

State of the world's protected areas 2007



An annual review of global conservation progress

UNEP World Conservation Monitoring Centre
Supported by the European Commission



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The UNEP-World Conservation Monitoring Centre (UNEP-WCMC) is the biodiversity assessment and policy implementation arm of the United Nations Environment Programme (UNEP), the world's foremost intergovernmental environmental organization. The centre has been in operation since 1989, combining scientific research with practical policy advice.

UNEP-WCMC provides objective, scientifically rigorous products and services to help decision makers recognize the value of biodiversity and apply this knowledge to all that they do. Its core business is managing data about ecosystems and biodiversity, interpreting and analysing that data to provide assessments and policy analysis, and making the results available to international decision-makers and businesses.

Since 1981 UNEP-WCMC has compiled the World Database on Protected Areas (WDPA) from protected area information provided by competent agencies and other contributors. A joint project of UNEP and IUCN, produced by UNEP-WCMC and the IUCN World Commission on Protected Areas (IUCN WCPA), the WDPA is the largest assembly of data on the world's terrestrial and marine protected areas. The database holds spatial and attribute information from governments and NGOs on more than 120,000 national and international protected areas. Increasingly, the WDPA also holds information on private, community and co-managed reserves. It is also the basis for the UN List responding to the United Nations General Assembly resolution in 1962 to record the status of the world's protected areas.

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Introduction

The Annual Report on Protected Areas (2007) highlights achievements made in protected areas around the world during the past year. Through this publication,

the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) provides an annual assessment of progress made towards targets set by international agreements such as the United Nations Convention on Biological Diversity (CBD) and the Millennium Development Goals (MDGs). This publication should provide useful insights to anyone directly involved with or interested in the protection of natural and cultural areas for biodiversity protection or sustainable development.

An overview of site-level protected areas achievements in 2007 are balanced with national, regional and global measures of progress. The report addresses both the current status of global and national protected area coverage for terrestrial and marine environments, with additional insights on forest biodiversity and the high seas. Topics such as the management effectiveness of protected areas, livelihood impacts and climate change are highlighted to demonstrate the breadth of conservation issues related to protected areas. The report concludes with a look at 2008 as the International Year of the Reef (IYOR).

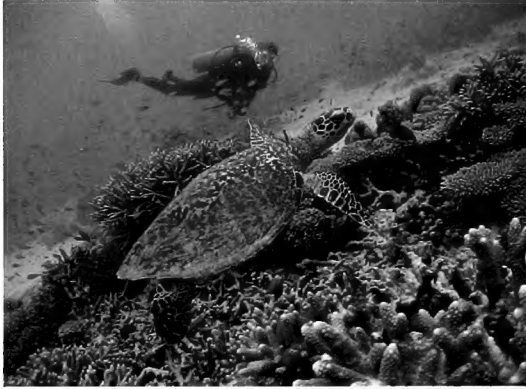
All of the analyses presented here draw from information contained within the World Database on Protected Areas (WDPA) and associated data. The WDPA, maintained by UNEP-WCMC is the only comprehensive global dataset on marine and terrestrial protected areas and is a key tool for conservation decision-making and assessing progress towards specific protected area targets and goals. It is a joint project of the United Nations Environment Programme (UNEP) and the International Union for Conservation of Nature (IUCN) that relies on IUCN's World Commission on Protected Areas and an Advisory Group to review protected areas data and make improvements. As custodian of the WDPA, UNEP-WCMC acknowledges the critical importance of the data contributions that have been provided by individuals, communities, nations, and regions around the world. These valuable sources of protected areas data and knowledge are an essential part of the growing quality and quantity of information that is the basis for this and future reports.

Since one of the key indicators of success in conservation is continuity over time, this report is expected to form a baseline for monitoring the successes and challenges associated with establishing and managing protected areas – while looking ahead to critical social, scientific, and political issues that will affect the conservation community in the years to come.

C. Besançon



C.J. Wantenaar



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Protected areas: values and challenges

The International Union for Conservation of Nature (IUCN) defines a protected area as: *'a clearly defined geographical space recognized, dedicated and managed, through legal or other effective means to achieve the long-term conservation of nature with associated ecosystem services and cultural values'*¹. The definition is broad, encompassing any geographically defined area (e.g. land, inland water, marine and coastal areas and their combinations) upon which some degree of protection of biodiversity is a priority. The values and challenges related to PAs continue to evolve as our experience with the science and policy of biodiversity protection increases.

Protected areas are internationally recognized as a major tool for conserving species and ecosystems. The ecosystems that they protect provide a range of goods and services essential to human wellbeing, such as watersheds and fertile soils. Local communities and indigenous peoples depend on natural resources such as forest products for survival, and wild lands can hold important cultural values, which protected areas can help to safeguard. Protected areas are also important for ecological research and education and can make significant contributions to local economies through the development of eco-compatible and sustainable forms of tourism.

Despite recognition of the importance of protected areas by the global community and various international conventions, protected areas face many threats, ranging from local sources of pollution and infrastructure development to the emerging global challenges related to climate change and invasive species. Threats are magnified where protected areas lack political support and have low financial resources, meaning that the biodiversity within their boundaries does not necessarily receive adequate protection.

For effective biodiversity protection through a functioning protected areas network, adequate funding for protected areas management is fundamental; additionally the global protected areas network must provide representative coverage of species and habitat types. Finally, it is essential to ensure that the needs of a growing human population are balanced with the need to conserve the world's biological diversity.

PROTECTED AREA MANAGEMENT AND GOVERNANCE

Protected areas can differ widely in their purpose and management and are categorized within a classification

system developed by IUCN and encouraged by the Convention on Biological Diversity (CBD), which classifies protected areas according to their management objectives.

The IUCN categories (Box 1) have come under recent review, and their format and use was discussed at the 2007 Protected Areas Categories Summit. This Summit, part of a longer consultative process, has resulted in a new IUCN Guidelines document on the use of the category system, including re-drafting of some elements of the definition of a protected areas, and the descriptions of the categories themselves.

The IUCN management categories do not provide information on how a protected area is governed, and a separate protected areas 'governance matrix' has been developed by IUCN². The term 'governance' refers to who holds decision-making power, how this power is exercised, and how the views of citizens or stakeholders are incorporated into decision making; though related, this is different from 'ownership'.

Box 1: IUCN PROTECTED AREA MANAGEMENT CATEGORIES

Category	Title	Managed for
Ia	Strict Nature Reserve	Science
Ib	Wilderness Area	Wilderness protection
II	National Park	Ecosystem protection and recreation
III	Natural Monument	Conservation of specific natural features
IV	Habitat/Species Management Area	Conservation through management intervention
V	Protected Landscape/Seascape	Landscape/seascape conservation and recreation
VI	Managed Resource Protected Area	Sustainable use of natural ecosystems



N Burgess

The IUCN Governance Matrix allows sites to be categorized as privately owned and managed, government owned and managed, community owned and managed or 'co-managed' – typically between governments or non-governmental organizations (NGOs) and surrounding communities. As yet, little information exists about governance categories for most protected area sites and national authorities are only now beginning to collect and monitor that information. As knowledge of the matrix spreads, the World Database on Protected Areas (WDPA) will become a useful tool for tracking and highlighting trends for new and innovative governance systems.

NATIONALLY AND INTERNATIONALLY RECOGNIZED PROTECTED AREAS

Nationally designated protected areas are those that are recognized, supported and designated by national legislation and/or authority. The analysis of the historic evolution and spatial distribution of national sites over a country represents a useful tool to assess the level of commitment of national governments towards conservation issues, as well as the challenges that they have to face in site designation. International organizations, through the establishment of conventions and targets, have encouraged national governments to jointly create a system of collective protection. International sites can thus be defined as areas that are recognized and protected by international agreements, such as treaties or conventions.

International Conventions, Agreements and Initiatives

The necessity to create an international movement for protecting important sites emerged after World War I, when international concerns arose regarding the long-term protection of some areas of outstanding cultural and natural value – including the Grand Canyon in the United States of

America and the Great Pyramid of Giza in Egypt. International cooperation, calling for nations to share responsibility for the protection of important sites, is thought to assure greater protection than national initiatives alone. Since the 1970s, international organizations and conventions have fostered the establishment of international sites and have encouraged national governments to set a number of protection targets. Following are some key international instruments that affect protected areas and their conservation success.

UN Convention on Biological Diversity

In June 1992 the Earth Summit was held in Rio de Janeiro, Brazil, with the aim of bringing nations together to reach global agreement on sustainable development. The Convention on Biological Diversity (CBD) was one of the major agreements to come out of the Earth Summit, where it was signed by 150 government leaders, and entered into force in December 1993. Today there are 191 contracting Parties to the CBD.

The objectives of the Convention are outlined in Article 1 of the CBD as:

'...the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.'

The Conference of the Parties (CoP) is the governing body of the Convention, and advances implementation of the Convention through its decisions. It meets every two years to consider the state of implementation of the Convention.

In 2004, the 7th Conference of the Parties to the CBD established the Programme of Work on Protected Areas (POWPA) to:

'support the establishment and maintenance by 2010 for terrestrial and by 2012 for marine areas of comprehensive, effectively managed, and ecologically representative national and regional systems of protected areas that collectively, inter alia through a global network contribute to achieving the three objectives of the Convention and the 2010 target to significantly reduce the current rate of biodiversity loss at the global, regional, national and sub-national levels and contribute to poverty reduction and the pursuit of sustainable development, thereby supporting the objectives of the Strategic Plan of the Convention, the World Summit on Sustainable Development Plan of Implementation and the Millennium Development Goals.'

The CBD POWPA contains a number of targets for protected areas, including targets on protected areas coverage, management, and funding; relevant targets are outlined in Box 2.

At the same time, the CoP established an Ad Hoc Open-ended Working Group on Protected Areas (WGPA) to support and review the implementation of the programme of work and report to the Conference of the Parties. In addition to the WGPA, the POWPA Friends, an informal consortium of governmental, non-governmental, and intergovernmental organizations, provides direct support to implementation of the CBD POWPA and has been instrumental in the organization of regional workshops which have provided a platform for discussion, sharing of experience and training.

Further information on the CBD, and its targets and decisions, can be found at www.cbd.int.



C. Corrigan

UN Millennium Development Goals

The Millennium Development Goals (MDGs) are eight goals to be achieved by 2015 in response to the world's main development challenges. The MDGs are drawn from the actions and targets contained in the United Nations

Millennium Declaration, adopted by 189 nations and signed by 147 heads of state and governments during the UN Millennium Summit in September 2000. Protected areas are an explicit part of MDG goal 7, 'Ensure Environmental

Box 2: INTERNATIONAL PROTECTED AREAS TARGETS

Convention on Biological Diversity

The Seventh Conference of the Parties in 2004 was a key CBD meeting for protected areas, with Decisions 28 and 30 leading to the 2010 and 2012 targets for protected area coverage. The 7th CoP was also where the Programme of Work on Protected Areas (POWPA), as an annex to Decision 28, was agreed upon. Selected goals and targets from decision 28 and 30 are shown below:

Decision 28 (Annex): Programme of Work on Protected Areas

Goal 1.1: To establish and strengthen national and regional systems of protected areas integrated into a global network as a contribution to globally agreed goals.

Target: By 2010 terrestrially, and 2012 in the marine area, a global network of comprehensive, representative and effectively managed national and regional protected area systems is established as a contribution to:

- (i) the goal of the Strategic Plan of the Convention and the World Summit on Sustainable Development of achieving a significant reduction in the rate of biodiversity loss by 2010;
- (ii) the Millennium Development Goals – particularly Goal 7 on ensuring environmental sustainability;
- (iii) the Global Strategy for Plant Conservation.

Decision VII/30: Strategic Plan: future evaluation of progress.

Provisional framework for goals and targets:

Target 1.1: At least 10 per cent of each of the world's ecological regions effectively conserved.

Target 1.2: Areas of particular importance to biodiversity protected.

Goal 4.3 of the Programme of Work on Protected Areas:

To assess and monitor protected area status and trends
Target: By 2010, national and regional systems are established to enable effective monitoring of protected area coverage, status and trends at national, regional and global scales, and to assist in evaluating progress in meeting global biodiversity targets.

Millennium Development Goals

Goal 7: to 'ensure environmental sustainability' and within this goal there are two targets which are relevant to protected areas.

Target 1: Integrate the principles of sustainable development into country policies and programmes, and reverse the loss of environmental resources.

Target 2: Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss.



Sustainability, and the relevant MDG targets are outlined in in Box 2. Further information on the MDGs can be found at www.un.org/millenniumgoals/.

UNESCO World Heritage Sites

The United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Programme seeks to 'encourage the identification, protection and preservation of cultural and natural heritage around the world considered to be of outstanding value to humanity'. The UNESCO World Heritage Convention, which promotes the designation of biological and cultural World Heritage Sites, was adopted by UNESCO in 1972, and has been ratified by 185 State Parties. To be included on the World Heritage List, sites must be of outstanding universal value and meet at least one out of ten selection criteria. Parties put forward their nominated sites to UNESCO every year and, if accepted, sites are inscribed to the World Heritage List. Currently there are 679 cultural, 174 natural and 25 mixed sites, in 145 countries. Further information on the World Heritage Convention can be found at <http://whc.unesco.org>.

UNESCO Man and the Biosphere Reserves

UNESCO's Man and the Biosphere Programme's (MAB) overriding aim is to improve the global relationship of people with their environment. The Programme was launched in 1970, and its Biosphere Reserve concept was launched in

1974, with revisions in 1995. Biosphere reserves have three interconnected functions:

- conservation: landscapes, ecosystems, species and genetic variation;
- development: economic, human and culturally adapted;
- logistic support: research, monitoring, environmental education and training.

Currently there are 531 Biosphere reserves in 105 countries. Further information on the MAB Programme can be found at www.unesco.org/mab/.

The Ramsar Convention on Wetlands

The Convention on Wetlands, also known as 'the Ramsar Convention', was signed in Ramsar, Iran in 1971. The Convention aims to conserve and wisely use all wetlands through local, national and regional cooperation in concert with sustainable development. A broad definition of wetlands is used, with protected habitats including lakes, rivers, marsh, peatlands, near-shore marine areas, coral reefs, mangroves, and similar human-made areas such as rice paddies. It currently has 158 signatory Parties who are encouraged to identify important wetland areas for inclusion in the List of Wetlands of International Importance and designate them as international protected areas. As of August 2008, the Ramsar List contains more than 1,759 wetlands covering 161 million hectares.

The World Database on Protected Areas

The World Database on Protected Areas (WDPA) is the largest assembly of data on the world's terrestrial and marine protected areas and, as such, represents a fundamental tool in tracking progress towards conservation targets. A joint project of the United Nations Environment Programme (UNEP) and the International Union for Conservation of Nature (IUCN), the WDPA is managed by UNEP-WCMC and has the support of IUCN's World Commission on Protected Areas to ensure data flow and improvement. The WDPA holds spatial and attribute information from governments and non-governmental organizations on over 120,000 national and international protected areas. Increasingly, the WDPA also holds information on private, community and co-managed reserves.

WHAT IS THE PURPOSE OF THE WDPA?

UNEP-WCMC uses the database to complete the periodic United Nations List of Protected Areas that tracks the status of the world's protected areas. The WDPA is also utilized as a monitoring and assessment tool under the CBD

Programme of Work on Protected Areas (Goal 4.3). The WDPA is currently being used to assess the world's progress towards the 2010 and 2012 targets on biodiversity coverage, biodiversity representation, and management effectiveness. The database is also being used to implement gap analyses of protected areas at national and regional scales, as well as environmental impact assessment and international emergency response action planning. The data from the WDPA underlies most of the analyses presented in this report.

UPDATES TO THE WDPA IN 2007

Since January 2007, the coverage and quality of spatial and attribute data in the WDPA has increased markedly, with particular emphasis on acquiring information about protected areas establishment dates and knowledge on marine protected areas. During this period, entries on nearly 14,000 sites in the WDPA have undergone data improvements, such as clarified boundaries or corrected establishment dates. This includes updates to over 4,056 existing national sites, and the addition of 9,777 new

The World Database on Protected Areas is a foundation dataset for conservation decision making. It contains crucial information from national governments, non-governmental organizations, academic institutions, international biodiversity convention secretariats and many others. It is used for ecological gap analysis,

[Rapid Assessment Of Land Use Change In and Around Protected Areas \(RALUCIAPA\)](#)

national sites. Entirely new national and regional datasets have been added to the WDPA for Australia, South Africa, Mozambique, Congo Basin, Russia, and the European Union. More than 260 internationally recognized sites such as Ramsar Convention, UNESCO Man and Biosphere Reserves, and UNESCO World Heritage Sites have also been updated. Some of the new protected areas declared in 2007 are described in the following section.

REDEVELOPING THE WDPA IN 2008

For over 25 years the WDPA has been updated continually and used for conservation and planning purposes. In recent years the number of protected areas, the breadth of information stored and the variety of applications for the dataset have increased. In order to improve the database and its ability to hold a range of information on more than 120,000 sites that exist around the world, the WDPA has undergone considerable redevelopment. The redeveloped database stores information on a wider range of protected

areas to cover not just nationally or internationally designated sites but community reserves, private reserves and other innovative governance types. It also captures multiple designations and management zones within one site, including no-take and buffer zones, and therefore enables a true portrayal of sites that have both terrestrial and marine components. Along with the redevelopment, 2008 will also see the improvement of further national datasets, for example Uganda, Malawi, Tanzania and Namibia. Finally, an extensive review of marine protected areas (MPA Global) undertaken through the 'Sea Around Us Project' at the University of British Columbia with the support of the World Wide Fund for Nature (WWF) and UNEP-WCMC, has been fully integrated into the WDPA.

ACCESSING THE WDPA

The WDPA, including downloadable data for noncommercial use, can be accessed at www.wdpa.org.

On the ground: achievements in 2007

The designation of new protected areas sites is critical for ensuring that a global network of protected areas is representative of the habitats, species, cultures, and ecological processes that exist. Understanding the implications of protected areas at the site level provides important insights for analyses at national, regional, and global levels. For this reason the following sections are dedicated to highlighting the characteristics of some of the sites that have been created during the past year. Protected areas can be recognized by national and/or international authority. Some of the new national and international protected areas declared in 2007 are described below

AFRICA'S NEW PROTECTED AREAS

One of Africa's most important protected area achievements in 2007 was the establishment of a vast rainforest reserve in the Democratic Republic of Congo. The *Sankuru Natural Reserve* harbours several species endemic to the Congo forests such as the bonobo – an endangered great ape closely related to humans; the okapi; elephants; and other species of primates, including the rare owl-faced monkey and the blue monkey. The key location and impressive dimension of the reserve, which at 30,570 km² – approximately the same size as Belgium – is one of the largest tropical rainforest protected areas in the world, helps to link other isolated and fragmented protected areas in the Democratic Republic of Congo and reinforces the protection of the whole zone. These 'corridors' of protection are also considered crucial for both the survival of migratory and large ranging species and the sustainability of the ecosystems. The protection of the reserve also helps mitigate the effects of climate change, as its rich tropical forest stores some 660 million tonnes of carbon, an amount equal to the carbon dioxide emissions from 38 million cars over 10 years. Besides ecological protection, the reserve plays an important social role: created as a community participative conservation area, it focuses on developing new economic activities and building management capacity of local and indigenous people, thus addressing both the humanitarian crisis derived from the recent war, and the pressures from commercial hunting for bushmeat.

In 2007, the Government of Tanzania designed the *Wami Mbiki Wildlife Management Area* as part of a pilot project to strengthen the link between biodiversity conservation and income generation. The ultimate aim of the project is to create a constant flux of tourists, attracted to the area by the



C. Bisançon

presence of wildlife. For this purpose, local communities were organized in an Authorized Association of 24 villages to manage game. Capacity building and environmental awareness activities have been implemented to empower local people and demonstrate the interdependencies between wildlife protection and livelihoods benefits, thus strengthening their compliance with conservation strategies. A lack of political and economic support is considered one of the main challenges protected areas face, and the official designation of the area (one among 16 Pilot Wildlife Management Areas), represents an important indicator of renewed sensitivity and commitment towards biodiversity conservation in Africa.

PROTECTED AREAS AND CULTURAL HERITAGE IN THE AMERICAS

Colombia's *Serranía de los Churumbelos Auka Wasi National Park*, the newest of the 53 protected areas of the country, contains 971 km² for the protection of a high biodiversity area inhabited by the endangered Andean bear, jaguar, puma and tapir. In particular, the area supports 461 species of birds, 77 per cent of which depend on the ecosystems of the region. The extremely high levels of species richness and presence of endangered and endemic species make the area particularly important from both national and international perspectives. Furthermore, the park is unique for its coverage of both Amazonian and Andean ecosystems. Located in south eastern Colombia, it is part of a corridor stretching from the lowlands of the



Amazon Basin to the slopes of the Andean Mountains (between 300 and 2,500 metres above mean sea level) and unifying two pre-existing national parks, *Cueva de los Guácharos* and *Alto Fragua Indi Wasi*. Significantly increasing the network of protected areas of the region, the park is thus considered essential to preserve the wide variety of ecosystems such as forests, swamps, lakes, and wide barren plains (*páramos*). This designation signals the beginning of a large-scale investment in protected areas of Colombia, which is expected to continue in 2008.

In 2007 *Chapada Limpa Extractive Reserve* was established in the Brazilian Maranhão. The creation of a protected area in the Cerrado of Maranhão is fundamental for the viability of the species living in the region as it represents a 'transition' area within three different ecoregions: *Cerrado*, *Caatinga* and *Amazônia*. However, the ecological importance of the area is threatened by soya and eucalyptus plantations, as well as cattle ranching, and it is estimated that only 20 per cent of the original cerrado is still left in Brazil. In order to enhance the protection within the reserve, the local population, traditionally dedicated to agro-extractive activities, are now in charge of the sustainable management of the natural resources of the reserve, relying on the extraction of bacuri and babaçu for income generation, and palms products and small scale agriculture for their subsistence.

MARINE PROTECTION IN ASIA AND PACIFIC

Three new wildlife management areas in Papua New Guinea cover a combined area of 710 km² and offer protection to some of the unique wildlife species of Asia-Pacific. Combined with existing parks, the Tonda extension, Aramba, and Weriaver areas raise the protection of the *TransFly Ecoregion*, a transboundary low-lying coastal region of grasslands, savannas, wetlands and monsoon forest habitat, to almost 20,000 km², or 20 per cent of the ecoregion.

Indonesia has designated seven marine protected areas (MPA) in the *Raja Ampat* archipelago. The 9,000 km² reserve network formalizes six sites that were previously closed to fishing by local communities to preserve fishing livelihoods, and contains 45 per cent of the region's shallow water ecosystems. No-take zones will comprise 20 per cent of each MPA, whilst traditional fishing methods will be permitted in the remaining 80 per cent.

Finally, a large network of *Benthic Protection Areas* was established by the New Zealand government in October 2007. The network covers 1.2 million km² of the deep sea area and 30 per cent of the entire New Zealand Exclusive Economic Zone (EEZ). As trawling and dredging is banned in the area, the network represents the largest protected area to be set aside to date in a nation's EEZ.

WORLD HERITAGE SITES

A total of 23 new sites were added to the World Heritage list in 2007: 6 natural, 16 cultural and 1 mixed cultural/natural. A primeval beech forest in *Slovakia* and *Ukraine* was among these sites, as was the volcanic *Teide National Park* in Spain and *The Ecosystem and Relict Cultural Landscape of Lopé-Okanda in Gabon*. *Lopé-Okanda* is distinctive for its incorporation of both tropical forest and relict savanna landscapes, and provides habitat for a larger number of threatened large mammal species than in any other similar area of rainforest in the Congo Basin. The area also contains rock carvings and other evidence of human settlements and migration routes spanning 400,000 years.

In accordance with Article 11 (4) of the Convention, sites requiring special operations and further assistance are inscribed on the List of World Heritage in Danger. In 2007 improvements in the management of four sites assisted their removal from the list: *Everglades National Park (USA)*; *Río Plátano Biosphere Reserve (Honduras)*; *Royal Palaces of Abomey (Benin)*; and *Kathmandu Valley (Nepal)*. However, three sites were added to the list of World Heritage Sites in Danger: *Galapagos (Ecuador)*; *Niokolo-Koba National Park (Senegal)* and *Samarra (Iraq)*. Currently, 30 properties are inscribed on the 'in danger' list.

There was also an unprecedented delisting from the World Heritage list when the *Arabian Oryx Sanctuary* in Oman was removed. The World Heritage Committee deleted the property because of Oman's decision to reduce the size



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of the protected area by 90 per cent, in contravention of the Operational Guidelines of the Convention. This was seen by the Committee as destroying the outstanding universal value of the site which was inscribed in 1994.

NEW MAN AND BIOSPHERE (MAB) RESERVES

In 2007 the first Biosphere Reserve in the United Arab Emirates was established. The **Marawah Biosphere Reserve** is the first reserve of its kind to be designated in the country and is contributing to the protection of coastal ecosystems and species, including the second largest population of dugongs in the world. Most of the islands of the reserve are home to local populations who, using traditional non destructive fishing, rely on the marine resources for their daily protein intake. Human settlements in the area date back as far as the 16th century, and this confers further cultural and archaeological significance to the Marawah Biosphere Reserve.

NEW RAMSAR SITES

Of the 63 new sites added to the Ramsar list in 2007, 19 were designed by **Tunisia** at the occasion of the celebrations for the 20th anniversary of the establishment of the present government. The sites are spread all over the territory and encompass a wide variety of wetland types. From an ecological perspective, the tidal sites, rare in the

Mediterranean Basin, are particularly important for their role in sustaining birds, fish and shellfish. Also added was the **Zambezi floodplain** in Zambia, known as the Baratose floodplain, which is the second largest wetland in the country and, as the spawning ground for over 80 species of fish and a source of suitable land for grazing and agriculture, is a major source of livelihood for the Lozi people. The wetland hosts a great number of wildlife species, including hippopotamus and crocodile. It also provides natural flood control for the Zambezi River, and determines the Lozi way of life, with the flooding season being celebrated annually.



C White



SELECTED MEETINGS AND EVENTS IN 2007

The designation of a new site is an important indicator for local, national and global analysis, as it provides information about ecosystem coverage within the existing network of protected areas. However, policy making is also influenced by information exchange at international level, principally during the gathering of experts, practitioners, and those who live in and near protected areas. This section highlights the main meetings, events, and outputs in 2007 concerning protected areas.

Nine subregional workshops to support and review implementation of the Programme of Work on Protected Areas were co-ordinated by the CBD Secretariat with the assistance, both financially and in many other ways, of the PoWPA Friends group of non-governmental organizations. These meetings began in 2006 and ran to the beginning of 2008, with five of them taking place in 2007. [Information at: <http://www.cbd.int/doc/meetings/pa/wgpa-02/information/wgpa-02-inf-06-en.doc>].

The socio-economic impact of protected areas was also on the agenda in 2007. **The Poverty and Environment Partnership** (PEP 10, 30 January–1 February, Nairobi, Kenya and PEP 12, 19–21 November, Washington DC, USA) discussed the livelihood impacts of protected areas. [Information available at <http://www.povertyenvironment.net/pep/>].

The IUCN Marine Protected Areas Summit (10–12 April 2007, Washington D.C, USA) resulted in the release of a new road map for establishment of MPAs: Establishing Networks of Marine Protected Areas – Making It Happen (available online at www.iucn.org/themes/wcpa/biome/marine/mpa_networks/networks.html).

The IUCN Protected Areas Categories Summit (7–11 May 2007, Almeria, Spain) was convened to provide guidance as to how protected area management categories should be best applied to support stakeholders in their conservation efforts.

Global Network of Protected Forest Areas under the CBD: Opportunities and Challenges (9–11 May 2007, Freiburg, Germany) produced specific recommendations for a review of the Programme of Work on Protected Areas with relation to forests. [Information available at <http://www.zef.de/>].

The 2007 International Day for Biological Diversity: Biodiversity and Climate Change (22 May 2007) highlighted the importance of considering linkages between biodiversity and climate change. Biodiversity and climate change were also emphasized during discussions on Reducing Emissions from Deforestation and Degradation (REDD) at the United Nations Framework Convention on Climate Change (UNFCCC) COP 13 in Bali, Indonesia. [Information available at <http://unfccc.org/unfccc/event/climate-change/cop-13-and-cop/mop-3.html>].

The Experts Informal Workshop on High Seas Governance in the 21st Century (17–19 October 2007, New York, United States of America) brought together global experts to address the growing issue of high seas governance and priorities for protection (<http://www.globaloceans.org/highseas/pdf/IUCNWorkshop2007.pdf>).

The Protected Areas Management Effectiveness Experts Working Group Meeting (18–19 April 2007, Bangkok, Thailand) discussed progress towards improving management effectiveness in protected areas.

The 10 per cent target: improving protected area coverage to protect biodiversity

Both the Convention on Biological Diversity (CBD) and the Millennium Development Goals (MDGs) have established terrestrial and marine targets for protected areas coverage, to be achieved by 2010 and 2012 respectively. These targets call for 'at least 10 per cent of each of the world's ecological regions [to be] effectively conserved' (see Box 2).

In 2003, UNEP-WCMC together with a broad consortium of conservation organizations produced the first analyses of global terrestrial protected areas coverage, to track the world's progress towards the 10 per cent target. The results, presented at the 2003 Fifth World Parks Congress, showed that 11.5 per cent of the global land area was covered by protected areas, suggesting that, at a global scale, the 10 per cent target had already been achieved. Further analyses in 2003² revealed, however, that protected areas were not

providing representative coverage of the 14 WWF biomes (which divide the world using the major global plant communities, determined by rainfall and climate) with protection ranging from 4.6 per cent to 26.3 per cent. Additionally, ecological gap analysis of terrestrial vertebrate protection in 2004⁴ found that the habitats of a large proportion of threatened vertebrate species were completely unprotected.

The previous analyses demonstrated the need, when measuring progress towards the 2010 and 2012 targets, to not only measure progress in terms of area protected, but also of ecological and regional representativeness. The analyses below summarize the national, regional and global coverage of terrestrial and marine protected areas; and the ecological representation of protected areas coverage, using WWF terrestrial and marine ecoregions as a framework to represent ecological variation across the world.



C. Besançon

Box 3: ANALYSING PROTECTED AREAS COVERAGE

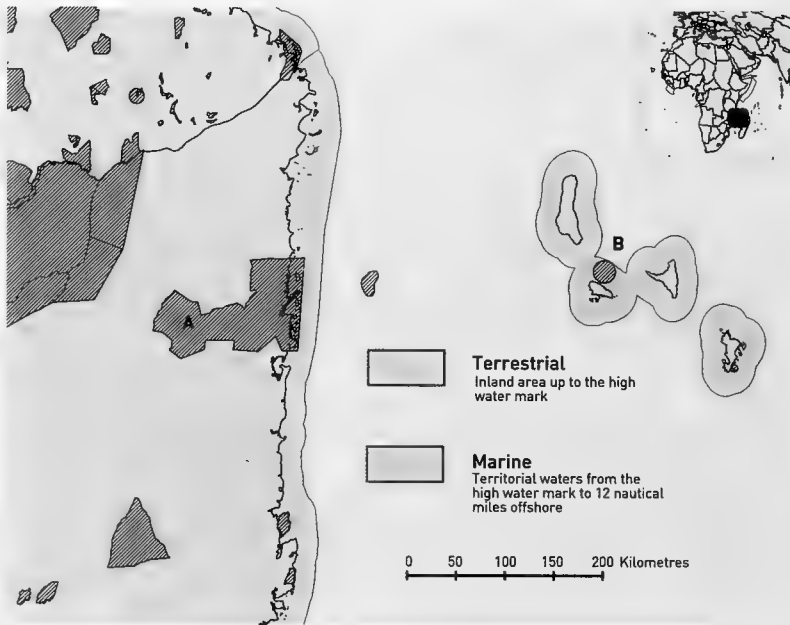
The January 2008 version of the WDPA has been used by UNEP-WCMC for these analyses. Protected areas were overlain onto the 'World Vector Shoreline Plus dataset', and a global maritime boundaries dataset, using the ESRI ArcGIS 9.2 mapping programme, to calculate the terrestrial and marine area protected globally, and for individual regions and countries.

Terrestrial area was defined as land up to the high water mark of each nation. Marine area was defined as the territorial seas of each nation, which extend up to 12 nautical miles offshore, following the definition in the Millennium Ecosystem Assessment (MEA 2005). In total, 236 nations and dependent territories were assessed, using the International Organization for Standardization (ISO) 3166-1 A3 list⁵ to define nations.

A major aim of these analyses was the measurement of national progress towards the CBD targets. We therefore included all nationally designated protected areas held in the WDPA in our analysis (113,962 protected areas) and excluded internationally recognized sites. Proposed or recommended sites were also excluded. We retained

those nationally designated protected areas where no IUCN management category information was available.

Spatial map-based data (known as 'polygon' data) are held for approximately 60 per cent of protected areas within the WDPA, which means that the shapes of the protected area boundaries are known (such as for protected area 'A' in the figure below). For those protected areas within the WDPA for which spatial boundary data was not available, but where the location and area was known (such as protected area 'B' in the figure), a circular buffer from the point location of the protected area, using the known area of the protected area, was produced (creating a 'buffered point'), to estimate the coverage of the site. Overlaps exist among protected areas, with the boundaries of one protected area (for example a strict nature reserve, Category I) found with the boundaries of another (for example, a protected landscape, Category V). This means that a simple addition of the area of each protected area within a country can result in an overestimate of the total area protected. Where protected areas overlapped, these were 'dissolved' within the ESRI ArcGIS 9.2 mapping programme, so that the area covered by both protected areas was only counted once.



The 10 per cent target: how much of the Earth is protected?

GLOBAL PROTECTED AREAS COVERAGE

Protected areas coverage globally has been tracked since the World Parks Congress in 2003⁶, and estimates of the global coverage of protected areas provide a valuable method of assessing progress towards international targets and produce useful global statistics for policy makers.

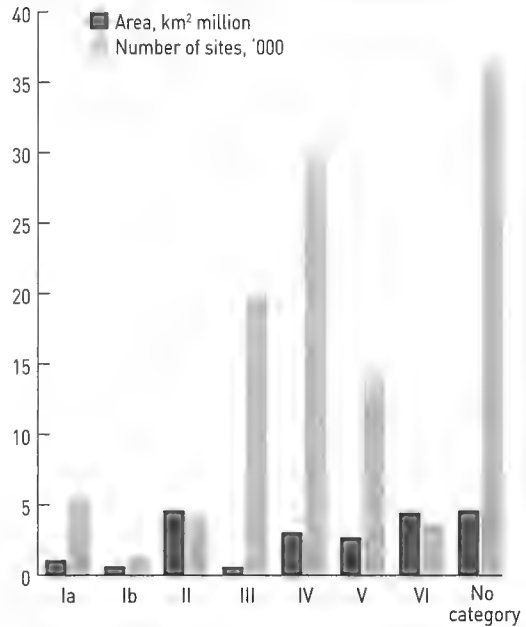
Global protected area coverage over time

Trends in rate of protected areas establishment can be highlighted using time series analyses. This also represents a fundamental tool for understanding the historical context of protected area establishment and, under specific circumstances, can be used to predict future establishment rates. The world's first officially designated park, Yellowstone National Park in the United States of America, was established in 1872. Since then, the number of nationally designated and internationally recognized sites has risen dramatically (Figure 1), and now stands at over 120,000 terrestrial sites.

Global coverage and IUCN management category designation

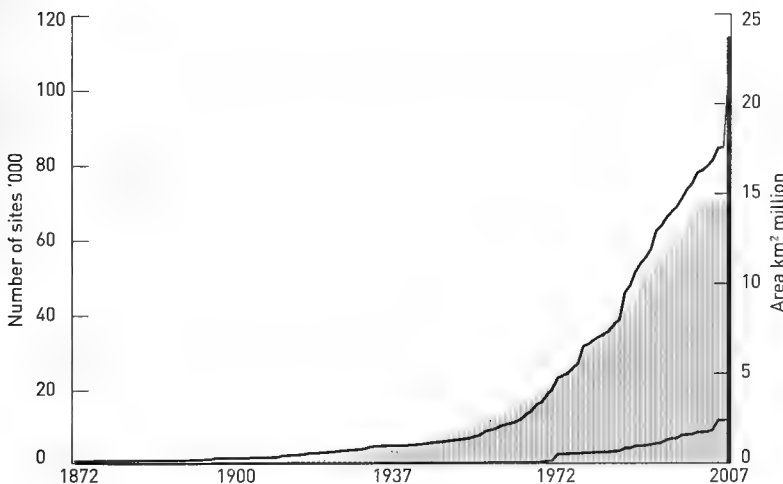
Global statistics can also provide an overview of protected area trends, such as the number of protected areas designated under different IUCN management categories. Countries are progressively designating protected areas

Figure 2: PROTECTED AREAS BY IUCN MANAGEMENT CATEGORY



using the full range of IUCN categories (Figure 2), although approximately 40 per cent of sites contained within the

Figure 1: GROWTH OF NATIONALLY DESIGNATED PROTECTED AREAS, 1872-2007



- cumulative number of protected areas with known year of establishment
- cumulative number of protected areas including those with no known year of establishment
- cumulative area of terrestrial protected areas with known year of establishment
- cumulative area of terrestrial protected areas including those with no known year of establishment
- cumulative area of marine protected areas with known year of establishment
- cumulative area of marine protected areas including those with no known year of establishment

Protected Areas

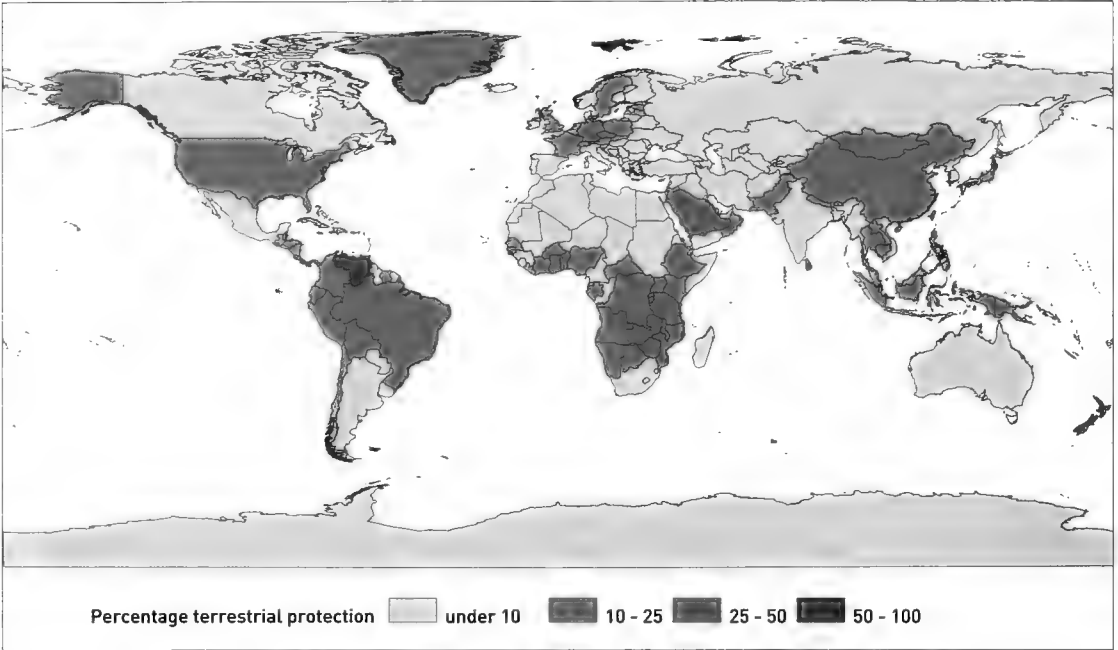
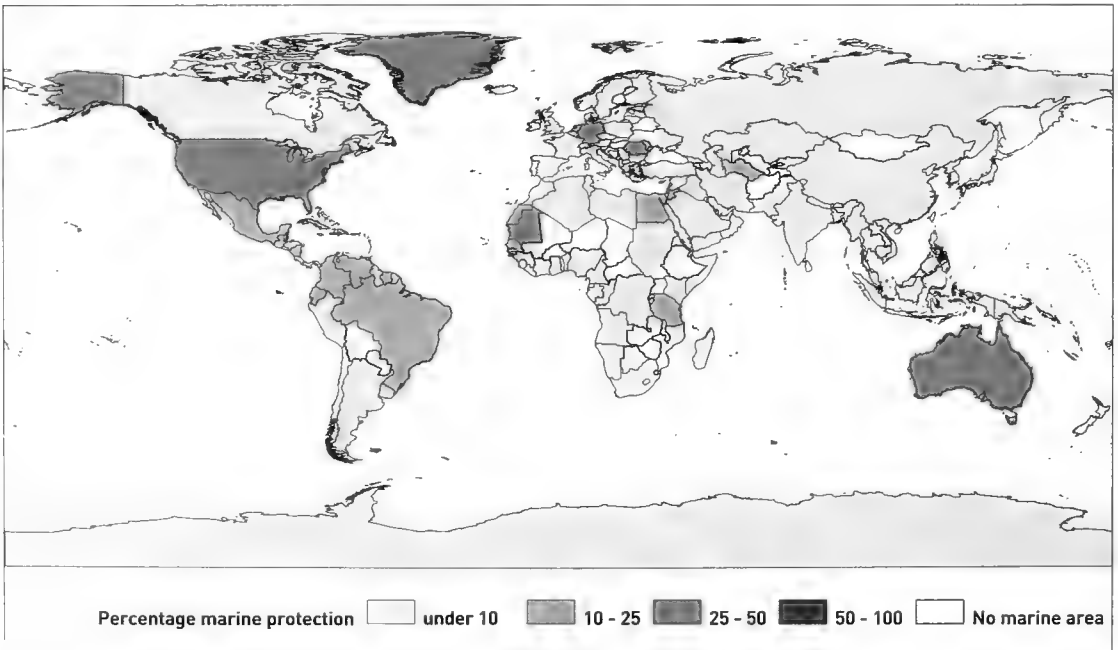


Figure 3: TERRESTRIAL PROTECTION BY COUNTRY

Figure 4: MARINE PROTECTION BY COUNTRY



WDPA do not have an IUCN category, either because they have not been assigned or the designation information is not available to the WDPA. Interestingly, although IUCN Management Category IV has the highest number of protected areas, Categories II and VI, which have a much lower number of protected areas, cover a greater total area

Current global protected areas coverage

Globally, 11.3 per cent of national territories (terrestrial and marine area) are covered by nationally designated protected areas. In terms of the division between terrestrial and marine environments, terrestrial protected area coverage reaches 12.2 per cent, exceeding the 10 per cent target at a global scale⁷. In comparison, the marine environment has received much less attention: protected areas cover 5.9 per cent of the world's territorial seas and less than 1 per cent of the high seas (see page 26). The uneven coverage of terrestrial and marine protected areas is an issue that is becoming increasingly recognized on an international scale, and is discussed further on pages 26-28.

Measuring progress towards the 10 per cent target: issues of scale

The 10 per cent target provides an important approach to conservation planning that is easy to understand and can be measured using available data. The scale at which the target is assessed, however, can have a large impact on the conclusions that are drawn on whether the target has been met. The analyses below show that although the global target for terrestrial protected area cover was reached before 2003, there are regions and nations that still fall well below the target. Regional and national analyses are important for highlighting these priority areas, and future analyses to track progress are essential.

REGIONAL PROTECTED AREAS COVERAGE

Table 1 shows the percentage of each of the world's regions⁸ that is protected, ranked in terms of the highest percentage protection for terrestrial area.

Nine of the 15 regions of the world recognized by UNEP-WCMC currently have more than 10 per cent of their terrestrial area within protected areas (Table 1). This includes all parts of the Americas, East and South East Asia, Eastern and Southern Africa, Western and Central Africa, Europe, and the Caribbean.

The situation is less encouraging for marine habitats: only three of the 15 regions (Australia/New Zealand, South America and North America) have more than 10 per cent protected area cover in their marine area, probably due to the presence of a few very large marine protected areas. Four regions (South East Asia, Pacific, South Asia and Eastern and Southern Africa) have less than 2 per cent coverage.

Table 1: AREA PROTECTED PER REGION

Region ^a	Total area km ² million	Percentage Coverage by Protected Areas		
		All area	Terrestrial	Marine
South America	19.84	20.06	21.09	11.05
Central America	0.74	18.92	23.54	8.01
North America	27.54	16.78	17.93	10.43
East Asia	12.76	14.69	15.94	2.62
Eastern and Southern Africa	12.91	13.23	14.66	1.02
Europe	6.48	12.27	13.79	6.57
Australia/ New Zealand	9.11	11.72	9.95	24.33
Western and Central Africa	13.33	10.05	10.33	3.93
North Africa and Middle East	13.08	8.12	8.37	3.77
North Eurasia	23.33	7.74	7.69	8.55
South East Asia	10.07	7.07	13.73	1.71
South Asia	4.87	6.58	7.09	1.35
Caribbean	0.88	6.54	14.69	3.55
Pacific	3.02	2.85	9.70	1.29
Antarctic	14.79	0.07	0.01	1.09

Table 2: MEETING THE TARGETS

% protected	Number of countries	
	Terrestrial	Marine
<10	130	166
10 to 25	78	16
25 to 50	23	11
50 to 100	5	1
Total countries	236	194

NATIONAL PROTECTED AREAS COVERAGE

Of the 236 nations assessed, the mean protection of their terrestrial area was 12.2 per cent (+/- 0.86 s.e., n=236), and for their marine area was 5.1 per cent (+/- 0.81 s.e., n=194).

Although mean coverage per nation is above the 10 per cent target for terrestrial area, there is a great deal of variation in protection among nations, and only 45 per cent (106 of 236) of nations had over 10 per cent coverage of their terrestrial area (Table 2). Marine protection is much lower with only 14 per cent (28 of 194) of nations reaching 10 per cent protected area coverage for their marine area. Figures 3 and 4 illustrate the number of countries reaching different levels of protection for their terrestrial and marine areas.

The 10 per cent target: how much biodiversity is protected?

Analysis of the total area of land or sea covered by protected areas provides one indication of progress towards achieving global conservation targets. The CBD targets, however, call for 'at least 10 per cent of each of the world's ecological regions [to be] effectively conserved' and 'areas of particular importance to biodiversity [to be] protected' (see Box 2). Measuring progress towards these targets therefore requires an assessment of the extent to which the world's ecological regions and priority areas for biodiversity are protected.

Carrying out this assessment requires a measurable definition of 'ecological region'. WWF ecoregions provide one such definition, dividing the world into biogeographic units. UNEP-WCMC, in collaboration with The Nature Conservancy and WWF, has analysed the representation of biodiversity by protected areas, using the WWF Terrestrial Ecoregions of the World and the Marine Ecoregions of the World (MEOW) to define ecological regions. Overlay analyses, using the January 2008 version of the WDPA, and including both national and international sites, were

carried out using the same methods as described previously (Box 3).

TERRESTRIAL ECOREGION COVERAGE

The WWF Terrestrial Ecoregions of the World provide a biogeographic classification of the world's terrestrial area. The terrestrial world is divided into eight biogeographic realms (geographical regions where distinctive assemblages of plants and animals occur) and 14 biomes (the major global plant communities, determined by rainfall and climate); within these are 825 ecoregions. Ecoregions are defined by WWF as 'a large area of land or water that contains geographically distinct assemblages of natural communities sharing a large majority of species, dynamics, and environmental conditions'.

The mean percentage protection per ecoregion is above the 10 per cent target, at 20.3 per cent; however, there is a large range in the percentage protection. Across the world, only 56 per cent (466) of the WWF terrestrial ecoregions currently meet the 10 per cent protection target (Figure 5).

Figure 5: TERRESTRIAL ECOREGION PROTECTION

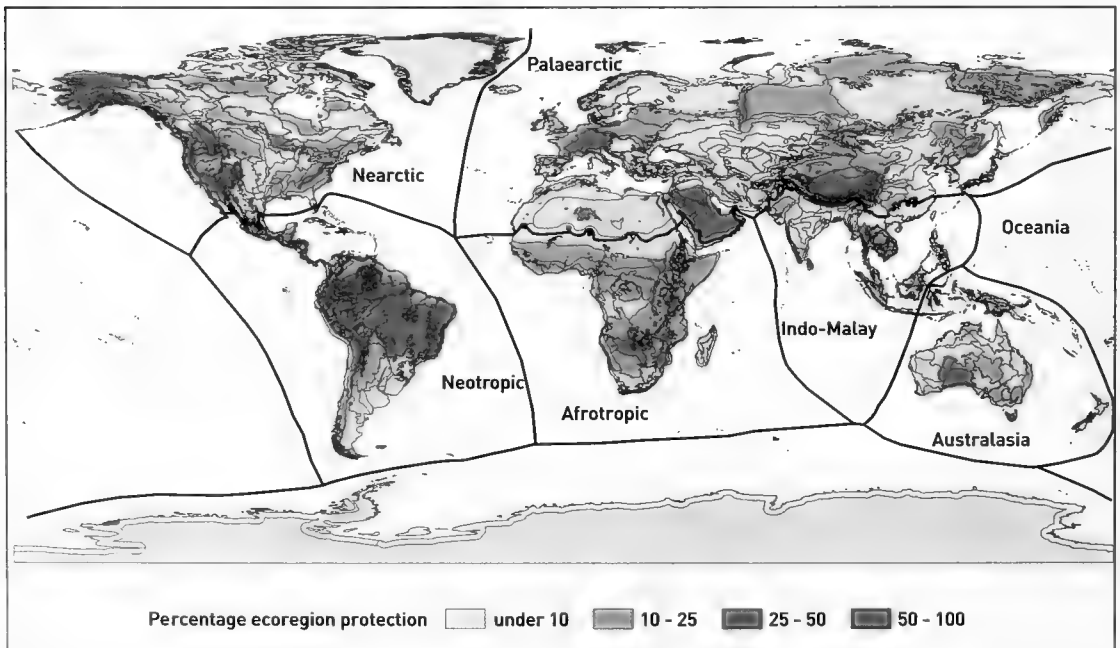


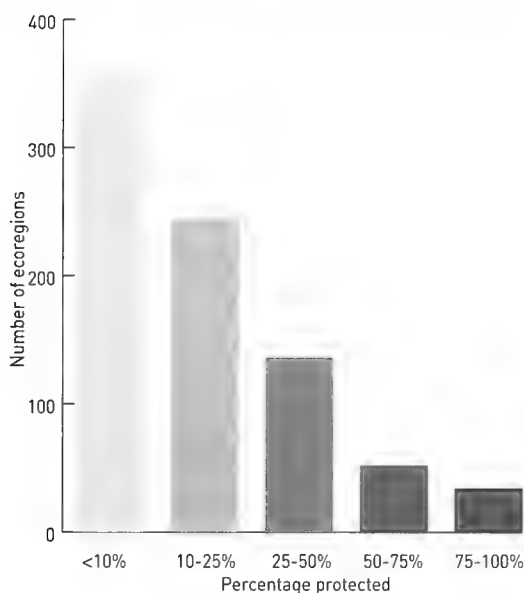
Figure 6: TERRESTRIAL ECOREGIONS AND THE 10% TARGET

Figure 6 highlights the high proportion of ecoregions that have protection levels below 10 per cent. The overall protection of each realm shows that two of the eight realms, Indo-Malay (9.9 per cent) and Oceania (7.7 per cent), are protected under the 10 per cent target. These are followed by the Palaearctic (11.5 per cent), Australasia (11.3 per cent), Afrotropics (15.9 per cent) and the Nearctic (17.5 per cent) all protected at over 10 per cent, and the Neotropics have 27.1 per cent protection. Although national and international protected areas only cover 0.03 per cent of Antarctic, it is protected by the international Antarctic Treaty System. Similarly, analysis by WWF biome shows two of the 14 biomes have less than 10 per cent of their area protected, and four have less than 50 per cent of their ecoregions reaching the 10 per cent target (Table 3).

These analyses indicate that there are still large regions of the world that contain distinctive biodiversity, but are not protected to the CBD target level. Even when ecoregions are protected at 10 per cent or more, it does not necessarily follow that all habitat types within the ecoregion will be represented. The development of national ecological datasets, and the continued updating of the WDPA, are required for more detailed analyses at a finer scale. This would provide additional insights into national goals, and ultimately help with setting or revising national conservation targets.

Priority ecoregions for biodiversity conservation: the Global 200

WWF has identified a set of ecoregions whose conservation would achieve the goal of saving a broad diversity of the

Table 3: BIOME AND ECOREGION PROTECTION

Biome	Biome protection (%)	Ecoregions in each biome that have met the 10% target (%)
Flooded grasslands and savannas	42	80
Mangroves	29	84
Montane grasslands and shrublands	28	68
Temperate conifer forests	27	75
Tropical and subtropical moist broadleaf forests	23	59
Tropical and subtropical grasslands, savannas and shrublands	16	63
Temperate broadleaf and mixed forests	14	62
Tundra	13	62
Deserts and xeric shrublands	11	44
Mediterranean forests, woodlands and scrub	11	56
Tropical and subtropical dry broadleaf forests	10	39
Boreal forests/taiga	10	46
Tropical and subtropical coniferous forests	9	53
Temperate grasslands, savannas and shrublands	5	19

Table 4: GLOBAL 200 ECOREGION PROTECTION

G200 Ecoregion	Protected (%)
TOP 5	
Galapagos Islands scrub	97.4
Socotra Island desert	95.8
Pantanal flooded savannas	84.4
Palawan moist forests	82.5
Sierra Nevada coniferous forests	82.4
BOTTOM 5	
Canadian boreal taiga	2.6
Central Asian deserts	2.1
Chukhote coastal tundra	1.8
Chilean matorral	1.4
Madagascar mangroves	0.6

Protected Areas

Table 5: MARINE PROVINCE PROTECTION

Marine province	Protected [%]
TOP 5	
Galapagos	99.5
Northeast Australian Shelf	83.6
Hawaii	75.7
Amsterdam-St Paul	75.0
Lord Howe and Norfolk Islands	25.3
BOTTOM 5	
Magellanic	0.2
St. Helena and Ascension Islands	0.2
Southern New Zealand	0.1
Continental High Antarctic	0.0
Juan Fernández and Desventuradas	0.0

World's ecosystems. The Global 200 (G200) ecoregions are those with exceptional levels of biodiversity (high species richness or endemism) or those with unusual ecological or evolutionary phenomena.

Compared with the full set of terrestrial ecoregions, Global 200 ecoregions have higher protection; the mean

protection for a G200 ecoregion is 22.8 per cent, and 102 of the 143 terrestrial Global 200 (71 per cent) are protected at or above the 10 per cent target. However, as with ecoregions, there is a wide variation in protection, and Table 4 highlights the top and bottom five protected G200 ecoregions.

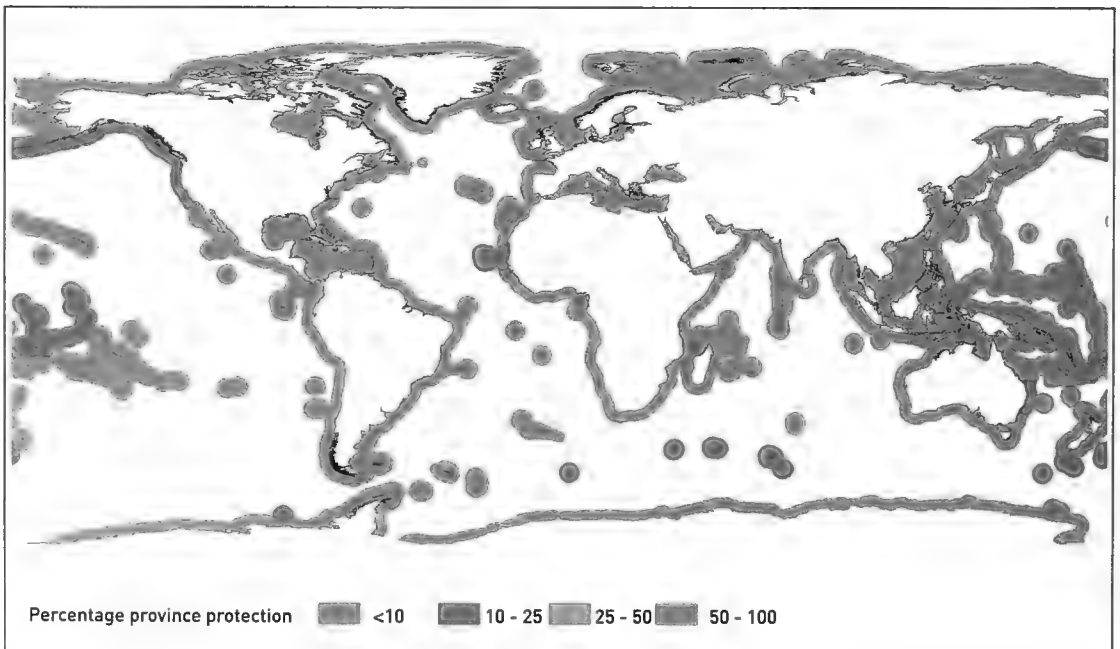
MARINE ECOREGION COVERAGE

The Marine Ecoregions of the World provide a biogeographic classification of the world's coasts and shelves. As with terrestrial ecoregions, the smallest unit is an ecoregion, which are found within provinces (major habitat types, equivalent to terrestrial biomes) and realms (broad latitudinal divisions of polar, temperate, and tropical seas, with subdivisions based on ocean basins and continents). There are 232 ecoregions, found within 62 provinces and 12 realms.

Recent analyses of marine ecoregion protection were carried out as a joint project between The Nature Conservancy, UNEP-WCMC and IUCN. The January 2008 version of the WDPA, combined with MPA Global, was used to create the best available dataset on marine protection, and the methods of analysis were the same as for the terrestrial ecoregions.

As with protection of territorial seas, marine ecoregion protection falls well below terrestrial protection, and most marine ecoregions fail to meet the 10 per cent target. Of the 232 marine ecoregions, only 18 per cent (42) meet the 10 per

Figure 7: MARINE PROVINCE PROTECTION



cent target, and almost half (115) of ecoregions have less than 1 per cent protection. As with terrestrial ecoregions, protection is unevenly distributed: 11 per cent of ecoregions have over 20 per cent protection, and the Great Barrier Reef Marine Park accounts for more than 20 per cent of the marine protected area coverage.

At a broader scale, provinces tell a similar story; 18 of the 62 provinces have less than 1 per cent protection, and only 12 of these are protected at or over the 10 per cent target (Figure 7). Provinces with protection of over 10 per cent tend to be those that occur around small islands, where it is not unusual for a high percentage of the marine and terrestrial area to be protected. Table 5 shows the top and bottom five protected marine provinces.

None of the marine realms are protected over the 10 per cent target (Table 6), and areas of particular concern include the temperate realms of the Northern Atlantic (0.67 per cent protected), South America (0.09 per cent protected) and Southern Africa (0.22 per cent protected), which are areas of high biodiversity.

These analyses highlight the poor state of marine protection around the globe. Recent work by Wood *et al.* (2008) suggests that, given current designation rates for MPAs, it may take decades, rather than years, for marine protection to reach the 10 per cent targets set by the CBD and MDGs. Marine protection should therefore be seen as a high priority for protected area policy makers in the coming years.

Table 6: MARINE REALM PROTECTION

Marine realm	Realm area within 200 nautical miles of high water mark (million km ²)	MPA area in realm (million km ²)	% protection
Eastern Indo-Pacific	19.05	0.76	3.98
Tropical Eastern Pacific	4.36	0.16	3.73
Arctic	11.91	0.41	3.42
Southern Ocean Temperate	9.71	0.25	2.53
Northern Pacific Central	-9.79	0.19	1.89
Indo-Pacific	27.86	0.47	1.67
Tropical Atlantic	13.60	0.19	1.39
Temperate Australasia	5.44	0.05	1.01
Temperate Northern Atlantic Western	11.26	0.08	0.67
Indo-Pacific	14.41	0.03	0.23
Temperate Southern Africa	1.92	0.00	0.22
Temperate South America	6.40	0.01	0.09
TOTAL	135.72	2.59	1.91



H. Baasjans/Sill Pictures

The 10 per cent target: focus on forests

Forests contain as much as 90 per cent of terrestrial biodiversity, with tropical forests being particularly important in terms of both species richness and their concentration of endemic species, or those species not found anywhere else on Earth⁹. The world's forests also provide a wide variety of other ecosystem services for people, such as protection of fisheries, watersheds, soils and carbon storage (see page 31), with many of the rural poor depending on forest products to meet basic livelihood needs.

In recognition of the vital role of forest protection in biodiversity conservation, the CBD has set targets for forests, stating that 'at least 10 per cent of the world's forest types' (decision VIII/15) should be effectively conserved by 2010. This target emphasizes the fact that different forest types, such as tropical lowland forest and boreal forest, are vastly different in their species composition and in the ecosystem services that they provide, and should all be considered separately in the protection targets. If there are some particular forest types that have low levels of protection, these can be considered 'gaps' in the protected area network. In response to this, a number of conservation organizations, including UNEP-WCMC, World Resources Institute (WRI), and WWF, together with the Institute of

Forest and Environmental Policy (IIFP) University of Freiburg have collaborated to determine the current level of protection for forest globally, and to identify gaps in protection of forest types, WWF ecoregions, and biodiversity hotspots and wilderness areas as defined by Conservation International (CI).

The *Global Ecological Forest Classification and Forest Protected Area Gap Analysis*¹⁰ project focused on forest protection under IUCN Management Categories I-IV (although Categories V-VI have the objective of biodiversity conservation, they still allow some form of forest use) and clearly indicates that the world's protected areas do not adequately conserve the global extent of forest cover. Preliminary analyses from the project suggest that almost 8 per cent of the world's forests are currently protected within protected areas under IUCN Categories I-IV, suggesting that an increase in forest protection is required. If Categories V and VI are considered, then protected areas cover just over 13 per cent of the world's forests. However, the extent to which those forests are well managed and are preventing deforestation is unknown until analyses of deforestation rates by protected area management category are undertaken.

C. Besancon



On a finer biogeographical scale, preliminary results suggest that around 65 per cent of the WWF ecoregions have forest area protected at levels below the 10 per cent target. The least well-protected ecoregions are found in the northern conifer forests and tropical Africa (particularly the Congo Basin; see Figure 5). Additionally, many of the conservation priority areas, such as the CI biodiversity hotspots and high biodiversity wilderness areas, are protected at levels below the 10 per cent target: just under two thirds of hotspots fail to meet the protection targets. Together, these areas harbour a significant proportion of global biodiversity, and forest protection in these areas should be considered a high priority.

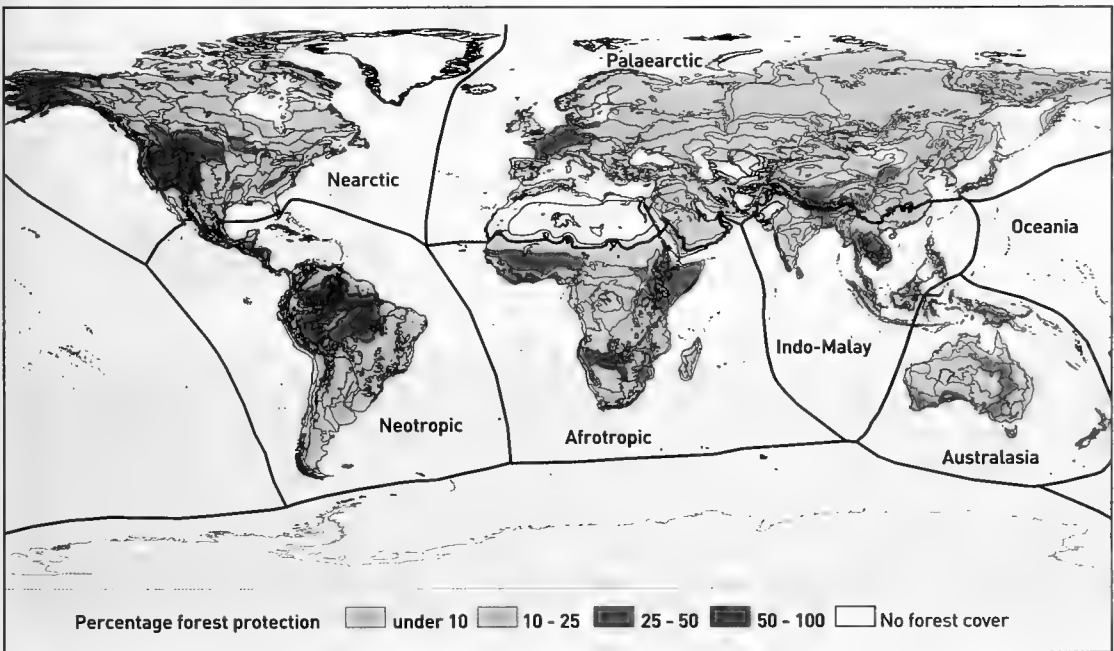
The study also highlighted an issue in that a significant proportion of global forest area has still to be assigned a forest type which prevents the accurate assessment of protection by forest type. Although the 10 per cent target should be regarded as a minimum political target for forest protection, differences in results at different scales of analysis highlight the need to consider targets at national, regional, and global scales.

The final results from this study will be published in late 2008, and will be available through UNEP-WCMC and the Institute of Forest and Environmental Policy (IFP) University of Freiburg.



T. Jones

Figure 8: FOREST PROTECTION



Spotlight on the high seas

Around 50 per cent of the Earth's surface is considered the 'high seas' (see Figure 9), that is, marine areas beyond national jurisdiction. These remote, deep offshore areas of the oceans harbour some 90 per cent of the planet's biomass, and host a remarkable diversity of species and ecosystems, many of which remain undiscovered¹¹. Recent scientific studies demonstrated that life in the high seas is impacted and threatened by human activities and climate change, thus the protection of high seas areas has become a top priority on the international political agenda and for marine conservation efforts.

Despite the urgent need to ensure that protection occurs not only in coastal, near shore environments, but also on the high seas, recent analyses by UNEP-WCMC suggest that less than 1 per cent of high seas habitat is protected¹².

One of the most promising tools proposed to ensure the sustainable management and protection of marine biodiversity, habitats and ecosystems beyond national jurisdiction is the development of high seas marine protected areas (HSMPAs). Although HSMPAs pose a number of challenges, including governance and legal issues, it is important to understand and begin planning how to implement marine protected areas in waters beyond national jurisdiction. They are a means to conserving the valuable array of high seas organisms, habitats and processes that are essential for the ecological functions of

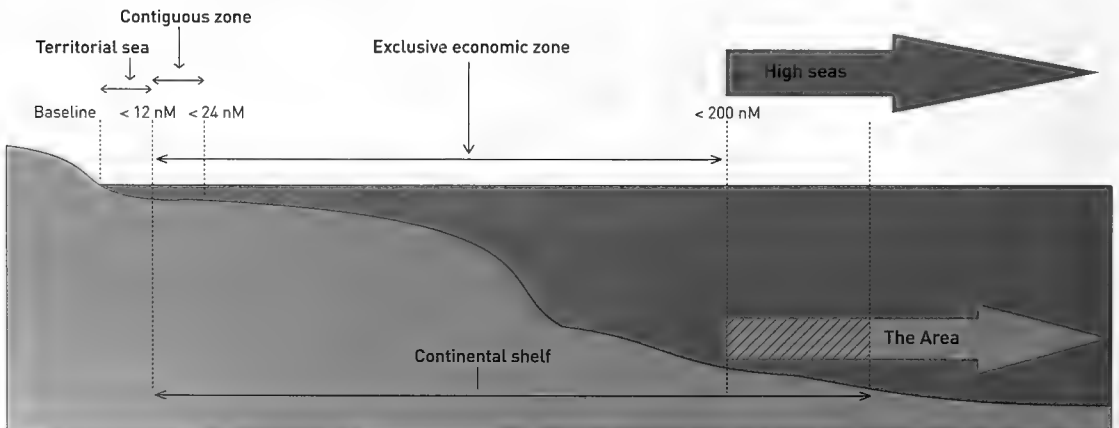
the oceans and for life on Earth.

In 2002, the World Summit on Sustainable Development (WSSD) called for 'the establishment of marine protected areas consistent with international law and based on scientific information, including representative networks, by 2012'. Recognizing the importance of HSMPAs as a tool to reach this target, the World Parks Congress agreed in 2003 on the establishment of five scientifically significant and globally representative HSMPAs by 2008. The target is also reflected in the Programme of Work on Protected Areas of the CBD. These and similar commitments were integrated *inter alia* in IUCN's Ten Year HSPA Strategy (2004) and in the programmes of work of other global and regional bodies, such as the OSPAR Commission for the Protection of the Marine Environment of the North-East Atlantic.

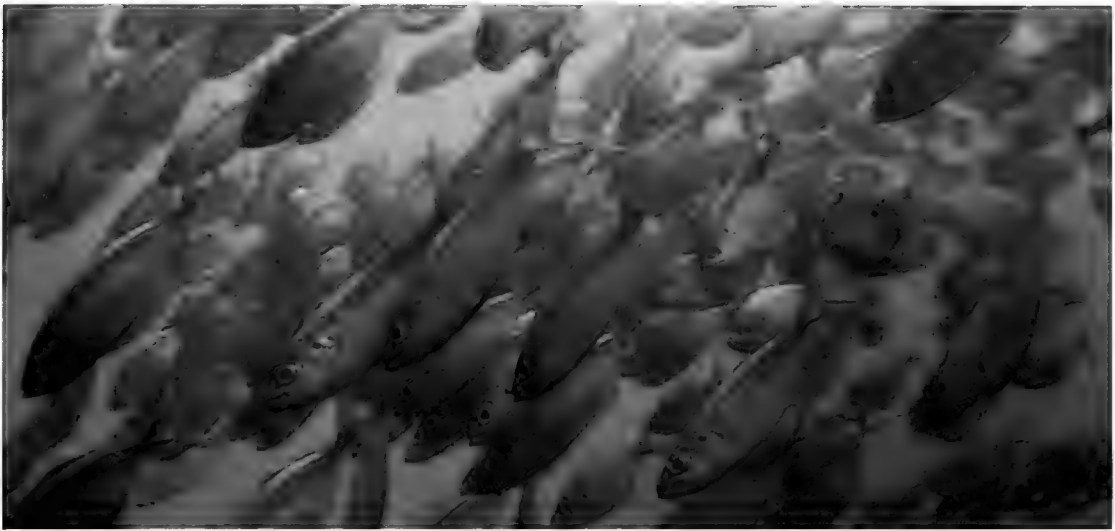
Current protection of the marine environment within and beyond areas of national jurisdiction

Current protection of the oceans and seas is disproportionately less than to that of terrestrial environments (see pages 16-23), with most marine conservation efforts focusing on coastal areas. However, the depletion of traditional shallow-water fish stocks and resources, combined with technological advances, has spurred increased interest in the deep waters and high seas, particularly from the commercial sector. Taking into account

Figure 9: THE EXCLUSIVE ECONOMIC ZONE AND THE HIGH SEAS



Source: IUCN



C.J. Wantenaar

the vulnerability of marine biodiversity and ecosystems in these remote offshore areas, there is an urgent need for international action to ensure that existing and future activities on the high seas are regulated, controlled and managed sustainably and effectively.

The UN Convention on the Law of the Sea (UNCLOS) provides the legal framework applicable to all activities in the oceans and seas. UNCLOS defines a number of legal maritime boundaries (cf. Figure 9) and sets out the rights and duties for states to explore and exploit marine resources, including those found in the water column and on the seabed in areas beyond national jurisdiction. Planning and implementation of HSMAs provides numerous challenges, ranging from establishing the legal mandate to ensuring that international governance and management arrangements are in place for monitoring and enforcement of conservation measures. The percentages below, based on a recent protected areas coverage analysis conducted by UNEP-WCMC, show that the international community is just beginning to address these HSMAs challenges (Table 7).

High seas protection

UNEP-WCMC has recently analysed existing proposals for high seas areas in need of protection and in accordance with criteria as decided by the CBD COP 9 meeting in May 2008. Relevant international efforts are being conducted for various purposes/scales, ranging from prioritization of large ocean parts to protect entire high sea ecosystems to areas designed to conserve single species or group of species. The UNEP-WCMC analysis consolidates previous prioritization work and provides a current, global review of high priority areas and the gaps in coverage that still exist.

Geographic information from 12 separate HSMAs

prioritization schemes (ranging from 1-32 sites each) were mapped (see Figure 10 overleaf). The colour scale indicates where proposed areas overlap, i.e. where certain areas have been prioritized by more than one organization or methodology. The largest overlap (highest priority) of areas can be found in the North-central and South-west Atlantic, the South-west Pacific and the Ross Sea area of the Southern Ocean. These areas should act as a focus for future HSMAs planning with resources being allocated to increase scientific research and assessments of political feasibility. CBD criteria and expert review will also be critical. The map also illustrates large gaps in coverage, particularly in the North-east Pacific and Southern Ocean, highlighting the need for future assessments of the marine environment in these areas.

Despite our gaps in knowledge, it is important to adopt a precautionary approach and use what has been learnt to date. The scientific criteria for HSMAs adopted at the 2007 Azores Workshop¹³ give guidance to high seas protection. The timely creation of pilot HSMAs in the identified high priority areas are an important step in achieving the sustainable management and protection of the World's Oceans.

Table 7: NEAR AND OFFSHORE MARINE PROTECTION

Territorial seas (within 12 nautical miles of the coast) protected	Marine protection beyond the territorial seas
%	%
5.9	0.5

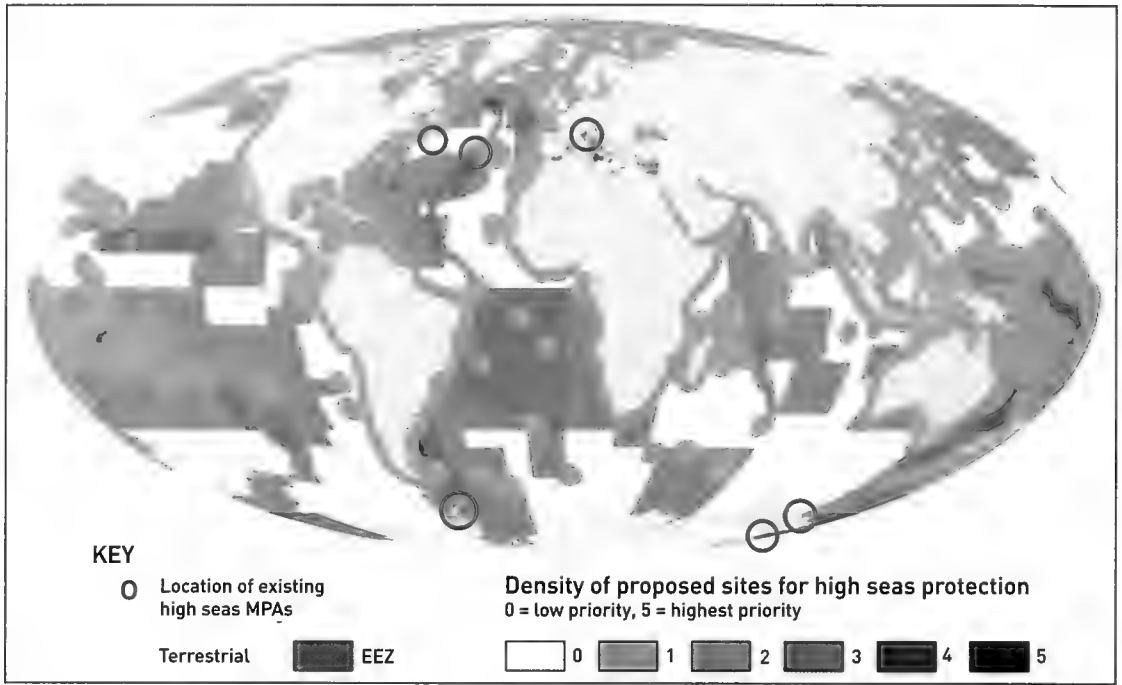


Figure 10: DENSITY OF EXISTING AND PROPOSED HIGH SEAS MARINE PROTECTED AREAS

Box 4: MAJOR ACCOMPLISHMENTS IN 2007 RELATED TO HSMPAS

UNEP Global Marine Assessment, February 2007

This report highlighted that our understanding of the high seas and deep oceans is disproportionately lower than that of other biological realms, and that there are limits to both the spatial and temporal coverage of current marine assessments. Recommendations to fill these gaps to enable a wide-ranging assessment of the world's oceans were made.

World Commission on Protected Area's Marine Summit 10-12 April 2007

Members of the WCPA-Marine Senior Advisory Group and WCPA-Regional Coordinators with other key members of the global MPA community were brought together to agree a new, global MPA Call to Action.

High Seas MPA Task Force of the World Commission on Protected Areas, June 2007

A Plan of Action for building representative networks of MPAs in the High Seas was released. The plan outlines key issues and establishes targets, including the designation of

five 'pilot' HSMPAs by 2008 and MPAs in five ocean basins by 2010.

CBD Expert Workshop on ecological criteria and biogeographic classification systems for marine areas in need of protection

Azores, Portugal, 2-4 October, 2007

Seven scientific criteria to identify biologically and ecologically significant areas and scientific guidance for designing MPA networks were developed. The criteria are: uniqueness or rarity; special importance for life history stages of species; importance for threatened, endangered or declining species and/or habitats; vulnerability, fragility, sensitivity or slow recovery; biological productivity; biological diversity; naturalness.

IUCN Workshop on High Seas Governance for the 21st Century, New York, 17-19 October 2007

More than 50 leading experts in international maritime policy, science, law and economics gathered to explore policy and regulatory options to improve oceans governance beyond areas of national jurisdiction (BANJ). A 'toolbox' of solutions was identified to address the gaps in governance and regulatory mechanisms.

Protected areas in practice

As has been highlighted through this report, global and regional measures of the area of land or type of biodiversity protected are not adequate for assessing biodiversity conservation success. They give no indication of the extent to which the land within the protected area is effectively conserved, nor do they provide context of the impact of protected areas on local livelihoods. This requires the application of protected area data to policy relevant analyses of the effectiveness and impacts of protected areas, and is an important step in assessing the extent to which they deliver biodiversity conservation goals on the ground.

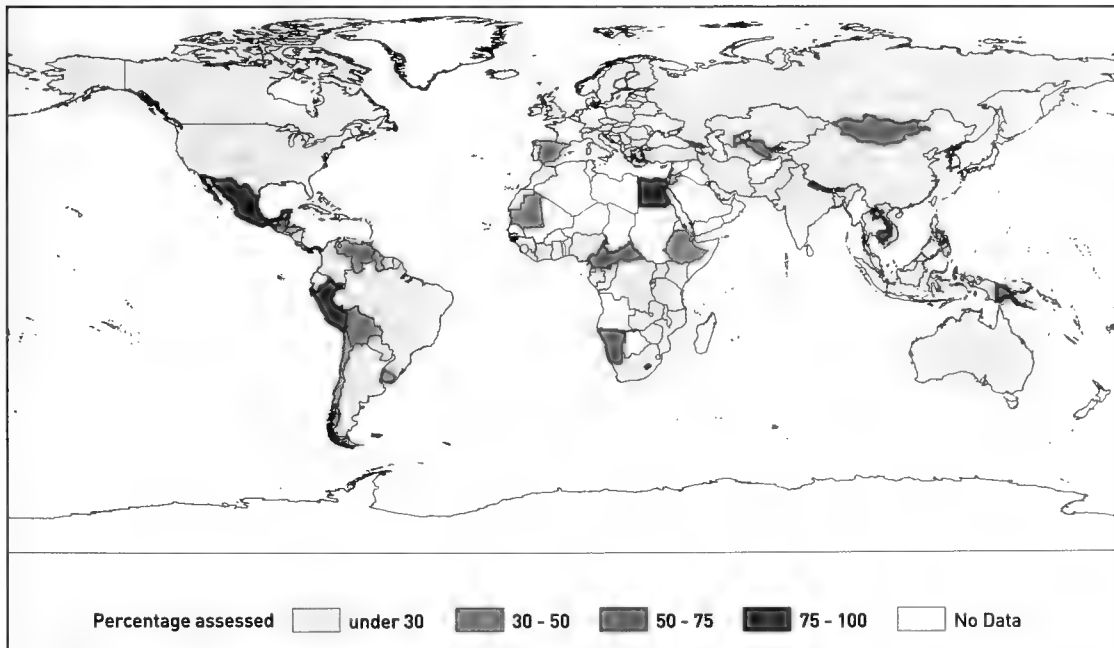
TOWARDS EFFECTIVELY MANAGED PROTECTED AREAS

Studies of protected area management effectiveness are important to ensure conservation success. Where designated protected areas lack adequate management, there is the risk that they will become 'paper parks' with legal boundaries on paper, but little conservation action on the ground. Protected areas across various regions have different pressures acting upon them (for example, illegal

activities such as logging and mining, political and economic interests) and different forms of governance (for example, indigenous and community conserved areas), and are not likely to achieve conservation goals without some form of management structure, or customary controls in place. Management effectiveness evaluations are conducted for individual protected areas, with the goal of assessing the extent to which the protected area in question is achieving its goals and objectives. This is largely related to design issues, adequacy of management systems, and delivery of conservation outcomes. The number of assessments of management effectiveness in protected areas has been steadily increasing over the last ten years.

Several assessments have been undertaken both at site and system levels by national protected area agencies, international NGOs (such as WWF and The Nature Conservancy) and with the support from large funding agencies (such as the World Bank and the Global Environment Facility). A target for management effectiveness and a number of activities have been established by

Figure 11: PROTECTED AREAS MANAGEMENT EFFECTIVENESS





R. Billings/FAO

the CBD Programme of Work on Protected Areas, encouraging the 191 Parties to implement management effectiveness evaluations of at least 30 per cent of their protected areas by 2010.

The *Global study into management effectiveness evaluation of protected areas* project was implemented by the IUCN World Commission on Protected Areas (WCPA) between 2005 and 2007. This study aimed to strengthen the management of protected areas by investigating the most important factors leading to effective management. To achieve this, the study assembled and analysed information from over 6,300 protected areas assessments in more than 100 countries.

The global study has also contributed to the review of the progress made by countries towards the 2010 targets on management effectiveness set by the CBD. As Figure 11 shows, evaluations of management effectiveness are still short of the 30 per cent target on a global scale, and there is a significant lack of data on African protected areas. However, this picture is constantly improving as countries make significant efforts to meet the 2010 targets. In order to promote cooperation on Protected Areas Management Effectiveness (PAME) and to enable the conservation community to share experiences and lessons learned from

these assessments, UNEP-WCMC, as part of a consortium of partners, has developed a PAME module, linked to the WDPA, which makes the results of the Global Study freely available. Through this module, users can obtain information on PAME methodologies and their implementation, and identify the protected areas that have been assessed. They can also have access to publications and submit their own data. The PAME module can be found at www.unep-wcmc.org/wdpa/me.

FOREST PROTECTED AREAS AND LIVELIHOODS

A large number of the rural poor rely on forest resources, either directly, through use of forest products, or indirectly, through the ecosystem services that forests provide. The area of land covered by protected areas has been identified as a specific indicator within the Millennium Development Goals to demonstrate progress towards the *'integration of sustainable development into country policies and practices'* (MDG Indicator 7 Target 9).

The livelihood impacts of protected areas is a growing issue on the international agenda, as countries continue to designate protected areas to meet international targets. Indeed, a number of meetings have been dedicated to the socio-economic aspects of protected areas and biodiversity conservation in 2007; including those involving the Poverty and Conservation Learning Group (PCLG) and the Poverty and Environment Partnership (PEP). However, the net livelihood impacts of protected areas are not well known due to a lack of standardized methodologies with which to assess them, and the difficulty in placing values on costs and benefits.

A review of the literature by UNEP-WCMC (Coad *et al.*, 2008)¹⁴ suggests that the impact of forest protected area costs and benefits upon local communities is, to a large extent, dependent upon protected area management and governance. For example, strictly protected forest areas with top-down management structures (generally associated with IUCN Management Categories I-III) can result in major livelihood costs, such as lack of access to resources and even displacement, and cause conflict with local communities. Protected area management allowing sustainable use of forest resources (generally associated with IUCN Management Categories V-VII), have been shown to provide tangible benefits through, for example, tourism or markets for forest goods. However, significant costs can still be incurred by communities if institutional capacity to manage the protected area is lacking, and issues of governance and tenure rights for local people are not resolved. In addition, the distribution of livelihood costs and benefits is not equal, and is an obvious problem that should be addressed if protected areas are to be beneficial for local communities. Although these trends are indicated by the current literature, the type of governance within protected

areas of different IUCN management categories is rarely taken into account in protected area research, and further analyses of the effects of different governance regimes and management structures would help to inform further conservation policy.

PROTECTED AREAS AND CLIMATE CHANGE

In 2007, global climate change was high on the international agenda, with a number of important international meetings held to discuss strategies and tools to combat global climate change. This focus firstly considers the role of protected areas within the Reducing Emissions from Deforestation and Degradation (REDD) policy framework and, secondly, their carbon storage capacity.

Protected areas and Reducing Emissions from Deforestation

Reducing Emissions from Deforestation and Degradation (REDD) in developing countries was a hot topic in 2007, and was central to discussions at the UN Framework Convention on Climate Change (UNFCCC) COP-13 in Bali, Indonesia. REDD will enable developing countries to receive carbon credits for reducing national scale deforestation after 2012, although an agreement has not been reached yet and the methods of compensation are still to be resolved. It is likely that REDD may be measured at a national level, but implemented on the ground.

Protected areas could have a role in reducing national deforestation, either through the strengthening of existing forest protected areas or the declaration of new areas. The development of REDD policy can therefore be informed by past experience from protected area management, where it has been successful in reducing deforestation and supporting community livelihoods.

UNEP-WCMC, with the support of the Department for International Development (UK), the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Germany), UNEP, and WWF UK have undertaken a review of the topic (Clark *et al.*, 2008)¹⁵ which concluded that protected areas are generally an effective tool for reducing deforestation within their boundaries, although the extent to which deforestation is merely displaced to surrounding areas (known as 'leakage') is unclear. In addition, protected areas designated under the more restrictive IUCN Protected Area Management Categories (I-II) seem to be more effective at reducing deforestation than those which include a focus on sustainable use (V-VI), although there are only a small number of studies on deforestation within Category V-VI protected areas. As deforestation studies rarely consider the levels of community involvement within the protected areas, it is often difficult to ascertain the role that communities can play in reducing deforestation. Some insight can, however, be gained through analyses of



S. Chape

deforestation rates in indigenous lands and community forestry areas, where reduced deforestation rates have been observed.

In view of the livelihoods impacts of protected areas discussed above, it is likely that a protected area network could be a valuable component of a national REDD strategy. This is particularly true in consideration of the livelihood costs and benefits in existing forest carbon markets, an analysis of which (Miles, 2008) has identified issues similar to those identified for protected area management; including lack of established tenure and the inequitable distribution of resources. Careful consideration of the potential impacts of REDD mechanisms based on past experience is therefore required, including an assessment of the management and governance strategies that facilitate provision of livelihood benefits. Involvement of local communities in planning and implementation of REDD, and ensuring sharing of the benefits from REDD finance is likely to result in a more sustainable solution to deforestation and forest degradation.

Carbon storage within protected areas

Although protected areas are established with the primary goal of biodiversity conservation, they place restrictions on

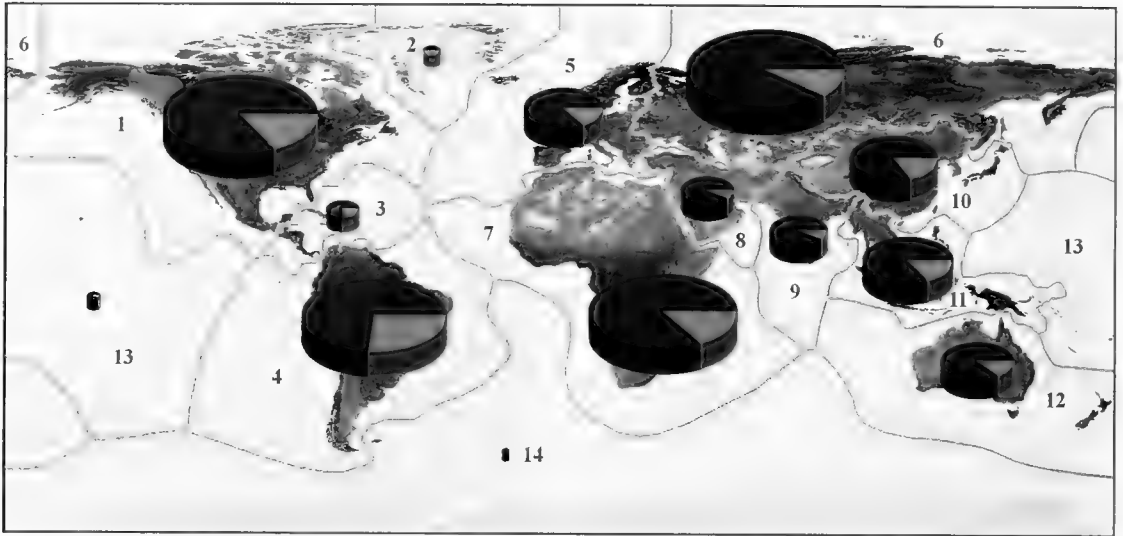


Figure 12: CARBON STOCK IN TERRESTRIAL REGIONS (proportional pie-charts).

The amount of carbon stored within the protected area network is represented by the green segments. In total, 15.2 per cent (312 gigatonnes) is stored within the world's protected areas and 84.8 per cent (1,740 gigatonnes) elsewhere.

Table 8: CARBON STOCK, BY REGION

Region/ number		Carbon stock		Carbon in PA %
		Total Gt	PA Gt	
1	North America	388	59	15.1
2	Greenland	5	2	51.2
3	Central America and Caribbean	16	4	25.2
4	South America	341	91	26.8
5	Europe	100	14	13.6
6	North Eurasia	404	36	8.8
7	Africa	356	49	13.7
8	Middle East	44	3	7.8
9	South Asia	54	4	7.2
10	East Asia	124	20	16.3
11	South East Asia	132	20	15.0
12	Australia/ New Zealand	85	10	12.0
13	Pacific	3	0	4.3
14	Antarctic and peripheral islands	1	0	0.3

Carbon stock values are rounded to the nearest whole number for presentation purposes. Percentages have been calculated from the exact stock values.

Sources:

Ruesch, A.S. & H.K. Gibbs. Global biomass carbon stock map based on IPCC Tier-1 Methodology. Oak Ridge National Laboratory's Carbon Dioxide Information Analysis Center (in review).
 IGBP-DIS 2000. Global Soil Data Products CD-ROM. Global Soil Data Task, International Geosphere-Biosphere Programme, Data and Information System, Potsdam, Germany. <http://www.daac.ornl.gov>.
 UNEP-WCMC & IUCN 2008. World Database on Protected Areas. March 2008.
 UNEP-WCMC & IUCN WCPA. <http://www.unep-wcmc.org/wdpa>

land use within the area protected, also providing some level of protection to the carbon stored in that area. In recognition of the importance of the carbon storage capacity of protected areas in mitigating global climate change, a global scale estimate of terrestrial carbon storage within the protected area network was produced by UNEP-WCMC (Figure 12 and Table 8). The map combines data for carbon storage in above and below ground biomass with data for carbon stored in soils to 1m depth, overlain with protected area data from the WDPA. From a global store of 2,052 gigatonnes (Gt) of carbon, 15.2 per cent lies within the boundaries of protected areas, highlighting their potential importance in climate change mitigation. These results could contribute to discussions of REDD policy leading up to the post-2012 climate agreements, and will enable further analyses relevant to the UNFCCC and to the work of the CBD on climate change.

Moving ahead to 2008, such work provides the basis for the identification of areas that have both high carbon and high conservation value for protection, and again underlines the value of protected areas for addressing climate change. This work will be undertaken in collaboration with the University of East Anglia and the University of Cambridge. In addition, UNEP-WCMC aims to work with the University of South Dakota, the University of Wisconsin-Madison and The Nature Conservancy to estimate the effects of deforestation within and around protected areas on carbon storage, with a focus on humid tropical forest.

The year ahead:

International Year of the Reef

Coral reefs cover less than 1 per cent of the world's surface, but are amongst the most diverse and productive ecosystems on earth, housing 25 per cent of all marine species and providing an estimated 25 per cent of the fish catch in developing countries. Coral reefs produce \$375 billion per year in goods and services, securing the livelihood of over one million fishermen and providing food for over 500 million people. They are also vital to the achievement of CBD biodiversity targets and the UN Millennium Development Goals. The requirement for improved coral reef management has been incorporated into CBD decisions. The past few decades have seen a considerable global decline in the health of coral reefs and their associated ecosystems, primarily due to human influences. Coral reef ecosystems face continued threats from pollution, bottom trawling, climate change, and the aquarium trade, and the rate of coral cover loss exceeds that of tropical forests. 2007 saw the inclusion for the first time of 10 coral species on the IUCN *Red List of Threatened Species*¹⁶.

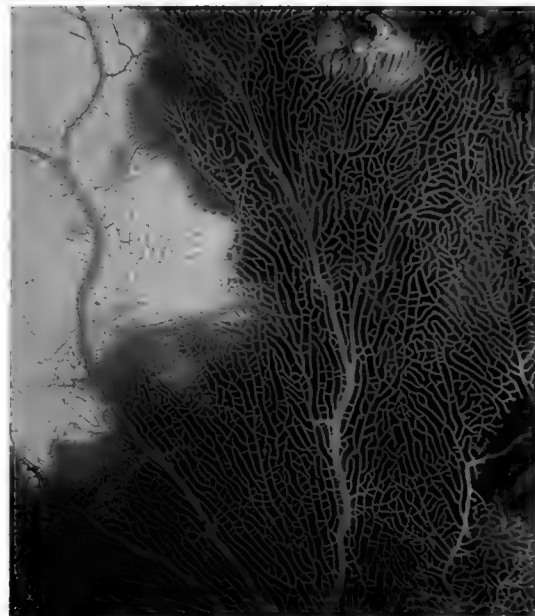
A STEP FORWARD FOR MPAS?

The International Year of the Reef 2008 (IYOR), designated by the International Coral Reef Initiative (ICRI), brings together governments, individuals, corporations, and schools around the world to host events and initiatives to: raise awareness about ecological, economic, social and cultural value of coral reefs; promote conservation action and improve understanding of critical threats; and strengthen long-term support for coral reef conservation and the development of effective management strategies.

Data from 2006 has indicated that approximately 1,100 protected areas have coral reefs, accounting for 25 per cent of the world's Marine Protected Areas (MPA)¹⁷. Furthermore, an estimated 15-22 per cent of coral reefs are found within protected areas globally, achieving the 10 per cent coverage target set for 2012 by the CBD for representation of all ecosystems. However, the achievement of this global target does not tell the entire story, and highlights the difficulties with global targets, which can obscure national and regional patterns and trends. For example, Belize has set a target of 30 per cent coverage for a network of MPAs considered necessary to protect the interconnected nature of reef habitats and, in Australia, the Great Barrier Reef Marine Park Authority has recently increased its area under strict protection [see



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P. Spillans de Leon



Y. Bertrand/UNESCO

Box 5: STRENGTHENING PROTECTION: THE GREAT BARRIER REEF

The Great Barrier Reef is the largest coral reef system in the world, and in 1975 over 98 per cent of the reef was designated as a marine protected area; an area roughly the size of Japan. However, the importance of considering factors other than simple protected area coverage can be emphasized through the fact that only 4.6 per cent was strictly protected, and 14 bioregions had no protection at all. In 2003, following campaigning by NGOs such as WWF, the area under strict protection by national parks and reserves (Category II) rose to 33 per cent. The Great Barrier Reef marine park covers 344,400km² of reef area; 62 per cent of which is managed for sustainable use of the ecosystem (Category VI).

Box 5). This Marine Park, together with the North-West Hawaiian Islands accounted for one third of all waters under protection in 2007, and the 2008 designation of the Phoenix Islands Protected Area, now the largest in the world, further concentrates the global coverage into a few key areas.

In 2008, the IUCN will work with UNEP-WCMC and partners to launch a new process entitled Protect Planet Ocean Review. This collaboration will provide an understanding of the progress made in conserving the critical marine environment.

Useful links

Convention on Biological Diversity	http://www.cbd.int/
International Coral Reef Action Network	http://www.icran.org/
International Union for Conservation of Nature	http://www.iucn.org/index.cfm
Millennium Development Goals	http://www.un.org/millenniumgoals/
Poverty and Conservation Learning Group	http://www.povertyandconservation.info/
Protected Areas Management Effectiveness Information Module	http://www.unep-wcmc.org/wdpa/me/
The Ramsar Convention on Wetlands	http://www.ramsar.org/
United Nations Framework Convention on Climate Change	http://unfccc.int/
United Nations Development Programme	http://www.undp.org/
United Nations Educational, Scientific and Cultural Organization	http://portal.unesco.org/
United Nations Educational, Scientific and Cultural Organization's Man and the Biosphere Programme	http://www.unesco.org/mab/mabProg.shtml
United Nations Educational, Scientific and Cultural Organization's World Heritage Sites	http://whc.unesco.org/
United Nations Environment Programme	http://www.unep.org/
UNEP World Conservation Monitoring Centre	http://www.unep-wcmc.org/
UNEP-WCMC Protected Areas Programme	http://www.unep-wcmc.org/protected_areas/protected_areas.htm
UNEP-WCMC Protected Areas Programme: list of publications	http://www.unep-wcmc.org/protected_areas/pubs.htm
World Commission on Protected Areas	http://www.iucn.org/about/union/commissions/wcpa/index.cfm
World Database on Protected Areas	http://www.wdpa.org/
WWF Ecoregions	http://www.worldwildlife.org/science/ecoregions/item1847.html

End notes

- 1 Dudley, N. [editor] *Guidelines for applying protected area management categories*, IUCN, Gland, Switzerland, 2008.
- 2 Borrini-Feyerabend, G., Kothari, A. and Oviedo, G. [2004]. *Indigenous and Local Communities and Protected Areas – Toward Equity and Enhanced Conservation*. IUCN Gland and Cambridge UK xviii + 111pp.
- 3 Hoekstra, J.M., Boucher, T.M., Rickettes, T.H. and Roberts, C. [2005]. Confronting a biome crisis: global disparities of habitat loss and protection. *Ecology Letters* 8; 23 - 29.
- 4 Rodrigues, A.S.L., Andelman, S.J., Bakarr, M.I., Boitani, L., Brooks, T.M., Cowling, R.M., Fishpool, L.D.C., Fonseca, G.A.B., Gaston, K.J., Hoffmann, M., Long, J.S., Marquet, P.A., Pilgrim, J.D., Pressey, R.L., Schipper, J., Sechrest, W., Stuart, S.N., Underhill, L.G., Waller, R.W., Watts, M.E.J. and X. Yan. [2004]. Effectiveness of the global protected area network in representing species diversity. *Nature* 428; 640-643.
- 5 Exceptions for these analyses were Hong Kong, Bouvet Island and the United States Minor Outlying Islands, which for individual analytical reasons were added to their parent nations.
- 6 The global coverage of protected areas is assessed annually for the Millennium Development Goal targets, and the United Nations List of Protected Areas is provided by UNEP-WCMC roughly every 4 years.
- 7 Analysis conducted at UNEP-WCMC in January 2008.
- 8 Using UNEP-WCMC regional groupings; for further information contact protectedareas@unep-wcmc.org.
- 9 Brooks T.M., Mittermeier R.A., da Fonseca G.A.B., Gerlach J., Hoffmann M., Lamoreux J.F., Mittermeier C.G., Pilgrim J.D. and Rodrigues A.S.L. [2006]. Global biodiversity conservation priorities. *Science* 313; 58-61.
- 10 For the full report, please see: http://www.unep-wcmc.org/protected_areas/docs/Forest_Gap_Analysis_June08.pdf.
- 11 Halpern, B.S., Walbridge, S., Selkow, K.A., Kappel, C.V., Micheli, F., D'Agrosa, C., Bruno, J.F., Casey, K.S., Ebert, C., Fox, H.E., Fujita, R., Heinemann, D., Lenihan, H.S., Madin, E.M.P., Perry, M.T., Seig, E.R., Spalding, M., Steneck, R. and Watson, R. [2008]. A Global Map of Human Impact on Marine Ecosystems, *Science* 319; 948.
- 12 High seas protection calculated using the January 2008 dataset, at the same time as national/ ecoregional protection was calculated; see Box 3 for details.
- 13 Updated May 2008: The 'Scientific Criteria for Identifying Ecologically or Biologically Significant Marine Areas in Need of Protection in Open-ocean Waters and Deep-sea Habitats' annexed to CBD COP9 decision IX/20 on marine and coastal biodiversity.
- 14 Available online at: http://www.unep-wcmc.org/climate/pdf/Coad_et_al_2008_Working_Paper.pdf.
- 15 The full reports on REDD, protected areas, and livelihoods can be found at <http://www.unep-wcmc.org/climate/publications.aspx>.
- 16 IUCN, 2007.
- 17 Wells S. [2008]. The International Year of the Reef 2008: Time to Renew Efforts for Coral Reef MPAs, *MPA News* pp. 2-3, February 2008.



Annual Report on Protected Areas

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