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IN-DEPTH REVIEW OF THE IMPLEMENTATION OF THE PROGRAMME OF WORK ON MARINE AND COASTAL BIOLOGICAL DIVERSITY

Note by the Executive Secretary

EXECUTIVE SUMMARY

The present note summarizes the findings of the in-depth review of the elaborated programme of work on marine and coastal biological diversity and suggests recommendations for improved implementation of the programme of work. Further information in relation to this note is available in a background document (UNEP/CBD/SBSTTA/14/INF/2), two expert workshop reports (UNEP/CBD/SBSTTA/14/INF/4 and UNEP/CBD/SBSTTA/14/INF/5), and three reports on scientific synthesis of the impacts of unsustainable fishing (UNEP/CBD SBSTTA/14/INF/6), the impacts of ocean fertilization (UNEP/CBD/SBSTTA/14/INF/7), and the impacts of ocean acidification (UNEP/CBD/SBSTTA/14/INF/8) on marine biodiversity, respectively.

Key findings and conclusions of the assessment of the progress made in the implementation of the programme of work include, *inter alia*:

(a) Despite evidence that progress is being made in many places and on many issues, from high-level policy-making to local and regional field initiatives, the global status and trend show serious declines in marine living resources, losses of coastal habitats, elevated pollution levels, and poor water quality in many areas. Overall deterioration of the marine environment is further exacerbated by the effects of climate change, such as sea-level rise and sea-temperature rise, and the potential impacts of ocean acidification as direct consequence of increased carbon dioxide emissions. Coastal communities and local economies are adversely impacted by such trends as poverty, land-use changes, overfishing, nutrient loading, sewage, and coastal development, which put the capacity of the marine environment beyond its sustainable limit;

(b) Pressures on coastal and marine biodiversity will continue to increase, with 50 per cent of the world's population living along the coasts by 2015, putting increasing stress on coastal resources;

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these human pressures will combine with the impacts of climate change, which will become more severe in the future;

(c) Slow progress has been made towards achieving the 2012 target of establishing ecologically representative and effectively managed marine protected areas networks, despite efforts in the last few years; less than 1 per cent of the ocean surface is protected, compared to nearly 15 per cent of protected-area coverage on land;

(d) Increase in sea-water temperature will have wide-ranging impacts on marine and coastal systems, from more frequent and severe coral bleaching events to rising sea levels and melting sea ice. Rising carbon dioxide concentrations in the atmosphere will result in sea water becoming more acidic, reducing the biocalcification of tropical and cold-water coral reefs, as well as other shell-forming organisms, such as calcareous phytoplankton, and impacting the entire marine food chain. Climate change may affect ocean circulation, including potentially reducing the intensity and frequency of large-scale water exchange mechanisms;

(e) Information available from the third and fourth national reports submitted by Parties to the Convention and from relevant organizations indicates that the programme of work has provided an effective framework to facilitate national, regional and global efforts to reduce the loss of marine and coastal biological diversity. The programme of work is also found to be useful in engaging various partners and creating synergy with relevant international and regional agreements, action plans and processes;

(f) Despite progress made, to different extents, in various countries and regions, the effective implementation of the programme of work in many countries was constrained by a range of barriers, such as: lack of political commitment and support; lack of mainstreaming and lack of integration of environmental, social and economic objectives; institutional and policy obstacles and weaknesses; insufficient human and technical resources and capacity; limited financial resources; lack of suitable data; low awareness; insufficient training in the use of guidelines and tools, and inadequate dissemination of such materials; limited or low involvement of indigenous and local communities and various stakeholders; and lack of economic incentives;

(g) Priority should be given to the following, in order to overcome the identified barriers and constraints, *inter alia*, enhancing cross-sectoral coordination and policy planning in regard to marine and coastal areas; enhancing coordination between levels of Government, with emphasis on local implementation; developing and strengthening stakeholder networks; demonstrating the economic and social value of marine and coastal biodiversity; undertaking periodic review of the adequacy of policies and legislation and their implementation; securing resourcing and funding through forward planning; enhancing capacity of personnel through training; making scientific information and traditional knowledge easier to access through improved information management; scaling-up and replicating demonstration projects; developing regional collaboration to address scientific information needs; developing or further enhancing spatial approaches to data management; developing international scientific expertise and processes for assessing and managing poorly known ocean areas such as the deep sea, and providing information about the status of marine biodiversity globally, as well as management options; and identifying areas of global ecological and biological significance in marine areas beyond national jurisdiction.

Drawing upon the findings and recommendations of the in-depth review and above-mentioned reports, the present note recommends some areas to be considered in updating the existing programme of work, in regards to, *inter alia* : (i) biodiversity conservation in marine areas beyond national jurisdiction; (ii) aspects of marine biodiversity related to climate change and addressing ocean acidification; (iii) impacts of unsustainable fishing; and (iv) improving the representativity of the global system of marine and coastal protected areas.

SUGGESTED RECOMMENDATIONS

The Subsidiary Body on Scientific, Technical and Technological Advice may wish to recommend that the Conference of the Parties adopt a decision along the following lines:

The Conference of the Parties

In-depth review of the progress made in the implementation of the elaborated programme of work on marine and coastal biological diversity, as contained in annex I to decision V/7

1. *Expresses its appreciation* to the Division of Environmental Policy Implementation (DEPI) of the United Nations Environment Programme (UNEP) for providing financial and technical support to the Secretariat of the Convention on Biological Diversity for preparing the background document (UNEP/CBD/SBSTTA/14/INF/2) and to Parties, other Governments and relevant organizations for submitting relevant information such as third and fourth national reports, voluntary reports and other relevant reports;

2. *Takes note* of progress made in the implementation of the elaborated programme of work on marine and coastal biological diversity, as contained in the annex I to decision VII/5, at national, regional and global levels and that implementation has been facilitated by the Executive Secretary as well as relevant United Nations agencies and international organizations;

3. *Recognizes and supports* the ongoing work under the United Nations to establish a legitimate and credible regular process for global reporting and assessment of the state of the marine environment, including socio-economic aspects, while building on existing regional assessments and avoiding duplication of effort;

4. *Notes with concern* the slow progress towards achieving the 2012 target of establishing ecologically representative and effectively managed networks of marine protected areas and that despite efforts in the last few years, still less than 1 per cent of the ocean surface is protected, compared to nearly 15 per cent of protected-area coverage on land;

5. *Recognizing* that the ocean is one of the largest natural reservoirs of carbon, which can significantly affect the rate and scale of global climate change, *requests* Parties, other Governments and relevant organizations to further integrate climate-change-related aspects of marine and coastal biodiversity into national biodiversity strategies and action plans (NBSAPs), national integrated marine and coastal management programmes, the design and management of marine and coastal protected areas, including the selection of areas in need of protection to ensure maximum adaptive capacity of biodiversity, and other marine environment and resource management-related strategies;

6. *Requests* the Executive Secretary to convene in collaboration with the secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) an expert workshop on oceans and climate change with a view of promoting joint responses of the two Rio conventions;

7. *Noting* that the world's oceans host 32 of the 34 known phyla on Earth and contain between 500,000 and 10 million species, and that new oceanic species are continuously being discovered, particularly in the deep sea, *requests* Parties, other Governments and organizations to further enhance globally networked scientific efforts, such as the Census of Marine Life, to continue to update a comprehensive global list of all forms of life in the sea, and further assess and map the distribution and abundance of species in the sea;

8. *Taking note that* the elaborated programme of work on marine and coastal biological diversity has been strengthened through subsequent decisions VIII/21, VIII/22, VIII/24, and IX/20, *decides* to further update the programme of work, taking into account, *inter alia*:

(a) Further emphasis on improving the representativity and other network properties, as identified in annex II to decision IX/20, of the global system of marine and coastal protected areas, in particular identifying ways to support Parties with the aim of accelerating progress in achieving the

commonly agreed 2012 target of establishing ecologically representative and effectively managed MPA networks, in particular within national jurisdiction;

(b) Progress on marine biodiversity conservation in areas beyond national jurisdiction and identification of ecologically or biologically significant marine areas in open-ocean waters and deep-sea habitats, considering the suggested update under the programme element 2 on marine and coastal living resources contained in annex I to this note;

(c) Climate change-related aspects of marine biodiversity, and the adverse impacts on marine biodiversity of ocean acidification as a direct consequence of increased carbon dioxide emissions;

(d) Adverse impacts of ocean fertilization and other human responses to climate change;

(e) Further emphasis on the role of the ecosystem approach in supporting ecological and social resilience and adaptation in the face of climate change, and the contribution of marine spatial planning to further strengthening the application of the ecosystem approach and integrated marine and coastal area management; and

(f) Further emphasis on the impacts of destructive fishing practices, unsustainable fishing and illegal, unreported and unregulated (IUU) fishing on marine biodiversity, in collaboration with FAO and the regional fisheries management organizations (RFMOs).

Identification of ecologically or biologically significant areas (EBSAs) and scientific and technical aspects relevant to environmental impact assessment in marine areas beyond national jurisdiction

9. *Expresses its gratitude* to the Governments of Canada and Germany for co-funding, and Canada for hosting, the Expert Workshop on Scientific and Technical Guidance on the Use of Biogeographic Classification Systems and Identification of Marine Areas Beyond National Jurisdiction in Need of Protection, held in Ottawa, from 29 September to 2 October 2009, to other Governments and organizations for sponsoring the participation of their representatives, and to the Global Ocean Biodiversity Initiative (GOBI) for its technical assistance and support; and *welcomes* the report of this Expert Workshop (UNEP/CBD/SBSTTA/14/INF/4);

10. *Welcomes* the report on Global Open Oceans and Deep Seabed (GOODs) Biogeographic Classification published by the Intergovernmental Oceanographic Commission of the United Nations Educational, Cultural and Scientific Organization (UNESCO), as contained in the report on Global Open Oceans and Deep Seabed (GOODs) Biogeographic Classification (UNEP/CBD/SBSTTA/14/INF/10), which was submitted pursuant to paragraph 6 of decision IX/20;

11. *Invites* Parties, other Governments and relevant organizations to use the "scientific guidance on the use and further development of biogeographic classification systems", contained in annex V to the report of the Ottawa Expert Workshop (UNEP/CBD/SBSTTA/14/INF/4), in their efforts to conserve and sustainably use marine and coastal biodiversity, and to enhance ocean management at a large ecosystem scale, in particular to achieve the 2012 target of the World Summit on Sustainable Development to establish representative networks of marine protected areas (MPAs);

12. *Urges* Parties, other Governments and relevant organizations to use the scientific guidance on the identification of marine areas beyond national jurisdiction, which meet the scientific criteria in annex I to decision IX/20, as contained in annex II to this note, based on annex VI to the above-mentioned workshop report (UNEP/CBD/SBSTTA/14/INF/4);

13. *Urges* Parties, other Governments and relevant organizations to cooperate, as appropriate, collectively or on a regional or subregional basis, to identify and protect ecologically or biologically significant areas in open-ocean waters and deep-sea habitats in need of protection, including by establishing representative networks of marine protected areas in accordance with international law, including the United Nations Convention on the Law of the Sea, and to inform the relevant processes within the United Nations General Assembly;

14. *Requests* the Executive Secretary to work with relevant organizations and initiatives, such as the World Conservation Monitoring Centre of the United Nations Environment Programme (UNEP-WCMC), the Global Ocean Biodiversity Initiative (GOBI) and others, to keep track of progress made in identification of ecologically or biologically significant areas in marine areas beyond national jurisdiction and vulnerable marine ecosystems (VMEs), and facilitate the sharing of scientific data, methods, experiences and lessons learned in this regard;

15. *Decides* to review progress made in the identification of ecologically or biologically significant areas in marine areas within and beyond national jurisdiction as part of its consideration of the 2012 target related to marine protected areas;

16. *Requests* Parties, in particular developed country Parties, other Governments and relevant organizations, to cooperate in facilitating capacity development activities, including through conducting a series of regional training workshops for developing country Parties, in particular the least developed countries and small island developing States among them, as well as countries with economies in transition, as well as relevant regional initiatives, such as regional seas organizations, in order to facilitate their efforts in identifying ecologically or biologically significant marine areas using the scientific criteria adopted in decision IX/20 as well as the scientific guidance on the identification of marine areas beyond national jurisdiction, which meet the scientific criteria in annex I to decision IX/20, as contained in annex II below;

17. *Requests* the Executive Secretary to prepare, in collaboration with the relevant international organizations, a training manual and modules, subject to the availability of financial resources, which can be used to meet the capacity-building needs for identifying ecologically or biologically significant marine areas using the scientific criteria adopted in decision IX/20 (annex I to decision IX/20) as well as the "scientific guidance on the identification of marine areas beyond national jurisdiction, which meet the scientific criteria in annex I to decision IX/20", as contained in annex II to this note ;

18. *Requests* the Executive Secretary to bring the two sets of scientific guidance on scientific criteria and biogeographic classification systems, as referred to in paragraphs 11 and 12, to the attention of relevant United Nations General Assembly processes, including the Ad Hoc Open-ended Informal Working Group to study issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction and the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea;

19. *Requests* the Executive Secretary to bring the scientific criteria (annex I to decision IX/20) and these sets of scientific guidance on scientific criteria and biogeographic classification systems to the attention of relevant organizations, including the Food and Agriculture Organization of the United Nations, International Maritime Organization, International Seabed Authority, regional fisheries management organizations (RFMOs), and regional seas organizations, with a view to fostering compatible initiatives to identify and protect ecologically or biologically significant areas;

20. *Recalling* decision IX/20, paragraph 27, *requests* the Executive Secretary to undertake a study in consultation with the Ad Hoc Open-ended Working Group on Article 8(j) and Related Provisions to identify specific elements for integrating the traditional, scientific, technical and technological knowledge of indigenous and local communities, consistent with Article 8(j) of the Convention, and social and cultural criteria and other aspects for the identification of marine areas in need of protection as well as the establishment and management of marine protected areas;

21. *Urges* Parties, other Governments and relevant organizations to adopt complementary measures to prevent significant adverse effects to areas identified as ecologically or biologically significant;

22. *Expresses* its gratitude to the Government of the Philippines and the Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) for co-hosting, and the European Commission for providing financial support for, the Expert Workshop on Scientific and Technical

Aspects relevant to Environmental Impact Assessment in Marine Areas Beyond National Jurisdiction, held in Manila, from 18 to 20 November 2009, and to other Governments and organizations for sponsoring the participation of their representatives, and *welcomes* the report of this Expert Workshop (UNEP/CBD/SBSTTA/14/INF/5);

23. *Invites* Parties, other Governments and relevant organizations to take into account the guidance provided in annexes II, III and IV to the Manila workshop report (UNEP/CBD/SBSTTA/14/INF/5) in the conduct of environmental impact assessments (EIAs) and strategic environmental assessments (SEAs), as invited in paragraph 8 of decision IX/20;

24. *Requests* the Executive Secretary, in collaboration with relevant organizations, including the United Nations Division for Ocean Affairs and Law of the Sea, the Food and Agriculture Organization of the United Nations, the International Maritime Organization and International Seabed Authority, and building upon the work of the Manila workshop, to develop scientific and technical guidance on environmental impact assessment and strategic environmental impact assessment in marine areas beyond national jurisdiction by making appropriate revisions to CBD Voluntary Guidelines on Biodiversity-inclusive Environmental Impact Assessment (decision VIII/28) and the CBD Draft Guidance on Biodiversity-inclusive Strategic Environmental Assessment (decision VIII/28), in order to make existing CBD guidelines on EIA and draft guidance on SEA applicable to marine systems in planning human uses of the ocean and coastal waters, and submit these guidelines for consideration of a future meeting of the Subsidiary Body on Scientific, Technical and Technological Advice prior to eleventh meeting of the Conference of the Parties to the Convention.

Impacts of destructive fishing practices, unsustainable fishing, and IUU fishing on marine and coastal biodiversity

25. *Expresses* its appreciation to the Food and Agriculture Organization of the United Nations (FAO) and to UNEP for the financial and technical support, and the Fisheries Expert Group (FEG) of the Commission on Ecosystem Management (CEM) of the International Union for the Conservation of Nature (IUCN) for technical support, provided for the FAO/UNEP Expert Meeting on Impacts of Destructive Fishing Practices, Unsustainable Fishing and Illegal, Unreported and Unregulated (IUU) Fishing on Marine Biodiversity and Habitats, which was organized in collaboration with the Secretariat of the Convention on Biological Diversity in pursuance of paragraph 2 of decision IX/20, at FAO, Rome, Italy, from 23 to 25 September 2009, and *welcomes* the report of this Expert Meeting, contained in document UNEP/CBD/SBSTTA/14/INF/6;

26. In view of identified information gaps and constraints in undertaking the scientific review due to limited resources available for the initial collaboration efforts with FAO and UNEP, and *noting* an urgent need to further review the impacts of destructive fishing practices, unsustainable fishing, and illegal, unreported and unregulated (IUU) fishing on marine biodiversity and habitats, building upon the initial efforts, *requests* the Executive Secretary to develop, in collaboration with FAO, UNEP, IUCN and other relevant organizations and scientific groups, subject to the availability of financial resources, a regular mechanism of joint expert processes to effectively address biodiversity concerns in sustainable fishery management, and report the progress of such collaboration at a future meeting of the Subsidiary Body on Scientific, Technical and Technological Advice prior to the eleventh meeting of the Conference of the Parties;

Impacts of ocean fertilization on marine and coastal biodiversity

27. *Welcomes* the report on compilation and synthesis of available scientific information on potential impacts of direct human-induced ocean fertilization on marine biodiversity (UNEP/CBD/SBSTTA/14/INF/7), which was prepared in collaboration with UNEP-WCMC and the International Maritime Organization in pursuance of paragraph 3 of decision IX/20;

28. *Recalling* decision IX/16 C, on ocean fertilization, *recognizes* that given the scientific uncertainty that exists, significant concern surrounds the potential intended and unintended impacts of large-scale ocean fertilization on marine ecosystem structure and function, including the sensitivity of

species and habitats and the physiological changes induced by micro nutrient and macro nutrient additions to surface waters as well as the possibility of persistent alteration of an ecosystem;

29. *Notes* that in order to provide reliable predictions on the adverse impacts on marine biodiversity of activities involving ocean fertilization, further work to enhance our knowledge and modelling of ocean biogeochemical processes is required;

30. *Notes* also that there is a pressing need for research to advance our understanding of marine ecosystem dynamics and the role of the ocean in the global carbon cycle;

Impacts of ocean acidification on marine and coastal biodiversity

31. *Welcomes* the compilation and synthesis of available scientific information on ocean acidification and its impacts on marine biodiversity and habitats (UNEP/CBD/SBSTTA/14/INF/8), which was prepared in collaboration with UNEP-WCMC in pursuance of paragraph 4 of decision IX/20;

32. *Expresses its concern* that increasing ocean acidification, as a direct consequence of increased carbon dioxide emissions, reduces the availability of carbonate minerals in seawater, important building blocks for marine plants and animals, and thus by 2100 it has been predicted that 70 per cent of cold-water corals, key refuges and feeding grounds for commercial fish species, will be exposed to corrosive waters, *noting* that given current emission rates, it is predicted that the surface waters of the highly productive Arctic Ocean will become under-saturated with respect to essential carbonate minerals by the year 2032, and the Southern Ocean by 2050, with disruptions to large components of the marine food web;

33. *Takes note* that many questions remain regarding the biological and biogeochemical consequences of ocean acidification for marine biodiversity and ecosystems, and the impacts of these changes on oceanic ecosystems and the services they provide, for example, in fisheries, coastal protection, tourism, carbon sequestration and climate regulation, and that the ecological effects of ocean acidification must be considered in conjunction with the impacts of global climate change;

34. *Requests* the Executive Secretary to develop, in collaboration with the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization, the Food and Agriculture Organization of the United Nations, the World Conservation Monitoring Centre of the United Nations Environment Programme, International Coral Reef Initiative (ICRI) and other relevant organizations and scientific groups, subject to the availability of financial resources, a series of joint expert review processes to monitor and assess the impacts of ocean acidification on marine and coastal biodiversity and widely disseminate the results of this assessment in order to raise awareness of Parties, other Governments and organizations and promote corresponding national assessment efforts so that relevant information collected at the national level can be incorporated into NBSAPs, national and local plans on integrated marine and coastal area management, and the design and management plans for marine and coastal protected areas, and also *requests* the Executive Secretary, given the relationship between CO_2 emissions and ocean acidification, to transmit the results of assessment to the Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) for further transmission to its Parties.

I. GLOBAL STATUS AND TRENDS OF MARINE AND COASTAL BIODIVERSITY

1. Global marine and environmental assessment undertaken in the recent years presented serious declines in marine living resources, continuous losses of coastal habitats and degradation of the marine environment in general. According to the Marine Living Planet Index (LPI), which tracks trends in a population of 341 representative marine species in four oceans, there was an average overall decline of 14 per cent of the Marine LPI between 1970 and 2005. This note summarizes only key findings on the status and trends, without providing specific references, based on the results of assessment contained in the in-depth review (UNEP/CBD/SBSTTA/14/INF/2). It did not attempt to provide an overall conclusion on the global status, as they are reflected in suggested recommendations above. Further information on coastal wetland, marine and coastal protected areas, and the impacts of climate change on marine and coastal biodiversity is provided in their corresponding in-depth review documents (UNEP/CBD/SBSTTA/14/3, UNEP/CBD/SBSTTA/14/5 and UNEP/CBD/SBSTTA/14/6).

2. **Estuaries:** Worldwide, there are about 1,200 major estuaries covering some 500,000 km^2. Some idea of their status can be obtained from a study of the magnitude and causes of ecological change in 12 estuaries and coastal seas in Europe, North America, and Australia from the onset of human settlement to the present day, using paleontological, archaeological, historical and ecological records to trace changes in important species, habitats, water quality parameters and species invasions. The primary cause of estuarine damage is human exploitation, which has caused 95 per cent of species depletions and 96 per cent of extinctions, often in combination with habitat destruction. Most mammals, birds and reptiles in estuaries were depleted by 1900 and had declined further by 1950. Oysters were the first invertebrate resource to degrade due to their value and accessibility as well as destructive harvesting methods in some areas. Human impacts have also destroyed over 65 per cent of seagrass and wetland habitat, degraded water quality and accelerated species invasions.

3. **Mangroves:** Mangroves, together with salt marshes and seagrasses, account for over half of all carbon storage in ocean sediments. Global mangrove cover is estimated at 15.2 million ha, with the largest areas in Asia and Africa followed by North and Central America. Twenty per cent, or 3.6 million ha, have been lost from the 18.8 million ha covering the planet in 1980. The rate of net loss appears to have slowed recently but is still high: about 185,000 ha were lost every year in the 1980s, but annual rate of loss in the years 2000-2005 was about 102,000 ha. The major causes of mangrove decline are conversion to aquaculture, agriculture, and urban, residential and tourism development, mainly due to a lack of understanding regarding the importance of their supply of essential ecosystem services, including, for example, coastal protection and stabilization, nutrient provision, and nursery protection for fish.

4. **Coral reefs:** According to the Global Coral Reef Monitoring Network (GCRMN), estimates assembled through the expert opinions of 372 coral reef scientists and managers from 96 countries are that the world has effectively lost 19 per cent of the original area of coral reefs; 15 per cent are seriously threatened with loss within the next 10 to 20 years; and additional 20 per cent are under threat of loss in 20 to 40 years. The latter two estimates have been made under a "business as usual" scenario that does not consider the looming threats posed by global climate change or that effective future management may conserve more coral reefs. However, 46 per cent of the world's reefs are regarded as being relatively healthy and not under any immediate threats of destruction, except for the "currently unpredictable" global climate threat. It should, however, be noted that these predictions carry many caveats due to various sources of uncertainties. Coral reef declines will have alarming consequences for approximately 500 million people who depend on coral reefs for food, coastal protection, building materials and income from tourism. This includes 30 million who are virtually totally dependent on coral reefs for their livelihoods or for the land they live on (atolls).

5. **Seagrasses:** Seagrasses cover approximately 0.1 – 0.2 per cent of the global ocean, and are of major importance for biodiversity as habitat for fish, birds and invertebrate species; as a major food source for endangered species such as dugong, manatee and green turtle; and for nutrient cycling and stabilizing sediments. The services that seagrasses provide in the form of nutrient cycling are valued at an estimated US$ 1.9 trillion per year, while their support for commercial fisheries is estimated to be worth

as much as US$ 3,500 per hectare per year. A recent comprehensive global analysis of the change in areal extent of seagrass populations demonstrates that, since the earliest records in 1879, seagrass meadows have declined in all areas of the globe where quantitative data are available, including both high and low latitudes. The study found that seagrasses have been disappearing at a rate of 110 km^2 per hectare per year since 1980 and that 29 per cent of the known areal extent has disappeared since seagrass areas were initially recorded in 1879. Furthermore, rates of decline have accelerated from a median of 0.9 per cent per hectare per year before 1940 to 7 per cent per hectare per year since 1990. Seagrass loss rates are comparable to those reported for mangroves, coral reefs and tropical rainforests, and place seagrass meadows among the most threatened ecosystems on Earth.

6. **Shellfish reefs:** Centuries of intensive fisheries extraction exacerbated by more recent coastal degradation have put oyster and other shellfish reefs near or past the point of functional extinction worldwide, in that the ecosystem functions and services provided by the reefs are lost. Oyster reefs are one of, and likely the most, imperilled marine habitat on Earth — oyster reefs are in poor condition, having declined more than 90 per cent from historic levels, in 70 per cent of bays and 63 per cent of the world's marine ecoregions. Even more troubling, oyster reefs are functionally extinct (>99 per cent loss of reefs) in 37 per cent of estuaries and 28 per cent of ecoregions. Globally, an estimated 85 per cent of oyster reefs have been lost—even greater than the losses reported for other important habitats, including coral reefs, mangroves, and seagrasses. Although oyster reefs are beginning to receive some conservation attention, they remain an obscure ecosystem component and still are vanishing at sometimes alarming rates. Ocean acidification will further pose a significant threat to shellfish reefs.

7. **Cold-water corals:** Cold-water corals are a taxonomically and morphologically diverse collection of organisms distinguished by their occurrence in deeper and colder oceanic waters. They can form large reefs, or occur singly or in tree-like thickets, and are fragile and easily damaged. Although the entire global extent of cold-water coral reefs is not known, they are estimated to cover 284,300 km^2, mainly on the edge of continental shelves or on seamounts. They provide habitat for many fishes and invertebrates and enhance the biological diversity of deepwater ecosystems. Radioactive dating techniques have shown that some living banks and reefs are up to 8,000 years old, and geological records indicate that cold-water coral reefs have existed for millions of years. It is estimated that more than a hundred deep-sea coral and sponge species live in the North Pacific off Alaska, at least 34 of which are corals. Researchers estimate that roughly 800 species of stony corals alone have yet to be discovered. Many cold-water coral reefs have been damaged by bottom-fishing activities, but the extent of this damage has not been quantified. Most of the reefs studied thus far show physical damage from trawling activities. Because of their vulnerability to damage from bottom trawling and their very slow rate of recovery (decades to centuries as most cold-water coral reefs grow slowly), most recent conservation efforts have focused on preventing damage to fisheries, although damage to the ocean bottom from other activities (for example, energy exploration) and climate change remains a concern. Ocean acidification presents a potentially serious future threat to cold-water coral reefs, because rates of calcium carbonate dissolution are greater in colder waters.

8. **Seamounts:** Our knowledge of seamounts and their fauna is limited, with only a small fraction of them sampled and virtually no data available in large areas of the world, such as the Indian Ocean. Although seamount biodiversity is still poorly understood on a global scale due to lack of sampling and exploration, available research results suggest that seamounts are often highly productive ecosystems, compared to adjacent deep-sea areas, that can support high biodiversity and special biological communities, including cold-water coral reefs as well as abundant fisheries resources. Some evidence suggests high levels of endemic species on seamounts, although these levels may vary between individual seamounts, regions and taxa, and may, in some cases, be limited to species with low dispersal ability. Seamounts are often linked with cold-water coral reefs, and they also support populations of deep-sea fish. They may be vulnerable because of their geographical isolation, which for some species may indicate genetic isolation. Seamount fish are particularly vulnerable to exploitation due to the fact that they are often long-lived, slow to mature, and produce only a few offspring.

9. **Hydrothermal vents:** Hydrothermal vents are found along all active mid-ocean ridges and back-arc spreading centres. The InterRidge Hydrothermal Vents Database lists 212 separate known vent sites, and there are likely to be more. Our knowledge about the location and extent of hydrothermal vents is far from complete, as is our knowledge about their biodiversity and ecology. It is known that vent sites support exceptionally productive biological communities in the deep sea, and that vent fauna range from tiny chemosynthetic bacteria to tube worms, giant clams and crabs. Ninety-one per cent of species in and around vents are endemic. Micro-organisms predominate, and thousands of low-abundance populations account for most of the observed diversity among phyla.

10. **Fishery resources:** According to FAO, an overall review of the state of marine fishery resources confirms that the proportions of overexploited, depleted and recovering stocks have remained relatively stable in the last 10 to 15 years, after the noticeable increasing trends observed in the 1970s and 1980s with the expansion of fishing effort. In 2007, about 28 per cent of stocks were either overexploited (19 per cent), depleted (8 per cent) or recovering from depletion (1 per cent) and thus yielding less than their maximum potential. A further 52 per cent of stocks were fully exploited and, therefore, producing catches that were at or close to their maximum sustainable limits with no room for further expansion. Only about 20 per cent of stocks were moderately exploited or underexploited. Most of the stocks of the top ten exploited species worldwide, which together account for about 30 per cent of the world marine capture fisheries production in terms of quantity, are fully exploited or overexploited. The areas showing the highest proportions of fully-exploited stocks are the Northeast Atlantic, the Western Indian Ocean and the Northwest Pacific. Overall, 80 per cent of the world fish stocks for which assessment information is available are reported as fully exploited or overexploited, thereby requiring effective and precautionary management.

11. **Dead zones:** One of the global trends of the past years had been an increase in the number of dead zones (hypoxic or oxygen-deficient areas) from 149 in 2003 to over 200 in 2006. Dead zones are usually caused by pollutants from urban and agricultural sources, which are also predicted to increase, leaching into coastal waters. Most dead zones, a few of which are natural phenomena, have been observed in coastal waters, which are also home to the primary fishing grounds.

12. **Seabirds and shorebirds:** According to the Red List Index (RLI), which is based on IUCN's reporting on risk of extinction, bird species face an especially steep decline in survival chances in marine and coastal ecosystems. Similarly, the Shorebird Population Status Index, developed to measure the effectiveness of protection of sites covered by the Ramsar Convention on Wetlands, seems to confirm the finding of the Red List Index that birds are especially threatened in coastal and marine ecosystems. The index finds that the decline in population status for shorebirds between the mid 1990s and the mid 2000s was 2.64 times greater than that for the previous decade. In other words, the global rate of biodiversity loss among this group of species more than doubled in 10 years. The declines were especially severe in East Asian, South Asian and Pacific flyways. The status and trends of albatross breeding populations are well documented and, with 19 of 21 species now globally threatened and the remainder Near Threatened, albatrosses have become the bird family most threatened with extinction. Many petrel species are also globally threatened. Although albatross and petrel species face many threats at their breeding sites, the main problems they encounter currently relate to the marine environment, particularly involving interactions with fisheries, notably the many thousands of birds killed annually by longline fishing. Some of the world's richest longline fishing grounds coincide with key foraging areas for vulnerable seabird species. Even a partial overlap between foraging and fishing areas is significant, since small increases in albatross mortality can have severe effects on these long-lived birds.

13. **Invasive alien species:** The number and severity of outbreaks and infestations of invasive alien species is growing, with dramatic effects on biodiversity, biological productivity, habitat structure and fisheries. Heavily disturbed and damaged marine areas are more likely to be vulnerable to invasive alien species, and their geographical distribution suggests a strong relationship between the occurrence of invasive species and disturbed, polluted and overfished areas, and in particular the location of major shipping routes at a global scale. It appears that the most devastating outbreaks of marine invasive alien species have occurred along the major shipping routes. The growing effects of climate change will most likely further accelerate these invasions and increase the likelihood of invasions by other species.

II. THE IMPLEMENTATION OF THE ELABORATED PROGRAMME OF WORK ON MARINE AND COASTAL BIOLOGICAL DIVERSITY

14. The Conference of the Parties to the Convention on Biological Diversity indicated, in annex I to decision VII/5, that the elaborated programme of work on marine and coastal biodiversity would be effective for a six-year time period (2004-2010) at which point its implementation would be reviewed in depth, and the programme of work revised, as necessary. In the annex to decision VII/31, the Conference of the Parties decided to undertake the in-depth review of the programme of work on marine and coastal biological diversity at its tenth meeting. The review was undertaken in accordance with guidelines provided in annex III to decision VIII/15.

15. This note summarizes only the main points of findings on the progress made in each programme element, without providing specific references or case-studies, based on the results of the review (UNEP/CBD/SBSTTA/14/INF/2). It does not attempt to provide an overall conclusion, as they are reflected in the suggested recommendations above.

A. Progress made in the implementation of integrated marine and coastal area management (IMCAM)

16. Integrated marine and coastal area management (IMCAM) is now being applied by a majority of coastal countries (both developed and developing countries) in the world. According to the 2005 national reports, 78 per cent of all Parties to the Convention on Biological Diversity have instituted improved integrated marine and coastal area management (including catchment management) in order to reduce sediment and nutrient loads into the marine environment. This figure is an increase from the second National Reports (submitted by countries in 2002) when only 28 per cent of the responding countries had institutional, administrative and legislative arrangements in place for the development of IMCAM. At that time, however, 58 per cent were developing such arrangements. Even though updated statistics are not available, it is likely that the implementation of IMCAM in its various forms is even greater at the present time. Every coastal country that has submitted a fourth national report or a voluntary report thus far has reported on some IMCAM-relevant initiatives. However, the integration of biological diversity concerns into sectoral activities still remains a challenge for IMCAM. Similarly, coordination between sectors and levels of government is yet to be further strengthened, as many activities, policies and legislation continue to be of a sectoral nature and do not provide effective measures for integration.

17. IMCAM has also been effectively implemented through the UNEP Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA). According to the second Intergovernmental Review of the GPA in 2006, more than 60 countries are involved in processes related to the national programmes of action, most of which are part of regional efforts coordinated by relevant regional seas organizations. The status of these NPAs ranges from the planning or preparation phase to actual implementation through pilot projects. The activities include pollution control, including sewage, nutrients, persistent organic pollutants (POPs) and heavy metals; waste water treatment; addressing eutrophication; environmental assessment and monitoring; as well as environmental restoration.

18. A relatively new trend evident in the last set of national and voluntary reports is the development of comprehensive, large-scale (bioregional or large marine ecosystem scale) national and regional IMCAM plans that consider ecosystems, species and habitats, as well as human uses and needs. Such plans are increasingly, though not yet comprehensively, backed by policy and legislation. The difference from coastal management projects of the past is that there is an increasing effort to consider ecosystems in their entirety. As an example, the Parliament of Norway has endorsed the need for integrated management of all maritime areas based on the ecosystem approach. Canada has established and is applying integrated oceans management in five large ocean management areas (LOMAs). The approach includes integrated oceans management governance and advisory bodies, comprehensive assessments of social, economic and ecological characteristics and their corresponding ecosystem-based conservation. Australia has developed science-based bioregional plans, which have proven effective in planning for and implementing IMCAM. Such bioregional plans are useful for a variety of management applications, as

well as the protection of biodiversity, as demonstrated in the Australian case-study provided in the background document (UNEP/CBD/SBSTTA/14/INF/2). Further details on implementation are provided in this document.

B. Progress made in conservation and sustainable use of marine and coastal living resources

19. The world's oceans host 32 of the 34 known phyla on Earth and contain somewhere between 500,000 and 10 million marine species. Species diversity is known to be as high as 1,000 per square metre in the Indo-Pacific Ocean, and new oceanic species are continuously being discovered, particularly in the deep sea. It is therefore not surprising that the genetic resources in the world's oceans and coasts are of actual and potential interest for commercial uses. There are numerous patents filed on marine genetic resources, which have led to products already on the market. Many of these products are of benefit to humankind. Information at the global scale on a large variety of marine ecosystems and species is being compiled by the Census of Marine Life, a global network of researchers now finalizing their work. The database of the Census already includes records for more than 16 million species, both previously and newly discovered (see http://www.iobis.org/).

20. The work through the FAO on developing an Ecosystem Approach to Fisheries (EAF) provides a promising example of applying the ecosystem approach to sector-based marine resources management. Important initiatives have been also undertaken by the GEF-supported Large Marine Ecosystem (LME) projects, which are piloting and testing ways to implement integrated management of oceans, coasts, estuaries and freshwater basins through the ecosystem approach. Since 1995, the Global Environment Facility has provided substantial funding to support country-driven projects for introducing multi-sector, ecosystem-based assessment and management practices for LMEs located around the margins of the oceans. In coastal areas, the ecosystem approach has been commonly implemented through IMCAM initiatives as well as sectoral approaches. Many countries are also undertaking related initiatives towards the conservation and sustainable use of marine living resources. For example, according to the third national reports, 93 per cent of all submitting coastal Parties have taken action to control excessive and destructive fishing practices; 24.5 per cent of them had plans in place for a comprehensive assessment of marine and coastal ecosystems, while another 26.5 per cent already had such assessments in progress. Ninety per cent of submitting coastal Parties had undertaken measures to protect areas important for reproduction, such as spawning and nursery areas.

21. Major new initiatives towards the conservation and sustainable use of coral reefs have been initiated during the last few years. These include the ongoing efforts at the national level, through the International Coral Reef Initiative (ICRI) and International Coral Reef Action Network (ICRAN); regional initiatives such as the Coral Triangle Initiative, the Coral Reef Initiatives in the Pacific (CRISP) Programme, the Micronesia Challenge, the Caribbean Challenge and the Indian Ocean Challenge; and the GEF-World Bank Coral Reef Targeted Research Project. Conservation of the world's highest biodiversity coral reefs is the target for Indonesia, the Philippines, Malaysia, Papua New Guinea, the Solomon Islands and Timor Leste. These countries formed the Coral Triangle Initiative in 2006 in response to calls by the Convention on Biological Diversity, WWF, Conservation International and The Nature Conservancy to reduce the loss of biodiversity and set up networks of MPAs. The initiative provides an example of large-scale efforts for building coral reef resilience, as called for under operational objective 2.2 of the programme of work (annex I to decision VII/5). (coral bleaching and physical degradation and destruction work plans).

22. Major international programmes are expanding knowledge of cold-water coral and other deep-sea ecosystems. The "Hotspot Ecosystem Research on the Margins of European Seas" (HERMES) project (www.eu-hermes.net) is an integrated pan-European project, with 50 partners funded by the European Commission, on cold-water coral reefs and other deep-sea habitats, such as cold seeps, anoxic environments, mounds, canyons and continental slopes. HERMES has established strong links with European and global marine policy-makers. HERMES concluded in March 2009, and was replaced by Hotspot Ecosystem Research and Man's Impact on European Seas" (HERMIONE) in April 2009. Some of the main findings of HERMES include new information about the major role viruses play in global biogeochemical cycles, deep-sea metabolism and overall functioning of deep-sea ecosystems. HERMES

also produced a set of Deep-Sea Briefs for policy-makers, addressing issues such as climate change in the deep sea, valuation of ecosystem goods and services, mapping the seafloor, the importance of microbes in the ocean, and deep-sea biodiversity. The Global Census of Marine Life on Seamounts (CenSeam) is a global study of seamount ecosystems to determine their role in the biogeography, biodiversity, productivity and evolution of marine organisms, and to evaluate the effects of human exploitation on and around seamounts. It is one of the projects undertaken as part of the Census of Marine Life. The project was launched in 2005 and is expected to produce a final report in 2010. The final report is expected to fill critical gaps in our knowledge about seamounts, particularly in understudied regions.

23. As recognized in decision VIII/24, the Convention on Biological Diversity has a key role in supporting the work of the General Assembly with regard to marine protected areas beyond national jurisdiction, by focusing on provision of scientific and, as appropriate, technical information and advice relating to marine biological diversity, the application of the ecosystem approach and the precautionary approach, and in delivering the 2010 target. Accordingly, the Convention on Biological Diversity is fulfilling this role through the development and adoption of scientific criteria for identifying ecologically or biologically significant marine areas in need of protection in open-ocean waters and deep-sea habitats, and by promoting work relating to the review and synthesis of the latest scientific information relating to these areas, as well as the development of a biogeographic classification system, in response to decision VIII/24, paragraph 44 (b), for deep- and open-ocean areas. The biogeographic classification system will provide a basis for implementation of the ecosystem approach in open- and deep-ocean areas, including marine spatial planning and the establishment of representative networks of marine protected areas and will provide a basis for directing further scientific research.

C. Progress made in the establishment and effective management of marine and coastal protected areas

24. The most up-to-date information about marine and coastal protected areas (MCPAs) can be found in the World Database on Marine Protected Areas (http://www.wdpa-marine.org/Default.aspx), which is maintained by UNEP-WCMC. Data for 2009 regarding numbers of MCPAs and area protected globally is not yet available, but the most recent information indicates that less than 1 per cent of the oceans globally are protected. The latest available statistics, from March 2008, show that there were then an estimated 4435 MCPAs worldwide. These MCPAs covered approximately 2.35 million km^2, which is equivalent to 0.65 per cent of the world's ocean surface or 1.6 per cent of the world's total EEZ coverage. Of the total area of MCPAs, a minority, or 12.8 per cent prohibit extractive activities. While it is likely that MCPA coverage has increased since 2008, with the declaration of new areas, it is evident that the world's oceans and coastal areas are still under-protected.

25. The trend towards establishing new MCPAs is clearly evident from the national and voluntary reports under the Convention on Biological Diversity. In the third National Reports (2005), 94 per cent of all Parties stated that their future plans included the development of new MCPAs. The 2008/2009 voluntary reports on marine and coastal biodiversity, as well as the (2009) fourth National Reports received to date indicate that all reporting coastal countries have established either one or several new MCPAs, and in some cases have developed national networks. In many cases, the coverage of MCPAs achieved to date is impressive. This trend is likely to continue in the future, as many countries have established targets related to MCPAs and networks. Often the goal is to protect 10 to 30 per cent of marine and coastal habitats, or to target specific ecosystem types, such as coral reefs. For example, Belize has a conservation target of 20 per cent for all marine and coastal bioregions, 30 per cent for reefs, 80 per cent for spawning aggregations and 60 per cent for turtle nesting sites. France aims to protect 10 per cent of its maritime space by 2012 and 20 per cent by 2020, amounting to a total of 11 million km^2 of sea. The Micronesia Challenge, which aims to conserve at least 30 per cent of near-shore marine resources in Micronesia by 2020, will eventually ensure protection for 6.7 million km^2, or five per cent of the entire Pacific Ocean.

26. There are numerous activities by countries individually or collectively to establish MCPAs and networks. While the area covered by MCPAs is increasing, it is still not enough to reach the 10 per cent

target set by the Convention on Biological Diversity. In addition, the global MCPA network is not yet representative, comprehensive, adequate or effectively managed. Particularly under-represented are ecosystems further away from shore, in exclusive economic zones (EEZs) and beyond. Open ocean habitats are also extremely under-protected. Climate change will present additional challenges to MCPA managers, but the establishment of additional MCPAs may be one of the best ways to increase the resilience of vulnerable ecosystems.

D. Progress made in preventing and minimizing the negative impacts of mariculture

27. Many countries, both developed and developing, have enacted (or are in the process of drafting) national aquaculture legislations and regulations that govern the licensing, monitoring and control of aquaculture. These legal instruments ensure that any development of the industry is founded on sustainable ventures, is appropriately located, and is carried on in accordance with high standards of environmental and ecological protection. Most laws and regulations cover several aspects of the supply side of aquaculture, including planning and access, water and wastewater, seed, feed, aquaculture investment, fish movement and disease control. According to the third national reports submitted under the Convention, 45 per cent of all Parties had developed effective methods for effluent and waste control. While most countries seem to have legal provisions and policy frameworks in place for sustainable aquaculture development, enforcement of laws and adherence to policies is still an issue in many cases. There are often limited financial and human resources with which to monitor and enforce regulations, and this is a particular problem for countries with large numbers of small-scale farmers. The most commonly implemented techniques include environmental impact assessment and site selection, and these techniques are also likely to have the greatest success in preventing or reducing negative impacts on biodiversity. Minimizing the release of effluents into the environment and the prevention of escapees are also receiving attention. The issue of genetic resources management still requires further work and research.

E. Progress made in preventing and eradicating invasive alien species

28. Marine and coastal invasive alien species remain a serious problem throughout the world — once invasive species are established, they are difficult to eradicate or manage, particularly in the marine environment. The ballast water vector is now being dealt with through the International Convention for the Control and Management of Ships' Ballast Water and Sediments; however this convention has not yet entered into force. Major pathways for introductions, in particular biofouling, still remain to be controlled through international efforts. Considering the apparently large contribution of biofouling to marine invasions, this issue should be addressed as a matter of urgency. The mariculture and marine litter vectors may also need further consideration. Finally, any strategy for the prevention of new invasions would also need to take into consideration that marine pollution and degradation of habitats make ecosystems more vulnerable to invasions, and thus should include building ecosystem resilience through improved management and protection.

Annex I

CONSIDERATION OF ELEMENTS TO BE UPDATED UNDER PROGRAMME ELEMENT 2: MARINE AND COASTAL LIVING RESOURCES, AS CONTAINED IN ANNEX I TO DECISION VII/5

Draft elements to be updated under "suggested activities" of operational objective 2.4

- To further compile, synthesize and analyse available information relevant to identifying areas of ecological or biological significance in open-ocean waters and deep-sea habitats beyond national jurisdiction, based on the CBD scientific criteria in annex I of decision IX/20, including through the UNEP-WCMC Interactive Map (IMAP), as in decision IX/20 paragraph 5;
- To further compile, synthesize and analyze available information relevant to the design of representative networks of MPAs, building on the annexes II and III of decision IX/20;
- To identify and assess threats to biological diversity in areas beyond national jurisdiction, including in areas identified as likely to meet the criteria for ecologically or biologically significant areas (annex I of decision IX/20);
- To take measures to enhance the protection of areas of ecological or biological significance in areas beyond national jurisdiction, including the establishment of marine protected areas and representative networks of marine protected areas, through, e.g., encouraging application of environmental impact assessment and strategic environmental assessment, taking into consideration specificities in areas beyond national jurisdiction, as identified in the Manila Workshop report (UNEP/CBD/SBSTTA/14/INF/5); and
- To further research and investigate the role of the ocean and its ecosystems in the carbon cycle.

Annex II

SCIENTIFIC GUIDANCE ON THE IDENTIFICATION OF MARINE AREAS BEYOND NATIONAL JURISDICTION, WHICH MEET THE SCIENTIFIC CRITERIA IN ANNEX I TO DECISION IX/20

1. There has been substantial experience at the national and regional level with the application of some or all of the criteria for identification of ecologically or biologically significant areas (CBD EBSAs) for multiple uses, including protection. While much of the experience is specifically within national jurisdictions rather than in areas beyond national jurisdiction and may not specifically use all the criteria in annex 1 to decision IX/20, the experience gained in national processes, and by other intergovernmental agencies (e.g. the FAO criteria for vulnerable marine ecosystems, FAO 2009) and NGOs provide guidance on the use of these criteria. Lessons learned about scientific and technical aspects of the application of the criteria within national jurisdictions are informative about likely performance of the criteria in areas beyond national jurisdiction, even if the policy and management responses might be developed through different processes.

2. There are no inherent incompatibilities between the various sets of criteria that have been applied nationally and by various IGOs (FAO, International Maritime Organization, International Seabed Authority) and NGOs (e.g., BirdLife International and Conservation International). Consequently, most of the scientific and technical lessons learned about application of the various sets of criteria can be generalized. Moreover, some of the sets of criteria can act in complementary ways, because unlike the CBD EBSA criteria (annex I to decision IX/20), some of the criteria applied by other United Nations agencies include considerations of vulnerability to specific activities.

3. It is important that the process of *identification* of CBD EBSAs is understood to be separate from the processes used to decide on the policy and management responses that are appropriate for providing the desired level of protection to those areas. The *identification* of areas that are ecologically or biologically significant is a scientific and technical step that takes account of the structure and function of

the marine ecosystem. The subsequent steps involve the *selection* of policy and management actions that take account of threats and socio-economic considerations as well as the ecological characteristics of the areas.

4. It is important to view the application of the criteria in annex I to decision IX/20 not only as an end in itself, but also as a contribution to a process that addresses the contents of annexes I, II, and III of this decision. In the application of the criteria in annex I to decision IX/20, scientific and technical information, and expertise are central considerations.

5. The application of the criteria should use all the information that is available on the area being considered. "Information" includes scientific and technical data, as well as traditional knowledge and knowledge gained through life-experience of users of the oceans. All information should be subjected to quality assurance methods appropriate for the type of information being considered.

6. Modelling approaches that use ecological relationships quantified in well-studied areas can be applied in more data-poor areas, and these can be an important source of knowledge for application of the criteria.

7. There is likely to be less information available on marine areas beyond national jurisdiction than in many areas within national jurisdiction and differences in the amount of information available between benthic and pelagic portions of particular marine areas and among marine areas around the globe. Recognizing the value of increased information, challenges due to data limitations in marine areas beyond national jurisdiction may be addressed through a range of scientific information, tools and resources. A lack of information should not be used as a reason to defer actions to apply the criteria to the best information that is available. Substantial progress has been made in areas where information was quite incomplete. In all areas, the application of the criteria needs to be reviewed periodically, as new information becomes available.

8. An important lesson from national, regional and international experience is that although the process of applying the criteria needs to be flexible, an orderly and systematic approach to identification of EBSAs in need of protection is superior to an ad hoc approach. A systematic approach makes better use of whatever level of information and scientific and technical expertise is available, and is more likely to identify the areas that are most appropriate for enhanced conservation action, including for inclusion in regional networks of MPAs. Therefore it is advised to take a structured step-wise approach to the evaluation of areas against the EBSA criteria and mapping of them in relation to each other, within a larger process that develops goals, objectives and targets; identifies gaps; considers conservation measures, including networks of protected sites; and has inclusive participation, feedback and revision.

9. Features of benthic and pelagic portions of marine ecosystems may differ in scale, dominant ecological processes and key structural properties, and the coupling of the benthic and pelagic portions of these systems is ecologically important, although often poorly characterized. In addition, there may be different amounts of information available on the benthic and pelagic portions of a system. As a consequence, application of the criteria should, to the extent possible, consider both the benthic and pelagic systems both separately and as an interacting system. Furthermore, ecosystems beyond national jurisdiction can have strong ecological connections to ecosystems *within* national jurisdictions. Evaluation of the CBD EBSAs beyond national jurisdiction needs to consider these connections.

10. The criteria for CBD EBSAs in annex I to decision IX/20 would usually be applied before the steps in annex II to this decision are undertaken. This means that CBD EBSAs generally would be identified before representative areas are selected. This order has two benefits:

a. Where there is sufficient information to identify CBD EBSAs, selecting representative MPAs that include many significant areas allows more efficiency in management.

b. Where information is incomplete and there is substantial uncertainty about the location of EBSAs, representative areas included in MPA networks can provide some protection to ecological processes while information is being acquired to allow more targeted protection.

11. The criteria function to rank areas in terms of their priority for protection, and not as an absolute "significant – not significant" choice. As such, an application of absolute thresholds for most criteria is inappropriate.

12. In the subsequent steps of *selection* of areas for enhanced conservation, an area may be in need of protection if it is evaluated as ranking highly on only a single criterion. An area may also be a priority for protection if it ranks relatively highly on multiple criteria, especially if the features which make the areas relatively important are not common elsewhere in the area under consideration. The process of decision-making with multiple criteria is a complex field with a large body of scientific and technical guidance available.

13. It is likely that there will often be insufficient information to use the criteria to delineate the precise boundaries of a CBD EBSA. In such cases, the criteria can at least identify the general area in need of protection, with boundaries determined in the selection steps, applying precaution and taking account of potential threats to the features that meet the criteria.

14. Areas which emerge from application of the criteria as in need of protection at regional scales should be treated as conservation priorities in the selection process, even if at the global scale the area would be evaluated as not as important on these criteria. An area which would be a conservation priority at the global scale should be considered a conservation priority in regional selection processes, even if application of the criterion at a more local scale might not rank the area as a particularly high priority.

15. When applying the criteria at scales where there are very different amounts of information available in different subareas, care should be taken not to bias the evaluation to favour (or discriminate against) the more information-rich parts of the larger region.

16. There may be significant benefits in harmonization of conservation planning and management actions if different bodies with spatially overlapping areas of competence were to coordinate the application of their respective criteria for identification of CBD EBSAs, or areas in need of more risk-averse management. Such coordination would allow all the relevant bodies to start their conservation planning with complementary lists or maps of areas in need of protection.

17. The amount and quality of information that is available about an area, and the degree to which the available information has been brought together systematically affects the time and resources required for scientific and technical experts to apply the criteria. "Expert opinion" processes based on best available knowledge may produce initial indications of ecological values in a given area and can help prioritize the consolidation of available information such that a thorough and systematic planning approach can be taken.

18. In order to achieve consistency in the application of the criteria in annex I to decision IX/20, specific guidance on the use of each criterion is included in appendix 1 of annex VI to document UNEP/CBD/SBSTTA/14/INF/4. This guidance has been consolidated from the experience reported by Parties, IGOs, NGOs and experts who have used these or similar criteria in the identification of EBSAs in marine ecosystems. This body of experience also highlighted some generic issues in the application of these criteria, including: (i) scale; (ii) relative importance/significance; (iii) spatial and temporal variability; (iv) accuracy, precision and uncertainty; and (v) taxonomic accuracy and uncertainty. Guidance on approaches for addressing these issues is provided in appendix 2 of annex VI to document UNEP/CBD/SBSTTA/14/INF/4.
