaging activities.

4. **Networks:** multiple marine reserves will need to be established in a region to ensure that the full range of biodiversity is conserved. These marine reserves should be incorporated into a network that maximizes connectivity and simultaneously minimizes the risk of impact from large-scale effects. To be fully functional, the network must protect cores sites, as well as suitable dispersal corridors and ecological stepping stones.

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i/ Ballantine, W.J. 1997. Design principles for systems of 'no-take' marine reserves. Paper for workshop: the Design and Monitoring of Marine Reserves at Fisheries Center, University of British Columbia, Vancouver, Feb 1997.

ii/ Secretariat of the Convention of Biological Diversity. 2004. Technical advice on the establishment and management of a national system of marine and coastal protected areas, SCBD, 40 pages (CBD Technical Series no.13)