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## Draft Policy Brief on Preserving Life: Halting Marine Biodiversity Loss and Establishing Networks of Marine Protected Areas in 2010 and Beyond



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# **Preserving Life: Halting Marine Biodiversity Loss and Establishing Networks of Marine Protected Areas in 2010 and Beyond**

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*Any opinions expressed in this chapter are solely the opinions of the contributing authors and do not reflect institutional positions on the part of the Global Forum on Oceans, Coasts, and Islands nor of any of the sponsoring organizations of the Global Oceans Conference 2010.*



# Marine Biodiversity and Networks of Marine Protected Areas in 2010 and Beyond

Prepared by Marjo Vierros, Biliana Cicin-Sain, Salvatore Arico, and Christophe Lefebvre

## Background – The Importance of 2010

The United Nations has declared 2010 the International Year of Biodiversity in celebration of life on earth and the value of biodiversity for our lives. It is also a milestone year for the Convention on Biological Diversity (CBD): The 10<sup>th</sup> meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD COP-10) will take place in Nagoya, Japan, in October to consider progress made towards the 2010 biodiversity target. This target, adopted in 2002, committed the Parties to the CBD to **achieve by 2010 a significant reduction in the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth.** This target was later endorsed by the World Summit on Sustainable Development (WSSD) as well as the United Nations General Assembly.

In 2004 at the 7<sup>th</sup> meeting of the CBD Conference of the Parties (COP), the Parties to the CBD adopted a number of sub-targets to clarify the 2010 biodiversity target, and to provide a flexible framework upon which national and/or regional targets may be developed. At the 8<sup>th</sup> meeting of the COP in 2006 these sub-targets were applied to various biomes, including the marine environment. These targets call for the **effective conservation of at least 10% of each of the world's marine and coastal ecological regions**; and for the **effective protection of particularly vulnerable marine habitats, such as tropical and cold water coral reefs, seamounts, hydrothermal vents mangroves, seagrasses, spawning grounds and other vulnerable areas in marine areas.**

Fifteen years have also now passed since the CBD Parties drafted the **Jakarta Mandate on Marine and Coastal Biological Diversity**. The Jakarta Mandate, which originated from a Ministerial Statement at the 2<sup>nd</sup> meeting of the CBD Conference of the Parties in Jakarta, Indonesia, in 1995, referred to a new global consensus on the importance of marine and coastal biodiversity. The Ministerial Statement reaffirmed the critical need for the COP to address the conservation and

sustainable use of marine and coastal biological diversity, and urged Parties to initiate immediate action to implement COP decisions on this issue. The Jakarta Mandate was operationalized through a programme of work on marine and coastal biodiversity in 1998 which was reviewed and updated by the seventh meeting of the COP in 2004, and is due to be reviewed again in 2010. Centered on the principles of the ecosystem approach and the precautionary approach, the programme of work provides a set of activities for countries to implement according to their national priorities. The activities are grouped under five programme elements that were seen to be global priorities: implementation of integrated marine and coastal area management; sustainable use of marine and coastal living resources; marine and coastal protected areas; mariculture; and invasive alien species.

The above milestones for the CBD on marine and coastal biodiversity will guarantee considerable focus on oceans and coasts at the CBD COP-10 in Nagoya. Additional urgency for further activities aimed towards the protection of the marine environment come from targets of the WSSD. In particular, we are only two years away from a target agreed to by the WSSD to **develop and facilitate the use of diverse approaches and tools, including the ecosystem approach, the elimination of destructive fishing practices, the establishment of marine protected areas (MPAs) consistent with international law and based on scientific information, including representative networks by 2012 and time/area closures for the protection of nursery grounds and periods, proper coastal land use; and watershed planning and the integration of marine and coastal areas management into key sectors.** This target recognized the important role representative networks of MPAs have in protecting samples of all biodiversity found in the world's oceans so as to ensure their health and survival for the benefit of present and future generations. The target also recognized that while MPAs are important and have been proven to be successful in reaching biodiversity and fisheries

goals, there also exist other tools that can be applied, alone or in combination, to bring about notable benefits to biodiversity and people.

As the deadlines to meet these targets draw near or have already passed, the year 2010 will be a time to take stock of why we have been unable to reach the 2010 biodiversity target, and what more can be done to reduce the rate of biodiversity loss in the future. We also need to contemplate priority activities needed to reach the 2012 target in regards to networks of MPAs. Our understanding of biodiversity, though far from complete, has improved since the inception of the CBD's Jakarta Mandate and the subsequent programme of work on marine and coastal biodiversity. New drivers of biodiversity loss have appeared, with climate change likely to cause increasing impacts in the future. Thus, it is time to re-evaluate our approach towards conservation and sustainable use of marine biodiversity, and to agree on actions that are most likely to bring about resilient ecosystems and species that can withstand a changing climate, and continue to provide the goods and services on which people depend.

## **The Case for Conserving Marine and Coastal Biodiversity**

The case for conserving marine and coastal biodiversity is a compelling one. Biodiversity in the oceans and coastal areas provides numerous benefits to people that include food resources, regulation of the Earth's climate, and cancer-curing medicines. According to calculations made by the Economics of Ecosystems and Biodiversity (TEEB) project, the value of coral reefs to humankind is between US\$ 130,000 and US\$ 1.2 million per hectare, per year<sup>1</sup>. Mangroves provide an estimated benefit of US\$ 584/ha for local communities for collected wood and non-wood forest products, US\$ 987/ha for providing nursery for off-shore fisheries and US\$ 10,821/ha for coastal protection against storms, totaling US\$ 12,392/ha. This figure does not take into consideration other services, such as carbon sequestration, provided by mangroves. Regardless, the figure is an order of magnitude larger than the benefits of converting the mangroves to shrimp farming<sup>2</sup>. The services seagrasses provide in the

<sup>1</sup> Science Daily: What Are Coral Reef Services Worth? US\$ 130,000 To US\$ 1.2 Million Per Hectare, Per Year <http://www.sciencedaily.com/releases/2009/10/091016093913.htm#at>

<sup>2</sup> Hanley, N. and Barbier, E. B. (2009) Pricing Nature: Cost-Benefit Analysis and Environmental Policy. Edward Elgar, London. Cited in TEEB – The Economics of Ecosystems and Biodiversity for

form of nutrient cycling are valued at an estimated US\$ 1.9 trillion/yr, while their support for commercial fisheries is estimated to be worth as much as US\$ 3500 ha/yr<sup>3</sup>.

The UN Food and Agriculture Organization (FAO) estimates that fish provide more than 2.6 billion people with at least 20% of their animal protein intake. This figure includes protein from a total of over 1000 species that are harvested from the world's capture fisheries<sup>4</sup>.

As we start to better understand the role of biodiversity in maintaining the earth's climate regulating system, the case for biodiversity conservation becomes even more urgent. It is estimated that approximately 93% of the Earth's CO<sub>2</sub> is stored and cycled through the oceans and that approximately 50% of the carbon in the atmosphere that becomes bound or 'sequestered' in natural systems is cycled into the seas and oceans<sup>5</sup>. An estimated 55% of all carbon in living organisms is stored in mangroves, marshes, sea grasses, coral reefs and macro-algae<sup>6</sup>, making the declines in many of these ecosystems (see section below) even more of a concern.

## ***Status and Trends in Marine and Coastal Biodiversity***<sup>7</sup>

Despite the demonstrated economic and social values provided by marine biodiversity (see section above), it is evident from the best available scientific information that the 2010 biodiversity target has not been reached for oceans and coasts globally. The global decline in marine biodiversity has been well documented. Available indicators, such as the Marine Living Planet Index, which tracks population trends of representative marine

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National and International Policy Makers – Summary: Responding to the Value of Nature 2009

<sup>3</sup> Waycott, M. et al (2009) Accelerating loss of seagrasses across the globe threatens coastal ecosystems. PNAS vol. 106 no. 30 12377-12381.

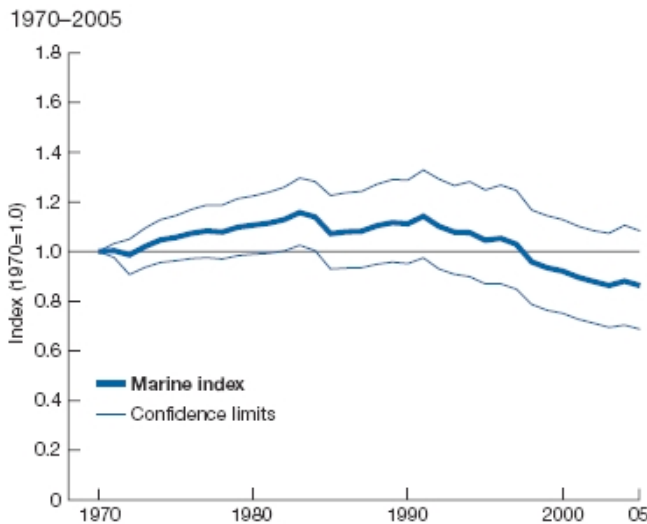
<sup>4</sup> FAO (2007) The World's Aquatic Genetic Resources: Status and Needs. Background document CGRFA-11/07/15.2 for the Eleventh Regular Session of the Commission on Genetic Resources for Food and Agriculture. <ftp://ftp.fao.org/ag/cgrfa/cgrfa11/r11w152e.pdf>.

<sup>5</sup> Nellemann, C., Hain, S., and Alder, J. (Eds). February 2008. In Dead Water – Merging of climate change with pollution, over-harvest, and infestations in the world's fishing grounds. United Nations Environment Programme, GRID-Arendal, Norway, [www.grida.no](http://www.grida.no)

<sup>6</sup> TEEB – The Economics of Ecosystems and Biodiversity (2009) Climate Issues Update. URL: <http://www.teebweb.org/>

<sup>7</sup> For a more detailed discussion on this topic, please refer to the Report on Implementation of the CBD Programme of Work on Marine and Coastal Biological Diversity (UNEP/CBD/SBSTTA/14/INF/2) available at <https://www.cbd.int/doc/?meeting=SBSTTA-14>

species (see figure 1 below) shows a continued decline overall in the abundance, diversity, and distribution of marine species.



**Figure 1:** The Marine Living Planet Index shows an average -14 per cent trend over 35 years in 1,175 populations of 341 marine species<sup>8</sup>.

According to available information from ecosystems ranging from coastal estuaries and shellfish reefs to deep-sea seamounts and pelagic fisheries, biodiversity in the oceans is declining, as demonstrated by the statistics below:

- According to the Global Coral Reef Monitoring Network (GCRMN), we have effectively lost 19% of the original area of coral reefs; 15% are seriously threatened with loss within the next 10-20 years; and an additional 20% are under threat of loss in 20-40 years<sup>9</sup>.
- Oyster reefs have declined more than 90% from their historical levels, making them one of the most imperiled marine habitats on earth<sup>10</sup>.
- Wetlands and seagrass communities continue to decline worldwide, drastically reducing their ability to provide valuable services in supporting fisheries, carbon sequestration and protecting coastal areas from storms. The rate of seagrass disappearance has been estimated to be 110 km<sup>2</sup>/yr since 1980, with 29% of the

<sup>8</sup> WWF–World Wide Fund For Nature (2008) The Living Planet Report 2008.

[http://assets.panda.org/downloads/living\\_planet\\_report\\_2008.pdf](http://assets.panda.org/downloads/living_planet_report_2008.pdf)

<sup>9</sup> Wilkinson, C. (2008) Status of coral reefs of the world: 2008. Global Coral Reef Monitoring Network and Reef and Rainforest Research Centre, Townsville, Australia, 296 p.

<sup>10</sup> Shellfish Reefs at Risk: A Global Analysis of Problems and Solutions [www.nature.org/shellfish](http://www.nature.org/shellfish)

known areal extent now lost since 1879. The rate of loss is accelerating<sup>11</sup>.

- Many cold water coral reefs have been damaged by bottom fishing activities. While the extent of this damage has not been quantified, most reefs studied thus far show physical damage from trawling activities. In addition, these reefs are especially threatened by ocean acidification, with estimates predicting that 70% of the 410 known locations with deep-sea corals may be in aragonite-undersaturated waters by 2099<sup>12</sup>.
- Fisheries stocks assessed since 1977 have experienced an 11% decline in total biomass globally, with considerable regional variation.<sup>13</sup>
- Globally, dead zones (oxygen deficient zones) are increasing due to nutrient over-enrichment from marine pollutants, as is the spread of invasive alien species<sup>14</sup>.

While the picture remains grim, there are also some bright spots, and progress has been made towards the achievement of the 2010 biodiversity target in relation to certain species and ecosystems. For example, available data indicates that the net loss of mangroves, while still very high, may have slowed down (from 185,000 ha/yr loss in the 1980s to 102,000 ha/yr during 2000-2005), possibly due to massive replanting campaigns following growing attention to the value of mangroves in the wake of the 2004 tsunami<sup>15</sup>. While the health of coral reefs near major population centers show a continued decline, reefs in the Indian Ocean and Western Pacific have shown significant recovery since the devastating 1998 bleaching events<sup>16</sup>. There are also many examples of local success stories, where drivers of biodiversity loss have been successfully addressed, and resources have

<sup>11</sup> Waycott, M. et al (2009) Accelerating loss of seagrasses across the globe threatens coastal ecosystems. PNAS vol. 106 no. 30 12377-12381

<sup>12</sup> Secretariat of the Convention on Biological Diversity (2008). Synthesis and Review of the Best Available Scientific Studies on Priority Areas for Biodiversity Conservation in Marine Areas beyond the Limits of National Jurisdiction. Montreal, Technical Series No. 37, 63 pages.

<sup>13</sup> Worm, B. et al (2009) Rebuilding Global Fisheries. Science 325: 578 – 585.

<sup>14</sup> Nellemann, C., Hain, S., and Alder, J. (Eds). February 2008. In Dead Water – Merging of climate change with pollution, over-harvest, and infestations in the world's fishing grounds. United Nations Environment Programme, GRID-Arendal, Norway, [www.grida.no](http://www.grida.no)

<sup>15</sup> FAO (2007) The World's Mangroves 1980-2005. FAO Forestry Paper 153, FAO, Rome

<sup>16</sup> Wilkinson, C. (2008) Status of coral reefs of the world: 2008. Global Coral Reef Monitoring Network and Reef and Rainforest Research Centre, Townsville, Australia, 296 p.

recovered due to protection measures. While these efforts should be celebrated and lessons learned, collectively they are not enough to slow the loss of biodiversity globally.

Given these declining trends, an important task now rests with the global oceans community to assess both the global status of marine biodiversity and progress made in achievement of biodiversity targets, as well as outline next steps in moving forward on the biodiversity agenda in upcoming years.

### ***The Implications of Climate Change for Marine and Coastal Biodiversity***

The impacts of climate change, which are predicted to increase in the future, have significant implications for marine biodiversity and will serve to exacerbate the negative impacts of other harmful human activities. As biodiversity is essential to ecosystem function, even slight impacts on marine biodiversity can have severe implications for global ecosystems.

Increases in water temperature will cause more frequent and severe coral bleaching events. Mass bleaching is expected to take place on an annual basis in the future, departing from the 4 to 7 years return-time of El Niño events. Coral bleaching will be exacerbated by the effects of degraded water quality and increases in the frequency and severity of extreme weather events<sup>17</sup>.

Ocean acidification will become a serious problem, reducing the biocalcification of tropical and cold-water coral reefs, as well as other shell-forming organisms, such as calcareous phytoplankton, impacting the entire marine food chain and resulting in less diverse biological communities<sup>18</sup>. According to the Interacademy Panel Statement on Ocean Acidification (June 2009), if current emission rates continue, models suggest that all coral reefs and polar ecosystems will be severely affected by 2050 or potentially even earlier<sup>19</sup>. Limiting atmospheric CO<sub>2</sub> levels significantly

below 350ppm will likely ensure the long-term viability of coral reefs<sup>20</sup>.

Rising ocean temperatures and increases in freshwater input from the melting of polar ice formations are likely to adversely impact ocean circulation, including potentially reducing the intensity and frequency of large-scale water exchange mechanisms. This, in turn, would impact both nutrient and larval transport systems and increase the risk of oxygen deficient zones<sup>21</sup>. Biodiversity in the deep oceans could also be affected, as warming oceans may result in large variations in the amount of organic material reaching the seafloor<sup>22</sup>.

Climate change will reduce the human benefits derived from marine biodiversity. Climate change, and its impacts on marine biodiversity, has significant implications for food security. A large portion of the world's population is heavily dependent upon ocean resources for sustenance. Impacts on marine food supplies will likely serve to exacerbate worldwide hunger and may lead to resource conflicts in certain areas.

Some climate change response strategies may also adversely impact marine biodiversity. For example, significant concern has been expressed about the potential impacts of large-scale ocean fertilization on marine species, habitats and ecosystem function. As a result, the CBD has called for a precautionary approach to ensure that ocean fertilization activities do not take place until there is an adequate scientific basis on which to justify such activities<sup>23</sup>.

Effective management and protection of marine areas, including through MPAs, will enhance the resilience of biodiversity to the impacts of climate change by removing other external stress factors,

<sup>17</sup> J.E.N. Veron et al (2009) The coral reef crisis: The critical importance of <350 ppm CO<sub>2</sub>. Marine Pollution Bulletin 58: 1428–1436.

<sup>18</sup> Secretariat of the Convention on Biological Diversity (2009). Scientific Synthesis of the Impacts of Ocean Acidification on Marine Biodiversity. Montreal, Technical Series No. 46, 61 pages. <https://www.cbd.int/doc/publications/cbd-ts-46-en.pdf>

<sup>19</sup> [http://www.interacademies.net/Object.File/Master/9/075/Statement\\_RS1579\\_IAP\\_05.09final2.pdf](http://www.interacademies.net/Object.File/Master/9/075/Statement_RS1579_IAP_05.09final2.pdf)

<sup>20</sup> 2009 Coral Reef Crisis Working Group Meeting, organized by the Royal Society of London. <http://static.zsl.org/files/statement-of-the-coral-reef-crisis-working-group-890.pdf>

<sup>21</sup> Policy Brief on Climate, Oceans and Security. 4<sup>th</sup> Global Conference on Oceans, Coasts and Islands. <http://www.globaloceans.org/globaloceans/sites/udel.edu.globaloceans/files/Climate-and-Oceans-PB-April2.pdf>

<sup>22</sup> K. L. Smith, Jr, H. A. Ruhl, B. J. Bett, D. S. M. Billett, R. S. Lampitt, and R. S. Kaufmann (2009) Climate, carbon cycling, and deep-ocean ecosystems. PNAS 106: 19211-19218.

<sup>23</sup> Secretariat of the Convention on Biological Diversity (2009). Scientific Synthesis of the Impacts of Ocean Fertilization on Marine Biodiversity. Montreal, Technical Series No. 45, 53 pages. <https://www.cbd.int/doc/publications/cbd-ts-45-en.pdf>

and thus providing a better opportunity for adaptation<sup>24</sup>.

### ***Implementation of Networks of MPAs and Other Measures for Conservation and Sustainable Use of Biodiversity***<sup>25</sup>

At the present time, only 0.5% of the oceans overall are covered by marine protected areas. More progress has been made closer to shore, with 6.3% of territorial sea now protected, an increase from 2.9% in 1990 and 5.0% in 2000<sup>26</sup>. While this figure falls short of the 10% target set by the CBD, it still demonstrates that considerable national action towards the conservation of the marine environment has been undertaken by countries individually or collectively. Figures for national Exclusive Economic Zones (EEZs) have not been calculated as of yet, given difficulties posed to such calculations by ongoing extended continental shelf claims. These statistics also demonstrate that deep-sea and open ocean areas beyond national jurisdiction remain some of the most under-protected regions on earth.

According to national reports submitted to the CBD, almost all countries now have one or more marine protected areas, and many have established national networks of MPAs. Recently, the establishment of spatially expansive marine protected areas, such as the Phoenix Islands Protected Area in Kiribati, the Papahānaumokuākea Marine National Monument in the Northwestern Hawaiian Islands, and the Chagos Islands MPA in the United Kingdom have greatly increased the amount of protected areas in the ocean. Ambitious regional initiatives, such as the Micronesia Challenge, the Caribbean Challenge and the Coral Triangle Initiative are also set to protect important marine biodiversity and demonstrate a positive trend in the use of MPAs to protect marine biodiversity and sensitive ecosystems. At the global level, the World Network of Biosphere Reserve under UNESCO's Man and the Biosphere Programme counts more than 150 coastal marine sites. With a rise in marine spatial planning and large-scale bioregional

classification initiatives, many countries are developing MPA networks as part of comprehensive management regimes, thus implementing MPAs in a broader ecosystem approach context.

Progress is also being made at the regional level, especially through the work of various Regional Seas Programmes, including those of the UN Environment Programme (UNEP). In the North Atlantic, for example, the OSPAR Commission is working to develop an ecologically coherent network of MPAs by the end of 2010. Other examples also exist, and Table 1 in the Annex contains examples of regional networks from a 2008 publication by UNEP-WCMC. The regional approach to protection of the marine environment, which is emphasized in UNCLOS, can often prove to be the most appropriate scale to encourage intersectoral cooperation in the protection of the marine environment and to move forward in the implementation of networks of marine protected areas.

Despite notable progress made, the global MPA network is not yet representative of all biodiversity. Of the nearshore habitats, coral reefs and mangroves are relatively well protected, while seagrasses and shellfish reefs are afforded relatively less protection in existing MPA systems. Very few spawning aggregations are protected. Approximately 43% of all MPAs (or about 65% of the total area that is protected) lie in the tropics (between 30°N and 30°S), with most of the remainder in the northern hemisphere. Intermediate latitudes (20°N to 50°N) and the southern temperate and polar latitudes are least represented<sup>27</sup>.

Deep-sea and open ocean habitats are also afforded very little protection, particularly in marine areas beyond the limits of national jurisdiction. Regional and national initiatives, such as the OSPAR network of MPAs have begun to identify and, in some cases, declare areas for protection. Within national jurisdiction, some countries are now actively seeking to protect deeper water habitats within their EEZs. Deep-sea pelagic habitats are presently afforded almost no protection.

There is no comprehensive information available about the management effectiveness of MPAs globally, although some national studies exist.

<sup>24</sup> Smith, Scott, et. al. "Climate Change on Marine Biodiversity and the Role of Networks of Marine Protected Areas." Oceans and Climate Change: Issues and Recommendations for Policymakers and for the Climate Negotiations. Policy Briefs Prepared for the World Ocean Conference, 11-15 May, 2009, Manado, Indonesia.

<sup>25</sup> For a more detailed discussion on this topic, please refer to the Report on Implementation of the CBD Programme of Work on Marine and Coastal Biological Diversity (UNEP/CBD/SBSTTA/14/INF/2) available at

<https://www.cbd.int/doc/?meeting=SBSTTA-14>

<sup>26</sup> Statistics courtesy of UNEP-WCMC (personal communication)

<sup>27</sup> UNEP-WCMC (2008) State of the world's protected areas: an annual review of global conservation progress. UNEP-WCMC, Cambridge.

According to anecdotal evidence, the management of many MPAs is still lacking. Some studies also show that MPAs have been more effective in reaching ecological than social goals<sup>28</sup>.

### *Challenges*<sup>29</sup>

Marine and coastal biodiversity loss is caused by multiple drivers that are intensifying. These drivers include development and land-use patterns, pollution, unsustainable fishing, invasive alien species and other impacts. Coastal populations are predicted to increase, with 50% of the world's population expected to live along the coasts by 2015. Projections from UNEP estimate that as much as 91% of all temperate and tropical coasts will be heavily impacted by development by 2050<sup>30</sup>. The impacts of climate change are also predicted to increase in the future, thereby exacerbating effects on marine biodiversity.

The drivers of biodiversity loss cannot be controlled by environmental agencies alone, and mainstreaming of biodiversity concerns into the activities of other sectors is often lacking. Slowing biodiversity loss requires the involvement of all sectors, including fisheries, forestry, agriculture, coastal development, and shipping. Biodiversity will continue to decline unless all ocean users incorporate biodiversity-relevant priorities into their activities.

The economic and social benefits and values of marine and coastal biodiversity are often not well understood by decision-makers, resulting in limited political will to undertake action towards biodiversity protection. This is particularly true if the required action is likely to be unpopular in the short term (such as limiting development, extractive or other revenue-generating activities), and the benefits of protection will only be apparent much after national election cycles have passed. The lack of appreciation about the goods and services provided by marine biodiversity may also explain the limited application of the precautionary approach in management.

<sup>28</sup> Christie, P. (2004) Marine Protected Areas as Biological Successes and Social Failures in Southeast Asia. American Fisheries Society Symposium 42:155-164

<sup>29</sup> These challenges condense information contained in national and thematic reports submitted to the Convention on Biological Diversity

<sup>30</sup> Nellemann, C., Hain, S., and Alder, J. (Eds). February 2008. In Dead Water – Merging of climate change with pollution, over-harvest, and infestations in the world's fishing grounds. United Nations Environment Programme, GRID-Arendal, Norway, www.grida.no

The economic and social costs and benefits of biodiversity conservation are not equitably shared. The short-term costs of, for example, establishing an MPA may be disproportionately borne by certain communities or resource users, while benefits may be shared by a larger group of users and could take a significant amount of time to materialize. In many developing countries, biodiversity conservation may be too costly when compared to other more immediate needs. Certain research activities, that can lead to improvements in scientific knowledge and provide a stronger basis for conservation efforts, can prove to be beyond the financial and technical capabilities of many developing nations.

Conservation measures do not always respect local cultural norms and social structures, and may not bring direct benefits to communities. In some parts of the world, conservation efforts have often ignored local and traditional knowledge and land/sea tenure systems in favor of a top-down scientific model, resulting in social and cultural losses to coastal communities. In many cases, MPAs have been more successful in bringing ecological rather than social benefits, and have thus failed to gain the support of communities.

Available data and information relating to the marine environment is not always easily accessible or well organized, and new research and monitoring efforts are not comprehensive and responsive to management needs. There is currently no comprehensive global assessment/monitoring of the status of biodiversity in the oceans, robust indicators are lacking, and existing efforts are not always well coordinated. As a result, we still have very little understanding of what we have and what we stand to lose.

## **The Way Forward—General Recommendations for Future Action**

### *A. Recommended Actions*<sup>31</sup>

- **Ensure that the conservation and sustainable use of marine biodiversity becomes the common concern of every country by creating an improved understanding of its economic and non-economic values.** In many cases, the goods and services provided by biodiversity are not well understood, and thus not highly valued in national policies that seek to maximize

<sup>31</sup> These actions condense information contained in national and thematic reports submitted to the Convention on Biological Diversity

economic development. Thus, it will be important to demonstrate the role biodiversity in the oceans plays in supporting human life and livelihoods through promoting its economic, social and cultural values. While economic valuation activities have recently become more common and have been effectively used in support of conservation measures, they have generally focused on selected ecosystems, such as coral reefs. Much less is known, for example, about the economic values of deep-sea ecosystems. Some studies have calculated the costs of specific conservation action (i.e. the cost to establish a global network of MPAs), but increased focus should also be paid to calculating the economic costs of inaction (failing to undertake conservation measures) in the long term. The work of initiatives such as the TEEB project should be supported and their results widely disseminated to decision-makers.

- **Ensure that marine biodiversity concerns are mainstreamed into the work of all relevant sectors, and that all stakeholders are included in the visioning, planning and management process**, in the overall framework of the ecosystem approach.
- **Mainstreaming and integration can be supported through national initiatives such as marine spatial planning, where all ocean users are involved in the planning and management process and work towards a common goal.** Mainstreaming has been most successful in countries where biodiversity is self-evidently a crucial component of national wealth (for example, in the form of tourism income), and thus each stakeholder has incentive to participate in the development and implementation of marine spatial planning. Communication and participatory approaches, such as multi-stakeholder dialogues, are an important tool in ensuring mainstreaming of biodiversity into all relevant sectoral policies.
- **Broadly implement ecosystem-based management, including through the establishment of networks of MPAs.** There is an urgent need to improve protection and management of the oceans, particularly in areas that are currently under-represented in MPA systems. Thus, there is a need to increase the coverage of MPAs and ensure that that MPA networks are representative of the full range of biodiversity in the oceans, including deep seas

and pelagic areas. Attention should be paid to ensuring that MPAs are well managed and that they provide both ecological and socio-economic benefits. MPAs alone are not enough, and the areas outside them (whether land or sea) need to be sustainably managed as well, keeping in mind that improved management will increase the resilience of marine and coastal biodiversity to impacts of climate change. Ultimately, MPAs are central to maintaining the processes upon which the sustainability of the marine environment depends. Towards this end, they need to be complemented by other actions including the establishment of ecological corridors. By integrating MPAs into marine spatial planning efforts, due consideration will be given to specific stakeholder needs, in the context of an integrated approach to management.

- **Create a global list of marine areas of ecological and biological significance, taking also into account representativity.** Significant progress is being made towards the identification of marine areas in need of special protection. For example, the work of the CBD in biogeographic classification and criteria for the identification of ecologically and biologically sensitive areas (EBSA)<sup>32</sup> outlines an important step toward improvements in marine protection capability in deep and open oceans. The efforts should be further supported and implemented through the development of a coherent global list of marine areas in need of special protection in marine areas beyond the limits of national jurisdiction, which will serve to provide scientific validation, and ultimately facilitate the creation of MPA networks at the national, regional, and global levels, in the context of the law of the sea, and under appropriate legal instruments which may include regional arrangements, such as Regional Fishery Management Organizations, Regional Seas, or appropriate global instruments. Lessons can be learned from successful regional efforts, including those under OSPAR (Oslo/Paris Convention for the Protection of the Marine Environment of the North-East Atlantic) and CCAMLR (Convention on the Conservation of Antarctic Marine Living Resources).
- **Strengthen capacity for the creation and management of networks of Marine**

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<sup>32</sup> CBD Decision IX/20 Annex 1

**Protected Areas.** As capacity is a central factor in the effective management of marine resources, especially in developing countries and Small Island Developing States (SIDS), capacity building is essential to the creation and management of networks of marine protected areas. International solidarity initiatives could support the strengthening of capacity and the development of national agencies dedicated to the management of MPAs, in the context of integrated coastal and ocean management. Concrete actions aimed at strengthening capacity for MPAs should be complemented by capacity-building activities in related areas, namely, sustainable fishing, marine scientific research and the management of adverse impacts of human activities on the marine environment.

- **Encourage the development of an institutional and intersectoral approach to marine protection in areas beyond national jurisdiction.** In light of increased activity in marine areas beyond the limits of national jurisdiction, including deep-sea fishing and oil and gas drilling, as well as new and emerging activities such as bioprospecting, the international community, and especially the United Nations, should seek to address existing legal and regulatory gaps in the international framework for protection of biodiversity in these areas. Options for the development of legal institutional mechanisms, as well as methods to better utilize existing management frameworks, should be developed and implemented to improve protection of marine biodiversity in areas beyond national jurisdiction.
- **Support and learn from creative local solutions.** There are many ways to improve the management of marine biodiversity, and the best solutions are often local. These bottom-up approaches are embedded in local knowledge and have a unique social and cultural context. Sharing information about local success stories may provide new ideas for management worldwide.
- **Improve the informational basis for management and for assessing progress** by ensuring that management action is based on the best available scientific information. Existing information should be made more accessible to all users, and new targeted research, monitoring and data analysis

activities supported. Initiatives such as the Regular Process for Global Reporting and Assessment of the State of Oceans, the continuation of the Census of Marine Life, the Global Ocean Biodiversity Initiative (GOBI), and Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) have much to offer for improving protection and management of biodiversity, and should be supported and coordinated. The role of local knowledge in management should also be acknowledged, and efforts to integrate it with scientific knowledge supported.

- **Address capacity and equity.** Marine biodiversity protection efforts should squarely address issues of capacity and equity. The concept of capacity is broad and includes the creation of an enabling policy and legislative environment; the availability of adequate staff and resources; the acquisition of specific skills through training and other means; and the availability of necessary equipment, such as hardware and software, including related appropriate technology transfer. Capacity needs vary greatly between countries and regions, and successful capacity building must be closely targeted to meet the needs of the recipients. Issues of equity in access and benefit sharing regarding marine genetic resources are a salient concern of developing countries and must also be directly addressed.
- **Improve long-term financing.** A majority of projects relating to conservation and sustainable use of marine and coastal biodiversity suffer from limited financial support, preventing them from becoming sustainable in the long term. There is a need for improved and forward-looking financial planning to allow networks of marine protected areas and other management efforts to become self-sustaining. Funding will need to fit the scope of the projects and the needs of the recipient countries or organizations, and may include small or larger grants, financing from GEF and other donors, user fees, conservation trusts, and other means. The development of business planning skills may be a fundamental component of project planning. In addition to management, improved funding is required for research, monitoring, and enforcement. It should be noted that where a management activity has community support, enforcement costs will likely be reduced.

## ***B. Opportunities to Advance the Marine Biodiversity Agenda in the Future***

- The CBD, and particularly COP-10, is expected to review and update the programme of work on marine and coastal biodiversity<sup>33</sup> by providing recommendations for future priorities. In this context, COP 10 provides opportunities to promote the importance of biodiversity in the oceans and the need for its conservation and sustainable use. These opportunities include:
  - The Oceans Day at Nagoya, organized by the Global Forum on Oceans, Coasts and Islands and partners and scheduled for October 23, 2010, will raise further awareness of the threats to, and the importance of, marine biodiversity, and the need to ensure relevant, timely and coordinated international action;
  - COP 10 may also provide an opportunity for participants in the Ministerial Segment, if they so wish, to agree on a Nagoya Oceans Mandate, as well as to provide concrete inputs into the development of future marine biodiversity related targets within the CBD.
- Management activities will need to be supported by the best available science, and thus international marine assessments are vital for ensuring the sustainable use of biodiversity in the oceans. Several opportunities exist for improving the scientific basis for management, including:
  - The Regular Process for Global Reporting and Assessment of the State of Oceans, which should be encouraged to collect information of relevance to marine biodiversity;
  - The newly-approved Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), which has the potential to provide targeted and management-relevant information on marine biodiversity, and to bring to the

attention of policy-makers the latest findings from scientific research;

- The Census of Marine Life, which is coming to an end in 2010. This international scientific collaboration has provided valuable information about the oceans, and its extension beyond 2010 should be supported.
- Coordination among all of these initiatives should also be actively pursued.
- The UNGA process on marine biodiversity beyond the limits of national jurisdiction will continue providing information relating to policy options to the UNGA process and encourage the development of consensus among the countries. At the same time, the Rio+20 process will provide a framework to develop long term goals, targets and specific strategies related to marine biodiversity in the context of the international debate on sustainable development.
- The UNFCCC and other climate-relevant processes can also assist in developing a comprehensive programme on all aspects of oceans and climate within and outside the UNFCCC, with the participation of the IPCC.

## **The Vision for the Future: The Nagoya Oceans Mandate**

Fifteen years after the inception of the Jakarta Mandate on Marine and Coastal Biodiversity, the Ministerial Segment of the CBD COP-10 provides a unique opportunity to review the Jakarta Mandate and to draft an updated Nagoya Oceans Mandate to pave the way forward in ensuring the long-term health and well-being of ocean and coastal biodiversity resources. **The Nagoya Oceans Mandate would provide the impetus and policy-enabling environment needed for renewed ambitious, relevant and timely efforts aimed at ensuring that marine and coastal biodiversity is sustained and enhanced in the future.**

The following is a list of elements that may be considered by governments for possible inclusion in the Nagoya Oceans Mandate.

The Mandate should pursue an overall vision to **ensure that the impacts affecting the marine environment are addressed so as to secure the structure and functioning of ecosystems and the well-being of human populations depending on**

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<sup>33</sup> Report on Implementation of the CBD Programme of Work on Marine and Coastal Biological Diversity (UNEP/CBD/SBSTTA/14/INF/2) available at <https://www.cbd.int/doc/?meeting=SBSTTA-14>

**the oceans for their sustenance.** To this effect, the Mandate should outline the need to guarantee conservation and sustainable use of biodiversity for well-being and development; the contribution of oceans to climate regulation through the maintenance of the carbon cycle and other biogeochemical cycles; and the continued production of food consistent with the carrying capacities of marine systems.

The Nagoya Oceans Mandate should be guided by a number of **principles** that are already central to all activities taken to implement the CBD:

- **The ecosystem approach**, which provides for a comprehensive, open-ended and highly integrated approach to issues affecting the marine environment. The approach should guide the way in which the perspectives and concerns of all stakeholders are addressed while ensuring the integrity of marine systems, so that they can deliver the goods and services on which human well-being and development depend;
- **The International Regime on Access and Benefit-Sharing**, which is likely to be adopted at COP-10, and which may provide guidance on the way in which activities related to marine genetic resources are conducted;
- **Best available scientific information** should be used as a basis for management decisions, keeping also in mind **the value of local and traditional knowledge**. Where scientific information is lacking, the **precautionary approach** should guide management.

The **vision** under the Nagoya Oceans Mandate may be achieved through the following actions:

- **To ensure that best scientific advice is provided through a regular and coordinated assessment of the marine environment in the context of ongoing and planned assessments**, such as the Regular Process for Global Reporting and Assessment of the State of Oceans and the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES);
- **To produce a sound conceptual and methodological approach to conservation priority-setting in the marine environment to inform further action by the Global Environment Facility** (especially its portfolios related to Biodiversity, Climate, and

International Waters portfolios), **and by other donors;**

- **To conduct a comprehensive valuation of the services provided by marine resources and biodiversity.** This valuation will be used as the basis upon which implementation modalities will be developed in support of positive incentives for operationalizing stewardship schemes for the marine environment at all scales, and involving both individual sectors as well as multi-stakeholder action;
- **To develop and implement priority actions that enhance the resilience of marine biodiversity to the impacts climate change, and ensure that the capacity of oceans to store carbon is maintained.** These activities may be undertaken in collaboration with UNFCCC;
- **To work towards the establishment of ecologically representative networks of marine protected areas** in the context of the ecosystem approach, supported by: Robust institutional mechanisms and management frameworks at the global, regional, and national levels; efforts toward improvements in capacity; and sound scientific evidence for the identification of ecologically sensitive marine areas;
- **To build capacity**, cutting across all of the themes in the Nagoya Oceans Mandate, through appropriate actions, including supporting the further development of scientific capabilities in the areas of research, monitoring and assessment; capacity for effective and adaptive management through ecosystem-based marine spatial planning; and educational measures and public awareness supported by effective communication; and institutional capabilities based on national policies;
- **To contribute to CBD's continued role in providing scientific and technical advice to the United Nations processes on marine biodiversity**, in particular, by maintaining links with the United Nations Informal Consultative Process on Oceans and the Law of the Sea and the Ad Hoc Working Group to study issues related to biodiversity in marine areas beyond national jurisdiction;
- **To ensure that the post-2010 Biodiversity Target is supported by marine-relevant sub-targets and indicators**, which would allow for the measurement of progress made in

conserving and sustainably using marine biodiversity;

- **To reaffirm the role of the Global Forum on Oceans, Coasts and Islands** as a framework for the presentation and discussion of stakeholders' perspectives and multi-stakeholder analyses;
- **To actively promote the disseminating and implementation of the Nagoya Oceans Mandate** as a vehicle for raising political will and for triggering actions at multiple scales in support of the achievement of the CBD objectives in relation to the marine environment.

The Nagoya Oceans Mandate would rely on the existing and elaborated (post-2010) CBD Programme of Work on Marine and Coastal Biodiversity, the renewed Strategic Plan of the CBD, other relevant programmes of work of the CBD, as well as pertinent programmes and activities of other intergovernmental, international, regional, national and local organizations.

The Mandate Nagoya Oceans would also rely upon a dedicated strategy encompassing the 2010-2020 period. A central element of this strategy would be to create and maintain networks of marine protected areas in the context of the ecosystem approach that are consistent with its vision. The focus on MPA creation would assist the achievement of the 10% MPA target by 2012. It would also provide for pilot initiatives that might be organized in the form of a network for supporting improved management of marine biodiversity, including in areas beyond national jurisdiction. In this regard, a promising approach is expected to be regional experimentation with MPA development in specific regions in areas beyond national jurisdiction, in collaboration with regional organizations and neighboring nations..

Issues related to marine and coastal biodiversity have not ceased being high on the international agenda since the time when the UNCLOS preamble reminded us that problems of ocean space are closely interrelated and need to be considered as a whole. Thus, the international oceans community should demonstrate, at this key juncture in 2010, its renewed commitment and capacity to deliver on a collaborative vision to ensure that future generations will continue to benefit from healthy oceans and biodiversity.

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## Annex

**Table 1: Examples of regional networks of MPAs involving two or more countries**

<b>Region</b>	<b>Countries</b>	<b>Progress</b>
Mesoamerican Barrier Reef	Mexico, Belize, Guatemala, Honduras	NTAs and multiple use; several initiatives underway to develop the network with support of TNC and WWF
Gulf of Mexico 'Islands in the Stream'	USA, Mexico, Belize	Early proposal
North-east Pacific	Countries from Mexico south to Colombia	Proposal developed
South-east Pacific	Countries from Panama south to Peru	Recommendation; to include MPAs and MCPAs
Tropical Eastern Pacific Marine Corridor Network (CMAR - or Corredor Marino)	Colombia, Costa Rica, Panama, Ecuador - San Jose Declaration	Implementation of network of five existing MPAs underway
Baja California to the Bering Sea (B2B)	USA, Canada, Mexico	28 sites identified
Scotian Shelf/Gulf of Maine	Canada, USA	
Eastern African Marine Ecoregion (EAME) Programme	Somalia, Kenya, Tanzania, Mozambique, South Africa	Priority 'seascapes' identified and ranked by WWF and support provided to protect some of these
MPA Network for the Countries of the Indian Ocean Commission	Madagascar, Mauritius, France (Reunion), Comores, Seychelles	Data-gathering underway
Western Africa Regional Network	Mauritania, Senegal, Gambia, Guinea-Bissau, Guinea, and Cape Verde	Initial steps underway
PERSGA MPA Network	Djibouti, Egypt, Jordan, Saudi Arabia, Somalia, Sudan and Yemen	Master Plan for the network prepared and some sites established
Caspian regional MPA Network	Azerbaijan, Islamic Republic of Iran, Kazakhstan, the Russian Federation and Turkmenistan	Initial discussions underway
South-east Asian MPA network	ASEAN and other countries	Action Plan prepared
Sulu-Sulawesi Marine Ecoregion (SSME)	Indonesia, Malaysia, Philippines	Framework for network developed with criteria for site selection
Natura 2000	Member countries of the EU	Under development and many sites established
Mediterranean	All countries bordering Mediterranean	Under development; to be comprised of several sub-regional networks
OSPAR	Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, UK	Criteria and guidelines developed and process well underway; sites currently being nominated
HELCOM	Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russian Federation, Sweden	Criteria and guidelines developed and process well underway; sites currently being nominated
Antarctic	25 members of CCAMLR	Planning underway for a regional MPA system
Arctic	Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden, USA	Discussions underway for an MPA network

Source: UNEP-WCMC (2008). National and Regional Networks of Marine Protected Areas: A Review of Progress. UNEP-WCMC, Cambridge.