Obligations and Gaps.
1. Introduction.

Protected areas are one of the less glamorous areas of international environmental law. They are commonly overshadowed by what are perceived as much more dramatic topics, which capture the public attention to a much greater degree. This is a highly ironic situation for three reasons. First, because protected areas are the foremost methods by which species and ecosystems are effectively preserved. Second, because protected areas are tangible, and are not merely theoretical constructs. Third, the obligation to create protected areas is one of the most long-standing goals in numerous environmental treaties. For a long time this goal was not tied to any specific outcomes, and the numbers of protected areas grew slowly. However, in the new century, due to an increased recognition of the above considerations, the international community has not only reiterated the goal to create more protected areas, they also set targets of what they want to achieve. The international interest is this area can be seen with a number of examples, such as marine protected areas and transboundary protected areas. Collectively, such support has lead to the creation, in total, of over 102,000 protected areas spread over the Earth.

However, despite the laudable intentions of this goal, and the success to date, fundamental gaps exist in the over-riding thinking of how new goals to further increase the numbers and types of protected areas, are to be achieved. These gaps are primarily due to a number of thematic gaps in the international architecture, designed to protect the Earth’s ecology. That is, certain key ecological areas, although noted in passing in a number of existing protected areas treaties are not necessarily central concerns. Moreover, in the specific agreements which have the knowledge and capacity to specifically cover such topics as forests, coral reefs, mountains or deserts, the machinery to create and enhance protected areas is missing.

Given that the problems of the gaps in the architecture will (if ever) take years to solve, a number of international organizations have begun to prioritise what areas they should be seeking to protect via working out where the current gaps are, by using, inter alia, inventories, comparative and thematic analysis. Despite the utilization of tentative lists and comparative and thematic analysis, it is not always clear what the primary conservation objectives should be, as there are a number of different approaches to consider and exactly what and where the priority areas are is a matter of debate between four different (but often overlapping) schemas. These schemas are the Udvardy system, the Global 200, Species Focused Approaches, and Hotspots. Although these schemas

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2 Indeed, whilst Conventions such the United Nations Framework Convention on Climate Change attract close to three hundred Non-Governmental Organisations (NGOs) per conference of the Parties, or 400 NGOs for the Convention on Biological Diversity, see Report of the 9th COP. FCCC/CP/2003/ 6. March 30, 2004. 35-38, and Report of the 7th COP to the CBD. UNEP/CBD/COP/7/21. Apr 13. pp. 3-7; the premier instruments for protected areas, such as the World Heritage Convention, typically only receive less than a dozen environmentally inclined NGOs. In 2003, there in addition to the advisory bodies, there were 20 NGOs, of which 6 were environmentally inclined. UNESCO. (2003). 27th Session of the WHC. WHC03/27.COM/24. 2003. Paris, 10 December. 2.
are all commendable, it is necessary to note that they are not all seeking to conserve the same areas. Nevertheless, given that the differences between are philosophical in their priority setting, it is not necessary to try to select which one is best. Rather, until the thematic gaps in the international legal architecture are filled by meaningful instruments which can directly list protected areas by specific type, the schemas should be fully utilised by the existing protected areas regimes, as the best way to prioritise what needs areas need to be saved, and thereby meet the goals that the international community has set itself.

I will argue, Part II of this article discusses the historical progression of the obligation to create protected areas, with a focus on marine protected areas and transboundary protected areas. Part III explores the thematic gaps in the current international system for protected areas in the context of marine, forest, dryland, and mountainous areas. Finally, Part IV examines the four different schemas and how each can be utilized to identify priority areas and meet international goals in spite of the current deficiencies in the system.

II. The current international initiatives to increase the numbers and types of protected areas, and enhance their status and management domestically, regionally and internationally are not new. This obligation is both long standing in both general and specific contexts. For example, the 1933 African Convention, (and its 1968 and 2003 successors) obliged its Parties to, ‘explore forthwith the possibility of establishing in their territories national parks and strict natural reserves’ in Africa. This was especially so for the benefit of endangered species. The 1940 Western Hemisphere Convention had a very similar obligation. This obligation is both long standing in both general and specific contexts.

Variations on this obligation (as opposed to the option) existed with the early treaties which were species specific. The first notable occurrence where habitat was protected, so
as to protect the targeted species, was the 1911 Convention Between the United States, Great Britain, Russia and Japan for the Preservation and Protection of Fur Seals.\textsuperscript{9} This approach was adopted with a number of other early species specific agreements, such as those related to the protection of certain birds and their associated habitats,\textsuperscript{10} as well as a later collection of species specific agreements ranging from Vicuna\textsuperscript{11} to sea turtles\textsuperscript{12} and whales.\textsuperscript{13}

Despite this relatively early success of international law in furthering the creation of protected areas, from an early point, momentum was building for the creation of more protected areas. For example, the second recommendation from the First World Congress on Protected Areas in 1962 called for the creation of,

A series of natural reserves providing permanent examples of the many diverse types of habitats, both natural and semi-natural, so as to preserve them permanently for world science.\textsuperscript{14}

The Conference went on to argue for the creation of an official world list for each, ‘bioclimatic region … of the most representative habitats’ so that such habitats may be, ‘selected and legally established at an early date’.\textsuperscript{15} The first truly international response to these calls was the 1968 UNESCO Conference on the Use and Conservation of the Biosphere. From this conference, the MAB program originated as a response to the recommendation that, inter alia, Member states accelerate the establishment and development of national parks and wildlife sanctuaries.\textsuperscript{16}

Three years later in 1971, the Ramsar Convention was concluded, so as to prevent the ‘irreparable loss’ of wetlands\textsuperscript{17} ‘by combining far-sighted national policies with co-ordinated international action’\textsuperscript{18} through which the Parties agreed to, ‘promote the conservation of wetlands and waterfowl by establishing nature reserves on wetlands’.\textsuperscript{19}

\textsuperscript{9} The 1911 Convention Between The United States, Great Britain, Russia and Japan for the Preservation And Protection Of Fur Seals. Treaty Series, No. 564; 37 Statutes at Large, 1542. Article 1.
\textsuperscript{10} Austria/Hungary/Italy 1875 Declaration for the Protection of Birds Useful to Agriculture. IPE, ibid. IV. 1561. The 1897, 1907, 1914 and 1927 Convention(s) Concerning Hunting (waterbirds) on Lake Constance and the Rhine Between Baden and Switzerland. In IPE, IV. 1599. 1916 Convention Between the United States and Great Britain for the Protection of Migratory Birds. IPE. IV, 1638.
\textsuperscript{11} Article 2. 1936 Convention Between the United States and Mexico for the Protection of Migratory Birds. IPE. IV. 1723.
\textsuperscript{15} See ’Closing Plenary Session.’ Ibid. 376-377. Recommendation No 3.
\textsuperscript{17} Ramsar. Preamble. Paragraphs 3 and 4.
\textsuperscript{18} Ramsar. Preamble. Paragraph 6.
\textsuperscript{19} Ramsar. Article 4.1.
furtherance of this objective, aside the obligation upon all Parties to designate at least one
wetland when acceding to the Convention, and broad invitations to all Parties to
increase the designation of their wetlands to the List of Wetlands of International
Importance, the Parties have set themselves the goal of possessing 2,500 sites
encompassing 250 million hectares by 2010 (they had 1,555 in 2005). The Ramsar
Parties have also directed resolutions to specific Parties, encouraging them to recognise
wetlands of international importance within their borders, and the need to specifically
conserv them.

The MAB and the Ramsar did not sate the international appetite for more protected
areas, and the 1972 United Nations Conference on the Human Environment, in calling
for all natural resources to be safeguarded, specifically added in Recommendation 38
that, ‘Governments take steps to set aside areas representing ecosystems of international
significance for protection under international agreement’. This point from Stockholm
was picked up by the 1972 Second World Congress on Protected Areas which called,

[U]pon all governments to widen the coverage of their protected areas so as to
ensure that adequate and representative samples of natural biomes and ecosystems
throughout the world are conserved in a coordinated system of national parks and
related protected areas.

The response of the international community to these recommendations was the creation
The international community’s desire to create more protected areas appeared to be in
full swing.

21 “And they may incorporate riparian and coastal zones adjacent to the wetlands, and islands or bodies of marine water deeper than
six metres at low tide lying within the wetlands, especially where these have importance as waterfowl habitat.” Ramsar. Article 2.1.
24 Final Act of the Ramsar Conference. Annex II. Recommendations adopted by the International Conference on the Conservation of
Wetlands and Waterfowl at Ramsar, Iran, 3 February 1971. Recommendation 1. Conservation of the Wadden Sea, northwestern
25 The natural resources of the Earth including the air, water, land flora and fauna and especially representative samples of natural
ecosystems must be safeguarded for the benefit of present and future generations through careful planning and management as
appropriate. Principle 2 of the Stockholm Declaration.
The World Heritage Convention (WHC) is just that—a convention is designed to protect the World’s outstanding Heritage. The World’s Heritage is that related to humanities, ‘creative [cultural] genius and of the rich resources of nature’. Together, these categories encompass many non-tangible universal values that belong to all peoples. The emphasis is upon the world’s heritage. That is, the Convention works on the principle that, ‘each and every country has a contribution to make’ and collectively, all the heritage of all nations, ‘together forms the patrimony of mankind’. Such heritage of, ‘outstanding interest’ needs, ‘to be preserved as part of the world heritage of mankind as a whole’. Despite clearly being sovereign property, some view this patrimony as a type of, ‘global commons’. As part of the patrimony of humankind or global commons of value to all humanity, the heritage must be safeguarded for future generations. To allow otherwise, whereby the heritage is destroyed, is deemed, ‘a harmful impoverishment of the heritage of all the nations of the world’. As such, all Parties shall seek to, ‘safeguard this unique and irreplaceable property, to whatever people it may belong’. Accordingly, the WHC exists in a continual momentum for the discovery and listing of sites of outstanding universal value.

The 1979 Convention on Migratory Species obliged all of its Parties to, ‘endeavor to conserve, and where feasible and appropriate, restore those habitats of the species which are of importance in removing the species from danger of extinction’. This obligation has also been transferred to all of the subsidiary CMS Agreements. Accordingly, obligations to create protected areas with regard to specific Agreements on particular migratory species can be found for Albatross and Petrels; Wadden Sea Seals; African-Eurasian Migratory Birds; Small Cetaceans of the Baltic and the North Seas; Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area; and

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35 Article III. (4)(a). See also Article II (1).
36 CMS. Article V(5)(e)-(g).
38 Wadden Sea Seals Agreement. Article VII.
39 AEWA. Preamble, and Article III.c,d & e.
European Bats \textsuperscript{42} Similar obligations exist within the CMS Memorandum of Understandings for the Great Bustard, \textsuperscript{43} the Slender billed Curlew, \textsuperscript{44} the Siberian Crane \textsuperscript{45} and the Aquatic Warbler. \textsuperscript{46}

The CMS, like the WHC, acted as a strong response to the action taken at the Second World Congress on Protected Areas. In a similar vein, tConvention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) was built on the recognition that the conservation of natural habitats is a vital component of the protection and conservation of wild flora and fauna.\textsuperscript{47} Each Contracting Party agreed under the Bern Convention, (and the related European Diploma, \textsuperscript{48} and Emerald Network) \textsuperscript{49} to take appropriate national policies, including necessary legislative and administrative measures to ensure the conservation of the habitats\textsuperscript{50} of the wild flora and fauna species, and especially that which was endangered, vulnerable and/or migratory. \textsuperscript{51} In furtherance of this goal, the Parties have identified, both critical habitat types and the habitats of key species in need of protection.\textsuperscript{52}


\textsuperscript{43} Great Bustard Memorandum of Understanding. Available from the CMS Secretariat. Point 6. Action Plan for the Middle European Population of the Great Bustard. Section 1. See also Sections 1.2.3 & 1.2.4.

\textsuperscript{44} Slender Billed Curlew MOU. Preamble. Section 1.

\textsuperscript{45} MOU, Siberian Crane. Preamble and Principle 1.

\textsuperscript{46} Memorandum of Understanding Concerning Conservation Measures for the Aquatic Warbler. Available from the CMS Secretariat. Preamble. See also Part 1 of the Action Plan Concerning Conservation Measures for the Aquatic Warbler.

\textsuperscript{47} Bern Convention. Preamble.

\textsuperscript{48} European Diploma. Annex I. Criteria. Section B (2). The applicant area must taken into account in regional planning in order to prevent projects which run counter to the objectives of the area from being approved.

\textsuperscript{49} Recommendation No. 114. (2004). On the Role of the Bern Convention in the Preservation of Biological Diversity,

\textsuperscript{50} Bern Convention. Articles 1, 3 (1), 4 (2).

\textsuperscript{51} Bern Convention. Article 4 (1) and (3).

Despite the fact that clear progress in the facilitation of the creation of protected areas was taking place throughout the 1970s, the third World Congress on Protected Areas nevertheless, called upon governments to,

Give high priority to the fulfillment of the ecological representiveness of their terrestrial protected areas systems by establishing new ones areas or enlarging existing ones.\(^{53}\)

Five years later, the World Commission on Environment and Development (WCED), introduced a novel idea. This idea was that of a target of how much protected areas should be sought. Specifically, although the WCED noted that the number of protected areas was growing, nevertheless,

A consensus of professional opinion suggests that the total expanse of protected areas needs to be at least tripled if it is to constitute a representative example of the Earth’s ecosystems. There is still time to save species and their ecosystems. It is an indispensable prerequisite for sustainable development.\(^{54}\)

The next major response of the international community to these types of recommendation came at the 1992 Earth Summit. However, one year before then, the

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53 Recommendation 2. Global System of Representative Terrestrial Protected Areas. Recommendations of the World National Parks Congress in 1982, has earlier suggested, in passing, that a 10% target be established for the protection of different biomes.  
1991 Madrid Protocol, building on a long established practice for the South Pole, came to oblige its signatories to protect Antarctica as, 'a natural reserve, devoted to peace and science' and effectively turned the location into one giant protected area. Building on from such momentum, the importance of protected areas was entrenched at the 1992 Earth Summit, in both Agenda 21 and the Convention on Biological Diversity. In the first instance, Agenda 21 iterated the importance of protected areas with regards to the conservation of forests, mountains, and biodiversity. In the second instance, the most important document to evolve from the 1992 Earth Summit to deal with protected areas was the Convention on Biological Diversity (CBD). Article 8 of the CBD obliged each Contracting Party, ‘as far as possible and as appropriate’ to,

(a) Establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity;
(b) Develop, where necessary, guidelines for the selection, establishment and management of protected areas or areas where special measures need to be taken to conserve biological diversity.

The ultimate aim of the CBD is, ‘the establishment and maintenance of an effectively managed, ecologically representative global system of protected area networks where human activities are managed to maintain the structure and functioning of the full range of ecosystems, in order to provide benefits to both present and future generations and to achieve a significant reduction in the rate of biological diversity loss’. In large part, this CBD objective is due to their conclusion that the creation and maintenance of protected areas are ‘essential’ in meeting all of the broad objectives of the CBD, the 2010 target (to significantly reduce the rate of biodiversity loss) from the World Summit on Sustainable Development and the attainment of the Millennium Development Goals. To achieve these goals, protected areas became incorporated within many of the thematic areas of the Convention, as well as becoming a central stand alone item on the CBD agenda, which is supplemented by active working groups.

Following the paths set by the WCED and the 1992 Earth Summit, The fifth World Congress on protected areas in 2004 broke the pattern of earlier Congresses in that it was laden with targets. The idea of targets for development in general, and sustainable

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55 See the 1964 Agreed Measures for the Conservation of Antarctic Fauna and Flora, from which all the Parties agreed to, ‘exert appropriate efforts, consistent with the Charter of the United nations, to the end that no one engages in any activity in the Treaty Area contrary to the principles or purposes of these Agreed Measures’. Moreover, each Party was obliged ("shall") take appropriate action to carry out these Agreed Measures. Article III & X. Agreed Measures.
57 Agenda 21. Chapter 11.14 (b)
58 Agenda 21. Chapter 13.7. (b)
59 Agenda 21. Chapter . 15.5. (g)
development in particular, although clearly part of the international architecture dating back to the WCED, received a huge boost with the United Nation’s Millennium Development Goals, and goal seven in particular of seeking to achieve environmental sustainability by, inter alia, integrating the principles of sustainable development into country policies and programmes, whilst also seeking to reverse the loss of environmental resources. Soon after, the idea of targets began to filter in a number of Multilateral Environmental Agreements. With specific regard to protected areas, a number of established conventions began to adopt soft targets.63 This theme of targets for protected areas was strongly replicated with the Fifth World Parks Congress. This Congress called for governments and appropriate international organizations to,

Maximize representation and persistence of biodiversity in comprehensive protected area networks in all ecoregions by 2012, focusing especially on threatened and under-exploited ecosystems and those species that qualify as globally threatened with extinction.64

As a series of subsidiary targets, the Congress called for all globally threatened species to be effectively conserved in-situ with the following immediate targets,

A. All Critically Endangered and Endangered Species globally confined to single sites are effectively conserved in situ by 2006.
B. All other globally Critically Endangered and Endangered Species are effectively conserved in situ by 2008.
C. All other globally threatened species are effectively conserved in situ by 2010.
D. Sites that support internationally important populations of restricted range species are adequately conserved by 2010.

They also called for ‘viable representations of every terrestrial, freshwater and marine ecosystems’ within protected areas with the following immediate targets,

A. A common global framework for classifying and assessing the status of ecosystems established by 2006.
B. Quantitative targets for each ecosystem type identified by 2008.
C. Viable representation of every threatened or under protected ecosystem conserved by 2010.65

Finally, the Congress called for, ‘a representative network of marine protected areas by 2012, as stated in the WSSD plan of implementation’.66 By the time of the 7th COP of the CBD in 2004, the above targets of the Fifth World Parks Congress, were being supplemented by the proposals of the working group on protected areas. The most

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64 See Recommendation 5.04. Building a Comprehensive and Effective Protected Area System. (Vth IUCN World Parks Congress).
66 See Recommendation 5.04. Building a Comprehensive and Effective Protected Area System. (Vth IUCN World Parks Congress).
controversial of these proposals, relating to the imposition of clear targets and timetables for the creation of more protected areas had been thoroughly square bracketed. Nevertheless, after some lengthy negotiations, broad targets (subject to national priorities) were agreed. These were,

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.

Within this broad target, a series of subsidiary targets were agreed. These include, ‘as a matter of urgency’ by 2006 ‘take action to establish or expand protected areas in any large, intact or relatively un-fragmented or highly irreplaceable natural areas, or areas under high threat, as well as areas securing the most threatened species in the context of national priorities, and taking into consideration the conservation needs of migratory species’. The 2010 target was also supplemented with gap analysis for representative systems by 2006, integration of these into broad sustainable development strategies by 2008, and designation of protected areas by 2009.

A. 3. Two Examples of the Facilitation of Growth Areas: Marine Protected Areas and Trans-boundary Protected Areas

A good example of the growing obligation to create protected areas is with Marine Protected Areas (MPAs). The international recognition of this obligation can be traced to the First World Conference on National Parks in 1962, which invited all governments with marine frontiers,

To examine as a matter of urgency the possibility of creating marine parks or reserves to defend underwater areas of special significance from all forms of human interference.

The necessity for direct action in this area was reiterated at the World Congress on protected areas in 1972, 1982, and 1994. These calls were supplemented by similar

72 “All governments concerned to set aside appropriate marine areas as national parks and reserves and to take action to extend the boundaries of existing terrestrial national parks and reserves to include representative marine ecosystems” Recommendation 4. Marine National Parks. In Elliot, H. (ed). Second World Conference on National Parks. (1972, IUCN, Lausanne). 443.
recommendations from notable and powerful national and international commissions, soft international law, and a large number of regional seas agreements covering, inter alia, the Mediterranean, the Caribbean, East Africa, the South East Pacific, and the North Atlantic. Against this background, the Fifth World Parks Congress in 2002 suggested, targets for this area, and the CBD, after long recognising the value of MPAs, called for,

The establishment and maintenance ... 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.

This goal was supplemented with the suggestion, that such a coverage should include marine ecosystems beyond areas of national jurisdiction in accordance with applicable international law. This decision from the CBD was consistent with the WSSD goals in this area. However, exactly how the high seas MPAS


75 Agenda 21. Chapter 17.7 and 17.85. Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities. Section 152 (d). UNEP(OCA)/LBA/IG.2/7. 5 Dec. 1995. Finally, see the FAO Code of Conduct for Responsible Fisheries. Section 6.8


80 CBD. Decision VII/28. Protected Areas. Annex. 1.1.3

(HSMPAs) are to be achieved, despite clear advocacy for them, and tacit support for them within the CBD, is less than clear.

A second example of the success of the growth of protected areas is with transboundary protected areas (TBPAs). By 2003, there were 169 TBPAs, involving 666 individual protected areas in 113 countries. Together, these sites represent at least 10% of all the world’s protected areas. These numbers did not develop quickly. Rather, they represent the culmination of over seventy years international co-operation, that began in 1932. Since that point, the utility of TBPAs has been consistently advocated in the World Parks Congresses, and a number of soft law documents of international environmental law. It has also been strongly mooted by the CBD, as well as by a number of international regimes. Most notably, the MAB, the WHC (which actively encourages TBPAs) and the Ramsar (which also directs Parties to cooperate in this matter).

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86 The first recorded TBPA was created in 1932, when Poland and Czechoslovakia announced their intention to have shared nature reserve. In the same year, the Waterton-Glacier International Peace Park, connecting the mountainous regions of the shared boundaries between the United States and Canada came into force.
89 Agenda 21. Chapter 15.7. Section (g)
Even the Global Environment Facility (with 29 TBPA under its auspice), and the International Timber Trade Organisation (ITTO) is also notable in this context, despite having no explicit mandate to further protected areas. Nevertheless, it has become actively involved of the support of a number of TBPA forest sites. TBPA, thus, have grown as a result of persistent efforts, over time, by a number of international regimes for protected areas.

B. 4. The Number of Protected Areas.

In 1958, the International Union for the Conservation of Nature (IUCN) proposed that an international list be established which contained all of the world’s protected areas. Soon after, the Economic and Social Council of the United Nations, requested the Secretary General to establish, ‘a list of national parks and equivalent reserves, with a brief description of each.’ Since this point, an international inventory has been produced every ten years, showing exactly how many protected areas are in existence. The overall number has grown from just over 1,000 in 1962, to 1,204 in 1971, 2,671 in 1982, to 12,754 in 1997. By 2003, the numbers had increased to a remarkable 102,102 protected areas. The 2003 figure is the equivalent to 12.65 of the Earth’s land.

98 The TBPA that the ITTO has supported include the Pulong Tau National Park in Malaysia, on the border region of Sabah and Sarawak, the Mengame-Minkebe Transboundary Gorilla Sanctuary on the Cameroon-Gabon border; the Betung-Kerihun National Park in Indonesia; the natural protected area system between Peru and Bolivia; the Condor Range between Ecuador and Peru; and the Phatam Protected Forest complex between Thailand, Cambodia and Laos. See ITTO. (2004). ‘The Incredible Condor’. ITTO Tropical Forest Update. 14(4). 1-7.
99 ECOSOC Resolution 713 (XXVII), 1959.
103 UN List. 2003. Ibid. 27.
surface. If marine protected areas were included in the calculation, 18.8 million kilometers of the Earth fall within protected areas. If marine protected areas are excluded from these calculations, the terrestrial extent of protected areas is some 17.1 million kilometers (11.5% of the land surface). This is almost the same as the entire continent of South America.104

Aside the generic figures included in the United Nations list of protected areas, it is also possible to note that a number of these are internationally recognised sites. The 2003 list included 4,633 internationally designated sites. Within these low thousands, a number of sites are particularly notable. The first set of noticeable sites comes from the WHC. This Convention has seen its numbers (of natural and cultural sites) go from 12 in 1978, to 754 listed sites in 125 State parties in 2005. Of these, 582 were inscribed as cultural properties, 149 as natural sites and 23 as mixed properties.105 MAB sites have increased from 56 in 1976 to to 459 sites in 97 countries in 2005.106 As of 2005, there were 1525 wetland sites, totaling 129.5 million hectares. In the Antarctic, there are 2741 square kilometers, of protected areas.107 By 2005, there were 64 areas in receipt of the European Diploma.108 The International Maritime Organisation also has a collection of notable areas under international protection.109

5. The sheer number of internationally recognized sites illustratesGaps in the progress of the obligation to create protected areasSystem.

III. In order to understand how the system of treaties came into being, it is important to examine the historical progression of the obligation to create protected areas. But, to understand how the system for protected areas exists in its present state and identify gaps in the current system, one must engage in a comprehensive thematic analysis.

108 For a detailed list and examination of some of the earlier sites, see Bauer, F. (2002). 'The European Diploma of Protected Areas’. 12 (3) Parks. 29, -33.
Although the sheer numbers of protected areas is, without doubt, impressive, the numbers are deceptive, for as the CBD noted, ‘existing systems of protected areas are neither representative of the world's ecosystems, nor do they adequately address conservation of critical habitat types, biomes and threatened species’. With regard to species threatened with extinction, more than 1,300 species of mammals, amphibians and threatened birds not represented in any protected areas. Similar problems exist with threatened or endangered plant species. For example, in Eastern Europe of the 796 important areas identified as containing threatened or endangered plant life, 170 had no legal protection. Likewise, with regard to ecosystems by type, although some ecosystems are well represented in protected area figures, such as with tropical humid forests (with a total of 23% coverage) subtropical Forests (16.9% coverage) and Mixed Island ecosystems, (29.7% coverage), other ecosystems, such as temperate Grasslands (with only 4.59% protected area coverage of the total known area) or lake systems (at only 1.54% coverage) are vastly underrepresented. Even within areas that appear well represented, the figures may be deceptive. For example, with over 17% of the Arctic landmass under formal protection, it may seem that the level of the protection of the Arctic is adequate. However, this statistic is problematic, as it disguises the very low protection afforded to the marine environment. It also discounts the fact that if the nearly one million kilometer Greenland national park is removed, the percentage drops by half. Or, if looking at the figures for protected areas in the Antarctic (a tiny 0.008% of the total land area) of the sites which are protected, these are located in two clusters, on the fringes of the Antarctic, with no sites a significant distance inland. Likewise, there is a complete absence of protected areas within Marie Byrd Land in western Antarctica. Even within relatively successful regimes such as the Ramsar, sites tend to be concentrated in certain regions, and of certain wetland types, much to detriment of other possible areas. For example, out of 1180 Ramsar sites listed at the end of 2002, only 70 were temporary pools. One of the best ways of looking at the problem of under, and over-representation of types of protected areas, is by looking at them thematically, in terms of ecosystem type. In this regard, marine, forest, drylands and mountainous areas are divisible categories.


A. Marine.

113 Conservation of Arctic Flora and Fauna. (2002). Protected Areas of the Arctic: Conserving a Full Range of Values. (CAFF Secretariat, in Department of Foreign Affairs, Canada). ii.
One of the best ways of looking at the problem of under, and over-representation of types of protected areas, is by looking at them thematically, in terms of ecosystem type. In this regard, marine, forest, drylands and mountainous areas are divisible categories.

The problem of vast areas without adequate representative coverage, is particularly obvious with MPAs, in that about only one fifth of all marine biogeographic types identified are encompassed within MPAs. This is not surprising in that although the international protected areas network now covers about 11 per cent of Earth's land surface, less than 1 per cent of the Earth's marine area is covered. As such, marine and coastal ecosystems are severely under-represented as protected areas, and the existing MPAs only protect a very small proportion of marine and coastal environments globally. Consequently, the existing MPAs make a relatively small contribution to the overall sustainable management of marine and coastal biodiversity. Moreover, the MPAs that do exist provide a very slanted picture. This is because of the 1.6 million kilometers attributed to MPAs, a few overtly large MPAs make up the lion’s share of this figure (with the difference between the mean size of an MPAs being 100,000 hectares, whilst the median size is 1,584 hectares). The other caveat in the MPA discussion, is that MPAs tend to be disproportionately represented in only certain parts of the world. For example, as of 2004, of the 20 WHC sites with a marine component, 11 of them were in Oceania/Australasia. Even within a number of relatively progressive international regimes which deal with such questions, such as with the Antarctic regime, the creation of MPAs has proven fraught with difficulty caused by concerns of sovereignty and overlapping international organisations, taking over twenty years to achieve the pitifully small total of only 3 MPAs.

This problem is particularly obvious with certain, key oceanic ecosystems, such as coral reefs. These ecosystems are important because, inter alia, globally, nearly two thirds of all fish harvest ultimately depend on the health of them. Coral reefs, (including both

118 CBD. Decision VII/5 Marine and Coastal Biological Diversity. Section 13.
119 CBD. Decision VII/5 Marine and Coastal Biological Diversity. Section 14.
cold and warm water corals), in particular, are the forests of the ocean. They have vast economic, cultural and ecological importance. On the last factor alone, although coral reefs occupy less than one quarter of 1% of the marine environment, coral reefs are home to more than a quarter of all known marine fish species and cumulatively they may hold close to 1 million species (although only 93,000 are known).123

Despite coral reefs being the hotspots of marine biodiversity, only slightly more than 400 MPAs contain them. Moreover, despite being identifiable within the listings of the WHC, MAB, Ramsar and the IMO,124 this critical subset of marine biodiversity is largely invisible as a particular theme for protected areas. Indeed, at the turn of the century, at least 40 countries lacked any marine protected areas for conserving their coral reef ecosystems.125 Although the MAB, the WHC, and most notably the Ramsar have recognised the category, as a subset within other areas of their overall work,126 the only international body which explicitly deals with coral reefs, the International Coral Reef Initiative (ICRI),127 despite voicing the importance of MPAs encompassing coral reefs, has no power to designate such areas.128

B. Forests.

Forests are an obvious choice as protected areas as natural forests are typically, strong repositories for biodiversity, with great cultural, economic and ecological importance. This common-sense realization is part of the reason why forests are, on the whole, relatively well protected. Indeed, the Global Forest Resource Assessment by the Food and Agricultural Organisation in the year 2000 estimated that around 12% of the world’s forests are included in IUCN protected areas categories.129 This is not surprising as of the

year 2000, 22 countries had already pledged to protect a minimum of 10% of their forests. Central America, South America, Eastern and Southern Africa, Australia and New Zealand have 25% or more of their forests within some kind of protected area. However, not all categories of forest have the same level of protection, and their situation is hidden beneath the generic figure. For example, forests in North Africa and the Middle East and in the Pacific are particularly poorly protected with less than 5% of their area within protected areas. Freshwater swamp forests in both tropical and temperate regions, mixed needle-leaved and broad-leaved forests in tropical regions and subtropical thorn and sclerophyllous dry forests are also, in general, poorly protected.

The recognition that forests should be prime candidates to be made into protected areas dates back to Second World Conference on National Parks in 1972. This goal was reiterated in 1982, and the considerably watered down 1992 Non-Legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of all Types of Forests. Agenda 21 has emphasised the importance of enhanced protected forest areas, as has the CBD, and the GEF. The GEF being particularly notable due to its economic support for a number of notable forest protected areas, such as the Amazon Region Protected Areas programme which aims to incorporate and additional 25 million hectares to read the goal of 37

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131 The most protected forests are tropical moist forests and temperate needle-leaf forests, which have over 11% of their area included in protected areas. Tropical dry forests are the least protected with less than 9% of their area included in protected areas belonging to management categories I-VI. About 10% of the temperate broad-leaved forests are included under protected area of various IUCN categories.
134 The third Congress noted the ‘critical situation’ with regard to the biomes of tropical forests (in given selected areas).
million hectares under protection. This would triple the existing extent of Brazil’s protected areas by 2012, to an area the size of Spain.\(^{139}\)

Despite the utility of the above processes, the only driving processes in the international community, aside some thematic studies in the WHC,\(^{140}\) which could effectively facilitate the establishment, expansion and management of forest protected areas, by virtue of the fact that they are forests, is either the Montreal Process, or the ITTO. Of these two, only the latter, is a formal international organization, with real possibilities in this area. The former, being largely driven by the development of sustainability indicators, of which protected areas are but one factor.\(^{141}\) Although the ITTO, also utilizes indicators, with an overlap into protected areas,\(^{142}\) the ITTO has actually gone a little further in the promotion of protected areas. This is despite the fact that although the primary instrument in this area, the International Tropical Timber Agreement,\(^{143}\) places a strong emphasis upon ‘sustainability’, no mention of protected areas is present in the document. The only mention of protected areas, in the high level documents, appears in the 2002 to 2006 ITTO Action Plan, under which the Parties pledged themselves to maintain the integrity of the resource base, including protected area networks.\(^{144}\) Since this point, the ITTO has assisted its member countries in setting aside and managing totally protected areas. Despite this support, the critical point to note is that the ITTO does not nominate, evaluate or list these protected areas and their individual worth for its own purposes. Rather, it only supports it members decisions in this area.

In many ways, the failure of the international community to develop a specific mechanism that could encompass forest protected areas, is a reflection of their larger failure to develop an effective and overall international forestry convention. Accordingly, despite a near universal recognition that forests make wonderful candidates as protected areas, as it stands, forest protected areas remain tangential to the Montreal Process, only within a discussion forum of the CBD, and only in the margins of the ITTO. The problem in this instance can be best demonstrated by the collapse of the United Nations Forest Forum in 2005. One of the few things that all of the participants could agreed, was calling upon all countries to significantly increase the area of protected forests and sustainably managed forests.\(^{145}\) However, as the UNFF collapsed, the only mechanisms left to achieve this goal were the Montreal Process, the CBD and the ITTO. Without an


\(^{143}\) ITTO. (1994). TD/TIMBER. 2/16.


international forestry convention or a similar mechanism, therefore, gaps in forest protection will continue to plague the international system of protected areas.

C. Mountains.

Mountain environments cover 27% of the world’s land surface, and host about 12% of the Earth’s human populations. Lowland people also depend on mountain environments for a wide range of goods and services, including water, food, timber and biodiversity. Mountains are also increasingly fragile, due to being under multiple anthropogenic threats. Accordingly, the conservation of mountain biodiversity and its linkage with protected areas was iterated at the WSSD, the CBD, Agenda 21, the World Parks Congress. However, aside some GEF support for this area, (one third of GEF sponsored protected area assistance goes to mountain areas, encompassing 107 projects in 64 countries), and some tangential focusing on mountains within the MAB, WHC, and Ramsar, there is no specific, over-riding body directing work in this area. This is all the more disappointing given that there are a number of regional instruments which are specifically focused on the conservation of certain mountain ecosystems, such as the Alpine Convention and the Carpathian Convention. However, once more, protected areas are but a small subset within a much larger sustainable management agenda, and there is no direct regional or international guidance or law by which protected areas in mountainous regions can be facilitated.

D. Drylands, Arid, Semi-arid, Grassland and Savannah Ecosystems.

Natural grasslands and savannahs host very distinctive plant and animal communities where diversity tends to increase towards the tropics. All these systems hold an array of native herbivores, and these, in turn, can support a high profile of mammals and avian predators. The savannah communities of East Africa, for example, are typified by large herds of ungulate herbivores including more than 70 species of antelope and other

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147 WSS/SD. Plan of Implementation. Paragraph 43.
148 Mountain Biodiversity. UNEP/CBD/COP/7/L.29.
149 See Chapter 13.7. (b) of Agenda 21.
150 See Recommendation 5.06. Strengthening Mountain Protected Areas as a Key Contribution to Sustainable Mountain Development. (Vth IUCN World Parks Congress).
medium to large sized bovids. At very fine spatial scales, natural grasslands can be among the most specifies rich habitats on Earth. Up to 80 plant species have been identified in a square meter in the Central Asian Steppe, and 42 plant species in a quarter of a square meter in pine Savannah on the US Atlantic coastal plain. Even deserts, which are not normally associated with biodiversity, can have highly unique species within them. Collectively, summary analysis of global habitat distribution of globally threatened mammals and birds shows that drylands, scrublands and grasslands make up the second most important group of threatened species of mammals, and a high proportion of continental species known to have become extinct since 1600, occurred in dry land ecosystem. 157

Due to such considerations, the CBD in its discussions on these areas has recommended the importance of, inter alia, protected areas as part of the strategy to combat biodiversity loss. 158 Despite such recommendations, the primary international instrument in this area the United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (CCD), although developing a series of ways to combat desertification, and protect both human communities and non-human biodiversity, 159 has been largely silent on the utilization or value of protected areas. The only other convention which has dealt with a small category of grasslands (those which are wet) in passing, has been the Ramsar. 160

IV. Identifying Priority Areas to Meet International Goals

7. Priority Areas.

Due to the multifaceted problems noted above, it has been suggested that, there is an urgent need to take action to improve the coverage and representativeness of protected areas nationally, regionally and globally. 161 However, recognition of this problem is easier to articulate, than developing an approach to solve it by which all countries, let alone those seeking to establish protected areas, can agree. Indeed, it is not always clear what the primary conservation objectives should be, as there are a number of different approaches to consider. Moreover, these different approaches often conflict. This particular problem is inflamed by the difficulties of limited resources and near unlimited

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161 Decision VII/28. Protected Areas..
demand. Accordingly, it has become increasingly necessary to seek prioritise what areas should be at the forefront of conservation efforts. A number of conventions have already started this process, with the development of strategies and inventories, designed to help select key areas which they could come to protect. Although the process of comparative and thematic analysis (whereby sites are put forward on tentative lists, and broadly compared) is made use, as a gap-analysis tool by, inter alia, the CBD, the and the Bern Convention, and the Ramsar, it is most notable with the WHC and its with its extensive emphasis upon tentative lists, and comparative and thematic analysis.

8. Selecting Priorities.

Despite the utilization of tentative lists and comparative and thematic analysis, it is not always clear what the primary conservation objectives should be, as there are a number of different approaches to consider and exactly what and where the priority areas are is a matter of debate between four different (but often overlapping) schemas. These schemas are the Udvardy system, the Global 200, Species Focused Approaches, and Hotspots. To one degree or another, most regimes interested in protected areas utilize one or more of


these schemas. For example, the GEF focuses on globally significant and representative ecosystems, including protected areas within the Global 200 (140 GEF projects covering 761 protected areas) and Hotspots (112 projects covering 606 protected areas) lists. The schemas, which will be addressed individually below, will enable the international community to meet goals for protected areas in spite of the current gaps in the system.

A. The Udvardy System.

In 1975, the Udvardy biogeographical system was unveiled. This was the first unified system that classified the natural ecosystems of the world in biogeographical realms, and the further divided them into biomes and showed their geographic distribution. At the top level, eight large Biogeographical Realms which are continent or sub-continent sized areas with geography and fauna/flora/vegetation were recognised. These were subdivided into 14 biomes. Biomes are groups of ecosystems that are related, and which show similarity in both appearance and internal structure, due to being influenced by the same climate, soil conditions and elevational conditions. Finally, they were divided into the last category of 193 (later reanalyzed as 227) biogeographical provinces, which approximately correspond to floristic regions of botanists and the faunal provinces of zoologists. Although this classification has some obvious limitations, such as overall bluntness, its restriction to only terrestrial considerations and focusing predominantly on vegetational components (with limited recognition of the species in them), it has the merit of being able to clearly identify the different biogeographical provinces of the Earth, and then accord them protection within appropriate protected area regimes. In this regard, the approach has clearly been successful. For example, all of Udvary’s Biomes are contained within some WHC Sites (with the most common being the 32 mountain systems, 26 tropical humid and 25 tropical dry forests) except with the biogeographical provinces recognised as cold winter deserts. Cold winter deserts, tundra and polar systems, and temperate grasslands (as of 2004 there are only four of each) are the least common biome classifications.


168 Africotropical; Antarctica; Australian; Indomalayan; Nearctic; Neotropical; Oceanian & Palaearctic.
169 Mixed mountain systems; Humid Tropical Forests; Tropical Dry/Desiduous Forests; Mixed Island Systems; Subtropical/temperate rainforest; Warm desert/semi deserts; Temperate Broad Leaf Forests; Temperate Needle leaf Forests; Evergreen Forests/Scrub; Tropical Grassland/Savannah; Lake Systems; Tundra/polar desert; Temperate Grasslands & Cold Winter deserts.
The ‘Global 200’ is the mechanism of the World Wildlife Fund (WWF), and it has been actively touted at the WHC. This mechanism seeks to answer many of the possible deficiencies of the Udvary system, as it covers marine areas, incorporates a much greater degree of weight towards biodiversity considerations within the biomes, and provides the clear objective of the protection of major habitat types (‘eco-regions’), and not just individual species or hotspots of diversity.

The Global 200 mechanism is predicated upon an analysis of the eco-regions representing the Earth’s 30 terrestrial, freshwater and marine major habitat types. An eco-region is defined as a relatively large unit of land or water containing a characteristic set of natural communities that share a large majority of their species, dynamics and evolutionary conditions. This was further divided by Major Habitat Type (MHT). MHTs describe different areas of the world which share similar environmental conditions, habitat structure and patterns of biological complexity and that contain communities with similar guild structures and adaptations. MHT classifications are roughly equivalent to biomes. Each MHT was further subdivided by biogeographical realm (e.g. Nearctic, Indian Ocean) in order to represent the unique flora and fauna in each area. This resulted in a collection 867 ‘ecoregions.’

The ecoregions were then analysed in terms of their species richness, endemic nature, higher taxonomic uniqueness (unique genera, relict species etc), extra-ordinary ecological or evolutionary phenomena (e.g. adaptive radiations, intact large assemblages, presence of migrations of large vertebrates). Notably, the rich and endemic nature of species, is not the sole defining characteristics, as a number of ‘sparse’ eco-regions (such as some boreal forests, tundra, and some ecoregions in very dry conditions) do not have high biodiversity counts in these regards. Accordingly, the enhanced emphasis was also given to ‘extra-ordinary ecological phenomena’ (i.e. ecosystem rarity) and ‘unusual evolutionary phenomena’ (such as uniquely adapted species to key environments). The most biologically outstanding of the 867 ecoregions – which were whittled down to 238 ecoregions - that deserve the most urgent conservation attention are referred the ‘Global 200.’ These 238 (the so called Global 200) are comprised of 142 terrestrial, 53 freshwater and 43 marine ecoregions.

This clear list gives the benefit of being able to present a a comprehensive strategy for conserving global biodiversity, that focuses not only on the obvious areas (such as tropical forests) but also the other distinctive ecosystems of the world (from tundra, grasslands, lakes, polar seas, mangroves etc) that hold the rest of the world’s biodiversity. The Global 200 thesis is that all such ecosystems and habitat types need to be represented within meaningful conservation strategies. This is especially so as some of these major habitat types (i.e. biomes) such as tropical dry forests and Mediterranean climate shrublands, are on average more threatened than are tropical moist forests and require

immediate conservation action, as they are not within any protected area regime. For example, fifty terrestrial Global 200 Ecoregions are not in any WHC Site, nor are 18 Marine Global 200 Ecoregions.

C. Species Focused Approaches.

An idea that falls between the need to protect habitats and key species, is that with regard to identifying key habitat which is necessary to protect, so as to conserve the biodiversity that rely upon that habitat. This focus may be upon individual species, biodiversity in general, or species threatened with extinction. The latter is a particularly common articulation of this approach given the clear links that can be made between species survival and habitat loss. Indeed in late 2005, an international team of scientists identified almost 600 sites around the world as ‘zones of imminent extinction’. Each site contained at least one endangered species which lived no-where else. Of the 794 ‘trigger species’ 408 are amphibians, 217 are birds and 131 are mammals. Although these figures are new, the recognition of this approach is not, as this is one of the most well known and long-standing orientation strategies for protected areas, and is well utilised within the CMS and Bern Conventions, and a secondary theme with regards to the Ramsar.

A species focused approach is also partly replicated in the IUCN/Species Survival Global Habitat Classification. This system is derived from calculations involved in the protection of the necessary habitat for species which are endangered, and listed on the IUCN Red List. These divide into a three level hierarchical system. The first level consists of 15 broad habitat categories. Of these, 11 subdivide into 78 second level habitat types, which are further subdivided into 154 third level categories. Within these divisions, it is possible to show that some first habitat sites are more protected in international protected area systems (such as forests in and wetlands). Conversely, the seven types of shrub-land are very poorly represented, as is over half (four out of seven) of all grassland types. Finally, marine and coastal habitats have a low occurrence in all continents/regions.

A variation on the above theme was offered by Birdlife International and their recognition of Endemic Bird Areas (EBAs). The variation is that one species is alone recognised as the key species linking to a habitat that should be the placed within a protected area. An endemic bird area is defined as,

An area which encompasses the overlapping breeding ranges of restricted range bird species, such that the complete ranges or two or more restricted range species are entirely included within the boundary of the EBA. This does not necessarily mean that the complete ranges of all of an EBA’s restricted range species are entirely included within the boundary of a single EBA, as some species may be shared between EBAs.\(^\text{179}\)

These are identified as areas that encompass the breeding ranges of two or more birds whose total breeding is restricted to 50,000 km or less. The biological importance of an EBA is measures by the number of restricted range species occurring in it, and whether they are shared with any other EBAs. Most EBAs support 2-10 restricted bird species. Globally, 218 EBAs have been identified. These 218 EBAs cover approximately 2% of the world’s land surface.\(^\text{180}\) Despite this relatively small area requiring protection, 144 EBAs are not within WHC sites.\(^\text{181}\)

The final variant on focusing on key species as the basis for protected areas focuses upon centres of plant diversity (CPD). This IUCN/WWF initiative identified 250 priority sites for the global conservation of higher plants.\(^\text{182}\) Plants were identified as key species because they are often highly threatened (the estimate is that as many as 60,000 species may become extinct by 2050, or 1 in 4 plants). Accordingly, the IUCN/WWF initiative identified areas around the world which are of, ‘the greatest importance for plant conservation’.\(^\text{183}\) Sites were selected on the basis of their botanical richness, geographically defined areas with high species diversity and/or endemism (such as the Atlas mountains), and/or vegetation types which are exceptionally rich and/or endemic (such as the Amazon rain forests). Additional considerations involved how much the site was threatened, the diversity of the habitats within a site, the proportion of species adapted to special edaphic conditions (i.e. limestone) and the potential use of the plants contained.\(^\text{184}\) Despite the utility of CPDs, only 20.2% of CPDs occur within WHC sites, while 79.8% do not.\(^\text{185}\)

D. Hotspots.

As noted above, protecting habitats because they are linked to species is not a new idea. However, the divergence from focusing upon individual species, to numbers of species within an area (as a justification for creating protected areas), only fully appeared on the

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\(^{183}\) IUCN/WWF. Ibid. 2.

\(^{184}\) IUCN/WWF. Ibid. . 3-4.

international arena in the early 1980s. By the end of the 1980s, the idea of creating PAs to encompass areas of rich biodiversity (in terms of species numbers) has been considerably refined by Norman Myers and the NGO Conservation International, with the concept of ‘hotspots’. Originally, 25 hotspots were identified, but this number was later taken to 32. This idea has become so influential, that the WSSD called upon all governments to, ‘effectively conserve and sustainably use biodiversity, promote and support initiatives for hot spot areas and other areas essential for biodiversity’.

To make the hotspot list, an areas must meet the criteria of endemism and threat. Although these criteria are not necessarily absolutely robust, the yardstick is that with regard to ‘threat’, the are should have 25% or less of its original primary natural vegetation cover remaining intact. The endemism criteria is that it has to have 0.5% of 300,000 species, or 1,500 endemic vascular plant species (roughly 0.5% of the world total) within its borders. As with the CPD approach, plants were chosen as the qualifiers as they are the basis for diversity for other taxonomic groups. Indeed, the hotspots have a high correlation with endangered species. For example, 57.5% of all mammal species listed as critically endangered or endangered are found within the 25 hotspots. 82.1% of all birds listed as critically endangered, and 81.3% of all birds listed as endangered are also within the 25 identified hotspot sites.

From the analysis derived from the above two considerations, 25 hotspots (plus two mini hotspots – the Galapagos and the Juan Fernandez Islands) have been identified and ranked. Of his 25 hotspots, 15 are tropic rainforests and nine are islands. When the number of hotspots was expanded to 32, Japan, the Madrean pine oak forests of Mexico and the South west US, Eastern Melanesia were added. Cumulatively they represent only

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187 In 1988 Norman Myers identified 10 threatened hotspots in the tropical rain forests of the world, estimating they contained 13% of all plant diversity in just 0.2% of the land area of the planet. In subsequent analysis, he added four other rain forests and four Mediterranean style ecosystems and came up with a total of 18 areas that accounted for 20% of the global plant diversity in just 0.5% of the land area of the planet. Mittermeier, R & Myers, N. (2000). Hotspots. (University of Chicago Press, Chicago). 26-27.


189 WSSD. Plan of Implementation. Paragraph 44. (g)

190 Not all hotspots, are the same. For example, in South east Asia, although there are many areas under threat, but are not all hotspots of species numbers, or where there are large numbers, they are not always endemic. Indeed, in this area, only 2.5% of the hotspots fulfilled all three criteria, and these were all within the Andes mountains Anon. (2005). ‘Some Hotspots Are Hotter than Others’. New Scientist. August 20. 19. In addition, many of the following options are constrained by the limitations of what is, and is not scientifically known about both species and habitat, as well as competing arguments on ecological theory. Brummit, N. (2003). ‘Biodiversity: Where’s Hot and Where’s Not.’ Conservation Biology. 17(5): 1442-1448. Pearce, F. (2000). ‘Spread the Wealth.’ N. Sci. Feb 26. 12.


192 Mittermeier. Ibid. 58.

193 The Caribbean, the Philippines and Madagascar and the Indian Ocean Islands are the highest priority hotspots of all. Mittermeier, Ibid. 53.

2.1 million square kilometres (for the 25 hotspots) or 2.3 % (for the 32 hotspots). This is approximately 1.44% (for the 25) of the land surface of the planet. Together, these places contain 131,399 endemic vascular plants or 43.8% of all plants on Earth. The 32 hotspots include more than 50% of the vascular plants and 42% of all land vertebrates. With the 25, when the non-endemic species are added, the total is closer to 70% of all the vascular plants on the planet in these spaces. They also contain 9,681 endemic (non-fish) species (35.5% of the global total). If the non-endemic are included, the total non-fish vertebrates on the planet is also closer to 70%.

A total of 56 WHC Sites are situated in 21 of the 25 selected priority hotspots. Because hotspots are generally very large (an average size of 663,000, in comparison to an average WHC site size of 9,960) some 29 WHC sites lie entirely within hotspots.

v. 10. Conclusion.

International and regional obligations to create protected areas can be traced to 1933. Nevertheless, a process began in 1962 which called for more protected areas to be created. The international community, over the following decades has responded with a variety of instruments, that facilitate the creation of protected areas in both generic and specifics senses. However, it has been implicitly argued that these instruments have not gone as far as they could have, and greater progress, via the creation of more protected areas needs to be achieved. This criticism, was first linked into a numerical target of exactly how many protected areas should be created, in 1987. The numerical targets, have since been iterated by the World Parks Congresses, and adopted by the CBD. These targets are despite the fact that there has already been substantial success in the creation of protected areas. Indeed, by 2003, there were over 102,102 registered protected areas in 191 countries. The 2003 figure is equivalent to 12.65 of the Earth’s land surface, or an area greater than the combined land area of China, South Asia and Southeast Asia. If marine protected areas (which along with TBPAs are good exemplars of the push for more protected areas) are included in the calculation, 18.8 million kilometers of the Earth fall within protected areas.

Despite the broad obligations to create more protected areas, and the strong international support for this goal, there are clear gaps in the international framework of protected areas. This is most notable, at the thematic level, with regard to marine, mountain, dryland (and types of) forest protected areas. In many ways, these gaps are because unlike with wetlands, there is no thematic international regime which has proved itself willing or able to pick up protected areas with their respective ecosystems. The answer to this problem which has evolved has been one of identifying priority areas. Some regimes have utilized a series of mechanisms, such as tentative lists, comparative and thematic analysis to help identify potential priority areas, and such analysis is often assisted by the schemas of the Udvardy system, hotspots, the Global 200 or notable areas of endemic species. Although these schemas are all commendable, it is necessary to note that they

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are not all seeking to conserve the same areas. Nevertheless, given that the differences between are philosophical in their priority setting, it is not necessary to try to select which one is best. Rather, until the thematic gaps in the international legal architecture are filled by meaningful instruments which can directly list protected areas by specific type, the schemas should be fully utilised by the existing protected areas regimes, as the best way to prioritise what needs areas need to be saved, and thereby meet the goals that the international community has set itself.