A GLOBAL OVERVIEW OF PROTECTED AREAS ON THE WORLD HERITAGE LIST OF PARTICULAR IMPORTANCE FOR BIODIVERSITY

A contribution to the Global Theme Study of World Heritage Natural Sites

DRAFT

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EXECUTIVE SUMMARY

This working paper provides a global overview of the current coverage of existing World Heritage Sites of particular importance for the conservation of biodiversity, and suggests existing protected areas of significant biodiversity value, which may merit future World Heritage nomination.

In 1996, IUCN initiated a project to prepare a global strategy for Natural World Heritage sites, and as part of this process began to prepare a series of thematic global overviews on World Heritage site coverage. This document is an updated addition to these theme studies.

A total of 141 sites, representing 65 countries and over 142 million ha of protected areas were identified as being of particular importance for biodiversity. The sites detailed in this study were selected on the basis of natural World Heritage sites that lay within or contained a site that had been defined as:

1. Criterion iv (significant biodiversity) (95 sites)
2. A WWF "Global 200" site (124 sites)
3. A Centre of Plant Diversity (CPD) (74 sites)
4. A Conservation International (CI) biodiversity hotspot (57 sites)
5. Vavilov Centres of Plant Genetic Diversity (40 sites)
6. An Endemic Bird Area (EBA) (71 sites)
7. Contains "Critically Endangered" taxa (60 sites)
8. Wetland of International Importance (Ramsar site) (16 sites)
9. An area of marine importance (contained coral reefs (14 sites), mangroves (18 sites) or turtle nesting beaches) (15 sites)

Global maps illustrating the distribution of the sites for each category were also produced. A coarse GIS analysis found only 6 out of 141 sites contained 8 of the 9 indicators listed above, no current natural and mixed World Heritage sites (as of November 1999) contained all 9 indicators. While terrestrial ecosystems are well represented, marine and wetland environments are not. Additionally over 90 sites were identified as potentially meriting consideration for future nomination.

It is hoped that this overview will assist IUCN in making comparative evaluations and provide the World Heritage Committee with a stronger scientific basis for making decisions on new World Heritage nominations.

INTRODUCTION

A global overview of World Heritage sites of particular importance for biodiversity

1.0 Overview

In 1996, IUCN initiated a project to prepare a global strategy for Natural World Heritage sites, and as part of this process began to prepare a series of thematic global overviews on World Heritage site coverage.

These overviews are intended to assist IUCN in making comparative evaluations of World Heritage site nominations and to provide the World Heritage Committee with a firmer scientific basis for making decisions. They also provide State Parties with the global perspective relevant to identifying potential World Heritage properties in their territories.

Global overviews of fossil sites, wetland and marine protected areas and forest protected areas have already been prepared, and two others are in development. In 1998 a preliminary working paper was compiled by the World Conservation Monitoring Centre (WCMC), providing an overview of World Heritage in the context of biodiversity conservation. The current document builds upon this first attempt, and addresses some of the key information needs identified in the 1998 study, as requiring further development.

The purpose of this document is twofold: firstly, it will provide an overview of current natural World Heritage sites of significant biodiversity value, and secondly, it will identify existing protected areas of high biodiversity value that may be considered for future inscription on the World Heritage List.

This overview identifies 141 natural and mixed World Heritage sites of particular importance for biodiversity. They represent 65 countries and over 142 million ha of protected areas. It also identifies 94 existing protected areas (ranked according to increasing levels of biodiversity value), that may merit future World Heritage nomination.

2.0 Issues to Consider

Biodiversity is a very broad area to cover, it is therefore important to define the issues that should be covered and the type of questions that should be addressed by an overview such as this.

Issues to consider when evaluating an area for biodiversity importance include:

- Biogeographic coverage
- Total number of species in area/species richness
- Degree of endemism
- Number of globally threatened species
- Importance for economically important species, including wild relatives

Questions to consider when looking at the existing World Heritage List in relation to biodiversity include:

- Which World Heritage sites are of particular importance for the protection/conservation of biodiversity?

- What types of biodiversity richness are currently missing from World Heritage sites?
- What sites might be of World Heritage quality in terms of biodiversity but are not currently listed?

3.0 What is Biodiversity?

One of the first things to identify in a study such as this is to determine what is meant by the term biodiversity. It is an imprecise term contracted from 'biological diversity'; that may be measured at genetic, species, habitat or ecosystem level.

The Convention of Biological Diversity (CBD) defines biodiversity as "the variability among living organisms from which all sources including inter alia, terrestrial, marine and other aquatic ecosystems and the complexes of which they are part; this includes diversity within species, between species and of ecosystems themselves".

Depending on the type of study, an appropriate indicator of biodiversity should be used. In many instances species is generally considered to be the most useful measure of biodiversity assessments, at local, national, regional or global levels. Common measures of species biodiversity include the following:

Species richness
Species richness refers to the number or count of species occurring at a given area. It is one of the easiest and most straightforward methods of measuring biodiversity. Ideally the measure consists of a complete catalogue of all the species occurring in the area under consideration. However in practice this is very difficult to achieve, due to many species being very small, and thus being difficult to identify and count in situ. Additionally in many countries of the world a high proportion of smaller species have not been scientifically named. Indeed it is estimated that 80-95% of all living species have yet to be described. Species counts may reflect the biological richness of an identified area, however they do not reflect its uniqueness or indicate the area's importance in a wider context.

Endemism
A species may be defined as an endemic if it is confined entirely to that area, and occurs nowhere else. Endemism may be described in a geographical context, for example endemic to a mountain peak, desert basin, river system or lake or an island. The concept of endemism generally becomes more significant as the defined area reduces in size. Assessing the number of endemic species in an area is more difficult than counting the total number of species in a given area. The former activity cannot be carried out in isolation, as it relies on having a complete knowledge of the distribution of species involved. If a World Heritage Site, or an area that is nominated as such has species that are endemic to it then the site is clearly of universal significance for that species.

Threatened species
A species may become threatened as a result of human activities and/or natural phenomena, the former affecting many more species. Anthropogenic threats include habitat loss, overexploitation for subsistence or commercial use and the introduction of exotic species (species that have not evolved naturally in that environment). These species are at significant risk of extinction due to the small size of remaining populations. The most threatened species are, therefore of the highest importance for the conservation of biodiversity.

This study has used species and ecosystem level indicators.

4.0 Assessment Methodology

In the 1998 pilot study, potential activities were identified that could be carried out using existing information that would help to review the current pattern of World Heritage sites, and assist in the guidance of future policy. A number of datasets were chosen help identify World Heritage sites of floral and faunal biodiversity importance. These were chosen based on their availability at WCMC, to ensure that a useful project could be completed within the timeframe available.

The site identification programmes and datasets that were used in the initial pilot study have been supplemented in this current study. Those datasets considered useful and subsequently used are the following:

Biogeography

- Udvardy Biogeographical Provinces
- Baileys Ecoregions

Prioritisation Programmes

- WWF Global 200 Ecoregions
- CI Global Biodiversity Hotspots
- Vavilov Centres of Plant Genetic Diversity (centres of crop origin and diversity)
- Centres of Plant Diversity (CPD)
- Endemic Bird Areas (EBAs)

Species

- Critically Endangered species
- Turtle nesting sites

Habitat

- Coral and mangrove distribution
- Wetlands of International Importance (Ramsar sites)

Using a Geographical Information System (GIS) all natural and mixed (cultural and natural) World Heritage properties (as of November 1999) were overlaid on top of the aforementioned datasets, allowing sites of biodiversity importance to be coarsely identified (Table 1). Additional tables and maps were derived from each individual dataset. Where appropriate cross-referencing using additional textual materials was also used, to provide greater value to the tables and ensure that the study was as accurate and comprehensive as possible, thus aiding in the more specific identification of World Heritage sites of biodiversity importance.

Additionally this procedure has allowed for the identification of 'gaps' in World Heritage coverage, and thus is a coarse method of identifying priority areas that may be considered for future World Heritage nomination.

The text that follows provides a brief explanation of the indicators used, and their significance in determining biodiversity importance.

5.0 Current World Heritage Sites

The Convention Concerning the Protection of the World Cultural and Natural Heritage (the World Heritage Convention), was adopted by the General Conference of UNESCO in 1972. To date more than 150 countries have acceded to the Convention, making it one of the most universal international legal instruments for the protection of the cultural and natural heritage. The Convention's primary mission is to define and conserve the world's heritage, by drawing up a list of sites whose outstanding values should be preserved for all humanity and to ensure their protection through a closer co-operation among nations.

Sites inscribed onto the World Heritage List may be defined as of natural heritage value or cultural heritage value. Those properties that have natural and cultural values are described as mixed sites. The World Heritage list can be viewed on-line at:
http://www.unesco.org/whc/nwhc/pages/doc/main.htm

"Natural heritage" designates outstanding physical, biological, and geological features; habitats of threatened plants or animal species and areas of value on scientific or aesthetic grounds or from the point of view of conservation. "Cultural heritage" is a monument, group of buildings or site of historical, aesthetic, archaeological, scientific, ethnological or anthropological value.

Global maps illustrating the distribution of the 150 current natural and mixed World Heritage properties (as of November 1999), at each indicator level is included in this report. This is also accompanied by a list of sites (Annex 1).

5.1 Criterion (iv)

"Natural" properties submitted for inclusion in the World Heritage List are considered to be of outstanding universal value if they meet at least one of four selection criteria. Sites inscribed under criterion iv *"contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation"*. (See Annex 3 for additional criteria).

Current properties fulfilling criterion iv (95) have been identified in this study, as they are clearly of significant biodiversity value. These sites are mapped (Map 1) and listed (Table 2) including a summary justifying their inclusion under criterion iv.

5.2 World Heritage Sites in Danger

In accordance with Article 11.4 of the Convention, the World Heritage Committee "shall establish, keep up to date and publish, whenever circumstances shall so require, under the title of "list of World Heritage in Danger", a list of properties appearing on the World Heritage List for the conservation of which major operations are necessary and for which assistance has been requested under this Convention."

The list includes cultural and natural heritage properties that are threatened by serious and specific dangers such as the threat of disappearance caused by accelerated deterioration, large-scale public or private projects or rapid urban or tourist development projects; destruction caused by changes in the use or ownership of the land; major alterations due to unknown causes; abandonment for any reason whatsoever; the outbreak or the threat of an armed conflict or natural disasters.

A World Heritage property may be added to the "List of World Heritage in Danger" at any time. There are currently 18 natural and mixed World Heritage sites of significant biodiversity value, that are listed as "in danger" (Table 3). What significance does this have for biodiversity?

Mapped distribution of these properties (Map 2) illustrates that most sites "in danger" occur in Africa (11 out of 18), 82% of which are within the central part of the continent (Central African Republic, Democratic Republic of Congo, Niger), an area that has experienced periods of military conflict in recent times. This suggests that inscription onto the World Heritage List does not necessarily guarantee effective stewardship or safeguard biodiversity, a consideration that should be noted when nominating potential sites.

5.3 Case Studies

The 1998 pilot study identified the possibility of developing case studies using information readily available from WCMC and IUCN, to demonstrate the biodiversity value of a wide range of different types of natural World Heritage site. A number of potential locations were suggested; the case studies selected are the following (Annex 2):

- Galápagos – demonstration of endemism, speciation and scientific contribution
- Bwindi – demonstration of a key threatened species
- Manú National Park – demonstration of high biodiversity

6.0 Biogeographical Coverage

Creating a hierarchical system of geographical areas that act as a framework for cataloguing species and ecological areas to be conserved, is essentially how the concept of biogeographical provinces originates. Paragraph 8 of the World Heritage Convention operational guidelines stipulates that natural properties should be classified according to biogeographical provinces (BPs). The use of BPs for the selection of such sites is built upon a biome by biome framework originating from M.D.F. Udvardy's "A Classification of the Biogeographic Provinces of the World" (1975), a hierarchical biogeographic classification system for all terrestrial and freshwater areas of the world.

Areas similar in type can be found at similar latitudinal and continental locations. Biogeographical provinces and ecoregions have a great significance with regard to conservation and development of resources. By grouping areas with a structured classification, it is possible to make predictions about areas that fall in the same biogeographical area. This limits experimental conservation practises and increases 'early warning' signals. Knowledge of this enables the identification of under-represented provinces, and potentially the prioritisation of such areas for future World Heritage nominations.

In this study Udvardy Biogeographical Provinces and Bailey's Ecoregions have been used as ecosystem indicators of biodiversity.

6.1 Udvardy Biogeographical Provinces

Using Udvardy's classification system, the world is divided into a hierarchy of Biogeographical Realms (the largest of biogeographical units that encompasses major climatic or physiographic zones) Biomes and Provinces. The following realms are recognised: Paleaearctic Realm, Nearctic Realm, Afrotropical Realm, Indomalayan Realm, Oceanian Realm, Australian Realm, Antarctican Realm, Neotropical Realm.

In this study World Heritage Sites of biodiversity importance have been classified according to the biogeographical realm (Table 1) to which they belong. A map and table (Map 3 & Table 4) identifying Udvardy's Biogeographic Provinces, and the location of natural and mixed World Heritage sites within them, also accompanies this report.

A map and table (Map 4 & Table 5) illustrating Biogeographical Provinces that do not currently contain World Heritage sites has also been produced. This may be used to identify potential sites for future inscription on the World Heritage List.

6.2 Bailey's Ecoregions

As with the Udvardy classification system, Bailey's ecoregions are large areas of a similar climatic state and vegetation type that break down into hierarchical layers.

This system divides the world into domains based on climatic similarity. Domains are further subdivided into divisions using climate type as a basis. Humid temperate domain can be further subdivided into the divisions of hot continental, prairie and subtropical. Divisions are divided into provinces with the use of climax plant formations. The prairie division can be split down to prairie parkland, prairie brush-land and tall-grass prairie.

Further details can be found in "*Ecoregions: The Ecosystem Geography of the oceans and Continents*" (Bailey, 1998).

7.0 Key Prioritisation Programme Areas

7.1 WWF Global 200 Ecoregions

In an attempt to provide a geographic focus for conservation work, the Worldwide Fund for Nature (WWF), has identified 200 sites, known as the 'Global 200'. Based on a landscape approach, these are biologically outstanding ecoregions of the Earth, which are most representative of the world's biodiversity and therefore most deserving of conservation attention. By concentrating its efforts in a limited number of these key ecoregions (80% of which fall within the priority biomes), WWF aims to be able to mount more comprehensive conservation programmes at an ecologically appropriate scale and thereby increase its long-term impact on saving the Earth's biodiversity.

Further details of the Global 200 are available on-line at:
http://www.panda.org/resources/publications/sustainability/priorities/priorities.htm

Maps identifying natural and mixed World Heritage sites within these ecoregions accompany this report (Map 5, 6 & 7). Ecoregions that do not currently contain World Heritage sites have also been mapped (Map 8).

7.2 Centres of Plant Diversity (CPD)

Concern about the rapid loss and degeneration of natural ecosystems and the urgent need to highlight the areas of prime botanical importance, hotspots, was the rational behind identifying Centres of Plant Diversity (CPD), a project undertaken by WWF and IUCN in 1994.

CPDs are concerned with first order sites that are of global botanical importance. Such areas are species rich, even if the number of species may not be accurately known, and/or is known

to contain a large number of endemic species. CPDS must have one or both of these two characteristics.

The sites are also likely to contain:

- an important genepool of plants of value to humans or that are potentially useful
- a diverse range of habitat types
- a significant proportion of species adapted to special edaphic conditions
- or the site is threatened or under imminent threat of large-scale devastation

"Centres of Plant Diversity" provides accounts of almost 250 major sites for conservation of plant diversity globally. Information provided includes patterns of plant distributions, threats and conservation efforts. These sites have been identified using factors such as floristic statistics, alongside inputs from experts familiar with particular geographical areas.

These publications can be obtained from IUCN and the data (currently only for part of Volume 3: The Americas) can be accessed on the Internet at:
http://nmnhwww.si.edu/botany/projects/centres/menutemp.html

A map (Map 9) and list (Table 6), showing the distribution of CPDs containing World Heritage sites accompanies this report. CPDs without World Heritage sites are also identified (Map 9 & Table 5).

7.3 Conservation International – Biodiversity Hotspots

The distribution of biodiversity around the globe is uneven, with some areas having far greater concentrations of living creatures than others. In an attempt to highlight those biologically rich areas that are under the greatest threat of destruction, Conservation International (CI) has created the concept of "biodiversity hotspots". Twenty-five priority hotspots have been identified, representing a variety of global ecosystems. Selection of these hotspots was based on three criteria: the number of species present, the number of endemic species in an ecosystem and the degree of threat faced. Hotspot areas cover less than 2% of global terrestrial ecosystems, yet account for 44% of all vascular plant species and 38% of birds, mammals, reptiles and amphibian vertebrate groups.

A concept first created by British ecologist Norman Myers, the identification of hotspots is one method of prioritising and targeting conservation activities and investments to have the greatest impact. The concept has been used by Conservation International and others to develop conservation strategies and to focus conservation activities.

The 25 global biodiversity hotspots are located in:

Tropical Andes
Mediterranean region
Madagascar and Indian Ocean Islands
Mesoamerica
Caribbean
Indo-Burma
Brazil's Atlantic Forest Region
Philippines
South Africa's Cape Floristic Region
Mountains of south-central China
Sundaland (in Indonesia, Malaysia, and Brunei Darussalam)
Brazil's Cerrado

Southwestern Australia
Polynesia and Micronesia Island complex, including Hawaii
New Caledonia
Western Ghats of India and the island of Sri Lanka
Darién and Choco regions of Panama and Colombia, and Western Ecuador
California Floristic Province (extending from southern Oregon to the northern part of Baja California)
Africa's western cape/succulent karoo
New Zealand
Central Chile
Guinean forests of West Africa
Caucasus
Eastern Arc Mountains and coastal forests of Tanzania and Kenya
Wallacea (Eastern Indonesia)

A map showing the distribution of CI biodiversity hotspots containing World Heritage sites accompanies this report (Map 10). CI hotspots without World Heritage sites are also mapped (Map 11).

7.4 Vavilov Centres of Plant Genetic Diversity

Russian botanist N.I. Vavilov (1887 - 1943) was known for undertaking systematic plant collection, pioneering research, and for the conservation of crop diversity in the early 20th century. However he became most widely associated with the identification of 12 major geographic regions, that contain highly diverse crop genetic resources. Known as "Vavilov Centres of Plant Genetic Diversity", these centres are believed to be where key cultural plants such as wheat, coffee and maize originate in wild form. They are found in geographical regions such as the Mediterranean, the Mexican highlands, Central China, and the Northern Andes, areas that are characterised by a long agricultural history, ecological diversity, mountainous terrain, cultural diversity, and a lack of heavy forest cover. These centres may or may not be located where a crop was first domesticated; wheat and barley were domesticated in south-west Asia, but a current centre of their varietal diversity is in Ethiopia; the tomato originated in north-west Peru, but the greatest domestic varietal diversity is in Mexico. Here these cultivated plants exist in wild form with a high level of genetic variation, and subsequently have a high adaptation and surviving ability.

As more and more land is used for agriculture and development, wild plants and Vavilov centres are increasingly threatened with extinction. Since cultural plants are based on very few variants, wild plants are essential to maintain and preserve the heritage of genetic variation.

A map (Map 12) and list (Table 8), showing the distribution of Vavilov Centres containing World Heritage sites accompanies this report. Vavilov Centres without World Heritage sites are also mapped (Map 13).

7.5 Endemic Bird Areas (EBAs)

Endemic Bird Areas (EBAs) are hotspots of restricted-range species with a breeding range less than 50,000 km^2. These species are under threat due to high vulnerability to pressures such as destruction of habitat, and therefore are of high importance to the conservation of biodiversity. An EBA encompasses the ranges (part or whole) of at least two endemic restricted-range birds. EBAs have been identified at a global level through the work of the Birdlife Biodiversity Project by Birdlife International.

All EBA's are given a priority rating of High, Urgent or Critical, depending on the biological value and current threat to the site. The biological importance of a site is measured by the number of restricted-range species occurring in an EBA and whether they are shared with other EBAs. Additionally, the size of the EBA is also a factor. The current threat level was assessed on the percentage of the restricted-range species in each EBA that are threatened and the categories of these species. The combination of the aforementioned criteria resulted in an overall priority rating.

Many natural World Heritage properties (71 of 150) were contained within EBAs, consequently it was thought useful to note the ranking system to allow further prioritisation of these sites.

Further details concerning EBAs can be found in "*Endemic Bird Areas of the World: Priorities for their conservation*" (Stattersfield *et al.*, 1998).

A map (Map 14) and list (Table 9), showing the distribution of EBAs containing World Heritage sites accompanies this report. EBAs without World Heritage sites are also mapped (Map 10) and listed (Tables 10 & 11).

8.0 Key Areas for Identified Species

8.1 Critically Endangered Taxa

The 1996 IUCN Red List of Threatened Animals provides taxonomic, conservation status and distribution information on species that have been evaluated using the IUCN Red List categories. This system is designed to determine relative risk of extinction. Its main purpose is to catalogue the species that are regarded as threatened at a global level.

"Critically Endangered" taxa are those facing an extremely high risk of extinction in the wild in the immediate future. These species have low population numbers and are often restricted to small geographical areas.

Using the UNEP-WCMC Species Conservation Database (SCD), critically endangered vertebrates were identified on a country-by-country basis. Map and literature based species distribution records were then used to determine which taxa fell within natural World Heritage properties.

The 1996 Red List can be obtained from IUCN, data can be accessed on-line at: http://www.wcmc.org.uk/species/animals/animal_redlist.html. An updated edition of this publication will be available by the end of 2000.

A map (Map 16) and list (Table 12), showing the distribution of "Critically Endangered" taxa contained within World Heritage sites accompanies this report.

8.2 Marine Turtles

Few reptiles are marine and the sea turtles are the most prominent of these species. This group is almost totally marine dwelling, only the females venture on to the beaches once every two to four years to lay clutches of eggs. It is generally recognised there are seven species, all are listed on the IUCN Red List and many populations have plummeted in recent years.

The Kemp's ridley (*Lepidochelys kempi*) is the least populous and listed as Critically Endangered. Around 3000 nesting females all return to one beach, Rancho Nuevo in the Gulf of Mexico, to lay their eggs. This area does not contain any World Heritage sites.

The hawksbill (*Eretmochelys imbricata*) is also listed as Critically Endangered. Numbers of this species are low mainly, primarily due to commercial trade in tortoiseshell. Many World Heritage sites contain nesting sites such as Aldabra Atoll, Seychelles and Ujung Kulon, Indonesia. The species can be found at feeding grounds within some marine sites such as the Great Barrier Reef, Tubbataha Reef Marine Park, Philippines and Belize Barrier-Reef Reserve System.

The leatherback turtle (*Dermochelys coriacea*), the largest of the species which can measure around two metres in length, is listed as Endangered. This species is also found globally but many populations have plummeted in recent years (to an estimated global total of 34,000 in 1996), leaving the population in the Pacific Ocean close to extinction. The most important rookeries for this species are on the northern coast of French Guiana and Suriname. Serious declines have affected populations on the Pacific coast of Mexico and Terengganu, Malaysia. There are currently no natural World Heritage sites in these areas.

The loggerhead turtle (*Caretta caretta*), which is also classed as Endangered can be found globally. It is estimated that around 30-40% of the world population nests on the south-east coast of the USA. Although no World Heritage sites are found here, one is present in the Everglades National Park, Florida that harbours also a nesting population of loggerheads.

The olive ridley turtle (*Lepidochelys olivacea*) is very similar in size and colour to the Kemp's ridley. Two of the main nesting sites are Escobilla, Mexico and along the beaches of Orissa, India. The Pacific population in Mexico has survived a huge loss of individuals but is making a recovery largely due to intensive conservation programmes. Those in Orissa are endangered by fishing practises of the nearby fleets. There are no World Heritage sites in these areas.

The green turtle (*Chelonia mydas*) is another species with a global distribution and listed as Endangered. Rookeries important for the species include Raine Island, Yemen and Sumatra. There are currently no World Heritage sites in these areas.

The flatback (*Natator depressus*) can be found in the coastal waters of Australia. The distribution of the species includes three World Heritage sites, the Great Barrier Reef, Shark Bay and Kakadu National Park. This is the species of least concern; it is listed as Vulnerable on the IUCN Red List.

There are no World Heritage sites covering the larger turtle nesting beaches. With the exception of the Kemp's Ridley, smaller rookeries can be found within many sites containing a beach element.

A map (Map 17) showing the distribution of marine turtle nesting sites within World Heritage properties (15) accompanies this report.

9.0 Key Habitat Areas

9.1 Ramsar sites

The Convention on Wetlands of International Importance (Ramsar Convention, 1971) is an intergovernmental treaty that aims to provide a framework for conservation and use of wetland sites of international importance. The mission statement declares:

"The Convention's mission is the conservation and wise use of wetlands by national action and international co-operation as a means to achieving sustainable development throughout the world."

The Convention has been ratified by 122 Parties. Currently 1,029 wetland sites are included on the Ramsar List of Wetlands of International Importance, totalling 78.2 million hectares. These sites are important for biodiversity, particularly as many provide habitat for a large variety of wetland birds. Key documents relating to the convention, its implementation and a list of current Ramsar sites can be accessed on-line at:
http://www.ramsar.org/index_key_docs.htm#conv

A list and description (Table 13), showing the distribution of Ramsar sites containing World Heritage properties accompanies this report.

9.2 Marine Biodiversity

Much of this report has focused on terrestrial ecosystems and measures of biodiversity, however the marine environment, which comprises 71% of the earth's surface and averages approximately 3.8km in depth, is also of significant biodiversity value. Although species diversity is low, there is a much greater range of phyla and classes than terrestrial equivalents, some with representatives found only within the marine environment. With approximately six out of ten people inhabiting coastal areas and the many oceans being exploited for food, energy, minerals and natural resources. The importance of this ecosystem cannot be underestimated.

The majority of World Heritage Sites are terrestrial based, however, a few, such as the Great Barrier Reef, Australia and the Belize Barrier-Reef Reserve System are entirely marine. Many sites have coastal borders and extensions into the oceans such as Río Plátano Biosphere Reserve, Honduras and Aldabra Atoll, Seychelles.

9.3 Coral Reefs and Mangroves

Marine sites containing coral and mangrove ecosystems are also in danger of degradation, primarily due to overexploitation.

Coral reefs have been compared to terrestrial rainforest ecosystems in the amount of diversity that exists and productivity. Coral itself is a living structure of the phylum Cnidaria and can be split into reef building and non-reef building groups. Coral reefs are the calcium carbonate structures produced by those reef-building corals. Geographical spread of these structures is essentially confined to between 30°N and 30°S. In recent years coral reefs have been declining mainly due to human impacts such as coastal development, dredging and destructive fishing practises including the uses of dynamite and cyanide.

The current marine World Heritage sites are based on large coral reef systems. The Great Barrier Reef and the Belize Barrier Reef are the two largest barrier reefs in the world. The reef and associated fauna is also protected at Tubbataha Reef Marine Park in the Philippines. The Philippines is host to around 1,500 species of fish and 400 species of coral and the Great Barrier Reef around 1,500 species of fish and 350 species of coral. Other sites include coral reefs within the boundaries of more terrestrial parks such as Aldabra Atoll in the Seychelles.

Coral reefs can be found globally but the reefs surrounding 6 countries account for more than 50% of the total cover. In Australia this is represented by the Great Barrier Reef and to a smaller extent Shark Bay, Western Australia and the Lord Howe Island Group. Important sites in Indonesia are represented by Ujung Kulon National Park and Komodo National Park. There are no natural World Heritage Sites in Papua New Guinea, Fiji or the Maldives.

Mangroves are shrubs and trees that live in the intertidal zone. These are represented by 69 taxa, which although have a wider distribution than the coral reefs, are also restricted to 30°N and 30°S. Mangrove communities are less diverse than reef systems, but are unique in their ability to provide habitat for marine and terrestrial species alike. In addition, they are important in the stabilisation of shorelines and their protection from coastal storms. It has been estimated that over 50% of the world's mangrove forests have already been lost, due to natural and human causes, such as the clearance trees for shrimp farms.

The most species rich mangrove communities are distributed in the Indo-Pacific. This diversity can be seen in World Heritage sites such as, Kakadu National Park and to a lesser extent Shark Bay, Western Australia and Komodo National Park, Indonesia. The Sundarbans, India and Bangladesh are an important remaining site of mangrove diversity. There are no sites containing mangroves in Papua New Guinea, the Philippines or Malaysia.

A map (Map 18) illustrating the distribution of mangroves and coral reefs within World Heritage sites accompanies this report.

10. 0 Key Findings

There are currently 150 natural and mixed (cultural and natural) properties inscribed on the World Heritage list. Using these identified criteria, a coarse GIS analysis was undertaken to determine those natural and mixed World Heritage sites that are of particular importance for biodiversity. Table 1 summarises this information on a site-by-site basis. Further breakdown of this information at criteria level is contained in the "Tables" section of this report.

In summary a total of 141 sites have been identified as being of particular importance for biodiversity in this study. These are represented within 64 countries and extend over 142 million ha of protected areas.

- Criterion (iv) – 95 sites

- Udvardy Biogeographical Provinces

96 provinces currently contain 1 or more natural or mixed World Heritage sites. Provinces best represented include the following:

Mediterreanan Sclerophyll – 9 sites
Oriental Deciduous Forest – 7 sites
East African Woodland/Savannah – 7 sites
West African Woodland/Savannah – 6 sites

- WWF Global 200
  104 sites located in terrestrial ecoregions
  35 sites located in marine ecoregions
  55 located in freshwater ecoregions

It should be noted that some World Heritage sites occur in more than one of these ecoregions

- Centre of Plant Diversity - 74 sites
- Conservation International biodiversity hotspot – 57 sites
- Vavilov Centre of Plant Genetic Diversity - 40
- Endemic Bird Areas - 71 sites (ordered by a priority rating dependent on a combination of biological importance and current threat level).
- Contains "critically endangered" vertebrate taxa – 60 sites
- Ramsar site – 16 sites
- An area of marine importance (classed as one indicator):
  Contains coral reefs – 14 sites
  Contains mangroves – 18 sites
  Contains turtle nesting beaches – 15 sites

In total 6 out of 141 sites contained 8 of the 9 criteria listed above. No natural or mixed World Heritage properties contained all 9 of these indicators. The use of Biogeographical and key global prioritisation tools (such as WWF Ecoregions), suggest that terrestrial ecosystems are better represented within the World Heritage List as compared to marine and wetland environments.

11. 0 Possible Future World Heritage Sites

Using the indicators that have been used to identify natural and mixed World Heritage properties of biodiversity importance, "gaps" in coverage have been identified. At an indicator-by-indicator level these can be summarised as:

- **Centres of Plant Diversity**
  421 Regional CPDs have been identified as not currently containing World Heritage Sites (Table 7).

- **Conservation International biodiversity hotspots**
  5 hotspot areas currently contain no natural World Heritage Sites. These are:
  New Caledonia
  Succulent Karoo
  Brazilian Cerrado
  Central Chile
  Cape Floristic Region

  It should be noted that the Cape Floristic Region was nominated for inscription onto the World Heritage List in January 2000.

- **Vavilov Centres of Plant Genetic Diversity**

There are 4 principal areas currently containing no natural World Heritage Sites. These areas do not have names, however the countries in which they occur and the principal crops originating in these areas are summarised below:

Chile - potato
Brazil – cassava, cocoa, yam
Turkey Iraq Iran – barley, wheat, rye, cabbage
Mexico Guatemala – beans, cotton seed, maize, cassava

- **Endemic Bird Areas**
  153 Endemic Bird Areas have been identified as not containing World Heritage Sites (Table 10). These sites are ranked according to priority. 56 EBAs are considered to be Critical, and thus could have even greater priority of future nomination (Table 11).

Using the same approach as that used to determine World Heritage sites of particular importance for biodiversity, a method of identifying existing protected areas that are of significant biodiversity value and thus could be nominated for future inclusion in the World Heritage list, was undertaken. Protected areas were ranked according to the number of biologically important indicator categories they fell within, in an attempt to prioritise possible future sites. A total of 93 sites were identified (Table 14).

Criteria used included: WWF Global 200 ecoregions, Centres of Plant Diversity, Vavilov centres, the occurrence of "Critically Endangered" vertebrate taxa, or sites of marine importance. Sites with the highest rank (5) are shown in Table 12. Interestingly, Mount Kinabalu National Park (Malaysia) was nominated for inscription onto the list in January 2000.

In an attempt to take this approach a step further, a coarse GIS analysis was undertaken to identify existing Ramsar sites, which are not currently World Heritage sites and are considered important for biodiversity (Table 15). These sites are biologically significant and are well established protected areas, they could therefore potentially be considered even more appropriate for future World Heritage nomination.

To prioritise these sites still further they were ranked according to the number of biodiversity indicator categories they occurred in. The two sites with the highest ranking (fell within 4 out of 6 categories) were:

- Cobourg Peninsula (Australia)
- Ord River floodplain (Australia)

12.0 Limitations of the Study

It is recognised that the use of broad global ecosystem datasets such as WWF Global 200, CPD, CI Biodiversity Hotspots and Vavilov Centres is a relatively broadbrush approach to take. However including other more specific biodiversity criteria has added extra strength and depth to the identification of World Heritage sites of significant biodiversity value.

It is also acknowledged that the methodology used for the analysis is relatively coarse, however it is one method of identifying and prioritising sites of high biodiversity value, that are or could merit inscription on the World Heritage List.

Cross checking the occurrence of biologically important and threatened species within existing World Heritage sites with management authorities and field staff, would enable greater accuracy in determining whether the approach used is indeed valid. However this was not within the scope of the project.

13.0 Conclusions and Recommendations for Future Work

This global overview of World Heritage sites that are of particular importance for biodiversity suggests that while terrestrial ecosystems are well represented, wetland and marine ecosystems are not. Further work is required to identify more comprehensively, potential marine and wetland sites that may merit future inscription to the World Heritage List.

Proposed activities for a future report include:

- The integration of Conservation International (CI) biodiversity 'hotspot' data, to aid prioritisation of potential natural World Heritage sites still further.
- The extension of the threatened taxa dataset to those species considered "Endangered".
- Further analysis of the distribution of current natural and mixed World Heritage sites by Udvardy Biogeographical Province and Bailey's Ecoregion, including their proportional representation (km^2 or ha).
- Additional case studies illustrating World Heritage sites of specific biodiversity value. Existing and future case studies could also be accompanied by maps of each site.
- Provide an updated, detailed table on biodiversity values of all World Heritage properties on a site-by-site basis.
- The identification of which types of biodiversity richness are currently missing from World Heritage sites.
- The provision of additional text and analysis to be made on the use of marine data, as a separate document.

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TABLES

The tables that follow provide a summary of World Heritage sites of particular biodiversity importance.

Table 1. Natural and mixed World Heritage sites of particular importance for biodiversity

Key to table

Code	Description
WWF	WWF Global 200 Ecoregion
CPD	Centre of Plant Diversity
CI	Conservation International Biodiversity Hotspot
EBA	Endemic Bird Area
IV	Listed under natural criterion iv on the WH List
Vavilov	Falls within one of the 12 Vavilov centres of plant genetic diversity

Code	Description
No. of Critically Endangered Taxa	Critically endangered on the IUCN Red List (1996)
Ramsar	Ramsar Convention site
Coral	Coral reef site
Mangrove	Mangroves
Turtle	Sea turtle nesting site

Realm	World Heritage Site	Country	Year	WWF	CPD	CI	EBA	IV	Vavilov	No. of Critically Endangered Taxa	Ramsar	Coral	Mangrove	Turtle
Nearctic	Gros Morne National Park	Canada	1987	YES	NO	NO	NO	NO	NO	0	NO	NO	NO	NO
Nearctic	Miguasha Park	Canada	1999	YES	YES	NO	NO	NO	NO	0	NO	NO	NO	NO
Nearctic	Nahanni National Park	Canada	1978	YES	NO	NO	NO	NO	NO	0	NO	NO	NO	NO
Nearctic	Wood Buffalo National Park	Canada	1983	YES	NO	NO	NO	YES	NO	0	NO	NO	NO	NO
Nearctic	Tatshenshini-Alsek/Kluane/Wrangell-St Elias/Glacier Bay	Canada/USA	1979	YES	NO	NO	NO	YES	NO	0	NO	NO	NO	NO
Nearctic	Carlsbad Caverns	USA	1995	YES	NO	NO	NO	NO	NO	0	NO	NO	NO	NO
Nearctic	Everglades National Park	USA	1979	YES	YES	YES	NO	YES	NO	1	YES	YES	YES	YES
Nearctic	Grand Canyon National Park	USA	1979	YES	NO	NO	NO	YES	NO	1	NO	NO	NO	NO
Nearctic	Great Smoky Mountains National Park	USA	1983	YES	NO	NO	NO	YES	NO	0	NO	NO	NO	NO
Nearctic	Mammoth Cave National Park	USA	1981	YES	NO	NO	NO	YES	NO	0	NO	NO	NO	NO

Realm	World Heritage Site	Country	Year	WWF	CPD	CI	EBA	IV	Vavilov	No. of Critically Endangered Taxa	Ramsar	Coral	Mangrove	Turtle
Nearctic	Redwood National Park	USA	1980	YES	YES	YES	YES	NO	NO	0	NO	NO	NO	NO
Nearctic	Yellowstone	USA	1979	NO	NO	NO	NO	YES	NO	0	NO	NO	NO	NO
Nearctic	Yosemite National Park	USA	1984	YES	YES	YES	NO	NO	NO	0	NO	NO	NO	NO
Palearctic	Pirin National Park	Bulgaria	1983	YES	YES	NO	NO	NO	YES	0	NO	NO	NO	NO
Palearctic	Srebarna Nature Reserve	Bulgaria	1983	NO	NO	NO	NO	YES	NO	0	YES	NO	NO	NO
Palearctic	Huanglong Scenic and Historic Interest Area	China	1992	YES	YES	YES	YES	NO	YES	0	NO	NO	NO	NO
Palearctic	Jiuzhaigou Valley Scenic and Historic Interest Area	China	1992	YES	YES	YES	YES	NO	YES	0	NO	NO	NO	NO
Palearctic	Mount Emei and Leshan Giant Buddha	China	1996	YES	NO	NO	YES	YES	YES	1	NO	NO	NO	NO
Palearctic	Mount Huangshan	China	1990	YES	NO	NO	YES	YES	YES	0	NO	NO	NO	NO
Palearctic	Mount Taishan	China	1987	NO	NO	NO	NO	NO	YES	0	NO	NO	NO	NO
Palearctic	Mount Wyui	China	1999	YES	YES	NO	NO	YES	YES	1	NO	NO	NO	NO
Palearctic	Wulingyuan Scenic and Historic Interest Area	China	1992	YES	NO	NO	NO	NO	YES	0	NO	NO	NO	NO
Palearctic	Plitvice Lakes National Park	Croatia	1979	YES	NO	NO	NO	NO	YES	0	NO	NO	NO	NO
Palearctic	Cape Girolata, Cape Porto & Scandola Nature Reserves in Corsica	France	1983	YES	YES	YES	NO	YES	YES	0	NO	NO	NO	NO
Palearctic	Pyrénées - Mont Perdu	France/Spain	1997	YES	YES	NO	NO	NO	YES	1	NO	NO	NO	NO
Palearctic	Ohrid Region with its Cultural and Historical Aspect and its Natural Environment	FYRM	1979	YES	NO	NO	NO	NO	YES	0	NO	NO	NO	NO
Palearctic	Meteora	Greece	1988	YES	NO	YES	NO	NO	YES	0	NO	NO	NO	NO
Palearctic	Mount Athos	Greece	1988	YES	NO	YES	NO	NO	YES	0	NO	NO	NO	NO
Palearctic	Yakushima	Japan	1993	YES	YES	NO	YES	NO	NO	0	NO	NO	NO	YES
Palearctic	Royal Chitwan National Park	Nepal	1984	YES	NO	YES	NO	YES	YES	0	NO	NO	NO	NO

Realm	World Heritage Site	Country	Year	WWF	CPD	CI	EBA	IV	Vavilov	No. of Critically Endangered Taxa	Ramsar	Coral	Mangrove	Turtle
Palearctic	Laurisilva of Madeira	Portugal	1999	YES	YES	YES	YES	YES	NO	2	NO	NO	NO	NO
Palearctic	Danube Delta	Romania	1991	YES	NO	NO	NO	YES	NO	2	YES	NO	NO	NO
Palearctic	Golden Mountains of Altai	Russia	1998	YES	YES	NO	NO	YES	NO	0	NO	NO	NO	NO
Palearctic	Lake Baikal	Russia	1996	YES	YES	NO	NO	YES	NO	0	YES	NO	NO	NO
Palearctic	Virgin Komi Forests	Russia	1995	YES	NO	NO	NO	NO	NO	0	NO	NO	NO	NO
Palearctic	Volcanoes of Kamchatka	Russia	1996	YES	NO	NO	NO	NO	NO	0	NO	NO	NO	NO
Palearctic	Western Caucasus	Russia	1999	YES	YES	YES	NO	YES	NO	0	NO	NO	NO	NO
Palearctic	Caves of Aggtelek and Slovak Karst	Slovakia	1995	YES	NO	NO	NO	NO	NO	0	NO	NO	NO	NO
Palearctic	Skocjan Caves	Slovenia	1986	YES	NO	NO	NO	NO	YES	0	YES	NO	NO	NO
Palearctic	Doñana National Park	Spain	1994	YES	NO	YES	NO	YES	YES	0	YES	NO	NO	NO
Palearctic	Garajonay National Park	Spain	1986	YES	YES	YES	YES	NO	NO	0	NO	NO	NO	NO
Palearctic	Ibiza, Biodiversity and Culture	Spain	1999	YES	YES	YES	NO	YES	YES	0	NO	NO	NO	NO
Palearctic	Arabian Oryx Sanctuary	Sultanate of Oman	1994	YES	NO	NO	NO	YES	NO	0	NO	NO	NO	NO
Palearctic	The Lapponian Area	Sweden	1996	YES	NO	NO	NO	NO	NO	0	NO	NO	NO	NO
Palearctic	Ichkeul National Park	Tunisia	1980	YES	NO	YES	NO	YES	YES	1	YES	NO	NO	NO
Palearctic	Göreme National Park and the Rock Sites of Cappodicia	Turkey	1985	NO	YES	NO	NO	NO	YES	0	NO	NO	NO	NO
Palearctic	Hierapolis-Pamukkale	Turkey	1988	YES	YES	YES	NO	NO	YES	0	NO	NO	NO	NO
Palearctic	Giant's Causeway and Causeway Coast	UK	1986	YES	NO	NO	NO	NO	NO	1	NO	NO	NO	NO
Palearctic	Gough Island Wildlife Reserve	UK	1995	NO	NO	NO	YES	YES	NO	0	NO	NO	NO	NO
Palearctic	St. Kilda	UK	1986	YES	NO	NO	NO	YES	NO	0	NO	NO	NO	NO
Palearctic	Durmitor National Park	Yugoslavia	1980	YES	NO	NO	NO	YES	YES	0	NO	NO	NO	NO
Afrotropical	Dja Faunal Reserve	Cameroon	1984	YES	YES	NO	YES	YES	NO	1	NO	NO	NO	NO
Afrotropical	Parc National de Manovo-Gounda-St Floris	Central African Republic	1988	YES	NO	NO	NO	YES	NO	1	NO	NO	NO	NO

Realm	World Heritage Site	Country	Year	WWF	CPD	CI	EBA	IV	Vavilov	No. of Critically Endangered Taxa	Ramsar	Coral	Mangrove	Turtle
Afrotropical	Taï National Park	Côte d'Ivoire	1982	YES	YES	YES	YES	YES	NO	0	NO	NO	NO	NO
Afrotropical	Mount Nimba Reserves	Côte d'Ivoire /Guinea	1982	YES	YES	YES	YES	YES	NO	0	NO	NO	NO	NO
Afrotropical	Garamba National Park	Dem. Rep. of Congo	1980	YES	YES	NO	NO	YES	NO	1	NO	NO	NO	NO
Afrotropical	Kahuzi-Biega National Park	Dem. Rep. of Congo	1980	YES	YES	NO	YES	YES	NO	0	NO	NO	NO	NO
Afrotropical	Okapi Faunal Reserve	Dem. Rep. of Congo	1996	YES	NO	NO	YES	YES	NO	0	NO	NO	NO	NO
Afrotropical	Salonga National Park	Dem. Rep. of Congo	1984	YES	YES	NO	NO	NO	NO	0	NO	NO	NO	NO
Afrotropical	Virunga National Park	Dem. Rep. of Congo	1979	YES	YES	NO	YES	YES	NO	1	YES	NO	NO	NO
Afrotropical	Simien National Park	Ethiopia	1978	YES	YES	NO	YES	YES	NO	2	NO	NO	NO	NO
Afrotropical	Mount Nimba Reserves (Guinea section)	Guinea	1981	YES	YES	YES	YES	YES	NO	0	NO	NO	NO	NO
Afrotropical	Mount Kenya National Park/Natural Forest	Kenya	1997	YES	YES	NO	YES	NO	YES	1	NO	NO	NO	NO
Afrotropical	Sibiloi/Central Island National Parks	Kenya	1997	YES	NO	NO	NO	YES	YES	0	NO	NO	NO	NO
Afrotropical	Tsingy de Bemaraha Strict Nature Reserve	Madagascar	1990	YES	YES	YES	YES	YES	NO	1	NO	NO	NO	NO
Afrotropical	Lake Malawi National Park	Malawi	1984	YES	NO	NO	NO	YES	NO	0	NO	NO	NO	NO
Afrotropical	Banc d'Arguin National Park	Mauritania	1989	YES	NO	NO	NO	YES	NO	2	YES	NO	YES	YES
Afrotropical	Air and Ténéré Natural Reserves	Niger	1991	NO	YES	NO	NO	YES	NO	0	No	NO	NO	NO
Afrotropical	'W' National Park	Niger	1996	NO	NO	NO	NO	YES	NO	1	YES	NO	NO	NO
Afrotropical	Djoudj National Bird Sanctuary	Senegal	1981	NO	NO	NO	NO	NO	NO	0	YES	NO	NO	NO
Afrotropical	Niokolo-Koba National Park	Senegal	1981	NO	NO	NO	NO	YES	NO	0	NO	NO	NO	NO

Realm	World Heritage Site	Country	Year	WWF	CPD	CI	EBA	IV	Vavilov	No. of Critically Endangered Taxa	Ramsar	Coral	Mangrove	Turtle
Afrotropical	Vallée de Mai Nature Reserve	Seychelles	1983	NO	YES	YES	YES	YES	NO	1	NO	NO	NO	NO
Afrotropical	Greater St. Lucia Wetland Park	South Africa	1999	YES	YES	NO	YES	YES	NO	1	NO	YES	YES	YES
Afrotropical	Kilimanjaro National Park	Tanzania	1989	YES	YES	NO	YES	NO	NO	1	NO	NO	NO	NO
Afrotropical	Ngorongoro Conservation Area	Tanzania	1979	YES	NO	NO	YES	YES	NO	1	NO	NO	NO	NO
Afrotropical	Selous Game Reserve	Tanzania	1982	YES	NO	YES	YES	YES	NO	1	NO	NO	NO	NO
Afrotropical	Serengeti National Park	Tanzania	1981	YES	NO	NO	YES	YES	NO	1	NO	NO	NO	NO
Afrotropical	Bwindi Impenetrable National Park	Uganda	1994	YES	YES	NO	YES	YES	NO	1	NO	NO	NO	NO
Afrotropical	Rwenzori Mountains National Park	Uganda	1994	YES	YES	NO	YES	YES	NO	1	YES	NO	NO	NO
Afrotropical	Mana Pools National Park, Sapi and Chewore Safari Areas	Zimbabwe	1984	YES	NO	NO	NO	YES	NO	1	NO	NO	NO	NO
Afrotropical	Victoria Falls/Mosi-oa-Tunya	Zimbabwe/ Zambia	1989	YES	NO	NO	NO	NO	NO	0	NO	NO	NO	NO
Indomalayan	The Sundarbans	Bangladesh	1997	YES	YES	NO	NO	YES	YES	1	YES	NO	YES	YES
Indomalayan	Kaziranga National Park	India	1985	NO	NO	YES	YES	YES	YES	1	NO	NO	NO	NO
Indomalayan	Keoladeo National Park	India	1985	NO	NO	NO	NO	YES	YES	0	NO	NO	NO	NO
Indomalayan	Manas Wildlife Sanctuary	India	1985	NO	NO	YES	YES	YES	YES	1	NO	NO	NO	NO
Indomalayan	Nanda Devi National Park	India	1988	NO	YES	NO	YES	YES	YES	0	NO	NO	NO	NO
Indomalayan	Sundarbans National Park	India	1987	YES	NO	NO	NO	YES	YES	1	NO	NO	YES	NO
Indomalayan	Komodo National Park	Indonesia	1991	YES	NO	YES	YES	YES	YES	1	NO	YES	NO	YES
Indomalayan	Lorentz National Park	Indonesia	1999	YES	YES	NO	YES	YES	YES	0	NO	NO	YES	NO
Indomalayan	Ujung Kulon National Park	Indonesia	1991	YES	YES	YES	YES	YES	YES	3	NO	NO	YES	YES
Indomalayan	Puerto-Princesa Subterranean River National Park	Philippines	1999	YES	YES	YES	YES	YES	NO	1	NO	NO	NO	NO
Indomalayan	Tubbataha Reef Marine Park	Philippines	1993	YES	NO	YES	NO	YES	NO	1	YES	NO	NO	NO
Indomalayan	Thung Yai - Huai Kha Kaeng Wildlife Sanctuaries	Thailand	1991	YES	YES	YES	NO	YES	YES	1	NO	NO	NO	NO
Indomalayan	Ha Long Bay	Viet Nam	1994	YES	NO	YES	NO	NO	YES	0	NO	NO	NO	NO

Realm	World Heritage Site	Country	Year	WWF	CPD	CI	EBA	IV	Vavilov	No. of Critically Endangered Taxa	Ramsar	Coral	Mangrove	Turtle
Oceania	Lord Howe Island Group	Australia	1982	YES	YES	NO	YES	YES	NO	1	NO	YES	NO	NO
Oceania	East Rennell	Solomon Islands	1998	YES	NO	NO	YES	NO	NO	0	NO	YES	NO	NO
Oceania	Henderson Island	Pitcairn Islands/UK	1988	NO	NO	YES	YES	YES	NO	0	NO	YES	NO	NO
Oceania	Hawaii Volcanoes National Park	USA	1987	YES	NO	YES	YES	NO	NO	1	NO	NO	NO	YES
Australian	Australian Fossil Mammal Sites	Australia	1994	YES	YES	NO	YES	NO	NO	0	NO	NO	NO	NO
Australian	Central Eastern Australian Rainforest	Australia	1986	YES	YES	NO	YES	YES	NO	0	NO	NO	NO	NO
Australian	Fraser Island	Australia	1992	YES	NO	NO	YES	NO	NO	0	NO	NO	YES	NO
Australian	Great Barrier Reef	Australia	1981	YES	YES	NO	NO	YES	NO	1	NO	YES	YES	YES
Australian	Kakadu National Park	Australia	1981	YES	YES	NO	YES	YES	NO	1	YES	NO	YES	NO
Australian	Macquarie Island	Australia	1997	YES	YES	NO	NO	NO	NO	0	NO	NO	NO	NO
Australian	Shark Bay	Australia	1991	YES	YES	YES	NO	YES	NO	1	NO	YES	YES	YES
Australian	Tasmanian Wilderness	Australia	1982	YES	YES	NO	YES	YES	NO	1	NO	NO	NO	NO
Australian	Uluru-Kata Tjuta National Park	Australia	1987	YES	YES	NO	NO	NO	NO	0	NO	NO	NO	NO
Australian	Wet Tropics of Queensland	Australia	1988	YES	YES	NO	YES	YES	NO	4	NO	YES	YES	NO
Australian	Willandra Lakes Region	Australia	1981	YES	NO	NO	YES	NO	NO	0	NO	NO	NO	NO
Antarctic	New Zealand Sub-Antarctic Islands	New Zealand	1998	YES	YES	NO	YES	YES	NO	0	NO	NO	NO	NO
Antarctic	Te Wahipounamu-South West New Zealand	New Zealand	1990	YES	NO	YES	YES	YES	NO	1	NO	NO	NO	NO
Antarctic	Tongariro National Park	New Zealand	1988	YES	NO	YES	YES	NO	NO	0	NO	NO	NO	NO

Realm	World Heritage Site	Country	Year	WWF	CPD	CI	EBA	IV	Vavilov	No. of Critically Endangered Taxa	Ramsar	Coral	Mangrove	Turtle
Neotropical	Los Glaciares	Argentina	1981	YES	YES	NO	YES	NO	NO	0	NO	NO	NO	NO
Neotropical	Península Valdés	Argentina	1999	YES	YES	NO	NO	YES	NO	0	NO	NO	NO	NO
Neotropical	Belize Barrier Reef Reserve system	Belize	1996	YES	NO	YES	NO	YES	NO	1	NO	YES	YES	YES
Neotropical	Discovery Coast Atlantic Forest Reserves	Brazil	1999	YES	YES	YES	YES	YES	NO	4	NO	NO	NO	NO
Neotropical	Iguaçu National Park	Brazil	1984	YES	NO	YES	YES	YES	NO	2	NO	NO	NO	NO
Neotropical	Southeast Atlantic Forest Reserves	Brazil	1999	YES	YES	YES	YES	YES	NO	1	NO	NO	NO	NO
Neotropical	Los Katios National Park	Colombia	1994	YES	YES	YES	YES	YES	NO	3	NO	NO	NO	NO
Neotropical	Area de Conservación Guanacaste	Costa Rica	1999	YES	NO	YES	YES	NO	NO	1	NO	YES	NO	NO
Neotropical	Cocos Island National Park	Costa Rica	1997	NO	NO	NO	YES	YES	NO	1	YES	YES	NO	NO
Neotropical	Talamanca Range-La Amistad Reserves	Costa Rica/Panama	1983	YES	YES	YES	YES	YES	NO	2	NO	NO	NO	NO
Neotropical	Desembarco del Granma National Park	Cuba	1999	YES	YES	YES	YES	NO	NO	1	NO	YES	YES	NO
Neotropical	Morne Trois Pitons National Park	Dominica	1997	NO	YES	YES	YES	YES	NO	0	NO	NO	NO	NO
Neotropical	Galápagos Islands	Ecuador	1978	YES	NO	NO	YES	YES	NO	4	NO	YES	NO	YES
Neotropical	Sangay National Park	Ecuador	1983	YES	YES	YES	YES	YES	NO	0	NO	NO	NO	NO
Neotropical	Tikal National Park	Guatamala	1979	NO	YES	YES	NO	YES	NO	0	NO	NO	NO	NO
Neotropical	Río Plátano Biosphere Reserve	Honduras	1982	YES	YES	YES	YES	YES	NO	2	NO	NO	YES	YES
Neotropical	Sian Ka'an	Mexico	1987	YES	NO	YES	NO	YES	NO	1	NO	NO	YES	YES
Neotropical	Whale Sanctuary of El Vizcaino	Mexico	1993	YES	YES	NO	NO	YES	NO	3	NO	NO	YES	NO
Neotropical	Darién National Park	Panama	1981	YES	YES	YES	YES	YES	NO	3	NO	NO	NO	NO
Neotropical	Historic Sanctuary of Macchu Picchu	Peru	1983	YES	YES	YES	YES	NO	YES	0	NO	NO	NO	NO
Neotropical	Huascarán National Park	Peru	1985	YES	YES	YES	YES	NO	YES	0	NO	NO	NO	NO
Neotropical	Río Abiseo National Park	Peru	1990	YES	YES	YES	YES	YES	YES	1	NO	NO	NO	NO
Neotropical	Canaima National Park	Venezuela	1994	YES	YES	NO	YES	YES	NO	0	NO	NO	NO	NO

Table 2. Natural World Heritage Sites listed under Criterion iv
(important and significant natuarl habitats for in-situ conservation of biological diversity)

Site	Country	Description
Península Valdés	Argentina	PenínsulaValdés contains very important and significant natural habitats for the in-situ conservation of several threatened species of outstanding universal value. It is a site of global significance for the conservation of marine mammals. It shelters an important breeding population of the endangered southern right whale as well as breeding populations of southern elephant seals and southern sea lions.
Central Eastern Australian Rainforest	Australia	This site, comprising several protected areas, is located predominantly along the Great Escarpment on Australia's East Coast. The outstanding geological features displayed around shield volcanic craters and the high number of rare and threatened rainforest species are of international significance for science and conservation.
Great Barrier Reef	Australia	A site of remarkable variety and beauty on the northeastern coast of Australia, the Great Barrier Reef contains the world's largest collection of coral reefs, with 400 types of coral, 1,500 species of fish, and 4,000 types of mollusc. It also holds great scientific interest, as the habitat of species, such as the dugong and the green turtle, which are threatened with extinction.
Kakadu	Australia	A unique example of a complex of ecosystems, including tidal flats, floodplains, lowlands and plateau, providing habitat for a wide range of rare or endemic species of plants and animals.
Lord Howe Island Group	Australia	A remarkable example of isolated oceanic islands, born of volcanic activity more than 2,000 metres under the sea. These islands boast a spectacular topography and protect numerous endemic species, especially birds.
Shark Bay, Western Australia	Australia	Shark Bay, with its islands and surrounding land has three exceptional natural features: its vast marine herbariums, which are the largest (4,800 square kilometres) and richest in the world, its dugong ('sea cow') population, and its stromatolites (colonies of algae which grow up alongside the mounds are among the oldest forms of life on earth). Shark Bay also shelters five species of endangered mammals.
Tasmanian Wilderness	Australia	Covering an area of over 1 million ha, the site constitutes one of the last expanses of temperate rainforest in the world.
Wet tropics of Queensland	Australia	The area, located in the far northeast of Australia, is made up largely of tropical humid forests. This biotope offers a particularly extensive and varied array of plants, as well as marsupials and singing birds, along with other rare and endangered animals and plant species.
The Sundarbans	Bangladesh	The Sundarbans mangrove forest, one of the largest such forests in the world, is formed at the delta of the Ganges, Bramaputra and Meghna rivers on the Bay of Bengal. The site is composed of three sanctuaries (Sundarbans West, South, and East) with a total area of 140,000 hectares. The three sanctuaries, intersected by a complex network of tidal waterways, mud flats and small islands of salt-tolerant mangrove forests, present an excellent example of on- going ecological processes, displaying the effects of monsoon rains, delta formation, tidal influence and plant colonization. The area is known for its wide range of fauna including 260 bird species, the Royal Bengal tiger and other threatened species, such as the estuarine crocodile and the Indian python.

Site	Country	Description
Belize Barrier-Reef Reserve System	Belize	The coastal area of Belize is an outstanding natural system consisting of the largest barrier reef in the northern hemisphere, offshore atolls, several hundred sand cays, mangrove forests, coastal lagoons, and estuaries. The seven sites included in this nomination illustrate the evolutionary history of reef development, provide spectacular underwater scenery, and are a significant habitat for threatened species, including marine turtles, manatee, and the American marine crocodile.
Discovery Coast Atlantic Forest Reserves	Brazil	The site contains a distinct range of species with a high level of endemism and reveals a pattern of evolution of great interest to science and of importance for conservation. The site displays the biological richness and evolutionary history of the few remaining areas of Atlantic forest of north-east Brazil. The fact that only these few scattered remnants of a once vast forest remain, make them an irreplaceable part of the world's forest heritage.
Iguazú National Park	Brazil	Some 80m high and 2,700m in diameter, on a basaltic line spanning the border between Argentina and Brazil, the waterfall located in the heart of this site is one of the most spectacular in the world. Made up of many cascades producing vast sprays of water and surrounded by sub-tropical rainforest with over 2,000 species of vascular plants, it is home to typical wildlife of the region: tapirs, giant anteaters, howling monkeys, ocelots, jaguars, caymans.
The Atlantic Forests South-East Reserves	Brazil	The Atlantic Forests (Southeast) contain the best and largest remaining examples of Atlantic forest in the south-east region of Brazil. The 25 protected areas that make up the site display the biological richness and evolutionary history of the few remaining areas of Atlantic forest of south-east Brazil. The area is also exceptionally diverse with high numbers of rare and endemic species.
Srebarna Nature Reserve	Bulgaria	The Srebarna Nature Reserve is a fresh-water lake supplied by the Danube river, extending over 600 ha. The site is the breeding ground of approximately 100 bird species, many of which are internationally threatened. Some 80 other bird species migrate here annually.
Dja Faunal Reserve	Cameroon	This is one of the largest and best protected humid forests in Africa. Almost completely surrounded by the Dja River, which forms its natural boundary, the reserve is especially noted for its biodiversity and a wide variety of primates.
Wood Buffalo National Park	Canada	Located in the plains in the north-central region of Canada, this park houses the largest population of wild bison in North America and is the natural nesting place of the whooping crane. The largest inland delta in the world, the one of the rivers Peace and Athabasca, is one of the natural attractions of the park.
Tatshenshini-Alsek/Kluane/Wrangell -St Elias/Glacier Bay	Canada/USA	These parks comprise an impressive complex of glaciers and high peaks on either side of the frontier between Canada and the United States of America (Alaska). These spectacular natural landscapes are home to many grizzly bears, caribou and Dall sheep.
Manovo-Gounda St Floris National Park	Central African Republic	The importance of this park rests with its wealth of flora and fauna. Its vast savannahs provide shelter for a wide variety of species: black rhinoceroses, elephants, cheetahs, leopards, wild dogs, red- fronted gazelles and buffaloes, while different types of waterfowl are to be found in the northern flood-plains.

Site	Country	Description
Mount Emei Scenic Area, including Leshan Giant Buddha Scenic Area	China	Biologically, the area supports a high diversity of plant and animal species including a number of endemic and globally threatened species. 3,200 plant species in 242 families have been recorded, of which 31 are under national protection, representing approximately one third of the total number of plants in the Sichuan province and one tenth of those found in China. 2,300 animal species have been recorded of which 29 are under national protection, 157 species being threatened or endemic animals to China.
Mount Wuyi	China	The area has what is probably the largest and best-preserved area humid subtropical native forest in the world. Of particular importance is the very high levels of biodiversity and the significant number of threatened species
Los Katios	Colombia	Extending over 72,000 hectares in north-western Colombia, Los Katios National Park comprises low hills, forests and humid plains. An exceptional biological diversity can be found in the park, which is home to many threatened animal species, as well as many endemic plants.
Cocos Island National Park	Costa Rica	Cocos Island National Park, located 550 km off the Pacific Coast of Costa Rica, is the only island in the tropical eastern Pacific with a humid tropical forest. Its position as the first point of contact with the northern equatorial counter current and the of interactions between the island and the surrounding marine ecosystem make the area an ideal laboratory for the study of biological processes. Marine area of the national park is one of the best places in the world to view large pelagic species such as sharks, rays, tuna and dolphins.
The Area de Conservación Guanacaste	Costa Rica	The Area de Conservación Guanacaste contains important natural habitats for the conservation of biological diversity, including the best dry forest habitats and communities from Central America to northern Mexico and key habitat for threatened or rare plant and animal species. The site demonstrates significant ecological processes in both its terrestrial and marine-coastal environments. These processes include: the evolution, succession and restoration of Pacific Tropical Dry Forest; altitudinal migration and other interactive biogeographic and ecological processes and major upwelling and the development of coral colonies and reefs.
Comoé National Park	Cote d'Ivoire	One of the largest protected areas in West Africa, this park is characterised by very great plant diversity. Due to the presence of the Comoé River, it contains plants that are normally only found much farther south, such as shrub savannahs and patches of thick rain forest.
Taï National Park	Côte d'Ivoire	This park is one of the last important remnants of the primary tropical forest of West Africa. Its rich natural flora, and threatened mammal species, such as the pygmy hippopotamus and eleven species of monkey, are of great scientific interest.
Mount Nimba Reserves	Côte d'Ivoire /Guinea	Located between Guinea and Côte d'Ivoire, Mount Nimba rises above the surrounding savannah. Its slopes, covered by dense forest at the foot of grassy mountain pastures, harbour an especially rich flora and fauna, with endemic species such as the viviparous toad and chimpanzees that use stones as tools.
Garamba National Park	Democratic Rep. Of Congo	Immense savannahs, grasslands or woodlands, interspersed with gallery forests along the river banks and swampy depressions, protect four large mammals: the elephant, giraffe, hippopotamus and white rhinoceros of which some 30 individuals remain.

Site	Country	Description
Kahuzi-Biega National Park	Democratic Rep. Of Congo	A vast area of primary tropical forest dominated bytwo spectacular extinct volcanoes, Kahuzi and Biega, the park is populated with a diverse and abundant fauna. One of the last groups of mountain gorillas lives between 2,100 and 2,400 metres above sea level.
Okapi Faunal Reserve	Democratic Rep. Of Congo	The Okapi Wildlife Reserve occupies one fifth of the Ituri Forest in the north-east of the Democratic Republic of Congo. The Zaïre River basin, of which the reserve and forest are a part, is one of the largest drainage systems in Africa and has yielded a large number of major evolutionary discoveries. The wildlife reserve contains threatened species of primates and birds and about 5,000 of the estimated 30,000 okapi surviving in the wild. The reserve also contains dramatic scenic values including waterfalls on the Ituri and Epulu rivers.
Virunga National Park	Democratic Rep. of Congo	The park of Virunga offers within its 790,000 ha an incomparable diversity of habitats: from swamps and steppes to the snowfields of Rwenzori at an altitude of over 5,000 m, and from the lava plains to the savannahs on the slopes of the volcanoes. Some 20,000 hippopotamuses live in its rivers, mountain gorillas refuge there and birds from Siberia winter there.
Morne Trois Pitons National Park	Dominica	Luxuriant natural tropical forest blends with volcanic features of high scenic appeal and scientific interest in this national park centered on the 1,342 m high volcano bearing the name of Morne Trois Pitons. With its precipitous slopes and deeply-incised valleys, fifty fumaroles and hot springs, freshwater lakes, a "boiling lake" and five volcanoes, located on the nearly 7,000-hectare park, together with the richest biodiversity in the Lesser Antilles, Morne Trois Pitons National Park presents a rare combination of natural features of World Heritage value.
Galápagos Islands	Ecuador	These volcanic islands have been called a unique "living museum and showcase of evolution". One-third of the island chain's vascular land plants are endemic, while endemic fauna includes invertebrate, reptile and bird species. The presence of unusual animal life - such as the land iguana, the giant tortoise, and the many types of finches - inspired Charles Darwin in his theory of evolution, following his visit there in 1835.
Sangay National Park	Ecuador	Sangay National Park is considered to have an extremely complex ecological composition and has received the highest resource analysis rating of any park in Ecuador. Its natural regions, terrestrial and aquatic ecosystems, physiographic formations, geology, history and other unique characteristics make it the most outstanding protected area in mainland Ecuador. Important indigenous species occurring in the park include the mountain tapir and the Andean condor.
Simien National Park	Eithiopia	The park is valued particularly for its flora and fauna, which, due to extreme topography and altitudinal range, remain relatively intact. The park is the refuge for threatened animals such as gelada baboon, Simen fox and Walia ibex, a goat species endemic to the Simien Mountains.
Cape Girolata, Cape Porto & Scandola Nature Reserves in Corsica	France	The nature reserve, part of the Regional Natural Park of Corsica, occupies the Scandola peninsula, an impressive porphyritic rock mass. Its vegetation is a good example of scrubland. Seagulls, cormorants and sea eagles can be found there. The clear waters, with the islets and inaccessible caves, host a rich marine life.

Site	Country	Description
Tikal National Park	Guatemala	Together with Sierra de las Minas Biosphere Reserve, Tika is the most important reserve in the country, because of its archaeological and bio/ecological interest. Rivers, lakes, swamps and flooding savanna ecosystems are important for biodiversity and migratory birds. The reserve contains the largest area of tropical rain forest in Guatemala and Central America, with a wide range of unspoilt natural habitats. A considerable number of threatened and CITES listed species are also found within the reserve.
Río Plátano Biosphere Reserve	Hondouras	Located in the watershed of the Río Plátano , the mountainous reserve, is one of the few remains of a humid tropical forest in Central America and contains abundant and varied plant- and wildlife.
Kaziranga National Park	India	In the heart of the Assam, this park is one of the last areas in northern India undisturbed by man. It harbours largest population of one-horned rhinoceroses in the world, as well many mammals, including tigers, elephants, panthers, bears, and thousands of bird species.
Keoladeo National Park	India	A former duck-hunting reserve of the Maharajas, this site remains one of the major wintering areas for large numbers of aquatic birds from Afghanistan, Turkmenistan, China and Siberia. Some 364 species of birds, including the rare Siberian crane, have been recorded in the park.
Manas Wildlife Sanctuary	India	On a gentle slope in the foothills of the Himalayas, where wooded hills give way to alluvial grasslands and tropical forests, the Manas sanctuary is home to a great variety of wildlife, including many endangered species, such as the tiger, the pygmy hog, and the Indian rhinoceros and elephant.
Nanda Devi National Park	India	The Nanda Devi National Park is one of the most spectacular wilderness areas in the Himalayas, and is dominated by the peak of Nanda Devi, which reaches over 7,800 metres. No humans live in the park, which has remained more or less intact because of its inaccessibility. It is the habitat of several endangered mammals, including the snow leopard, Himalayan musk deer and bharal.
The Sundarbans	India	The Sundarbans cover 10,000 km^2 of land and water in the Ganges delta. Occurring in India and Bangladesh, the site contains the world's largest region of mangrove forests, with 36 true mangrove, 28 associated and seven obligatory mangrove species representing 29 families and 49 genera. Apart from being the only mangrove forest in the world inhabited by the tiger, the Sundarbans contains a rich and unique biota, with a notable number of threatened reptiles.
Komodo National Park	Indonesia	These volcanic islands are inhabited by a population of around 5,700 giant lizards, whose appearance and aggressive behaviour have led them to be called "Komodo dragons". They exist nowhere else and are of great interest for scientists studying the theory of evolution. The rugged hillsides of dry savannah and pockets of thorny green vegetation contrast starkly with the brilliant white sandy beaches and blue waters surging over coral.
Lorentz National Park	Indonesia	The largest protected area in Southeast Asia (2.5 million ha). It is the only protected area in the world which incorporates a continuous, intact transect from snow cap to tropical marine environment, including extensive lowland wetlands. The area supports the highest level of biodiversity in the region. It also contains fossil sites which record the evolution of life on New Guinea.

Site	Country	Description
Ujung Kulon National Park and Krakatan National Reserve	Indonesia	This national park, located in the extreme south-west tip of Java on the Sunda Shelf, includes the Ujung Kulon peninsula and several offshore islands, and encompasses the natural reserve of Krakatoa. In addition to its natural beauty and geological interest - especially for the study of inland volcanoes - it contains the largest remaining area of lowland rainforests in the Java plain.
Mount Kenya	Kenya	Mount Kenya, 5,199 m, is the second highest peak in Africa. It is an ancient extinct volcano, during whose period of activity (3.1 - 2.6 million years ago) it is thought to have risen to 6,500m. There are twelve remnant glaciers on the mountain, all receding rapidly, and four secondary peaks that sit at the head of the U-shaped glacial valleys. The area inscribed includes the upper slopes of the mountain, and two salients which make up the National Park and surrounding Forest Reserve. With its rugged glacier-clad summits and forested middle slopes, Mount Kenya is one of the most impressive landscapes in Eastern Africa. The evolution and ecology of its afro-alpine flora also provide an outstanding example of ecological processes.
Sibiloi/Central Island National Parks	Kenya	Sibiloi National Park is situated on the east shore of Lake Turkana in northern Kenya. Lake Turkana's ecosystem with its diverse bird life and desert environment offers an exceptional laboratory for studies of plant and animal communities. The lake is also one of Africa's most important breeding areas for the Nile crocodile.
Tsingy de Bemaraha Strict Nature Reserve	Madagascar	Tsingy de Bemaraha Strict Nature Reserve is made up of karstic landscapes and limestone uplands cut into impressive "tsingy" peaks and a "forest" of limestone needles, the spectacular canyon of the Manambolo River, rolling hills and high peaks. The undisturbed forests, lakes and mangrove swamps are the habitat for rare and endangered lemurs and birds.
Lake Malawi National Park	Malawi	Located at the southern end of the immense Lake Malawi, with its deep and clear waters and background of mountains, Lake Malawi National Park protects many hundreds of cichlid fish species, nearly all endemic. Its importance in the study of evolution is comparable to that of the finches of the Galápagos Islands.
Banc d'Arguin National Park	Mauritania	Fringing the Atlantic coast, the park is made up of sand dunes, coastal swamps, small islands and shallow coastal waters. The austerity of the desert and the biodiversity of the marine zone result in a land and seascape of exceptional contrasting natural value. A wide variety of migrating birds spend the winter there. Several species of sea turtle and dolphin, which fishermen use to attract shoals of fish, can also be found.
Sian Ka'an	Mexico	Located on the east coast of the Yucatan peninsula, this biosphere reserve contains tropical forests, mangroves and marshes, a large marine section intersected by a barrier reef, and provides a habitat for an abundance of fauna and flora.
Whale Sanctuary of El Vizcaino	Mexico	Located in the central part of the peninsula of Baja California, the sanctuary contains exceptionally interesting ecosystems. The coastal lagoons of Ojo de Liebre and San Ignacio are very important reproduction and wintering sites for the grey whale, harbour seal, California sea-lion, northern elephant-seal and blue whale. The lagoons also offer shelter to four species of the endangered marine turtle.

Site	Country	Description
Royal Chitwan National Park	Nepal	One of the last populations of single-horned Asiatic rhinoceros lives in the park, which is also among the last refuges for the Bengal tiger.
New Zealand Sub-Antarctic Islands	New Zealand	The New Zealand Sub-Antarctic Islands are remarkable for their high level of biodiversity, population densities and for endemism in birds, plants and invertebrates. The bird and plant life, especially the endemic albatrosses, cormorants, landbirds and "megaherbs" are unique to the islands
Te Wahipounamu-South West New Zealand	New Zealand	Two-thirds of the park is covered with southern beech and podocarps, some of which are over 800 years old. The kea, the only alpine parrot in the world, lives in the park, as does the rare and endangered takahe, a large flightless bird.
Air and Ténéré Natural Reserves	Niger	This is the largest protected area in Africa, covering some 7.7 million hectares. The area considered as a protected sanctuary is only one- sixth of the total area. It includes the volcanic rock massif of the Air, a small Sahelian pocket, isolated as regards its climate and flora and fauna in the Saharan desert of Ténéré. The reserve boasts an outstanding variety of landscapes, plant species and wild animals.
'W' National Park	Niger	The portion of the "W" National Park in Niger is in a transition zone between savanna and forest lands and represents important ecosystem characteristics of the West Africa Woodlands/Savannah Biogeographical Province. The site reflects the interaction between natural resources and humans since Neolithic times. This interaction has produced characteristic landscapes and plant species and illustrates the evolution of biodiversity in this zone. The Niger River bordering the site is one of the largest rivers of Africa and an important wetland for the survival of bird species.
Darién National Park	Panama	Forming a bridge between the two continents of the New World, Darién National Park offers an exceptional variety of habitats - sandy beaches, rocky coasts, mangroves, swamps and lowland and upland tropical forests containing remarkable wildlife.
Talamanca Range-La Amistad Reserves	Panama/Costa Rica	The entire protected area comprises the single largest natural forest unit in Central America, containing several hundred endemic plant species and one of the last major refuges for threatened fauna. No other protected area complex in Central America contains as many viable populations, species, life zones, or as much altitudinal variation. The Talamanca range is estimated to harbour almost four percent of the varieties of all terrestrial species on earth.
Manú National Park	Peru	This immense 1.5 million-hectare park has successive tiers of vegetation rising from 150 to 4,200m above sea-level. The tropical forest in the lower tiers contains an unrivalled variety of animal and plant species. Some 850 species of birds have been identified and rare species such as the giant otter and the giant armadillo can also be found there. Jaguars are often sighted in the park.
Río Abiseo National Park	Peru	The National Park is covered by humid forests characteristic of this part of the Andes. There is a high level of endemism among the fauna and flora species of this park. The yellow-tailed woolly monkey, previously thought extinct, is found only in this area.
Puerto-Princesa Subterranean River National Park	Philippines	The park represents a significant habitat for biodiversity conservation. It contains a full mountain to sea ecosystem and protects the most significant forest area within the Palawan Biogeographic Province.

Site	Country	Description
Tubbataha Reef Marine Park	Philippines	Covering 33,200 hectares, including the North and South Reefs, this is a unique example of an atoll reef with a very high density of marine species. The North Islet serves as a nesting site for birds and marine turtles. The site is an excellent example of a pristine coral reef with a spectacular 100-metre perpendicular wall, extensive lagoons and two coral islands.
Laurisilva of Madeira	Portugal (Madeira)	The Laurisilva of Madeira is an outstanding relict of a previously widespread laurel forest type. It is the largest area of laurel forest surviving and is believed to be 90% primary forest, containing a unique suite of plants and animals including many endemic species such as the Madeiran long-toed pigeon. The greatest natural value of the laurisilva is its biological diversity. Nearly all its plants and animals are unique to the laurel forest. The Madeiran laurisilva is not only larger but has differences biologically from laurel forest elsewhere.
Danube Delta	Romania	The waters of the Danube, which flow into the Black Sea, form the largest and best preserved of European deltas. The Danube Delta hosts over 300 species of birds as well as 45 freshwater fish species in its numerous lakes and marshes.
Golden Mountains of Altai	Russian Federation	The Altai region represents an important and original centre of biodiversity of montane plant and animal species in northern Asia, a number of which are rare and endemic.
Lake Baikal	Russian Federation	Situated in south-east Siberia, Lake Baikal is the oldest (25 million years) and deepest (1,637 m) of the world's lakes. It contains 20% of the world's surface unfrozen freshwater reserve. Known as the "Galápagos of Russia", its age and isolation have produced one of the world's richest and most unusual freshwater faunas which is of exceptional value to evolutionary science. With its outstanding variety of endemic animals and plants Lake Baikal is one of the most biologically diverse lakes on earth.
Western Caucasus	Russian Federation	One of the global centres of plant diversity, the site has a great diversity of ecosystems with important endemic plant and wildlife species. It is also the place of origin and reintroduction of the mountain sub-species of the European bison.
Djoudj Bird Sanctuary	Senegal	Located in the Senegal River delta, this site is a wetland of 16,000 hectares, comprised of a large lake surrounded by streams, ponds and backwaters which form a living but fragile sanctuary for 1.5 million birds, such as the white pelican, the purple heron, the African spoonbill, the great egret and the cormorant.
Niokolo-Koba National Park	Senegal	Located in a well-watered area, along the banks of the Gambia River, the gallery forests and savannahs of Niokolo-Koba National Park protect a very rich fauna, among them the Derby eland (largest of the antelopes), chimpanzees, lions, leopards, a large population of elephants as well as many birds, reptiles and amphibians.
Aldabra Atoll	Seychelles	The site is comprised of four large coral islands which enclose a shallow lagoon; the group of islands is itself surrounded by a coral reef. Due to difficulties of access and the atoll's isolation, Aldabra has been protected from human influence and has as such become a refuge for some 152,000 giant tortoises, the world's largest population of this reptile.
Vallée de Mai Nature Reserve	Seychelles	The reserve shelters the vestiges of a natural palm forest preserved in close to its original state.

Site	Country	Description
Greater St. Lucia Wetland Park	South Africa	The five ecosystems in this National Park provide habitat for a significant diversity of African fauna and flora.
Doñana National Park	Spain	Notable for the great diversity of its biotopes, especially lagoons, marshlands, fixed and mobile dunes, scrub woodland and "maquis". It is home to five threatened bird species. It is one of the biggest heronries in the Mediterranean region and is the wintering site for more than 500,000 waterfowl each year.
Ibiza, biodiversity and culture	Spain	The well-preserved Posidonia, threatened in most Mediterranean locations, contains and supports a diversity of marine life.
Sinharaja Forest Reserve	Sri Lanka	Sinharaja is the last viable area of primary tropical rainforest in the country. More than 60 per cent of the trees are endemic and many of them are considered rare. There is much endemic wildlife, especially birds, the reserve is also home to 50% of the endemic species of mammals and butterflies, as well as many insects, reptiles and rare amphibians.
Arabian Oryx Sanctuary	Sultanate of Oman	This site is noted for its viable population of Arabian Gazelle as well as being a habitat for several species, such as the endangered houbara bustard, a species of wader, as a part of its highly diverse avifauna. It is one of the largest protected areas in the region and includes the only free-ranging herd of Arabian oryx in the world. The successful re-introduction of the oryx has been part of a process to rehabilitate a diverse and unique desert ecosystem.
Ngorongoro Conservation Area	Tanzania	Ngorongoro is one of the largest inactive, unbroken and unflooded calderas in the world. The conservation area has one of Africa'a largest wildlife conglomerations. Species include: wildebeest, buffalo, African elephant, hartebeest, spotted hyena, mountain reedbuck and leopard. The crater also has the densest known population of lion. Serengeti migrants including 1.7 million wildebeest, 260,00 zebra and 470,000 gazelles.
Selous Game Reserve	Tanzania	The park has a variety of relatively undisturbed vegetation zones, ranging from woodland to open grasslands. These habitats support populations of threatened animal species including elephants, black rhinoceroses, cheetahs, giraffes, hippopotamuses, crocodiles and wild dogs.
Serengeti National Park	Tanzania	Serengeti National Park, with its herds of ungulates and their associated predators, is the last remnant of a Pleistocene large mammal ecosystem in all its complexity. The park, in combination with the contiguous Ngorongoro Conservation Area and Maasai Mara National Park, is sufficiently large to ensure the survival of this savanna ecosystem.
Thungyai - Huai Kha Khaeng Wildlife Sanctuaries	Thailand	Stretching over more than 600,000 hectares along the Myanmar border, the sanctuary, which is relatively intact, contains examples of almost all the forest types of continental South-East Asia. It is home to a very diverse array of animals, including 77% of the large mammals, 50% of the large birds and 33% of the land vertebrates to be found in this region.
Ichkeul National Park	Tunisia	Lake Ichkeul and wetland are a stopover point for hundreds of thousands of migrating birds, such as geese, ducks, storks, pink flamingoes, who come to feed and nest here. The lake is one of the last remaining in a chain of lakes that once extended across northern Africa.
Bwindi Impenetrable National Park	Uganda	The park is known for its exceptional biodiversity, with more than 160 species of trees and more than 100 species of ferns. Many types of birds and butterflies can also be found there, as well as many endangered taxa, including the mountain gorilla.

Site	Country	Description
Rwenzori Mountains National Park	Uganda	Covering nearly 100,000 hectares in western Uganda, the park comprises the main part of the Rwenzori mountain chain, which includes Africa's third highest peak (Mount Margherita at 5,109 metres). The region's glaciers, waterfalls and lakes make it one of Africa's most beautiful alpine areas. The park protects many natural habitats, endangered species and an unusual flora, including the giant heather.
Gough Island Wildlife Reserve	United Kingdom	Gough Island, in the South Atlantic, is one of the least disrupted island and marine ecosystems in the cool temperate zone. One of the largest colonies of sea birds in the world lives there, amidst spectacular scenery of cliffs towering above the ocean. The island is also home to two endemic species of land birds, the galinulle and the Gough rowettie, as well as twelve endemic plant species.
Henderson Island	United Kingdom	In the eastern South Pacific, Henderson Island is one the few atolls in the world with its ecology almost unaltered by man. Its isolated location permits the study of the dynamics of insular evolution and natural selection. It is particularly notable for ten plants and four land birds, endemic to the island.
St. Kilda	United Kingdom	This archipelago includes some of the highest cliffs in Europe which provide a refuge for colonies of rare and endangered bird species, especially puffins and gannets. It is an outstanding example of remote island ecological colonisation and isolation of small species populations, and is of national importance for its geology, flora and fauna.
Everglades National Park	USA	This National Park is often called "a river of grass flowing imperceptibly from the sea". The exceptional variety of its water habitats has made it a sanctuary for a considerable number of birds and reptiles, as well as for threatened species such as the manatee.
Grand Canyon National Park	USA	Carved out by the Colorado River, the Grand Canyon, nearly 1,500 metres deep, is the most spectacular gorge in the world. Located in Arizona, it cuts across the Grand Canyon National Park. Its horizontal strata retrace the geological history of the past 2 billion years. Several species of endemic and threatened animals, birds and plants can be found in the park.
Great Smoky Mountains National Park	USA	Home to more than 3,500 plant species, almost as many trees (130 natural species) as in all of Europe. Many endangered animal species can also be found there, including what is probably the greatest variety of salamanders in the world.
Mammoth Cave National Park	USA	Recognised as an internationally important karst area, this site contains the longest cave system in the world. Over 200 species of animal are indigenous to the cave system including several endangered species of blind fish, shrimp, bat and freshwater mussel. Surface features are also important and Big Woods, a temperate deciduous oak-hickory dominated forest, that is reputed to be one of the largest and best remaining examples of the ancient forest of eastern North America.
Yellowstone	USA	Covering more than 9,000 km^2, Yellowstone National Park contains an impressive collection of geothermal phenomena, including more than 3,000 geysers, fumaroles and hot springs. Established in 1872, the park also contains a vast natural forest ecosystem that harbours grizzly bear, wolf, bison and wapiti populations.
Durmitor National Park	Yugoslavia	Dense pine forests are interspersed with clear lakes and harbour a wide range of endemic flora.

Site	Country	Description
Canaima National Park	Venezuela	Canaima National Park exhibits an exceptional geomorphology produced by weathering processes. The distinctive tepui formations give rise to numerous waterfalls, including Angel Falls, the world's highest. The high level of endemism found on the summits of the tepuis has led to the recognition of Pantepui as a unique biogeographical entity.
Mana Pools National Park, Sapi and Chewore Safari Areas	Zimbabwe	On the banks of the Zambezi River, great cliffs overhang the river and flood-plains where a remarkable concentration of wild animals can be found, including elephants, buffaloes, leopards and cheetahs.

Table 3. Natural World Heritage Sites of particular importance for Biodiversity included in the list of World Heritage in danger (November 1999)

Site	Country	Date of Inclusion	Criterion IV	Threat to Site
Iguaçu National Park	Brazil	1999	Yes	Road construction, helicopter flights and dams on the Iguaçu River.
Srebarna Nature Reserve	Bulgaria	1992	Yes	Destruction of the fresh-water habitat of bird populations. Dam construction upstream in Romania has permanently altered the hydrology of this site. Seasonal flooding is being prevented causing a significant decline in the biological productivity of the site. Agricultural and residential use of the surrounding land have affected the wetlands, leading to the decline of water bird populations.
Manovo-Gounda St. Floris National Park	Central African Republic	1997	Yes	Uncontrolled poaching by heavily armed groups, from within and outside of CAR has resulted in security problems, leading to the deaths of 4 Park staff in early 1997. According to IUCN, 80% of the Park's wildlife has been illegally harvested for commercial purposes.
Mount Nimba Nature Reserve	Côte d'Ivoire/ Guinea	1992	Yes	There are two main factors: a proposed iron-ore mining concession to an international consortium and the arrival of a large number of refugees to areas in and around the Guinean part of the site. The granting of the concession was announced in 1992 and included portions of the WH site.
Virunga National Park	Democratic Republic of Congo	1994	Yes	War in neighbouring Rwanda and the subsequent massive influx of refugees has led to massive deforestation and poaching.
Garamba National Park	Democratic Republic of Congo	1996	Yes	Civil unrest in the eastern part of the country has led to widespread attacks on the Park's infrastructure. Equipment has been looted and several staff have deserted the park.
Kahuzi-Biega National Park	Democratic Republic of Congo	1997	Yes	Armed conflict in the eastern part of the country has meant the site has been significantly impacted by the influx of refugees. There are reports of a large presence of militia groups and illegal settlers in the park, which has led to fires, increased poaching and illegal removal and burning of timber.
Okapi Wildlife Reserve	Democratic Republic of the Congo	1997	Yes	Equipment and facilities have been looted and wildlife poached due to armed conflict in the eastern part of the country. There are reports of illegal gold mining in the park occupied by the militia, and the staff have neither the facilities nor resources to manage the park.

Site	Country	Date of Inclusion	Criterion IV	Threat to Site
Salonga National Park	Democratic Republic of the Congo	1997	No	Heightened levels of threats due to poaching.
Sangay National Park	Ecuador	1992	Yes	Management plan needs to be implemented and damage created by road construction needs to be restored.
Simien National Park	Eithiopia	1996	Yes	Evidence of recent deterioration of the population of the Walia ibex. Other large mammals characteristic of the site (e.g. the bushbuck and the bushpig) have become extremely rare. Road construction and human population increase within the site are other threats.
Río Plátano Biosphere Reserve	Honduras	1996	Yes	This park is threatened by planned construction of a hydro-electric plant, illegal logging, grazing, agricultural encroachment, the introduction of exotic species, the absence of a management plan and a lack of park staff.
Manas Wildlife Sanctuary	India	1992	Yes	Site invaded by militants of the Bodo tribe in Assam. Damage to the sanctuary was estimated at more than US $2 million. Infrastructure damage during 1992-93 and poaching (particularly the greater one-horned rhino). Although security conditions in and around Manas have improved, the threat of insurgency still prevails.
Air and Ténéré Natural Reserves	Niger	1992	Yes	Military conflict and civil disturbance has affected the area in recent times. Flora and fauna populations are recovering but some species (e.g. ostrich) continue to be seriously threatened by poaching and international trade in live animals and its by-products. The site may be considered for removal from the List of World Heritage in Danger in 1999.
Ichkeul National Park	Tunisia	1996	Yes	The construction of three dams on rivers supplying Lake Ichkeul and its marshes has cut off almost all inflow of fresh water, increasing the salinity of the lake and marshes. Many fresh-water plant species have been replaced by halophytic plants, reducing the populations of reed-dependent migratory bird species such as purple heron, purple gallinule and reed warblers.
Ruwenzori Mountains National Park	Uganda	1999	Yes	A lack of resources, suspension of projects and serious security issues at the Park.

Site	Country	Date of Inclusion	Criterion IV	Threat to Site
Everglades National Park	USA	1993	Yes	Park Superintendent informed the Committee of extensive damage to Everglades' ecology due to: nearby urban growth; pollution from fertilisers; mercury poisoning of fish and wildlife and a fall in water levels caused by flood protection measures. In 1992, Hurricane Andrew altered much of Florida Bay and its ecological systems and destroyed the park's visitor centre. The site may be removed fron the sites in danger list shortly.
Yellowstone National Park	USA	1995	Yes	There are concerns that adjacent mining operations might compromise the values of the park, and threaten the watershed ecology of the Yellowstone River. Other pressures include: sewage leakage and waste contamination; the unconsidered and illegal introduction of non-native lake trout which are competing with the endemic Yellowstone cut-throat trout; road construction; and year-round visitor pressures.

Table 4. World Heritage Site by Udvardy Biogeographic Province.

World Heritage Site	Country	Udvardy Province	Total No.
Golden Mountains of Altai	Russian Federation	Altai Highlands	1
Göreme National Park and the Rock Sites of Cappodocia	Turkey	Anatolian-Iranian Desert	1
Arabian Oryx Sanctuary	Sultanate of Oman	Arabian Desert	1
Messel Pit Fossil Site Pyrénées – Mont Perdu	Germany Spain/France	Atlantic	2
Everglades National Park	USA	Austroriparian	1
Durmitor National Park Ohrid Region with its Cultural and Historical Aspect and its Natural Environment	Yugoslavia Former Yugoslav Republic of Macedonia	Balkan Highlands	2
The Sundarbans The Sundarbans	Bangladesh India	Bengalian Rainforest	2
Belovezhskaya Pushcha/Bialowieza Forest	Belarus/Poland	Boreonemoral	1
Iguazú National Park Iguaçu National Park	Argentina Brazil	Brazilian Rain Forest	2
The Giant's Causeway and Causeway Coast	United Kingdom	British Islands	1
Kaziranga National Park Manas National Park	India India	Burma Monsoon Forest	2
Yosemite National Park	USA	Californian	1
Tikal National Park Sian Ka'an Belize Barrier-Reef Reserve System	Guatemala Mexico Belize	Campechean	3
Canaima National Park	Venezuela	Campos Limpos	1
Nahanni National Park Wood Buffalo National Park Gros Morne National Park Miguasha Park	Canada Canada Canada Canada	Canadian Taiga	4
Western Caucasus	Russian Federation	Caucaso-Iranian Highlands	1
Kahuzi-Biéga National Park Okapi Wildlife Reserve	Dem. Rep. of Congo Dem. Rep. of Congo	Central African Highlands	2
Area de Conservación Gaunacaste Talamanca Range-La Amistad Reserves Río Plátano Biosphere	Costa Rica Costa Rica/Panama Honduras	Central American	3
Uluru-Kata Tjuta National Park	Australia	Central Desert	1
Sinharaja Forest Reserve	Sri Lanka	Ceylonese Rainforest	1
Carlsbad Caverns National Park	USA	Chihuahuan	1
Los Glaciares	Argentina	Chilean Nothofagus	1
Mt. Emei including Leshan Giant Buddha Scenic Area	China	Chinese Subtropical Forest	1
Cocos Island National Park	Costa Rica	Cocos Island	1
Los Katios National Park	Colombia	Colombian Coastal	1
Aldabra Atoll	Seychelles	Comores Islands and Aldabra	1
Dja Faunal Reserve Okapi Faunal Reserve Salonga National Park	Cameroon Dem. Rep. of Congo Dem. Rep. of Congo	Congo Rain Forest	3

World Heritage Site	Country	Udvardy Province	Total No.
Desembarco del Granma National Park	Cuba	Cuban	1
Mount Kenya National Park/Natural Forest	Kenya	East African Highlands	1
Manovo-Gounda St Floris National Park Garamba National Park Virunga National Park Kahuzi-Biega National Park Serengeti National Park Bwindi Impenetrable National Park Rwenzori Mountains National Park	Central African Republic Dem. Rep. of Congo Dem. Rep of Congo Dem. Rep. of Congo Tanzania Uganda Uganda	East African Woodland/Savanna	7
Mammoth Cave National Park Great Smoky Mountains National Park	USA USA	Eastern Forest	2
Willandra Lakes Region Australian Mammal Fossil Sites	Australia Australia	Eastern Grasslands and Savannas	2
Central Eastern Australian Rainforest Reserves	Australia	Eastern Sclerophyll	1
Simien National Park	Ethiopia	Ethiopian Highlands	1
Everglades National Park	USA	Everglades	1
Galápagos Islands	Ecuador	Galápagos Islands	1
Dinosaur Provincial Park	Canada	Grasslands	1
Taï National Park Mount Nimba Strict nature Reserve	Côte d'Ivoire Côte d'Ivoire /Guinea	Guinean Rain Forest	2
Canaima National Park	Venezuela	Guyanan	1
Hawaii Volcanoes National Park	USA	Hawaiian	1
Nanda Devi National Park Manas Wildlife Sanctuary Sagarmatha National Park Royal Chitwan National Park	India India Nepal Nepal	Himalayan Highlands	4
Pyrénées – Mont Perdu	Spain/France	Iberian Highlands	1
Thungyai – Huai Kha Khaeng Wildlife Sanctuaries	Thailand	Indochinese Rainforest	1
Keoladeo National Park	India	Indus-Ganges Monsoon Forest	2
Heard and McDonald Islands Macquarie Island New Zealand Sub-Antarctic Islands Gough Island Wildlife Reserve	Australia Australia New Zealand United Kingdom	Insulantarctica	4
Yakushima	Japan	Japanese Evergreen Forest	1
Ujung Kulon National Park	Indonesia	Java	1
Volcanoes of Kamchatka	Russian Federation	Kamchatkan	1
Lake Baikal	Russian Federation	Lake Baikal	1
Lake Malawi National Park	Malawi	Lake Malawi (Nyasa)	1
Sibiloi/Central Island National Parks	Kenya	Lake Rudolf	1
Morne Trois Pitons National Park	Dominica	Lesser Antillean	1

World Heritage Site	Country	Udvardy Province	Total No.
Komodo National Park	Indonesia	Lesser Sunda Islands	1
The Laurisilva of Madeira Garajonay National Park	Portugal Spain	Macaronesian Islands	2
Tsingy de Bemaraha Strict Nature Reserve	Madagascar	Malagasy Woodland/Savanna	1
Pirin National Park Plitvice Lakes National Park, Cape Girolata, Cape Porto, Scandola Nature Reserve and the Piana Calanches in Corsica Mount Athos Meteora Skocjan Caves Doñana National Park Ichkeul National Park Hieropolis-Pamukkale	Bulgaria Croatia France Greece Greece Slovenia Spain Tunisia Turkey	Mediterranean Sclerophyll	9
Srebarna Nature Reserve Messel Pit Fossil Site Caves of the Aggtelek Karst and Slovac Karst	Bulgaria Germany Hungary/Slovakia	Middle European Forest	3
Selous Game Reserve Mosi-Oa-Tunya/Victoria Falls Mana Pools National Park Sapi and Chewore Safari Areas	Tanzania Zambia/Zimbabwe Zimbabwe	Miombo Woodland/Savanna	3
Península Valdés	Argentina	Monte	1
New Zealand Sub-Antarctic Islands Te Wahipounamu – South West New Zealand Tongariro National Park	New Zealand New Zealand New Zealand	Neozealandia	3
Sangay National Park	Ecuador	Northern Andean	1
Kakadu National Park	Australia	Northern Coastal	1
Kakadu National Park	Australia	Northern Savanna	1
Redwood National Park Olympic National Park	USA USA	Oregonian	2
Jiuzhaigou Valley Scenic and Historic Interest Area Huanglong Scenic and Historic Interest Area Mount Taishan Mount Wuyi Mount Huangshan Wulingyuan Scenic and Historic Interest Area Shirakami-Sanchi	China China China China China China Japan	Oriental Deciduous Forest	7
Huascarán National Park	Peru	Pacific Desert	1
Darién National Park	Panama	Panamanian	1
Lorentz National Park East Rennell	Indonesia Solomon Islands	Papuan	2
Puerto-Princesa Subterranean River National Park	Philippines	Philippines	2
Danube Delta	Romania	Pontian Steppe	1
Manú National Park	Peru	Puna	1

World Heritage Site	Country	Udvardy Province	Total No.
Great Barrier Reef Wet Tropics of Queensland Fraser Island	Australia Australia Australia	Queensland Coastal	3
Canadian Rocky Mountain Parks Waterton Glacier Interational Peace Park Yellowstone National Park Grand Canyon National Park	Canada Canada/USA USA USA	Rocky Mountains	4
Tassili N'Ajjer Aïr and Ténéré Natural Reserves	Algeria Niger	Sahara	2
St Kilda	United Kingdom	Scottish Highlands	1
Atlantic Forest South East Reserves Discovery Coast Atlantic Forest Reserves	Brazil Brazil	Serro Do Mar	2
Vallée de Mai Nature Reserve	Seychelles	Seychelles and Amirantes Islands	1
Yosemite National Park	USA	Sierra-Cascade	1
Tatshenshini-Alsek/Kluane National Park/Wrangell-St.Elias National Park and Reserve and Glacier Bay National Park	Canada/USA	Sitkan	1
Simien national Park Sibiloi /Central Island National Park Kilimanjaro National Park Ngorongoro Conservation Area	Ethiopia Kenya Tanzania Tanzania	Somalian	4
Whale Sanctuary of El Vizcaino	Mexico	Sonoran	1
Greater St. Lucia Wetland Park	South Africa	South African Woodland/Savanna	1
Ha Long Bay	Viet Nam	South Chinese Rainforest	1
Henderson Island	United Kingdom	Southeastern Polynesian	1
Los Glaciares Huascarán National Park Río Abiseo	Argentina Peru Peru	Southern Andean	3
Australian Fossil Mammal Sites	Australia	Southern Sclerophyll	1
The Laponian Area	Sweden	Subarctic Birchwoods	1
Tasmanian Wilderness	Australia	Tasmanian	1
Dja Faunal Reserve Manovo-Gounda St. Floris National Park Comoé National Park Cliffs of Bandiagra (Land of the Dogons) 'W' National Park of Niger Niokolo-Koba National Park	Cameroon Central African Republic Côte d'Ivoire Mali Niger Senegal	West African Woodland/Savanna	6
Virgin Komi Forests The Laponian Area	Russian Federation Sweden	West Eurasian Taiga	2
Shark Bay, Western Australia	Auatralia	Western Mulga	1
Banc d'Arguin National Park Air and Ténéré Natural Reserves Djoudj National Bird Sanctuary	Mauritania Niger Senegal	Western Sahel	3

World Heritage Site	Country	Udvardy Province	Total No.
Shark Bay, Western Australia	Australia	Western Sclerophyll	1
Sian Ka'an	Mexico	Yucatetan	1
Tatshenshini-Alsek/ Kluane National Park/ Wrangell-St Elias National Park and Reserve and Glacier Bay National Park	Canada/USA	Yukon Taiga	1
Historic Sanctuary of Machu Picchu, Manú National Park	Peru Peru	Yungas	2

Table 5. Udvardy Biogeographical Provinces not represented by World Heritage Sites

Udvardy Province
Alaskan Tundra
Aleutian Islands
Amazonian
Andaman and Nicobar Islands
Aral Sea
Arctic Archipelago
Arctic Desert
Arctic Desert and Icecap
Argentinian Pampas
Ascension and St Helena Islands
Atlas Steppe
Babacu
Bahamas-Bermudean
Borneo
Brazilian Planalto
Brigalow
Burman Rainforest
Caatinga
Campos Cerrados
Canadian Tundra
Central European Highlands
Central Polynesian
Ceylonese Monsoon Forest
Chilean Araucaria Forest
Chilean Sclerophyll
Cocos-Keeling&Christmas Islands
Colombian Montane
Congo Woodland/Savanna
Coromandel
Deccan Thorn Forest
East Melanesian
East Siberian Taiga
Eastern Sahel
Equadorian Dry Forest
Fernando De Noronja Island
Gran Chaco
Great Basin
Great Lakes
Greater Antillean
Greenland Tundra
Guerreran
Guinean Highlands
Higharctic Tundra
Hindu Kush Highlands
Icelandian
Iranian Desert
Kalahari
Karroo
Laccadives Islands

Udvardy Province
Lake Ladoga
Lake Tanganyika
Lake Titicaca
Lake Ukerewe (Victoria)
Llanos
Lowarctic Tundra
Madeiran
Madrean-Cordilleran
Mahanadian
Malabar Rainforest
Malagasy Rain Forest
Malagasy Thorn Forest
Malayan Rainforest
Maldives and Chagos Islands
Manchu-Japanese Mixed Forest
Marielandia
Mascarene Islands
Maudlandia
Micronesian
Mongolian-Manchurian Steppe
Namib
Northern Grasslands
Pamir-Tian-Shan Highlands
Pannonian
Patagonian
Revilla Gigedo Island
Sinaloan
South African Highlands
South Trinidade Island
Southern Mulga/Saltbush
Sulawesi (Celebes)
Szechwan Highlands
Sumatra
Taiwan
Takla-Makan-Gobi Desert
Tamaulipan
Thailandian Monsoon Forest
Thar Desert
Tibetan
Turanian
Uruguayan Pampas
Valdivian Forest
Venezuelan Deciduous Forest
Venezuelan Dry Forest
West Anatolian

Table 6. World Heritage Sites within Centres of Plant Diversity (CPD)

Site Name	Country
Tassili n'Ajjer	Algeria
Los Glaciares	Argentina
Península Valdés	Argentina
Australian Fossil Mammal Sites	Australia
Central Eastern Australian Rainforest	Australia
Great Barrier Reef	Australia
Kakadu National Park	Australia
Lord Howe Island Group	Australia
Macquarie Island	Australia
Shark Bay Western Australia	Australia
Tasmanian Wilderness	Australia
Uluru-Kata Tjuta National Park	Australia
Wet Tropics of Queensland	Australia
The Sundarbans	Bangladesh
Discovery Coast Atlantic Forest Reserves	Brazil
South East Forest Reserves	Brazil
Pirin National Park	Bulgaria
Dja Faunal Reserve	Cameroon
Miguasha Park	Canada
Huanglong Scenic and Historic Interest Area	China
Jiuzhaigou Valley Scenic and Historic Interest Area	China
Mount Wuyi	China
Los Katios National Park	Colombia
Taï National Park	Côte d'Ivoire
Desembarco del Granma National Park	Cuba
Garamba National Park	Dem. Rep. of Congo
Kahuzi-Biega National Park	Dem. Rep. of Congo
Salonga National Park	Dem. Rep. of Congo
Virunga National Park	Dem. Rep. of Congo
Morne Trois Pitons National Park	Dominica
Sangay National Park	Ecuador
Simien National Park	Ethiopia
Cape Girolata, Cape Porto, Scandola Natural Reserve and the Piana Calanches in Corsica	France
Pyrénées – Mont Perdu	France/Spain
Tikal National Park	Guatamala
Mount Nimba Reserves	Guinea/Côte d'Ivoire
Río Plátano Biosphere Reserve	Honduras
Nanda Devi National Park	India
The Sundarbans	India
Lorentz National Park	Indonesia
Ujung Kulon National Park	Indonesia
Yakushima	Japan
Mount Kenya National Park/Natural Forest	Kenya
Tsingy de Bemaraha Strict Nature Reserve	Madagascar
Whale Sanctuary of El Vizcaino	Mexico

Site Name	Country
New Zealand Sub-Antarctic Islands	New Zealand
Air and Ténéré Natural Reserves	Niger
Darién National Park	Panama
Talamanca Range-La Amistad Reserves	Panama/Costa Rica
Historic Sanctuary of Macchu Picchu	Peru
Huascarán National Park	Peru
Manú National Park	Peru
Río Abiseo National Park	Peru
Puerto-Princesa Subterranean River National Park	Philippines
Laurisilva of Madeira	Portugal
Golden Mountains of Altai	Russian Federation
Lake Baikal	Russiaan Federation
Western Caucasus	Russian Federation
Vallée de Mai Nature Reserve	Seychelles
Greater Santa Lucia Wetland Park	South Africa
Doñana National Park	Spain
Garajonay National Park	Spain
Ibiza, Biodiversity and Culture	Spain
Sinharaja Forest Reserve	Sri Lanka
Kilimanjaro National Park	Tanzania
Thung Yai – Huai Kha Kaeng Wildlife Sanctuaries	Thailand
Göreme National Park and the Rock Sites of Cappodicia	Turkey
Hierapolis-Pamukkale	Turkey
Bwindi Impenetrable National Park	Uganda
Rwenzori Mountains National Park	Uganda
Everglades National Park	USA
Redwood National Park	USA
Yosemite National Park	USA
Canaima National Park	Venezuela

Table 7. Regional Centres of Plant Diversity not represented in the current World Heritage List

Region	Country	Area Name
Africa	Algeria	Babor Mountains in Petit Kabylie
Africa	Angola	Benguela and Bié Districts
Africa	Angola/Namibia	The Kaokoveld
Africa	Cameroon	Adamaova area
Africa	Cameroon	Campo-Kribi
Africa	Cameroon	Korup National Park
Africa	Cameroon	Mount Cameroon
Africa	Chad	Tibesti
Africa	Congo	Tsiama or Grand Bangou Forest
Africa	Congo	Odzala National Park and Biosphere Reserve
Africa	Congo/Democratic republic of Congo	Mayombe
Africa	Congo/Gabon	Massif ae Chaillu
Africa	Côte d'Ivoire	Odienné area
Africa	Côte d'Ivoire	South-east forest remnants
Africa	Democratic Republic of Congo	Haut Shaba
Africa	Democratic Republic of Congo	Itombwe
Africa	Democratic Republic of Congo	Kundelungu
Africa	Democratic Republic of Congo	Maiko National Park
Africa	Democratic Republic of Congo	Marungu highlands
Africa	Democratic Republic of Congo	Upemba National Park
Africa	Democratic Republic of Sáo Tomé and Príncipe	Mount Malabo
Africa	Democratic Republic of Sáo Tomé and Príncipe	Príncipe
Africa	Democratic Republic of Sáo Tomé and Príncipe	Sâo Tomé
Africa	Egypt/Sudan	Jebel Elba
Africa	Ethiopia	Bale Mountains
Africa	Ethiopia/Kenya/Somalia	Limestone bush / woodland
Africa	Gabon	Bélinga area and Ipassa-Mukokou Forest
Africa	Gabon	Cristal Mountains
Africa	Gabon	Massif de Doudou
Africa	Ghana	South west Ghana
Africa	Guinea	Fouta Djallon
Africa	Kenya	Shimba hills
Africa	Kenya/Uganda	Mount Elgon
Africa	Liberia	Cestos - Senkwen River area
Africa	Liberia	Loffa - Mano
Africa	Liberia	Sapo National Park
Africa	Libya	Al Jabal al Akhdar
Africa	Malawi	Mount Mulanje
Africa	Malawi/Zambia	Nyika Plateau
Africa	Mauritania	Atar area
Africa	Morocco	Coastal area near Agadir and to south
Africa	Morocco	High Atlas
Africa	Namibia/South Africa	Western Cape Domain (Succulent Karoo)
Africa	Nigeria	Oban Hills and Cross River National Park

Region	Country	Area Name
Africa	Rwanda	Nyungwe Forest Reserve
Africa	Sierra Leone	Gola High Forest
Africa	Sierra Leone	Loma
Africa	Somalia	Cal Madow
Africa	Somalia	Hobyo/Obbia area
Africa	Somalia	Nugual Valley
Africa	South Africa	Albany centre
Africa	South Africa	Cape Floristic Region
Africa	South Africa	Drakensberg Afromontane regional system
Africa	South Africa	Drakensberg Alpine Region
Africa	Sudan	Imatong Mountains
Africa	Sudan	Jebel Marra
Africa	Tanzania	Itigi Thicket
Africa	Tanzania	Msumbugwe
Africa	Tanzania	Pugu hills and Kazimzumbwi Forest Reserves
Africa	Tanzania	Rondo Plateau
Africa	Tanzania	East Usambaras Mountains
Africa	Tanzania	Mahle-Karobwa Hills
Africa	Tanzania/Kenya	Kitulo Plateau / Kipengere Mountains
Africa	Tanzania/Kenya	Nguru Mountains
Africa	Tanzania/Kenya	Taita hills
Africa	Tanzania/Kenya	Uluguru Mountains
Africa	Tanzania/Kenya	Uzungwa Mountains
Africa	Tanzania/Mozambique	Middle Ruvuma River area
Africa	Zambia	Lwangwa Valley
Africa	Zambia	Zambezi source area
Africa	Zimbabwe	Chimanimani Mountains
Africa	Zimbabwe	Great Dyke
Africa	Zimbabwe	Nyanga
Atlantic Ocean Islands	Cape Verde	Cape Verde Islands
Atlantic Ocean Islands	Portugal	Azores
Atlantic Ocean Islands	United Kingdom	Saint Helena
Australia and New Zealand	Australia	Australian Alps
Australia and New Zealand	Australia	Christmas Island
Australia and New Zealand	Australia	McIlwraith Range and Iron Range
Australia and New Zealand	Australia	North Kimberley Region
Australia and New Zealand	Australia	Sclerophyll forests of Far South-east New South Wales
Australia and New Zealand	Australia	Sydney Sandstone Region
Australia and New Zealand	New Zealand	Chatham Islands
Australia and New Zealand	New Zealand	Northland
Australia and New Zealand	New Zealand	North-west Nelson

Region	Country	Area Name
Caribbean Islands	Cuba	Cajalbana Tableland and Preluda Mountain Region
Caribbean Islands	Cuba	Coast from Juragoa to Casilda Peninsula; Trinidad Mountains; Sierra del Escambray
Caribbean Islands	Cuba	Pinar del Río
Caribbean Islands	Dominican Republic	Cordillera Central
Caribbean Islands	Dominican Republic	Los Haitises
Caribbean Islands	Dominican Republic	Sierra de Neiba
Caribbean Islands	Haiti	Morne la Viste
Caribbean Islands	Haiti	Pic Macaya
Caribbean Islands	Jamaica	Aripo Savannas Scientific Reserve
Caribbean Islands	Jamaica	Blue and John Crow Mountains
Caribbean Islands	Jamaica	Cockpit County
Central and North Asia	Kazakhstan/Kyrgystan/Tajikistan/Turkmenistan/Uzbekistan	Mountains of Middle Asia
Central and North Asia	Russian Federation	Chukotskiy Peninsula
Central and North Asia	Russian Federation	Primorye
Central and North Asia	Tajikistan/Uzbekistan	Zehraushan River basin and the Smarkand Mountains
China and East Asia	Cambodia	Cardamom Mountains
China and East Asia	China	Ailao Shan
China and East Asia	China	Chang Guancai Mountain Range
China and East Asia	China	Changbai Mountain region
China and East Asia	China	Da Tuzi Mountain Range
China and East Asia	China	Daba Mountains
China and East Asia	China	Dabie and Guniu Mountains
China and East Asia	China	Fanjing Mountains
China and East Asia	China	Funiu Mountains
China and East Asia	China	Gao Tai Mountain Range
China and East Asia	China	Gaoligong Mountains, Nu Jiang River and Biluo Snow Mountains
China and East Asia	China	Haba Snow Mountains
China and East Asia	China	Helan Mountains
China and East Asia	China	High Mt & Deep Gorge Reg.-Gaoligong Mt/Nu Jiang R/
China and East Asia	China	Jiulong Mountains
China and East Asia	China	Kunyu Mountains
China and East Asia	China	Lao Mountains
China and East Asia	China	Limestone region, south-west Zhuang Autonomous Reg
China and East Asia	China	Lingwu Mountains
China and East Asia	China	Mazui Mountain
China and East Asia	China	Mountains of Wisichuan
China and East Asia	China	Nanling Mountain Range
China and East Asia	China	Shennongjia
China and East Asia	China	South Yulong Mountains
China and East Asia	China	Southern Guangxi Province (Shiwanda Mountains and Nonggang Nature Reserves)
China and East Asia	China	Southern part of Taihang Mountains
China and East Asia	China	Tacheng basin and Ili Valley
China and East Asia	China	Taibai Mountain region

Region	Country	Area Name
China and East Asia	China	Tropical forests of Hainan
China and East Asia	China	Western slope of Do Hinggan Mountains, Horquin and Xilin Gol
China and East Asia	China	Wolong Mountains, Da and Xiao Liang Shan Mountains
China and East Asia	China	Wutai Mountains
China and East Asia	China	Xishuangbanna region
China and East Asia	China	Xizo Hinggan Mountain Range
China and East Asia	China	Yushan National Park
China and East Asia	China	Zayu, Medog, Yadon and Nyalam
China and East Asia	China	Zhongtiao Mountains
China and East Asia	Japan	Bonin (Ogasawara) Islands
China and East Asia	Japan	Mount Hakusan
China and East Asia	Japan	Mount Hyachine
China and East Asia	Japan	Rebun Island
China and East Asia	Japan	Shiroum Mountains
China and East Asia	Laos	Bolovens Plateau
China and East Asia	North Korea	Mount Chilbo Nature Reserve
China and East Asia	South Korea	Mount Chiri National Park
China and East Asia	South Korea	Mount Halla
China and East Asia	South Korea	Mount Sorak National Park and Biosphere Reserve
China and East Asia	Taiwan	Kenting National Park
China and East Asia	Taiwan	Yushon National Park
China and East Asia	Thailand	Doi Chiang Dao Wildlife Sanctuary
China and East Asia	Thailand	Doi Inthanon
China and East Asia	Thailand	Doi Suthep-pui National Park
China and East Asia	Thailand	Khao Soi Dao Wildlife Sanctuary
China and East Asia	Thailand	Khao Yai National Park
China and East Asia	Thailand	Limestone Flora
China and East Asia	Thailand	Tarutao National Park
China and East Asia	Thailand	Wet Seasonal Evergreen forests of south east Thailand
China and East Asia	Viet Nam	Bach Ma-Hai Van National Park
China and East Asia	Viet Nam	Cat Tien Biosphere Reserve
China and East Asia	Viet Nam	Cuc Phuong National Park
China and East Asia	Viet Nam	Langbian-Dalat Highland
China and East Asia	Viet Nam	Mount Fan Si Pan
China and East Asia	Viet Nam	Phu Khan
China and East Asia	Viet Nam	Yok Don Nature Reserve
Europe	Austria/France/Germany/Italy/Liechenstein/Slovenia/Switzerland	Alps
Europe	Belarus/Lithuania/Poland	Biatowieza Forest
Europe	Cyprus	Troodos Mountains
Europe	Czech Republic/Slovakia/Hungary/Poland/Romania/Ukraine	Carpathians
Europe	Greece	Crete
Europe	Greece	Mount Olympus
Europe	Greece	Mountains of Southern and Central Greece
Europe	Ireland	Burren
Europe	Portugal	Algarve

Site Number	World Heritage Site Name	Country	Year
1	Tassili N'Ajjer	Algeria	1982
2	Iguazú National Park	Argentina	1984
3	Los Glaciares	Argentina	1981
4	Península Valdés	Argentina	1999
5	Australian Fossil Mammal Sites	Australia	1994
6	Central Eastern Australian Rainforest	Australia	1986
7	Fraser Island	Australia	1992
8	Great Barrier Reef	Australia	1981
9	Heard and McDonald Islands	Australia	1997
10	Kakadu National Park	Australia	1981
11	Lord Howe Island Group	Australia	1982
12	Macquarie Island	Australia	1997
13	Shark Bay Western Australia	Australia	1991
14	Tasmanian Wilderness	Australia	1982
15	Uluru-Kata Tjuta National Park	Australia	1987
16	Wet Tropics of Queensland	Australia	1988
17	Willandra Lakes Region	Australia	1981
18	The Sundarbans	Bangladesh	1997
19	Belovezhskaya Puscha/Bialowieza National Park	Belarus/Poland	1992
20	Belize Barrier Reef Reserve system	Belize	1996
21	Discovery Coast Atlantic Forest Reserves	Brazil	1999
22	Iguaçu National Park	Brazil	1984
23	Southeast Atlantic Forest Reserves	Brazil	1999
24	Pirin National Park	Bulgaria	1983
25	Srebarna Nature Reserve	Bulgaria	1983
26	Dja Faunal Reserve	Cameroon	1984
27	Canadian Rocky Mountain Parks	Canada	1984
28	Dinosaur Provincial Park	Canada	1979
29	Gros Morne National Park	Canada	1987
30	Miguasha Park	Canada	1999
31	Nahanni National Park	Canada	1978
32	Wood Buffalo National Park	Canada	1983
33	Waterton and Glacier International Peace Park	Canada/USA	1995
34	Tatshenshini-Alsek/Kluane/Wrangell-St Elias/Glacier Bay	Canada/USA	1979
35	Parc National de Manovo-Gounda-St Floris	Central African Republic	1988
36	Huanglong Scenic and Historic Interest Area	China	1992
37	Jiuzhaigou Valley Scenic and Historic Interest Area	China	1992
38	Mount Emei and Leshan Giant Buddha	China	1996
39	Mount Huangshan	China	1990
40	Mount Taishan	China	1987
41	Mount Wyui	China	1999
42	Wulingyuan Scenic and Historic Interest Area	China	1992
43	Los Katios National Park	Colombia	1994
44	Area de Conservación Guanacaste	Costa Rica	1999
45	Cocos Island National Park	Costa Rica	1997
46	Talamanca Range-La Amistad Reserves	Costa Rica/Panama	1983
47	Comoé National Park	Côte d'Ivoire	1983
48	Taï National Park	Côte d'Ivoire	1982
49	Mount Nimba Reserves	Côte d'Ivoire/Guinea	1982
50	Plitvice Lakes National Park	Croatia	1979
51	Desembarco del Granma National Park	Cuba	1999

Site Number	World Heritage Site Name	Country	Year
52	Garamba National Park	Democratic. Republic. of Congo	1980
53	Kahuzi-Biega National Park	Democratic. Republic. of Congo	1980
54	Okapi Faunal Reserve	Democratic. Republic. of Congo	1996
55	Salonga National Park	Democratic. Republic. of Congo	1984
56	Virunga National Park	Democratic. Republic. of Congo	1979
57	Morne Trois Pitons National Park	Dominica	1997
58	Galapagos Islands	Ecuador	1978
59	Sangay National Park	Ecuador	1983
60	Simien National Park	Eithiopia	1978
61	Cape Girolata, Cape Porto & Scandola Nature Reserves in Corsica	France	1983
62	Pyrénées - Mont Perdu	France/Spain	1997
63	Ohrid Region with its Cultural and Historical Aspect and its Natural Environment	FYRM	1979
64	Messel Pit Fossil Site	Germany	1995
65	Meteora	Greece	1988
66	Mount Athos	Greece	1988
67	Tikal National Park	Guatamala	1979
68	Rió Plátano Biosphere Reserve	Honduras	1982
69	Caves of Aggtelek and Slovak Karst	Hungary/Slovakia	1995
70	Kaziranga National Park	India	1985
71	Keoladeo National Park	India	1985
72	Manas Wildlife Sanctuary	India	1985
73	Nanda Devi National Park	India	1988
74	Sundarbans National Park	India	1987
75	Komodo National Park	Indonesia	1991
76	Lorentz National Park	Indonesia	1999
77	Ujung Kulon National Park and Krakatan National Reserve	Indonesia	1991
78	Shirakami-Sanchi	Japan	1993
79	Yakushima	Japan	1993
80	Mount Kenya National Park/Natural Forest	Kenya	1997
81	Sibiloi/Central Island National Parks	Kenya	1997
82	Tsingy de Bemaraha Strict Nature Reserve	Madagascar	1990
83	Lake Malawi National Park	Malawi	1984
84	Cliffs of Bandiagara (Land of the Dogons)	Mali	1989
85	Banc d'Arguin National Park	Mauritania	1989
86	Sian Ka'an	Mexico	1987
87	Whale Sanctuary of El Vizcaino	Mexico	1993
88	Royal Chitwan National Park	Nepal	1984
89	Sagarmatha National Park	Nepal	1979
90	New Zealand Sub-Antarctic Islands	New Zealand	1998
91	Te Wahipounamu-South West New Zealand	New Zealand	1990
92	Tongariro National Park	New Zealand	1988
93	Air and Ténéré Natural Reserves	Niger	1991
94	'W' National Park	Niger	1996
95	Arabian Oryx Sanctuary	Oman	1994
96	Darien National Park	Panama	1981
97	Historic Sanctuary of Macchu Picchu	Peru	1983
98	Huascarán National Park	Peru	1985

Site Number	World Heritage Site Name	Country	Year
99	Manú National Park	Peru	1987
100	Río Abiseo National Park	Peru	1990
101	Puerto-Princesa Subterranean River National Park	Philippines	1999
102	Tubbataha Reef Marine Park	Philippines	1993
103	Laurisilva of Madeira	Portugal	1999
104	Danube Delta	Romania	1991
105	Golden Mountains of Altai	Russia	1998
106	Lake Baikal	Russia	1996
107	Virgin Komi Forests	Russia	1995
108	Volcanoes of Kamchatka	Russia	1996
109	Western Caucasus	Russia	1999
110	Djoudj National Bird Sanctuary	Senegal	1981
111	Niokolo-Koba National Park	Senegal	1981
112	Aldabra Atoll	Seychelles	1982
113	Vallée de Mai Nature Reserve	Seychelles	1983
114	Skocjan Caves	Slovenia	1986
115	East Rennell	Solomon Islands	1998
116	Greater St Lucia Wetland Park	South Africa	1999
117	Donana National Park	Spain	1994
118	Garajonay National Park	Spain	1986
119	Ibiza, Biodiversity and Culture	Spain	1999
120	Sinharaja Forest Reserve	Sri Lanka	1988
121	The Lapponian Area	Sweden	1996
122	Kilimanjaro National Park	Tanzania	1989
123	Ngorongoro Conservation Area	Tanzania	1979
124	Selous Game Reserve	Tanzania	1982
125	Serengeti National Park	Tanzania	1981
126	Thung Yai - Huai Kha Kaeng Wildlife Sanctuaries	Thailand	1991
127	Ichkeul National Park	Tunisia	1980
128	Goreme National Park and the Rock Sites of Cappodicia	Turkey	1985
129	Hierapolis-Pamukkale	Turkey	1988
130	Bwindi Impenetrable National Park	Uganda	1994
131	Rwenzori Mountians National Park	Uganda	1994
132	Giant's Causeway and Causeway Coast	UK	1986
133	Gough Island Wildlife Reserve	UK	1995
134	St. Kilda	UK	1986
135	Henderson Island	UK/Pitcairn	1988
136	Carlsbad Caverns	USA	1995
137	Everglades National Park	USA	1979
138	Grand Canyon National Park	USA	1979
139	Great Smoky Mountains National Park	USA	1983
140	Hawaii Volcanoes National Park	USA	1987
141	Mammoth Cave National Park	USA	1981
142	Olympic National Park	USA	1981
143	Redwood National Park	USA	1980
144	Yellowstone	USA	1979
145	Yosemite National Park	USA	1984
146	Canaima National Park	Venezuala	1994
147	Ha Long Bay	Viet Nam	1994
148	Durmitor National Park	Yugoslavia	1980
149	Victoria Falls/Mosi-oa-Tunya	Zambia/Zimbabwe	1989
150	Mana Pools National Park, Sapi and Chewore Safari Areas	Zimbabwe	1984

Map 1

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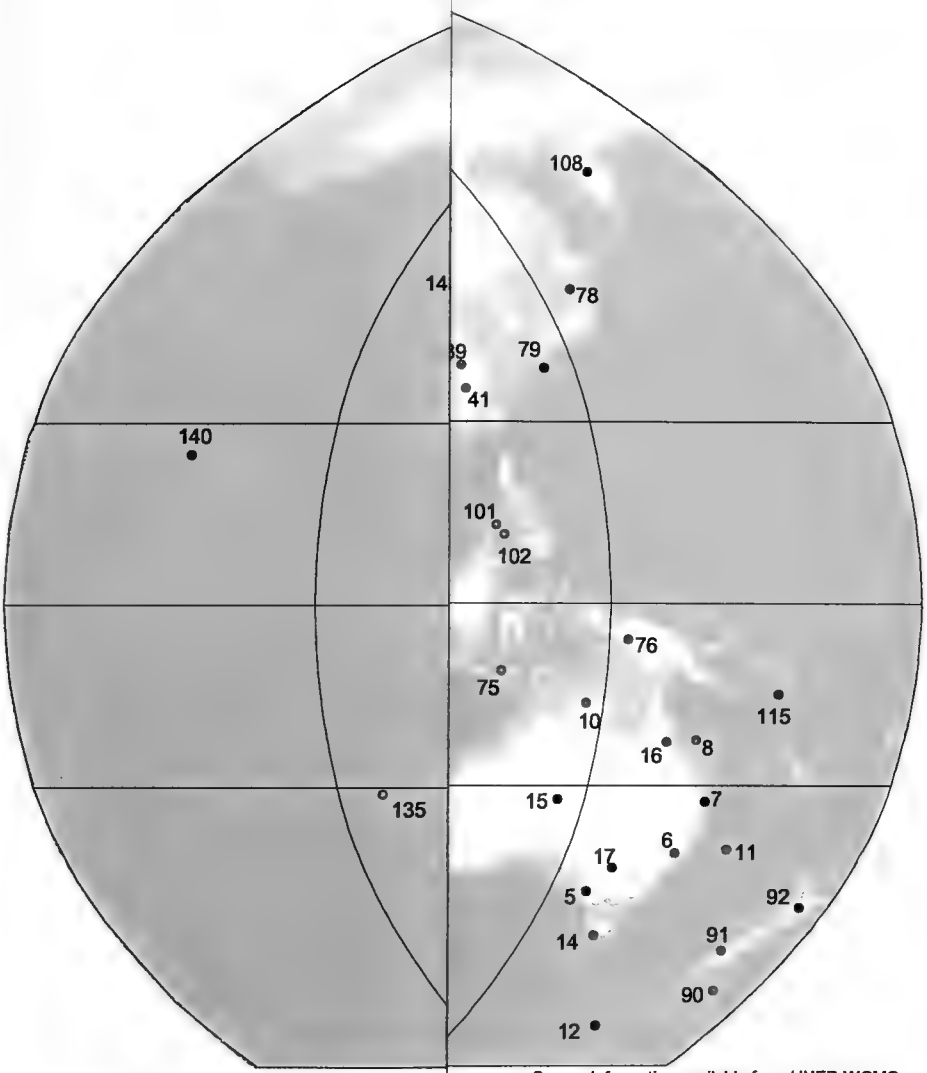

Source Information available from UNEP-WCMC

Natural World Heritage sites are nservation of biological diversity, including those contain

Ninety-five natural World Heritag

Natural World Heritage Sites Inscribed under criterion iv

Map 1

- Natural World Heritage Sites Inscribed under criterion iv
- Other Natural World Heritage Sites

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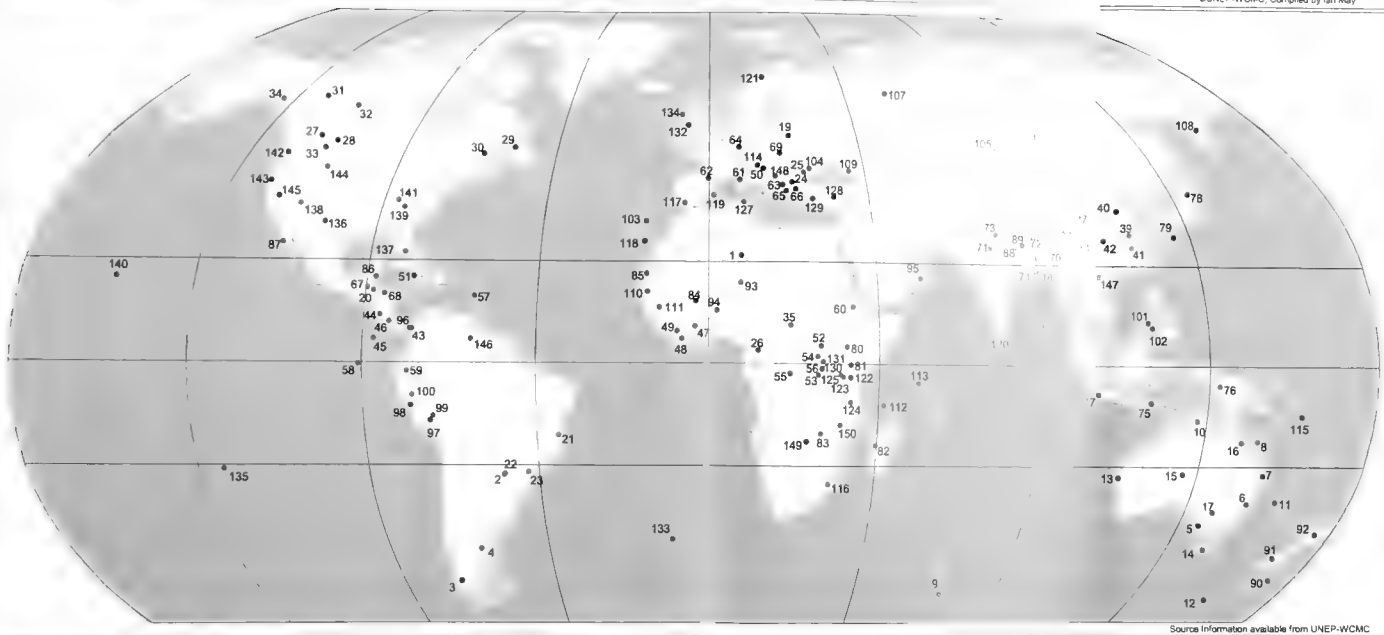

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Natural World Heritage sites are listed under criterion iv if they are considered to "contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation"

Ninety-five natural World Heritage sites are listed under criterion iv on the World Heritage list

Map 2

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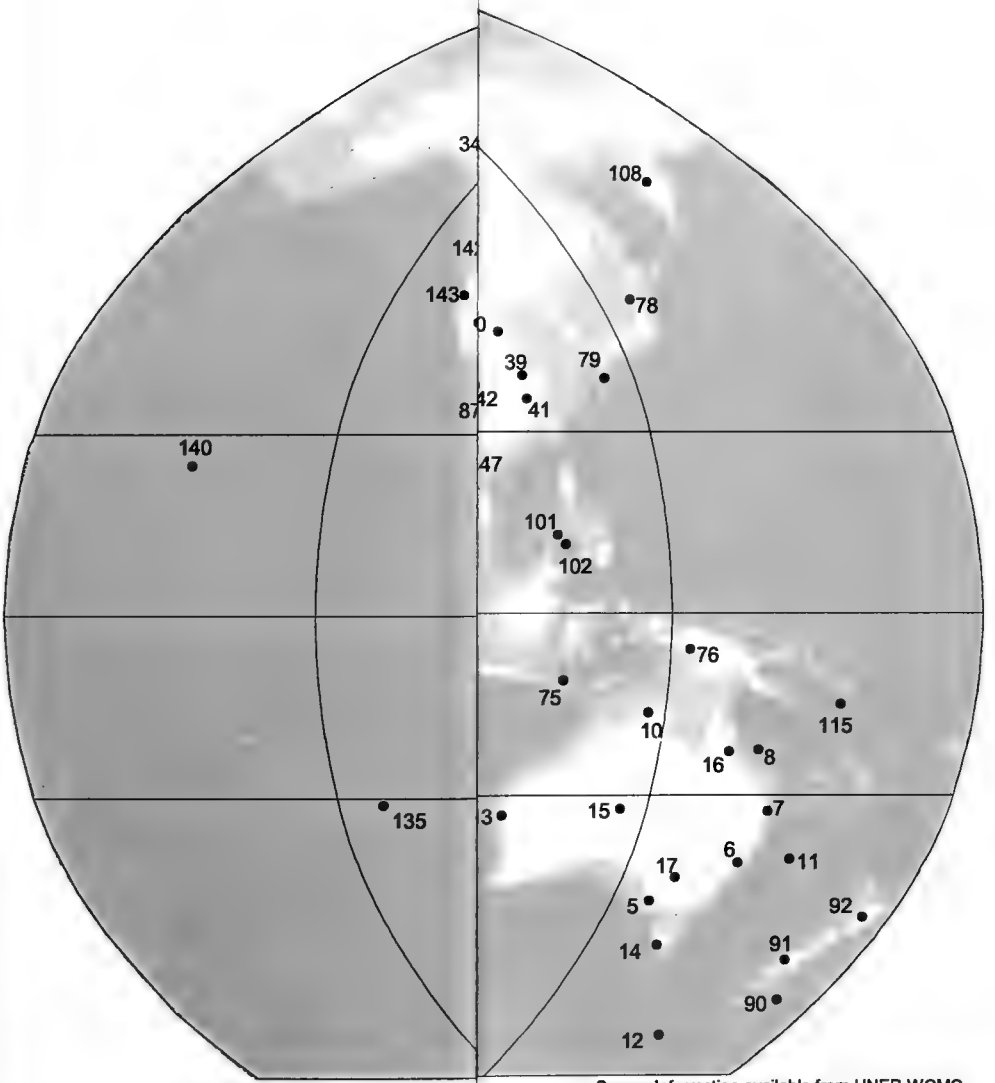

Source Information available from UNEP-WCMC

In accordance with Article 11.4 of ths shall so require", a list of World Heritage properties that are in Dang

The list includes cultural and natura ed by accelerated deterioration, large-scale public or private project major alterations due to unknown causes; abandonment; the outbreak

There are currently 18 natural Worl

Natural World Heritage Sites in Danger

Map 2

IUCN UNEP WCMC

- Natural World Heritage Sites in Danger
- Other Natural World Heritage Sites

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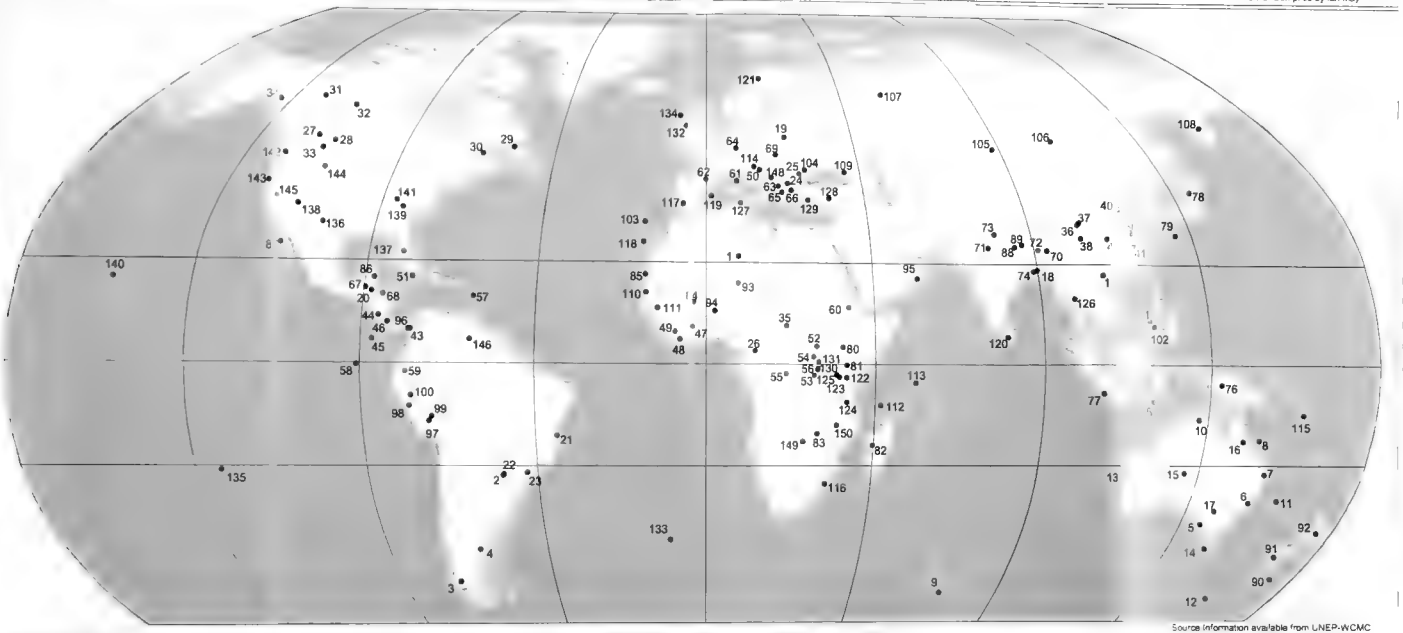

Source information available from UNEP-WCMC

In accordance with Article 11.4 of the Convention, the World Heritage Committee "shall establish, keep up to date and publish, whenever circumstances ·o require", a list of World Heritage properties that are in Danger.

The list includes cultural and natural heritage properties that are threatened by serious and specific dangers, such as the threat of disappearance caused ·· accelerated deterioration, large-scale public or private projects or rapid urban or tourist development projects; destruction caused by changes in the use or ownership of the land; m alterations due to unknown causes; abandonment; the outbreak or the threat of an armed conflict and natural disasters.

There are currently 18 natural World Heritage sites inscribed on the List of World Heritage in Danger.

Map 3

- Natural World Heritage Sites

Udvardy Biomes

- Cold-winter deserts
- Evergreen Sclerophyllous forests
- Lake systems
- Mixed island systems

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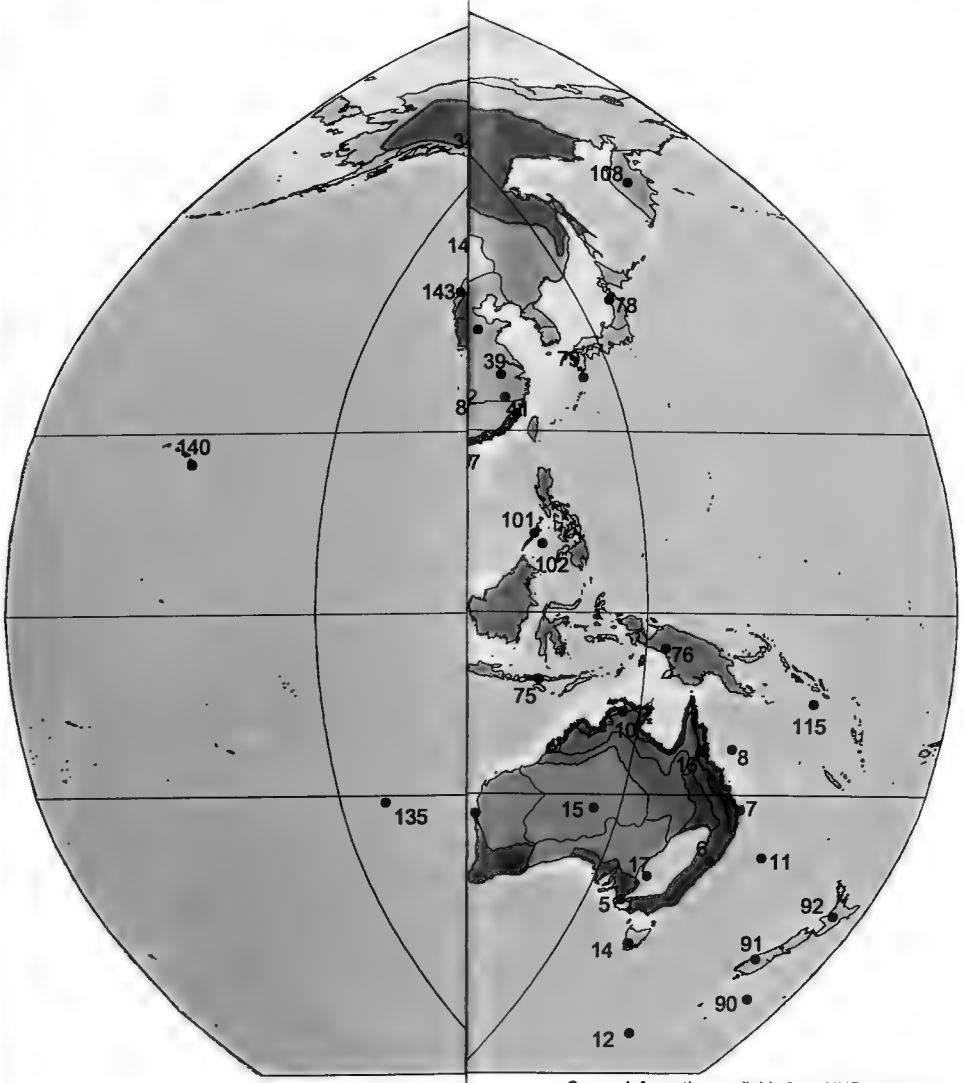

Source Information available from UNEP-WCMC

Udvardy's "Biogeographical Provi ater areas of the world. Such a classification system enables prec

Udvardy's classification system gr matic or biotic subdivisions.

The World Heritage Convention re

Natural and mixed World Heritage raphic Provinces have been delineated.

Natural World Heritage Sites and Udvardy Biomes

Map 3

- Natural World Heritage Sites

Udvardy Biomes

- Cold-winter deserts
- Evergreen Sclerophyllous forests
- Lake systems
- Mixed island systems
- Mixed mountain systems
- Sub-tropical / Temperate rain forests / Woodlands
- Temperate broad-leaf forests
- Temperate grasslands
- Temperate needle-leaf forests / Woodlands
- Tropical dry forests / Woodlands
- Tropical grasslands / Savannas
- Tropical humid forests
- Tundra communities
- Warm deserts / semi-deserts

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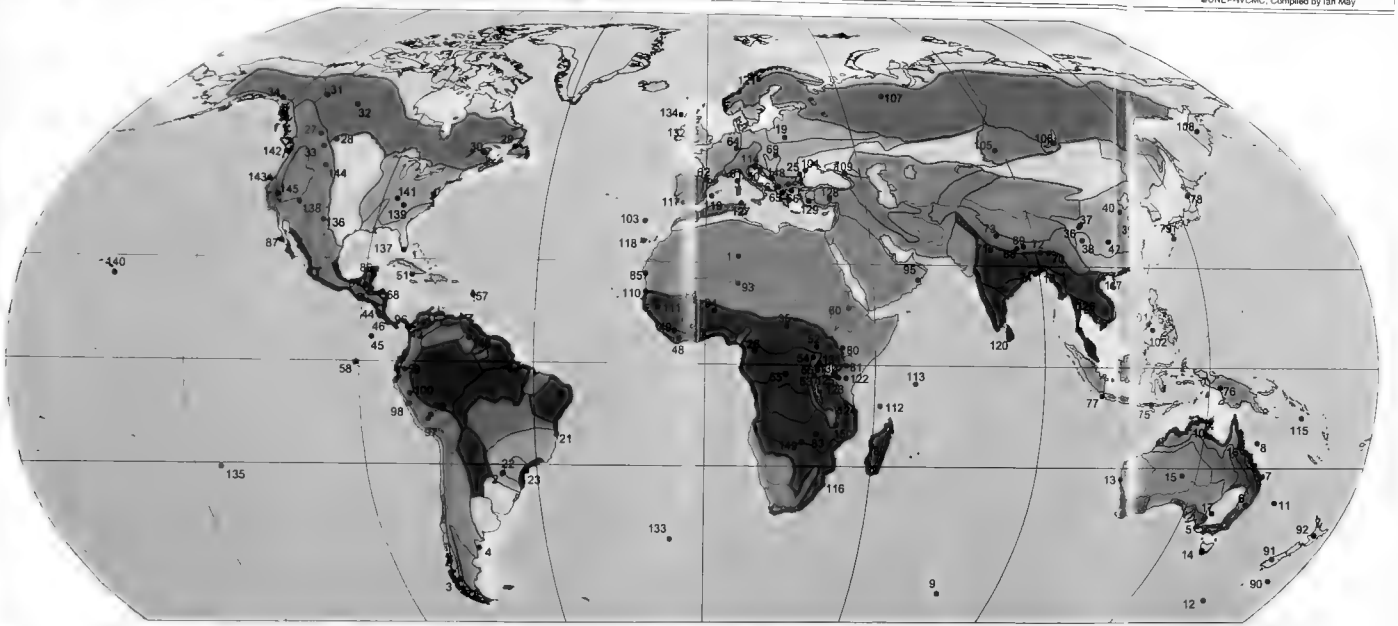

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Udvardy's "Biogeographical Provinces of the World" (1975) is an example of a hierarchical biogeographic classification system for terrestrial and freshwater areas of the world. Such a classification system enables predictions and assumptions to be made about similar biogeographical regions.

Udvardy's classification system groups the world into Realms, Biomes and Provinces. Realms are the largest unit; biogeographic provinces are ecosytematic or biotic subdivisions.

The World Heritage Convention requires natural World Heritage properties to be classified according to biogeographic provinces.

Natural and mixed World Heritage sites have been classified according to biogeographic province. This map is coloured by Biome within which Biogeographic Provinces have been delineated.

• Natural World Heritage Sites ge Sites

Map 4

Udvardy Biomes

- Cold-winter deserts
- Evergreen Sclerophyllous forests
- Lake systems
- Mixed island systems

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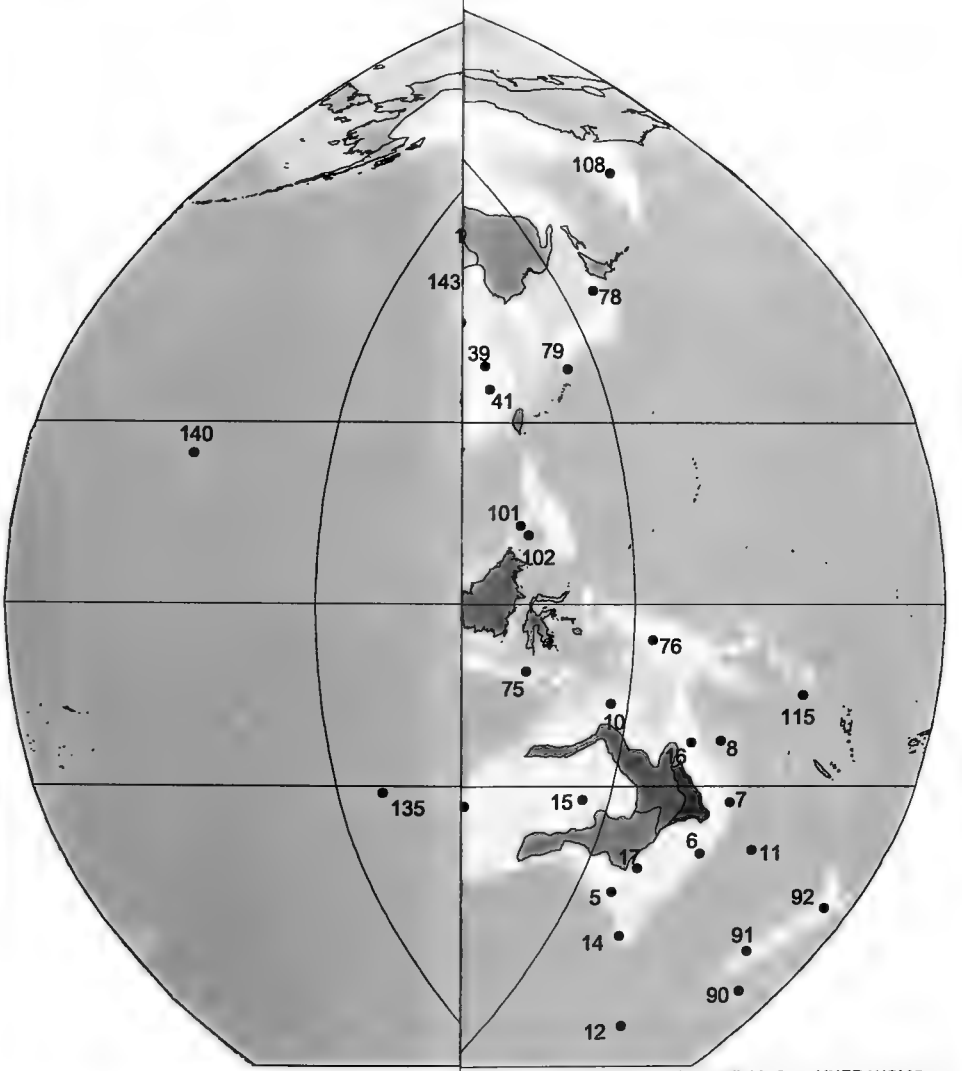

Source Information available from UNEP-WCMC

This map is coloured by en delineated.

There are currently 94 Bi

Potential new inscriptions

Udvardy Provinces not containing Natural World Heritage Sites

Map 4

• Natural World Heritage Sites

Udvardy Biomes

- Cold-winter deserts
- Evergreen Sclerophyllous forests
- Lake systems
- Mixed island systems
- Mixed mountain systems
- Sub-tropical / Temperate rain forests / Woodlands
- Temperate broad-leaf forests
- Temperate grasslands
- Temperate needle-leaf forests / Woodlands
- Tropical dry forests / Woodlands
- Tropical grasslands / Savannas
- Tropical humid forests
- Tundra communities
- Warm deserts / semi-deserts

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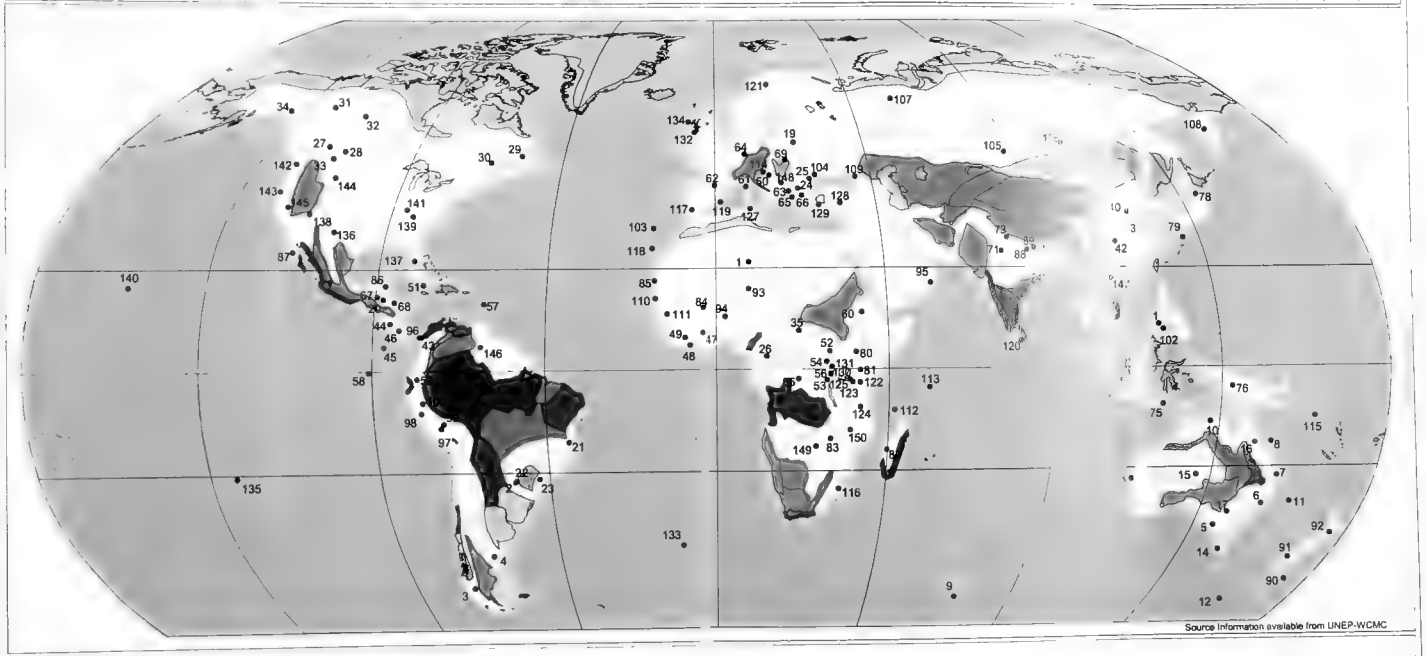

This map is coloured by Biome within which those Udvardy Biogeographical Provinces that do not contain natural World Heritage sites have been delineated.

There are currently 94 Biogeographical Provinces that do not contain Natural World Heritage Sites.

Potential new inscriptions to the World Heritage List could be focused on these areas.

Nat gions

Map 5

UNEP WCMC

Terrestrial Global 200

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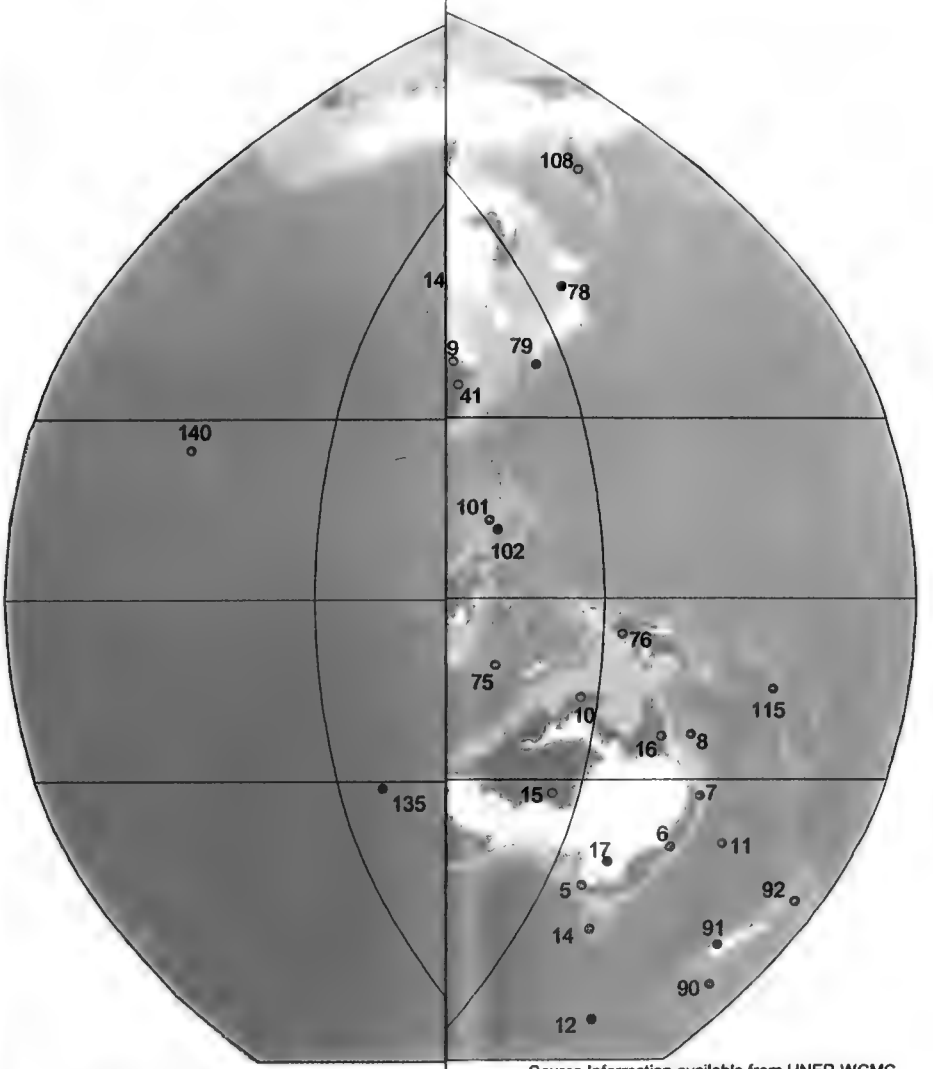

Source Information available from UNEP-WCMC

The WWF Global 200 Ecoreg nducted an analysis of ecoregions representing the nomena, and global rarity of major habitat types.

The analysis identified 233 ec 's conservation action. These include 136 terrestrial e
Compiled by WWF-US, ©WW

Natural World Heritage Sites and WWF Terrestrial Global 200 Ecoregions

Map 5

Terrestrial Global 200 Ecoregions

- Natural World Heritage Sites within Terrestrial Global 200 Ecoregions
- Other Natural World Heritage Sites

IUCN UNEP WCMC

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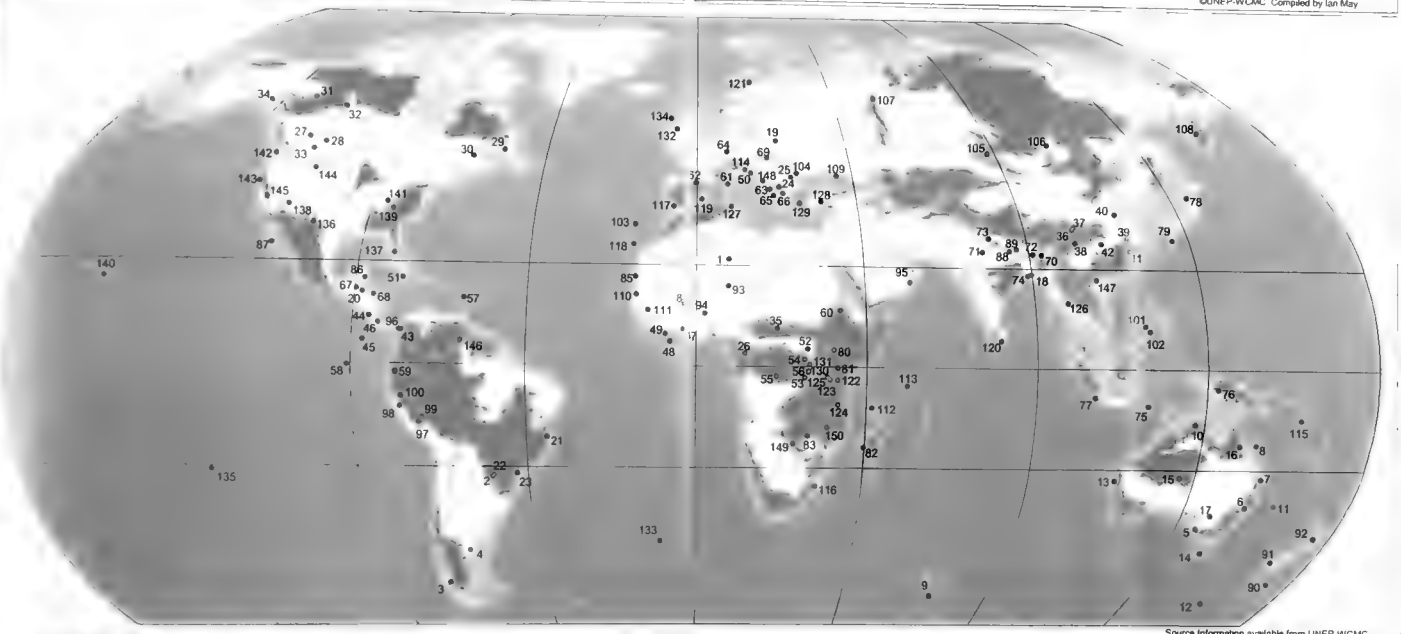

Source Information available from UNEP-WCMC

The WWF Global 200 Ecoregions show those areas of the world designated as high priority by WWF for its work in conservation. WWF's scientists conducted an analysis of ecoregions representing the Earth's major terrestrial, freshwater and marine habitat types, based on species richness, ecological or evolutionary phenomena, and global rarity of major habitat types

The analysis identified 233 ecoregions (the Global 200) that are outstanding examples of the world's diverse ecosystems and priority targets for WWF's conservation action. These include 136 terrestrial ecoregions. One hundred and four Natural World Heritage Sites occur within Terrestrial Global 200 Ecoregions.
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Ngions

Map 6

UNEP WCMC

Marine Global 200 Eco

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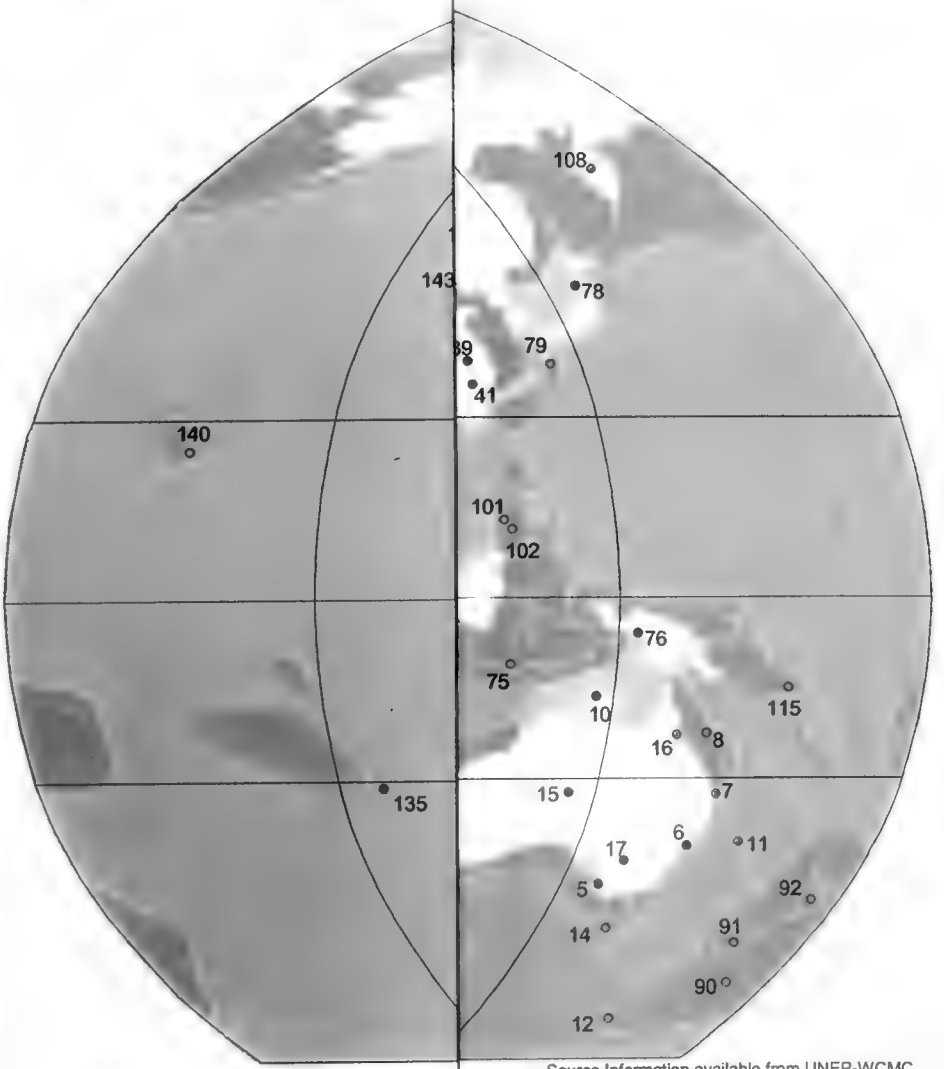

Source Information available from UNEP-WCMC

The WWF Global 200 Ecoregionducted an analysis of ecoregions representing theenomena, and global rarity of major habitat types.

The analysis identified 233 ecd's conservation action. These include 61 marine ecore
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Natural World Heritage Sites and WWF Marine Global 200 Ecoregions

Map 6

Marine Global 200 Ecoregions

- Natural World Heritage Sites within Marine Global 200 Ecoregions
- Other Natural World Heritage Sites

IUCN UNEP WCMC

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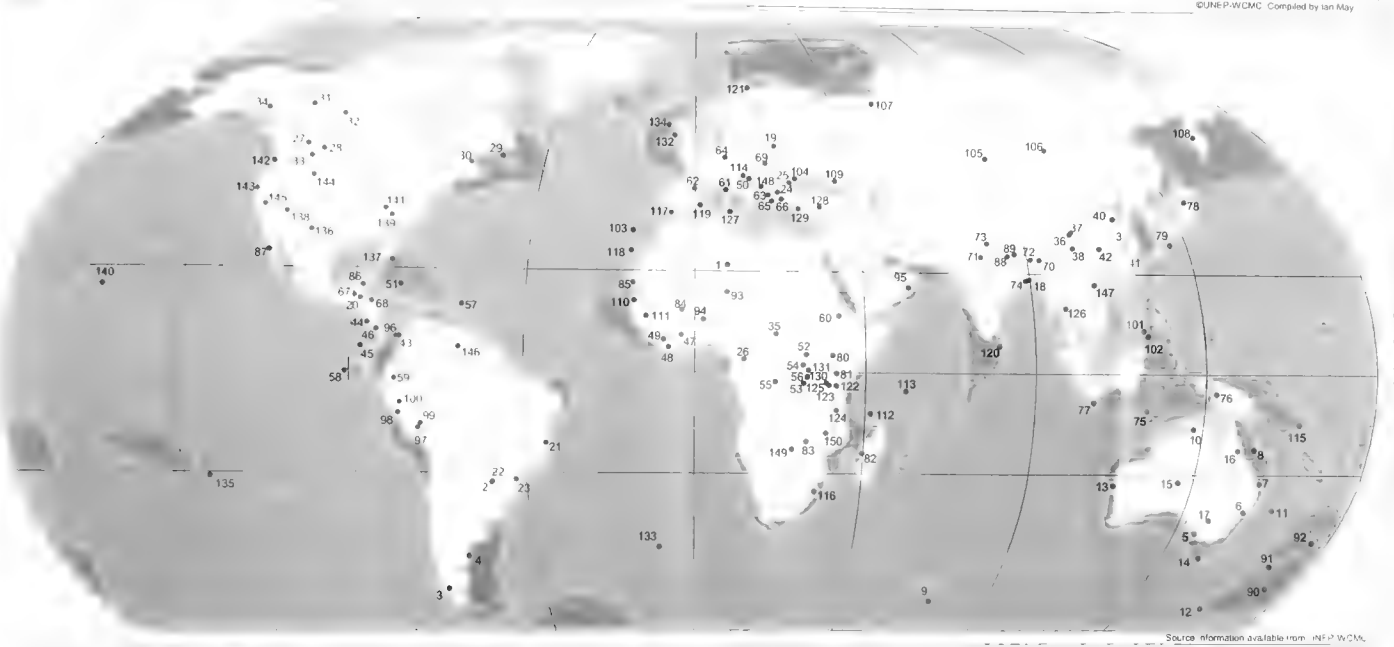

Source information available from UNEP-WCMC

The WWF Global 200 Ecoregions show those areas of the world designated as high priority by WWF for its work in conservation. WWF's scientists conducted an analysis of ecoregions representing the Earth's major terrestrial, freshwater and marine habitat types, based on species richness, ecological or evolutionary phenomena, and global rarity of major habitat types.

The analysis identified 233 ecoregions (the Global 200) that are outstanding examples of the world's diverse ecosystems and priority targets for WWF's conservation action. These include 61 marine ecoregions. Thirty five Natural World Heritage Sites occur within Marine Global 200 Ecoregions.

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Natur regions

Map 7

UNEP WCMC

Freshwater Global 200 E

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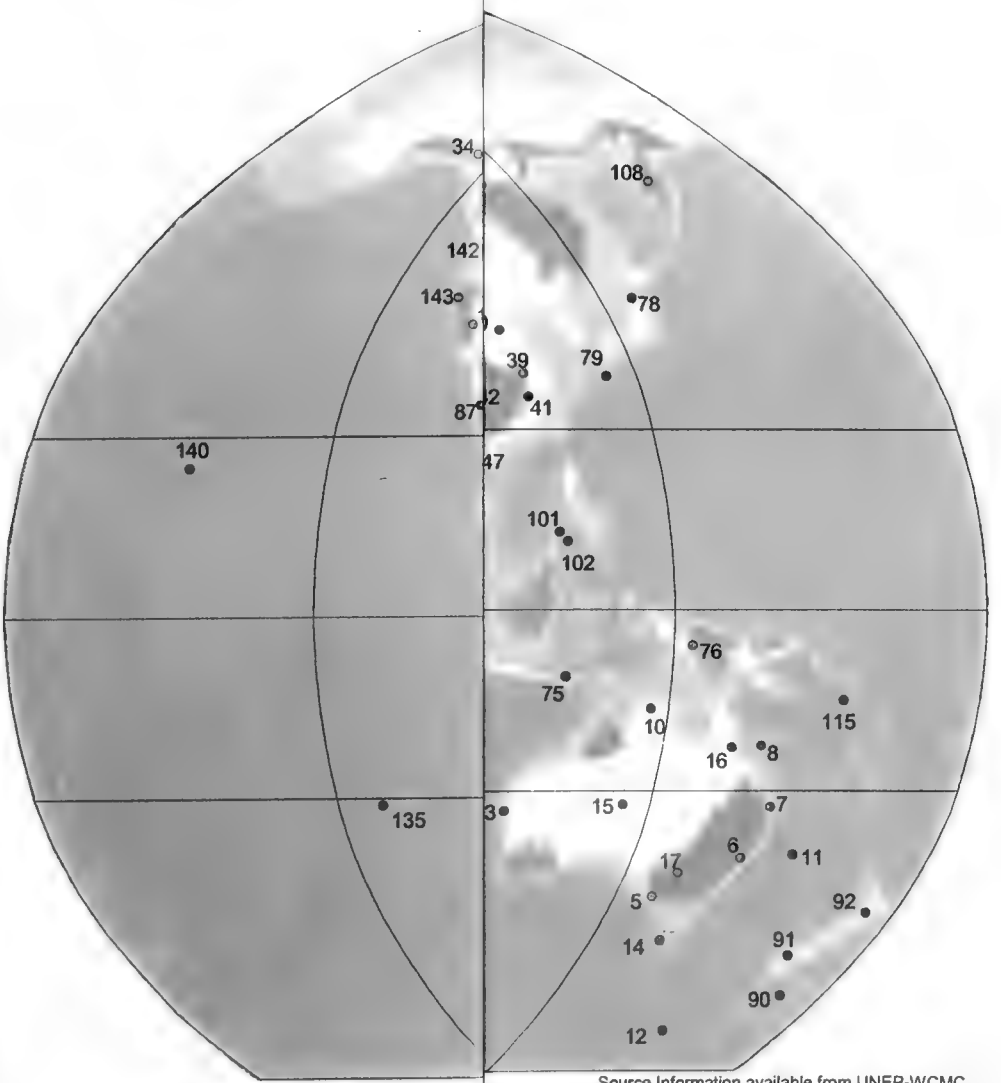

Source Information available from UNEP-WCMC

The WWF Global 200 Ecoregion conducted an analysis of ecoregions representing the E phenomena, and global rarity of major habitat types.

The analysis identified 233 ecore F's conservation action. These include 36 freshwater eco Compiled by WWF-US, ©WWF

Natural World Heritage Sites and WWF Freshwater Global 200 Ecoregions

Map 7

Freshwater Global 200 Ecoregions

- Natural World Heritage Sites within Freshwater Global 200 Ecoregions
- Other Natural World Heritage Sites

IUCN UNEP WCMC

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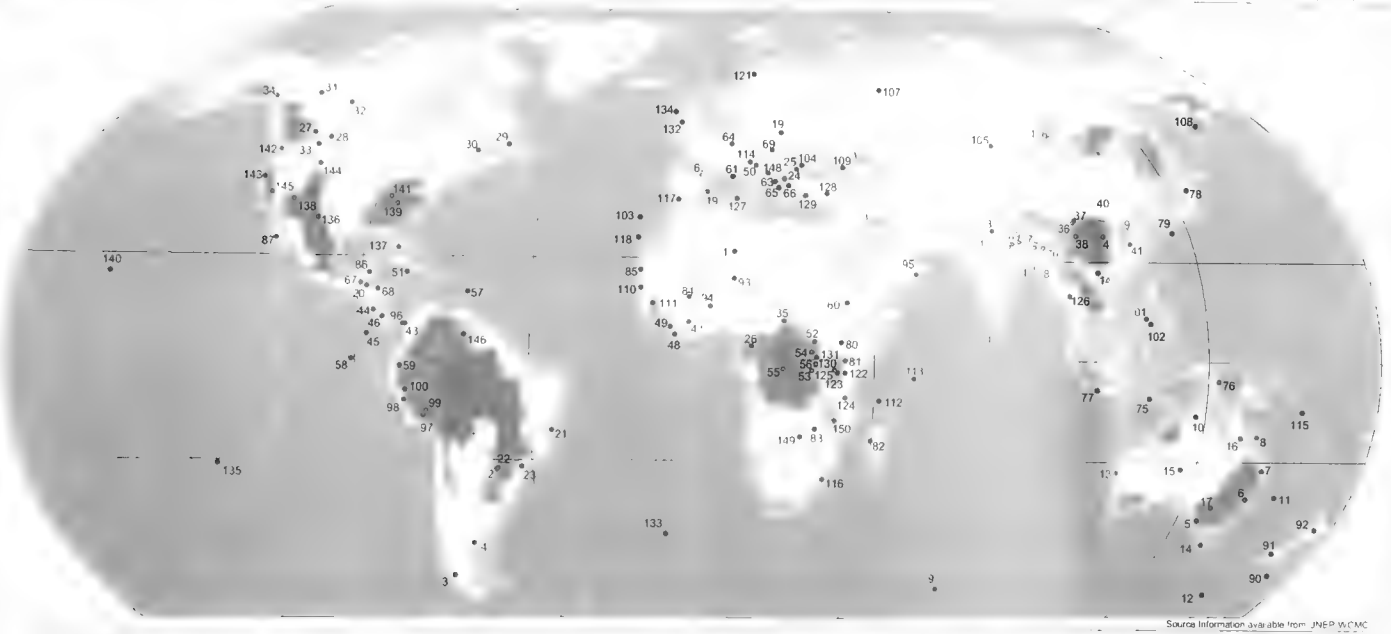

Source Information available from UNEP-WCMC

The WWF Global 200 Ecoregions show those areas of the world designated as high priority by WWF for its work in conservation. WWF's scientists conducted an analysis of ecoregions representing the Earth's major terrestrial, freshwater and marine habitat types, based on species richness, ecological or evolutionary phenomena, and global rarity of major habitat types.

The analysis identified 233 ecoregions (the Global 200) that are outstanding examples of the world's diverse ecosystems and priority targets for WWF's conservation action. These include 36 freshwater ecoregions. Fifty five Natural World Heritage Sites occur within Freshwater Global 200 Ecoregions.

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WWF Sites

Map 8

Terrestrial Global 200 E
Freshwater Global 200 E
Marine Global 200 Ecore

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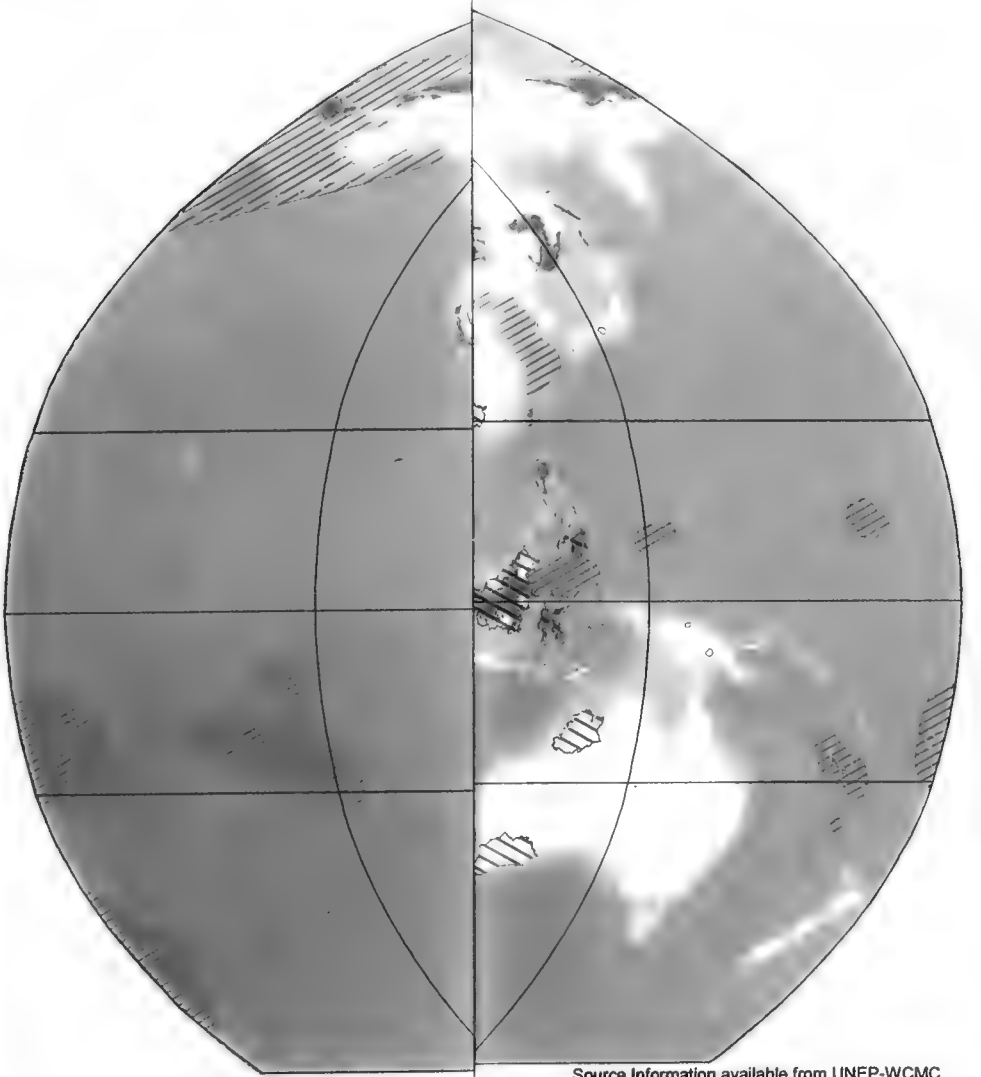

Source Information available from UNEP-WCMC

The WWF Global 200 Ecoregion
There are currently 69 Terrestrial
Potential new inscriptions to the
Compiled by WWF-US, ©WWF-

WWF Global 200 Ecoregions not containing Natural World Heritage Sites

Map 8

Terrestrial Global 200 Ecoregions
Freshwater Global 200 Ecoregions
Marine Global 200 Ecoregions

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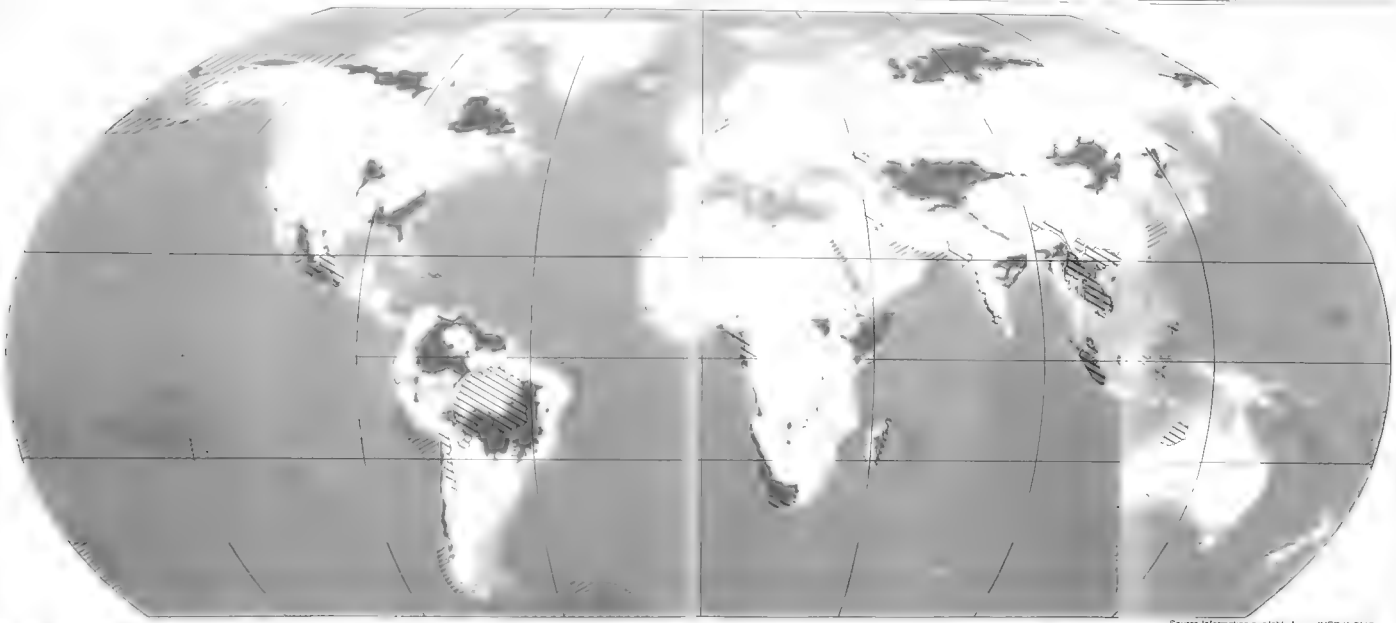

Source Information available from UNEP-WCMC

The WWF Global 200 Ecoregions identified in this map are those which do not contain any current Natural World Heritage Sites

There are currently 69 Terrestrial, 37 Freshwater and 33 Marine WWF Global 200 Ecoregions which do not contain Natural World Heritage Sites.

Potential new inscriptions to the Natural World Heritage list could be focused on these areas.

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Map 9

• Centres of Plant Divers

Note: The mapped CBD coverage is incomp
analysis of the Natural World Heritage Sites
compiled using supplementary data from "C
Diversity" Volumes I-III, (WWF/IUCN),(1994

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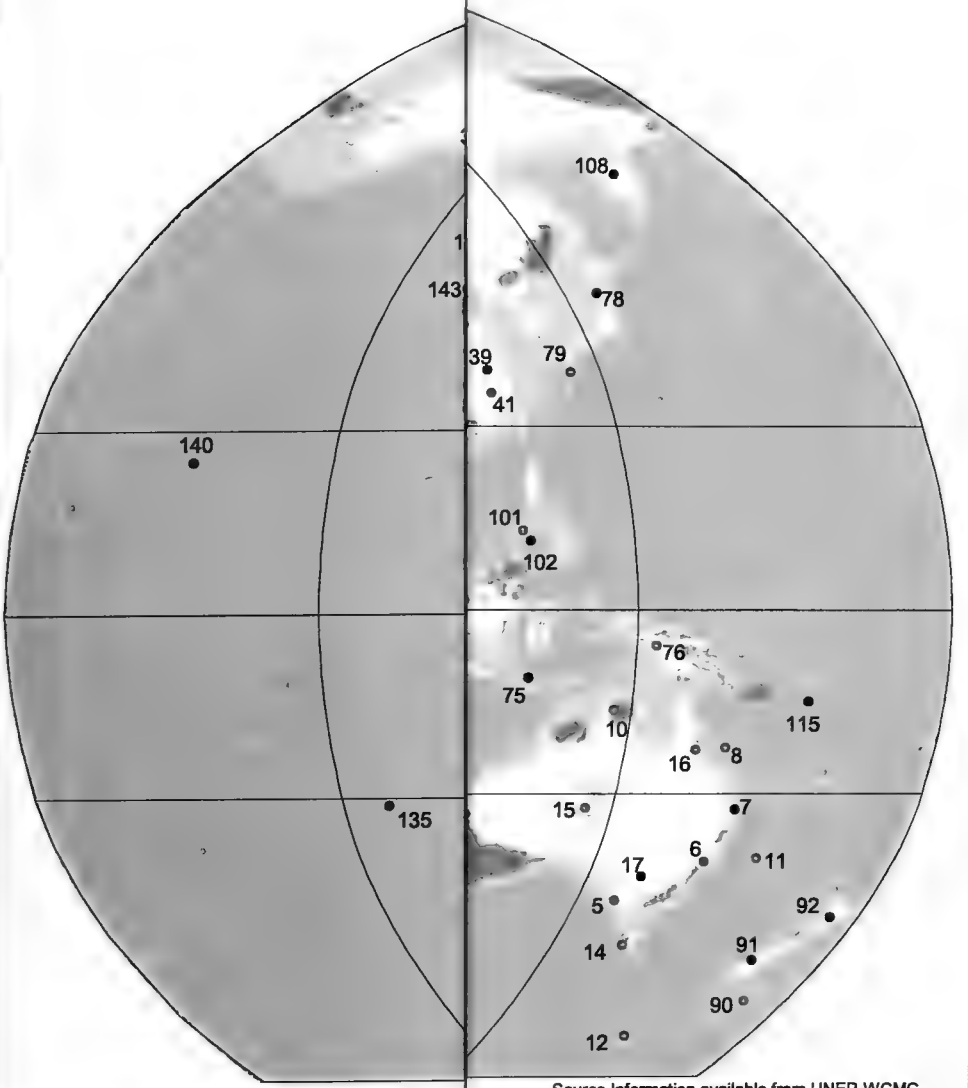

Source Information available from UNEP-WCMC

Concern about the rapid loss an s, was the rational behind identifying Centres of Pla

CPDs are concerned with first o ay not be accurately known: and/or is known to conta

The sites are also likely to conta proportion of species adapted to special edaphic cond Sites occur within Centres of Plant Diversity.

Natural World Heritage Sites and Centres of Plant Diversity

Map 9

• Centres of Plant Diversity

Note. The mapped CBD coverage is incomplete, however analysis of the Natural World Heritage Sites has been compiled using supplementary data from "Centres of Plant Diversity" Volumes I-III, (WWF/IUCN),(1994)

• Natural World Heritage Sites within or containing Centres of Plant Diversity
• Other Natural World Heritage Sites

IUCN

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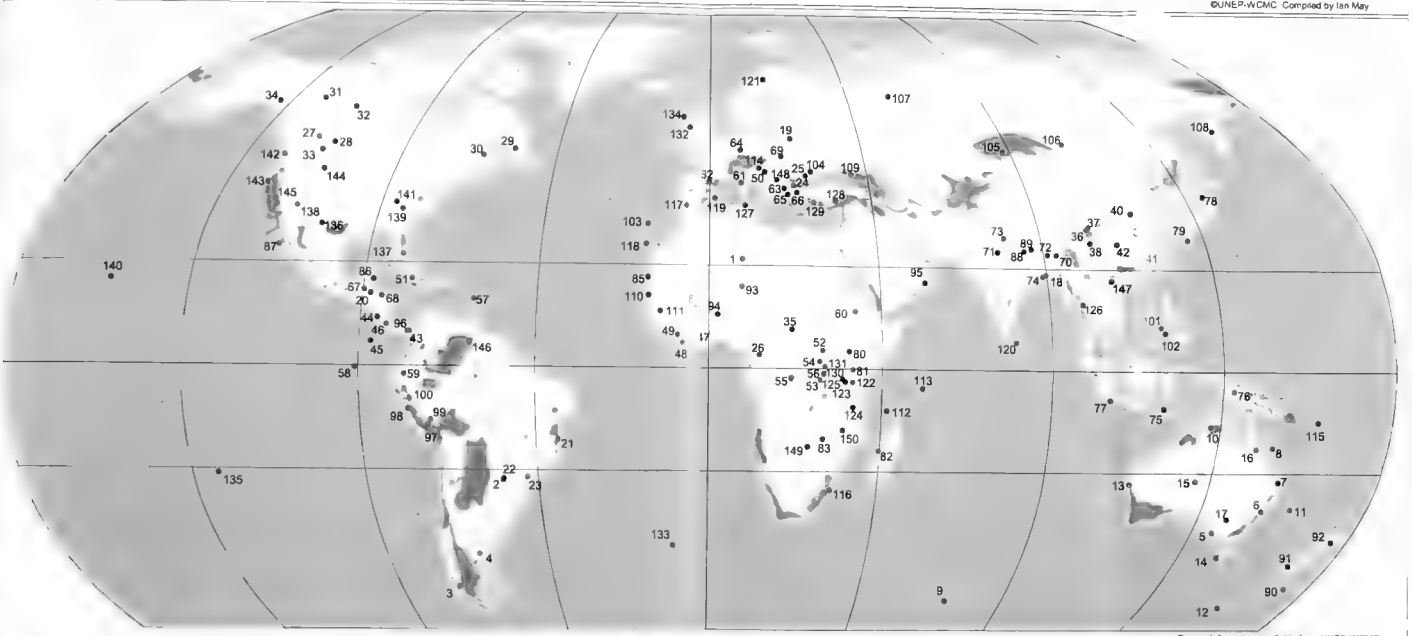

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Concern about the rapid loss and degeneration of Natural Ecosystems and the urgent need to highlight the areas of prime botanical importance, hotspots, was the rational behind identifying Centres of Plant Diversity (CPD).

CPDs are concerned with first order sites that are of global botanical importance. Such areas are evidently species rich, even if the number of species may not be accurately known: and/or is known to contain a large number of endemic species.

The sites are also likely to contain an important genepool of plants of actual or potential value to humans, a diverse range of habitat types, a significant proportion of species adapted to special edaphic conditions and may be threatened or under imminent threat of large-scale devastation. Seventy four Natural World Heritage Sites occur within Centres of Plant Diversity.

Natural World Hotspots

Map 10

Conservation International Biod

Hotspot area
Outer Limit

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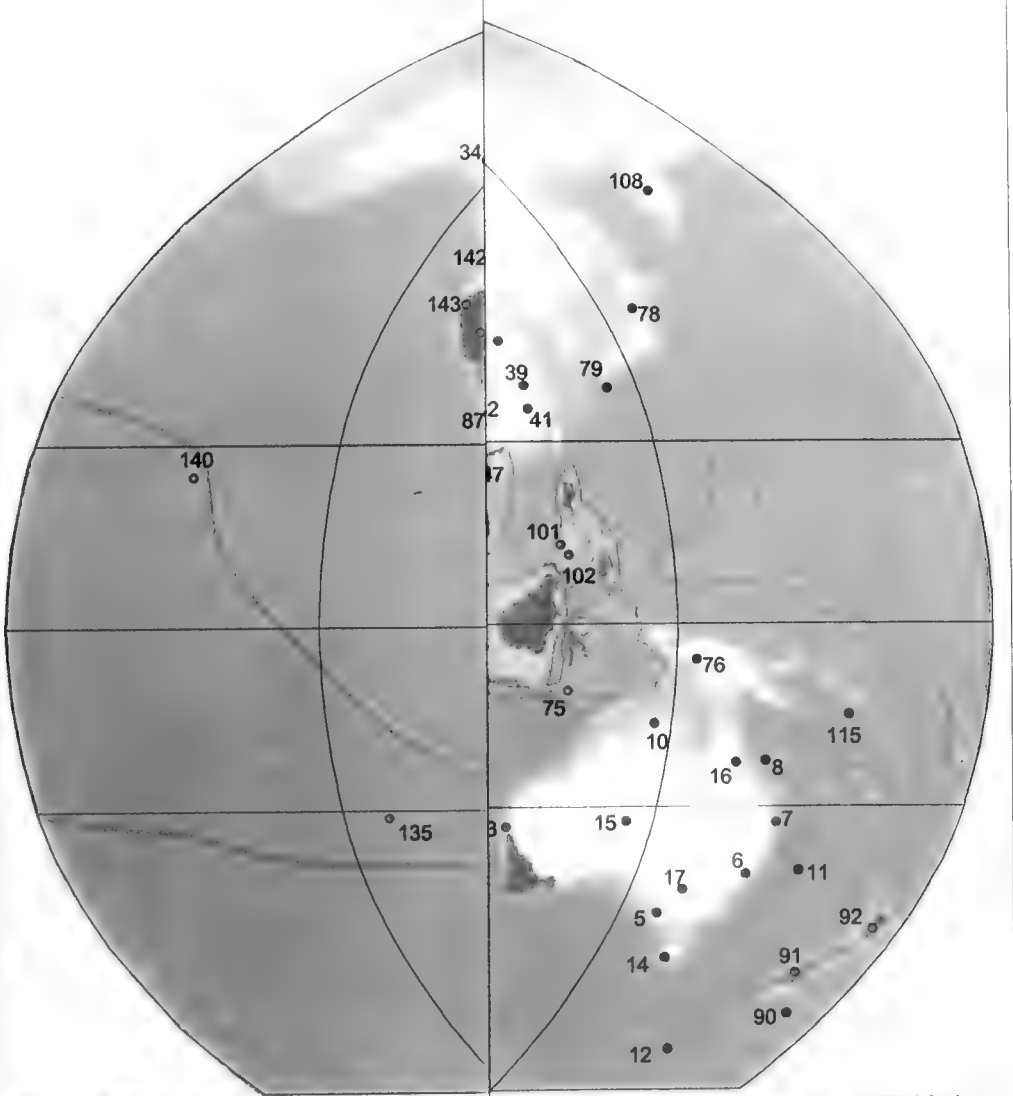


Mapped with the kind permission of Conservation International

Source Information available from UNEP-WCMC

Conservation International (CI) h p identifies the location of these hotspots that are used as a cons

The 25 priority hotspots are bas of threat they face.

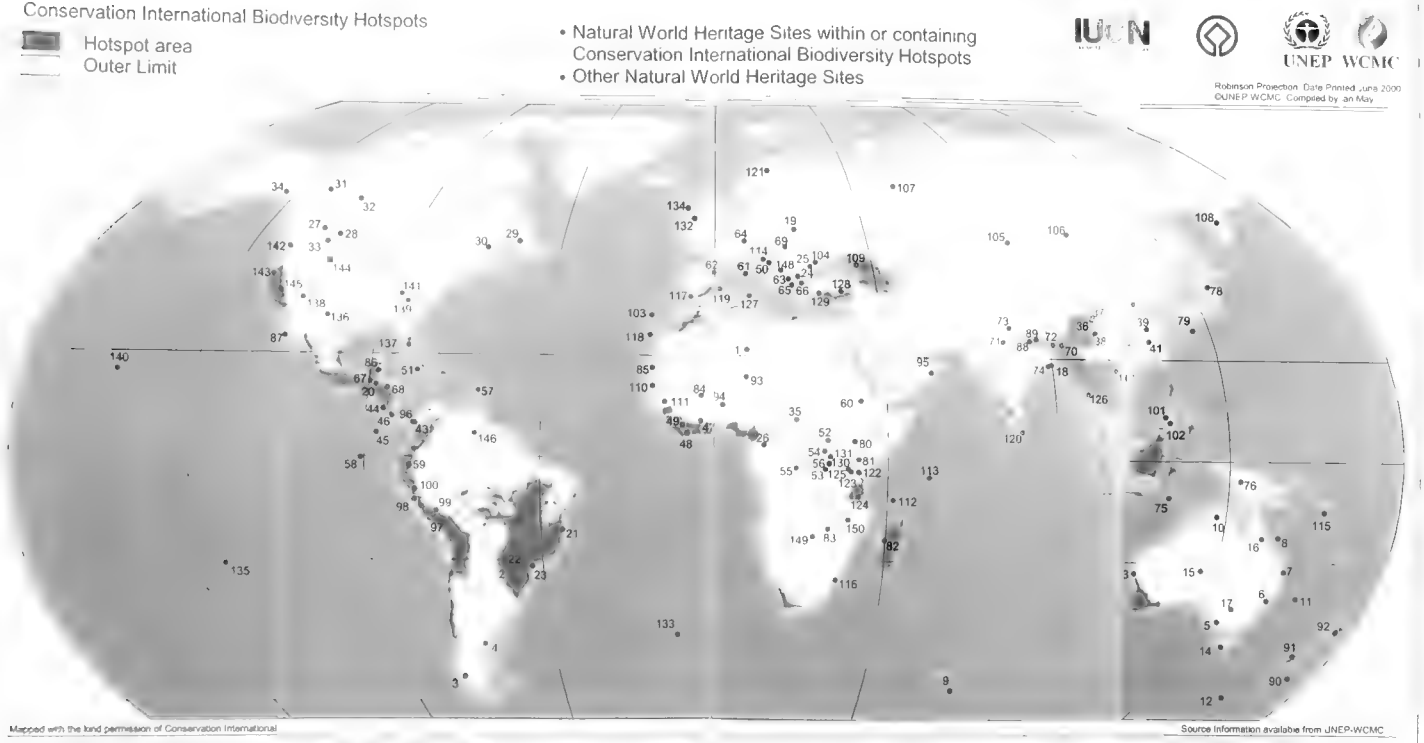
Together the 25 hotspot areas c cent of four vertebrate groups.

Fifty seven Natural World Herita

Conservation International (200

Natural World Heritage Sites and Conservation International Biodiversity Hotspots

Map 10



Conservation International (CI) has identified those biologically rich areas under the greatest threat of destruction as "biodiversity hotspots". This map identifies the location of these hotspots that are used as a conservation priority tool by CI and others.

The 25 priority hotspots are based on three criteria: the number of species present, the number of endemic species in an ecosystem and the degree of threat they face.

Together the 25 hotspot areas cover less than 2 percent of the planet's land area, yet account for 44 percent of all vascular plant species and 38 percent of four vertebrate groups.

Fifty seven Natural World Heritage Sites occur within Conservation International Biodiversity Hotspots.

Conservation International (2000). Biodiversity Hotspots Map. Conservation International: Washington, DC.

Conse atural

Map 11

Conservation International Biodiv

Hotspot area
Outer Limit

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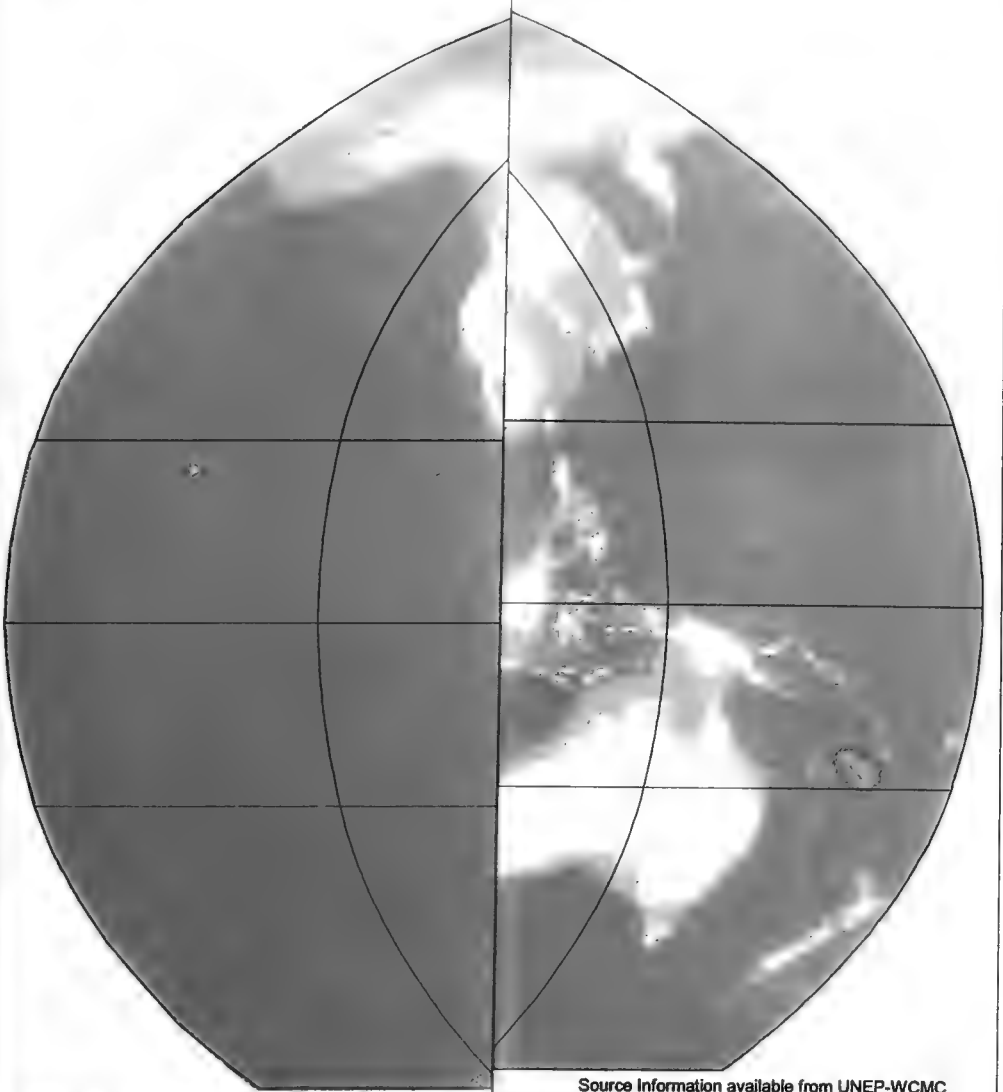

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Source Information available from UNEP-WCMC

The areas identified in this ge Sites.

There are currently 5 Cons

Potential new inscriptions t

Conservation International

Conservation International Biodiversity Hotspots not containing Natural World Heritage Sites

Map 11

Conservation International Biodiversity Hotspots

Hotspot area
Outer Limit

IUCN UNEP WCMC

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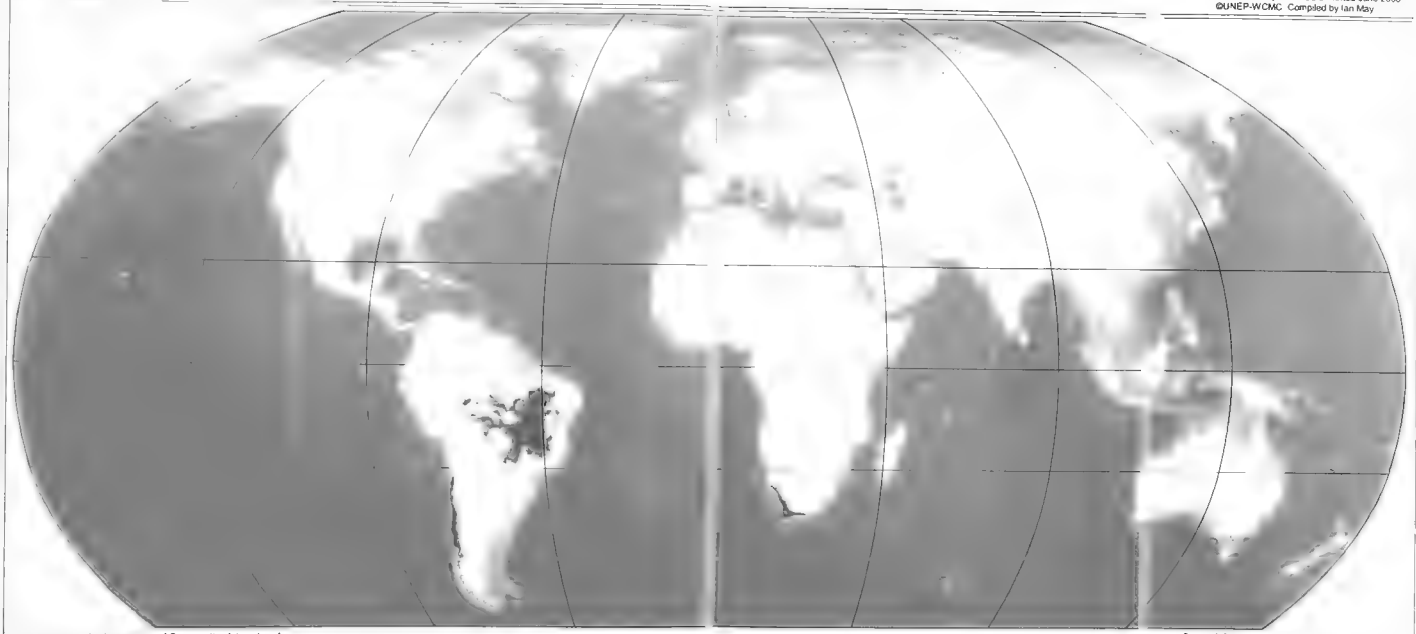

Mapped with the kind permission of Conservation International

Source Information available from UNEP-WCMC

The areas identified in this map are those Conservation International Biodiversity Hotspots that do not currently contain any Natural World Heritage Sites.

There are currently 5 Conservation International Biodiversity Hotspots that do not contain Natural World Heritage Sites.

Potential new inscriptions to the Natural World Heritage List could be focused on these areas.

Conservation International (2000). Biodiversity Hotspots Map. Conservation International: Washington, DC.

Map 12

UNEP WCMC

Vavilov Centres

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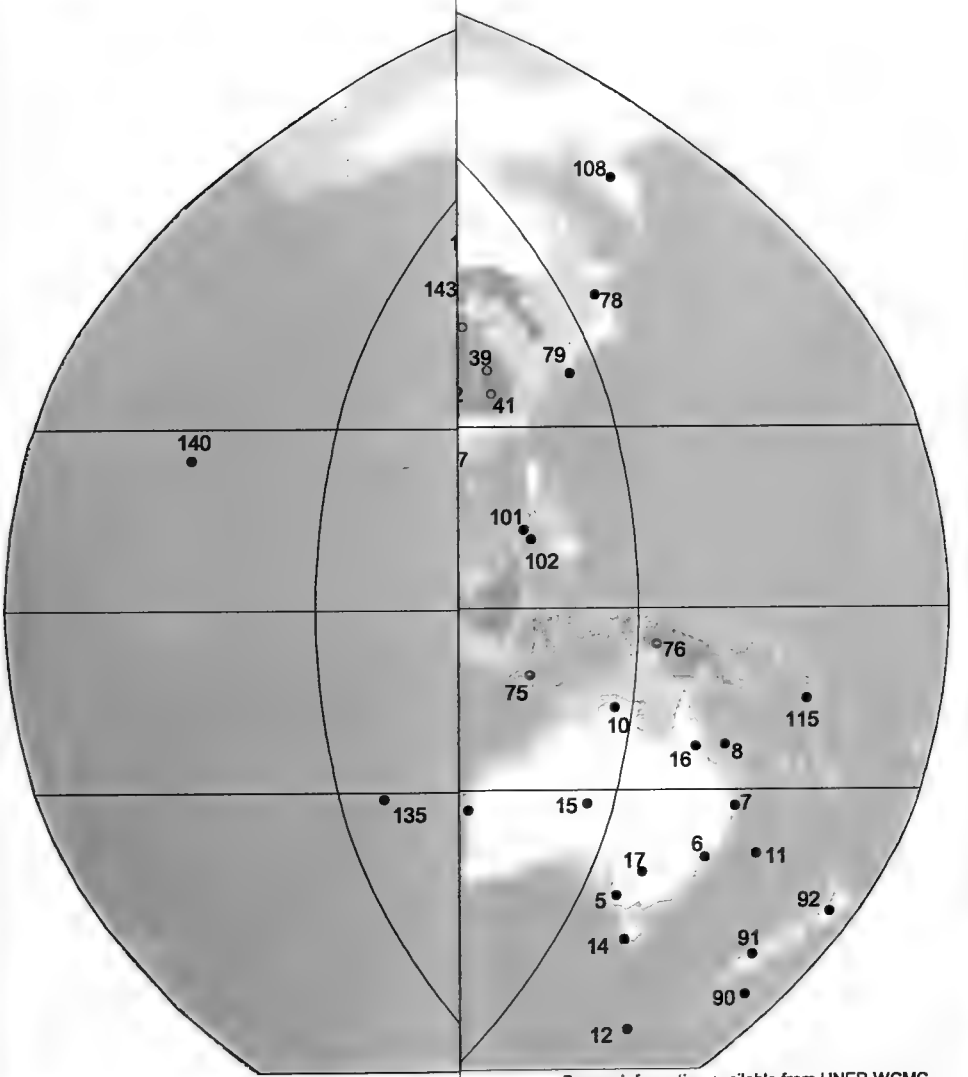

Source information available from UNEP-WCMC

The theory of "Centres of Plant n identified as containing highly diverse crop genetic reso wheat, coffee and maize originate in wild form.

As more and more land is used ltural plants are based on very few variants, wild plants are

Forty natural World Heritage site

Natural World Heritage Sites and Vavilov Centres

Map 12

Vavilov Centres

- Natural World Heritage Sites within Vavilov Centres
- Other Natural World Heritage Sites

IUCN UNEP WCMC

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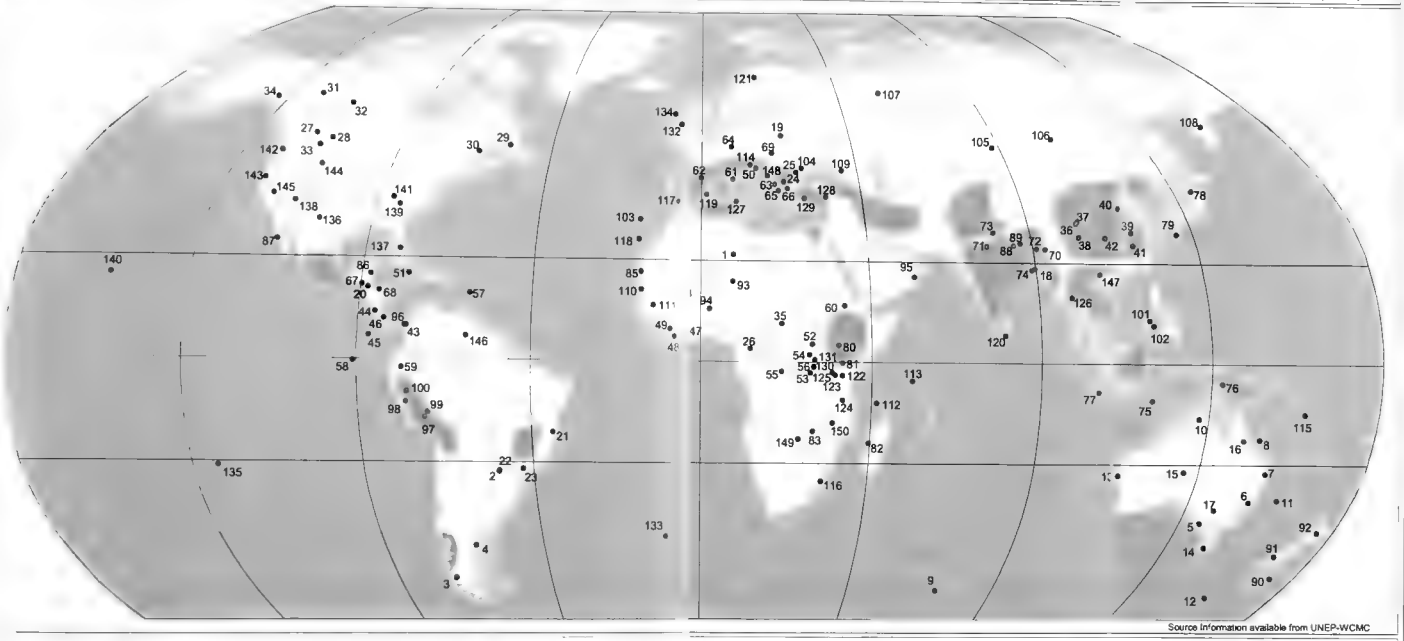

Source Information available from UNEP-WCMC

The theory of "Centres of Plant Genetic Diversity" was created by Russian botanist N.I. Vavilov (1887 - 1943). Twelve geographical regions have been identified as containing highly diverse crop genetic resources, with a high adaptation and surviving ability. These regions are believed to be where key cultural plants such as wheat, coffee and maize originate in wild form.

As more and more land is used for agriculture and development, wild plants and Vavilov centres are increasingly threatened with extinction. Since cultural plants are based on very few variants, wild plants are essential to maintain and preserve the heritage of genetic variation.

Forty natural World Heritage sites occur within the 12 Vavilov Centres of Plant Genetic Diversity.

Map 13

UNEP WCMC

Vavilov Centres

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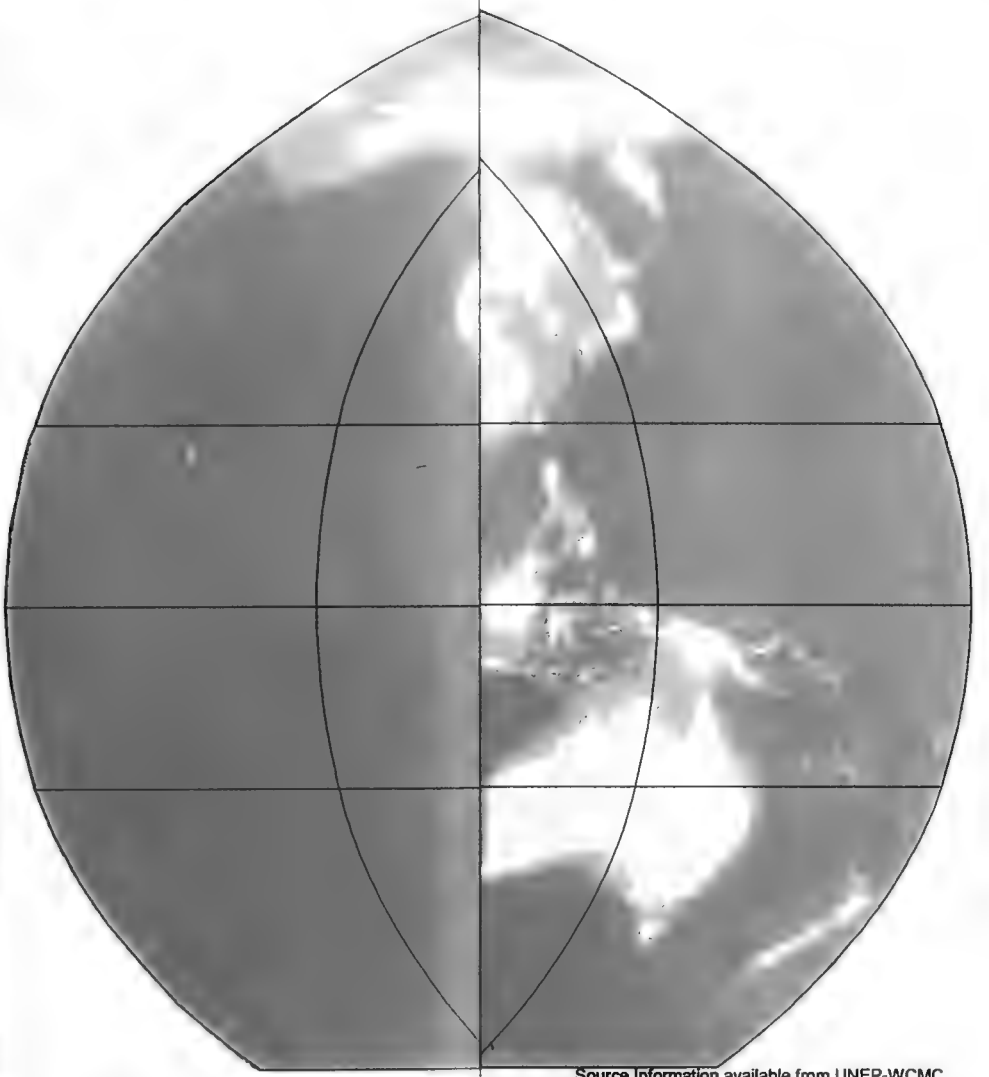

Source Information available from UNEP-WCMC

The areas identified in this map a

There are currently 4 Vavilov Cer

Potential new inscriptions to the N

Vavilov Centres not containing Natural World Heritage Sites

Map 13

IUCN UNEP WCMC

Vavilov Centres

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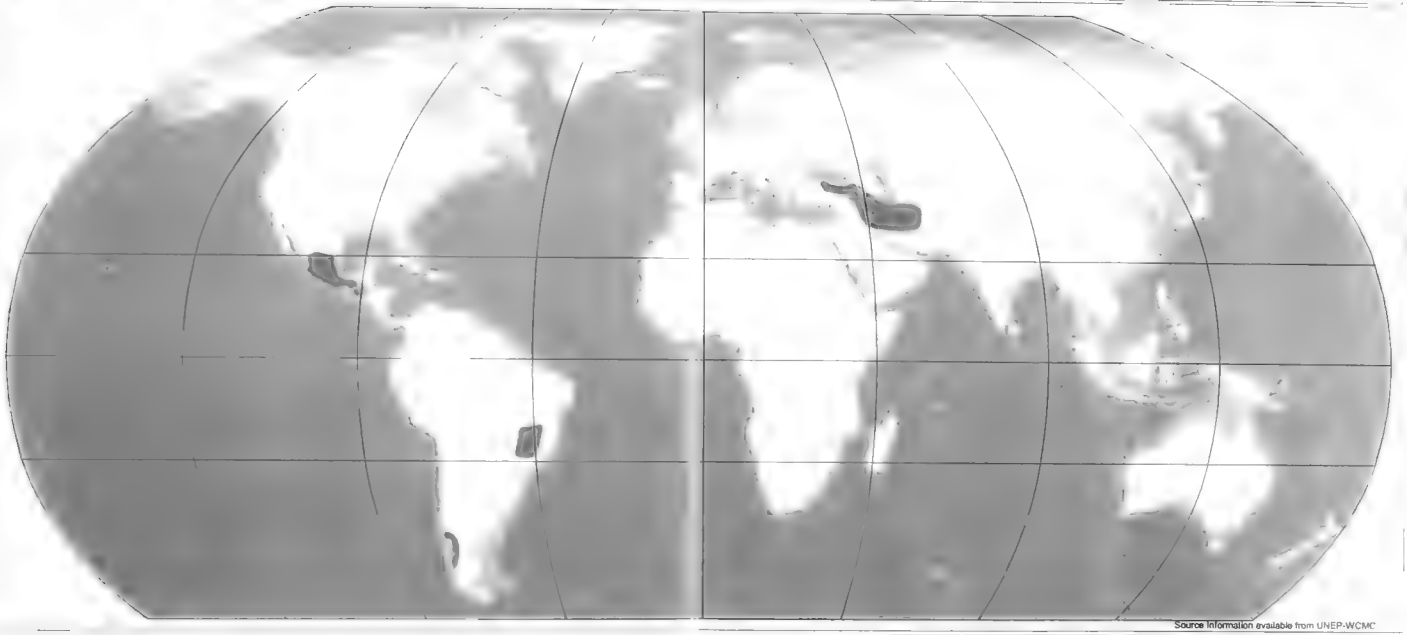

Source Information available from UNEP-WCMC

The areas identified in this map are those Vavilov Centres of Plant Genetic Diversity that do not currently contain Natural World Heritage Sites.

There are currently 4 Vavilov Centres that do not contain Natural World Heritage Sites.

Potential new inscriptions to the Natural World Heritage List could be focused on these areas.

Map 14

UNEP WCMC

Endemic Bird Areas

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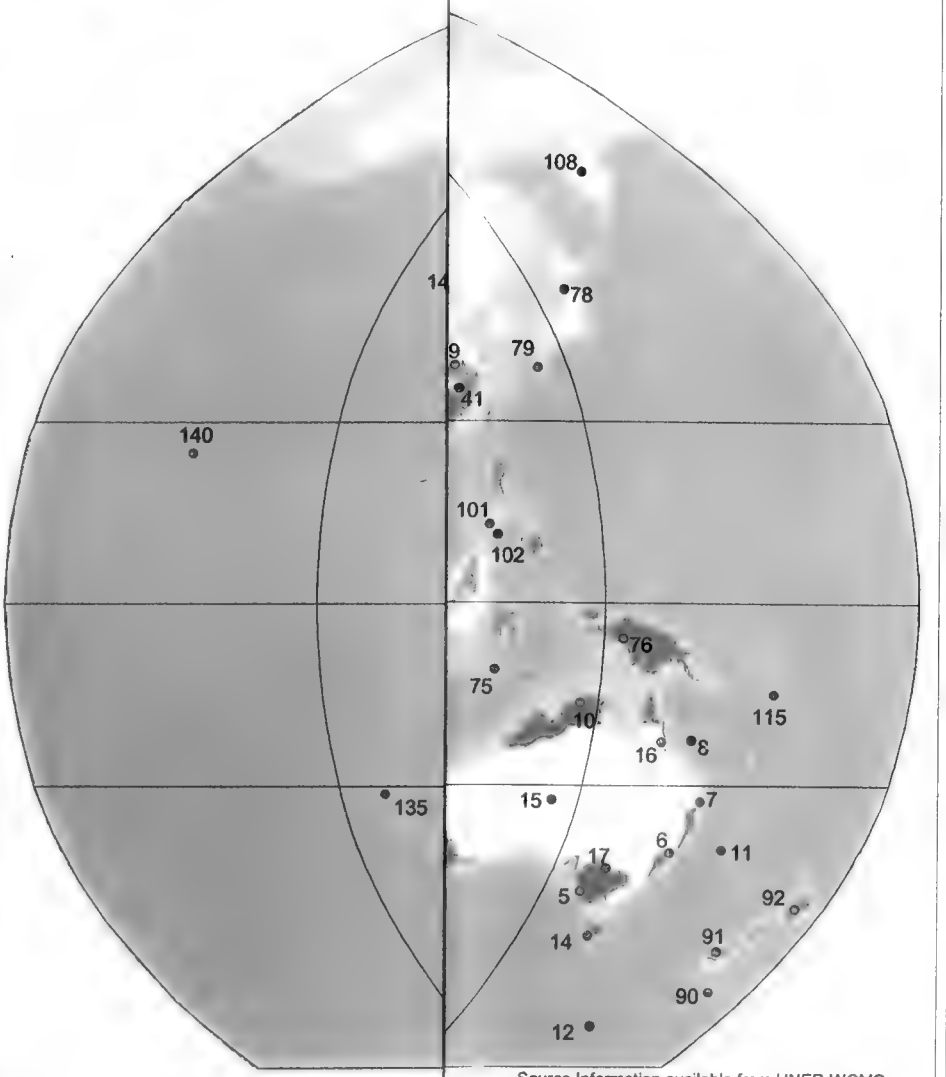

Source Information available from UNEP-WCMC

Endemic Bi km²,
are under th ervation
of biodiversi

Seventy one

Natural World Heritage Sites and Endemic Bird Areas

Map 14

Endemic Bird Areas

- Natural World Heritage Sites within Endemic Bird Areas
- Other Natural World Heritage Sites

BirdLife IUCN UNEP WCMC

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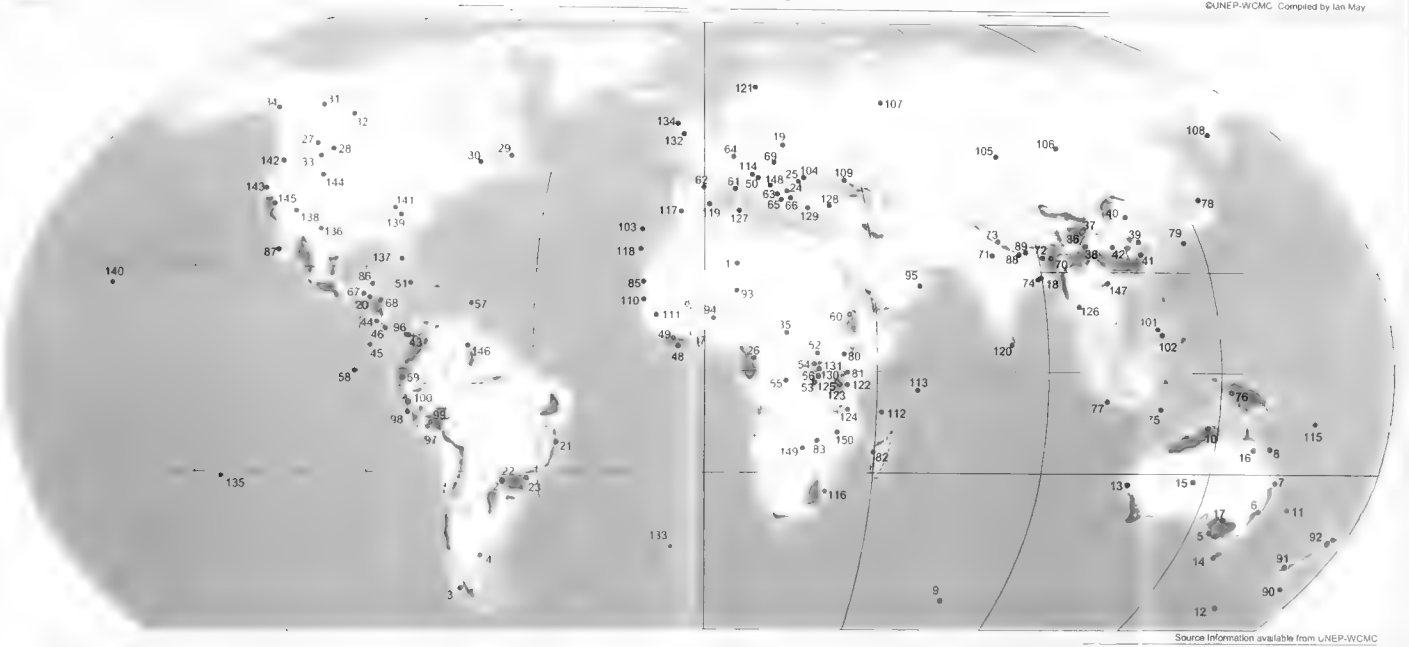

Source information available from UNEP-WCMC

Endemic Bird Areas (EBAs) are hotspots of restricted-range species of birds. These species, with a breeding range less than 50,000 km², are under threat due to high vulnerability to pressures such as destruction of habitat and therefore, are of high importance to the conservation of biodiversity. An EBA emcompasses the ranges (part or whole) of at least two endemic restricted-range birds.

Seventy one Natural World Heritage Sites occur within Endemic Bird Areas.

Map 15

UNEP WCMC

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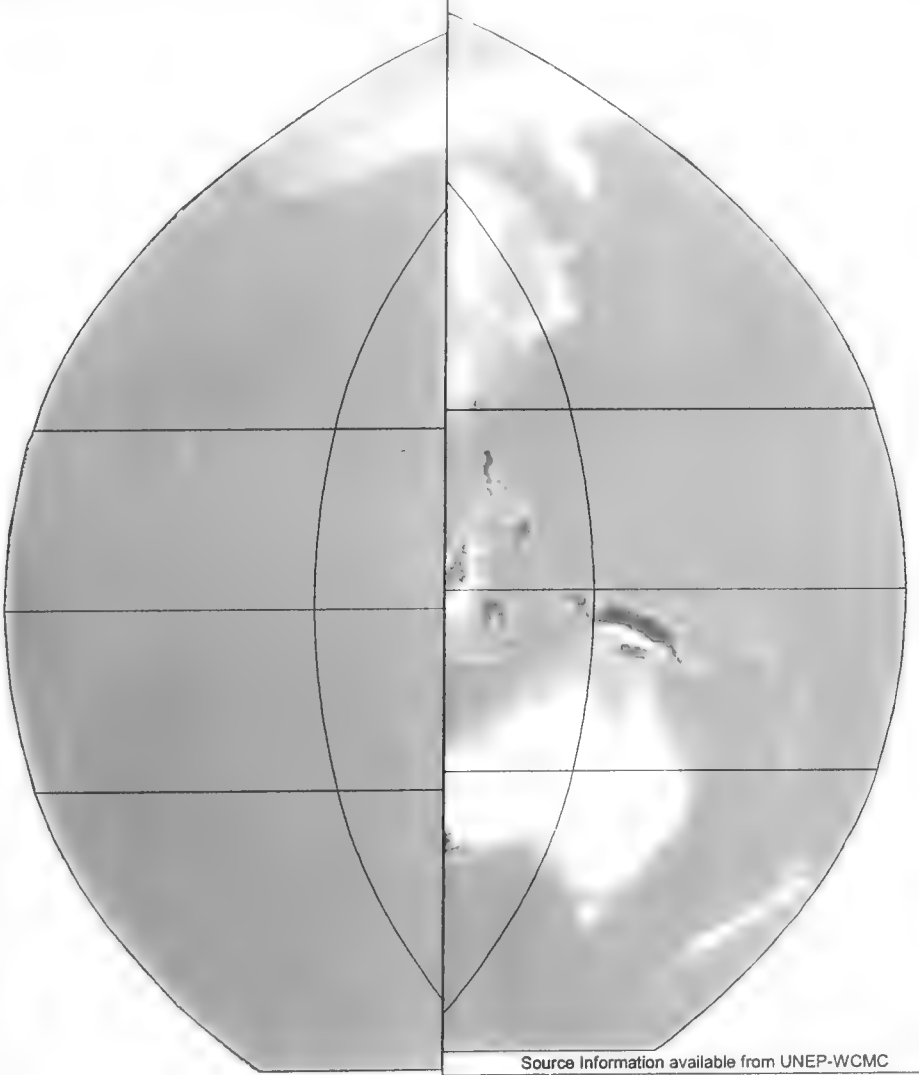
Endemic Bird Areas



Source Information available from UNEP-WCMC

The areas identified in t

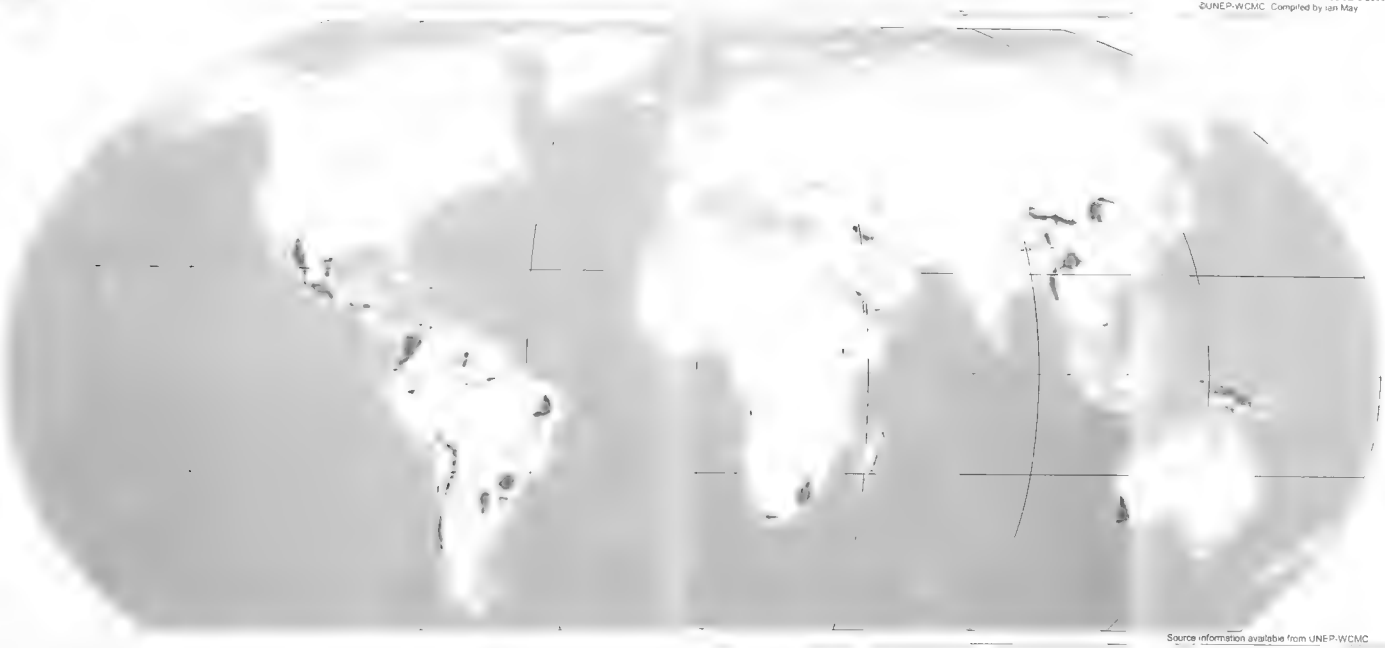
There are currently 153

Potential new inscriptio

Endemic Bird Areas not containing Natural World Heritage Sites

Map 15

Endemic Bird Areas



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The areas identified in this map are those Endemic Bird Areas that do not currently contain any Natural World Heritage Sites.

There are currently 153 Endemic Bird Areas that do not contain Natural World Heritage Sites.

Potential new inscriptions to the Natural World Heritage List could be focused on these areas.

Critical Sites

Map 16

UNEP WCMC

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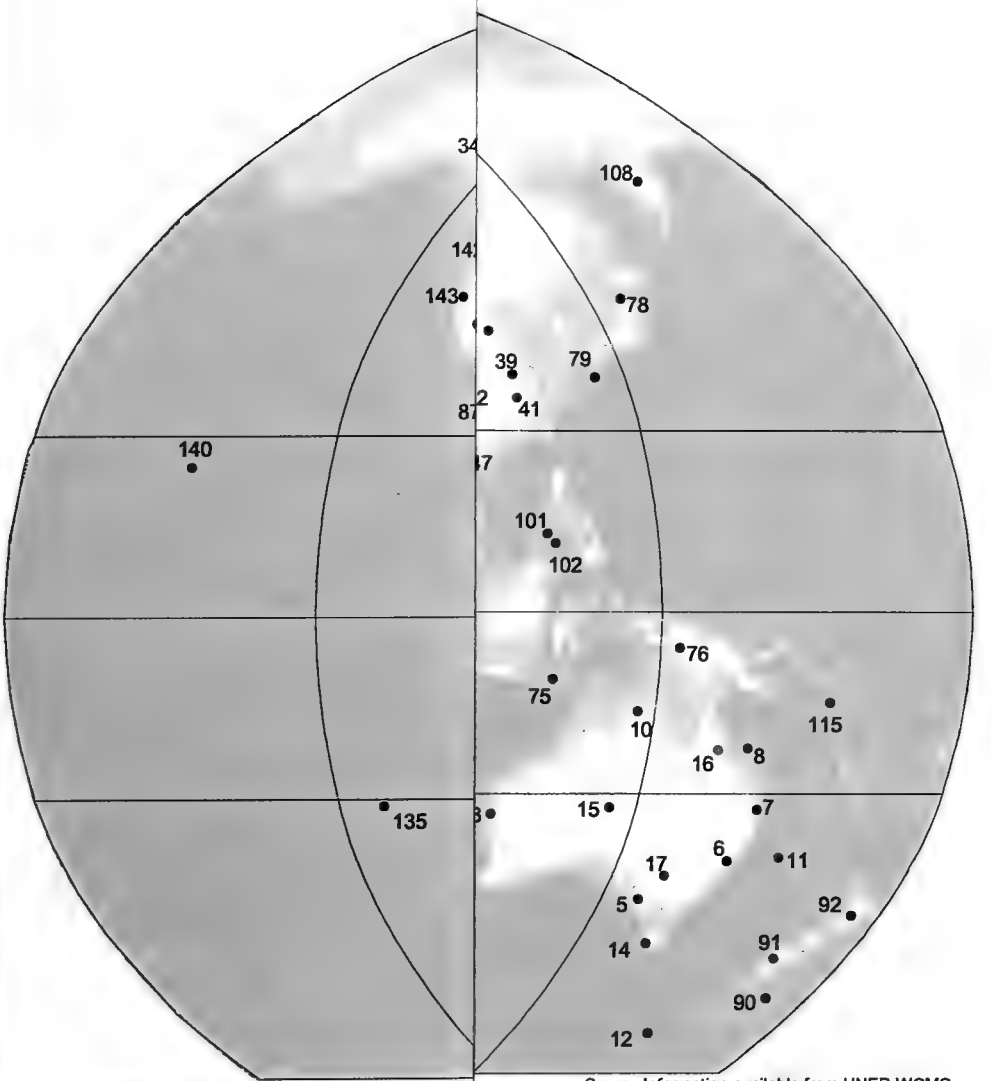

Research and Mapping of Critically Endangered Mammals and Bi

Source Information available from UNEP-WCMC

The 1996 IUCN Red List of Threa ated using the IUCN Red List categories. This system is de atened at a global level.

"Critically Endangered" taxa are t n numbers and are often restricted to small geographical a

Using the UNEP-WCMC Species and literature based species distribution records were

Critically Endangered Vertebrate Taxa and Natural World Heritage Sites

Map 16

Number of Critically Threatened Vertebrate Taxa contained within Natural World Heritage Sites

• 0 • 1 • 2 • 3 • 4

IUCN The World Conservation Union

UNEP WCMC

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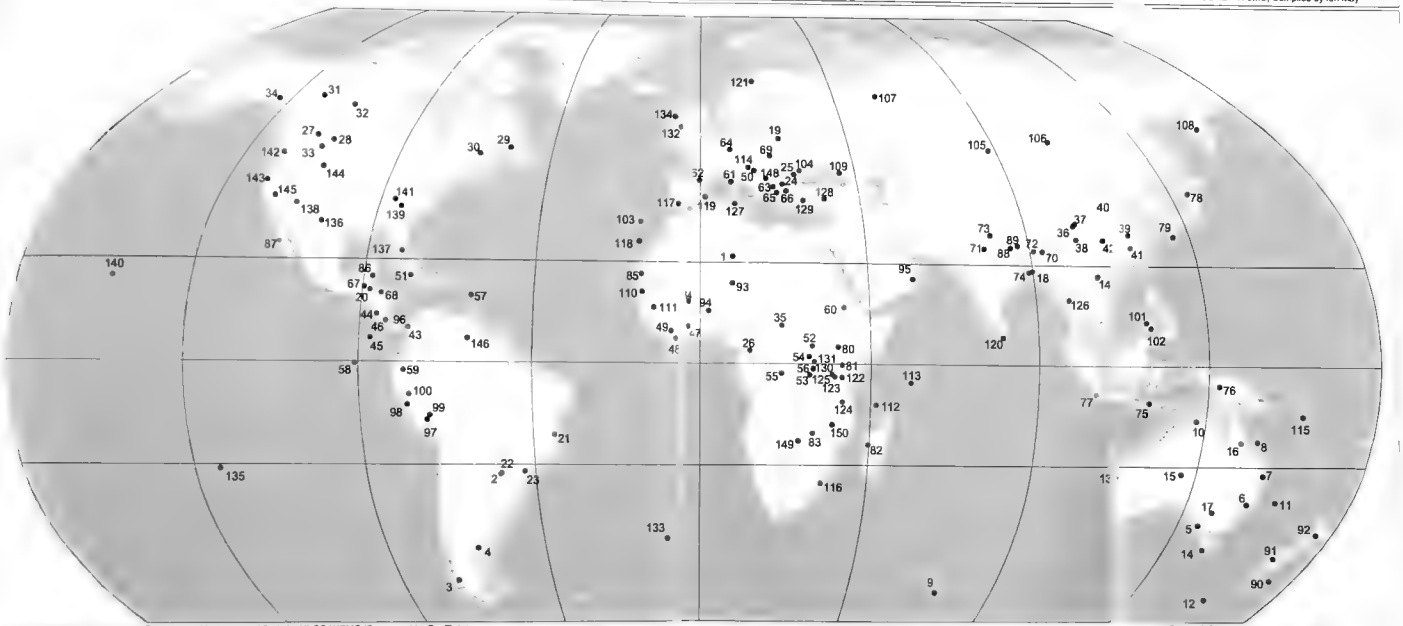

Research and Mapping of Critically Endangered Mammals and Birds by UNEP-WCMC (Sponsored by Rio Tinto)

Source Information available from UNEP-WCMC

The 1996 IUCN Red List of Threatened Animals provides taxonomic, conservation status and distribution information on species that have been evalu[ated] using the IUCN Red List categories. This system is designed to determine relative risk of extinction. Its main purpose is to catalogue the species that are regarded as threa[tened] at a global level.

"Critically Endangered" taxa are those facing an extremely high risk of extinction in the wild in the immediate future. These species have low populatio[n] numbers and are often restricted to small geographical areas.

Using the UNEP-WCMC Species Conservation Database (SCD), critically endangered vertebrates were identified on a country-by-country basis. Map [and] literature based species distribution records were then used to determine which taxa fell within natural World Heritage properties.

Nates

Map 17

UNEP WCMC

Marine Turtle Nesting Be

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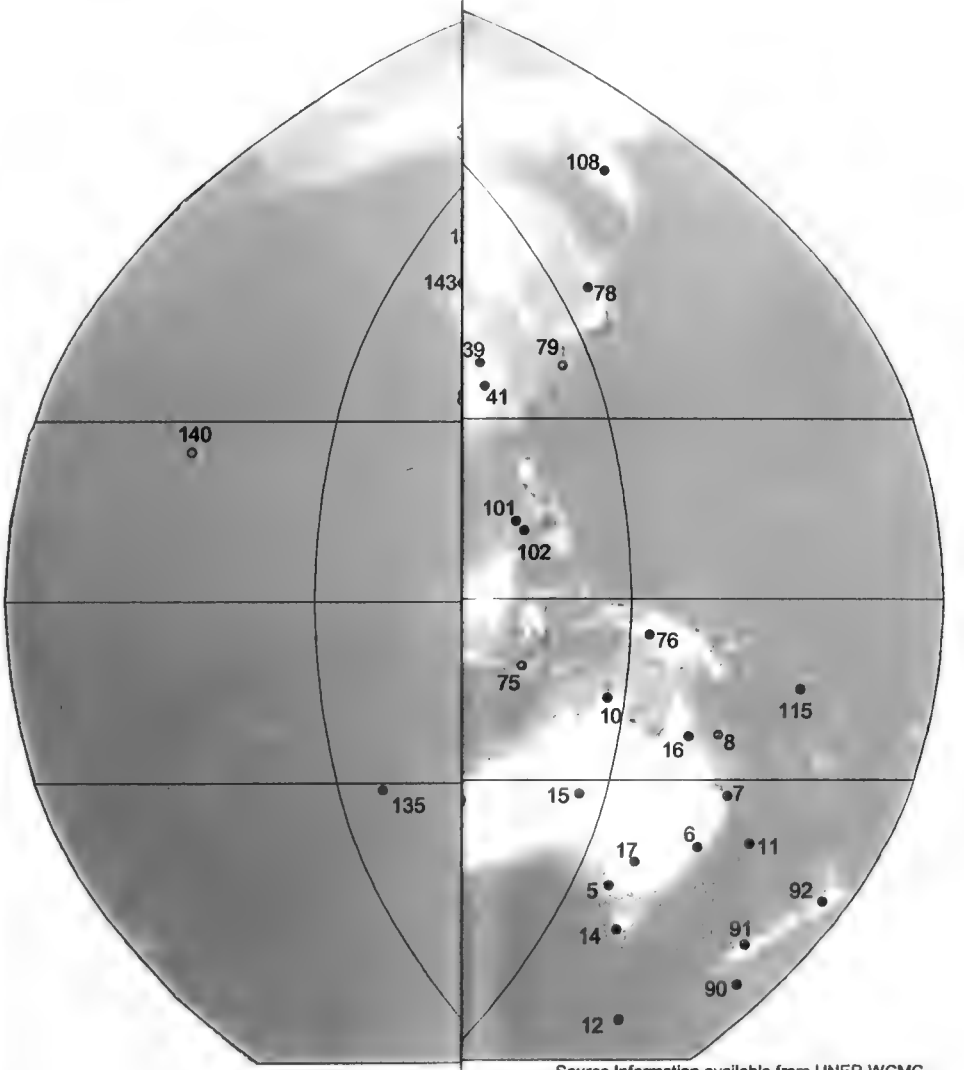

Source Information available from UNEP-WCMC

Of all the marine reptiles the sea sting and feeding grounds.
The females come ashore once e plummeted in recent years.
Fifteen Natural World Heritage S

Natural World Heritage Sites and Marine Turtle Nesting Beaches

Map 17

— Marine Turtle Nesting Beaches

• Natural World Heritage Sites containing Marine Turtle Nesting Beaches
• Other Natural World Heritage Sites

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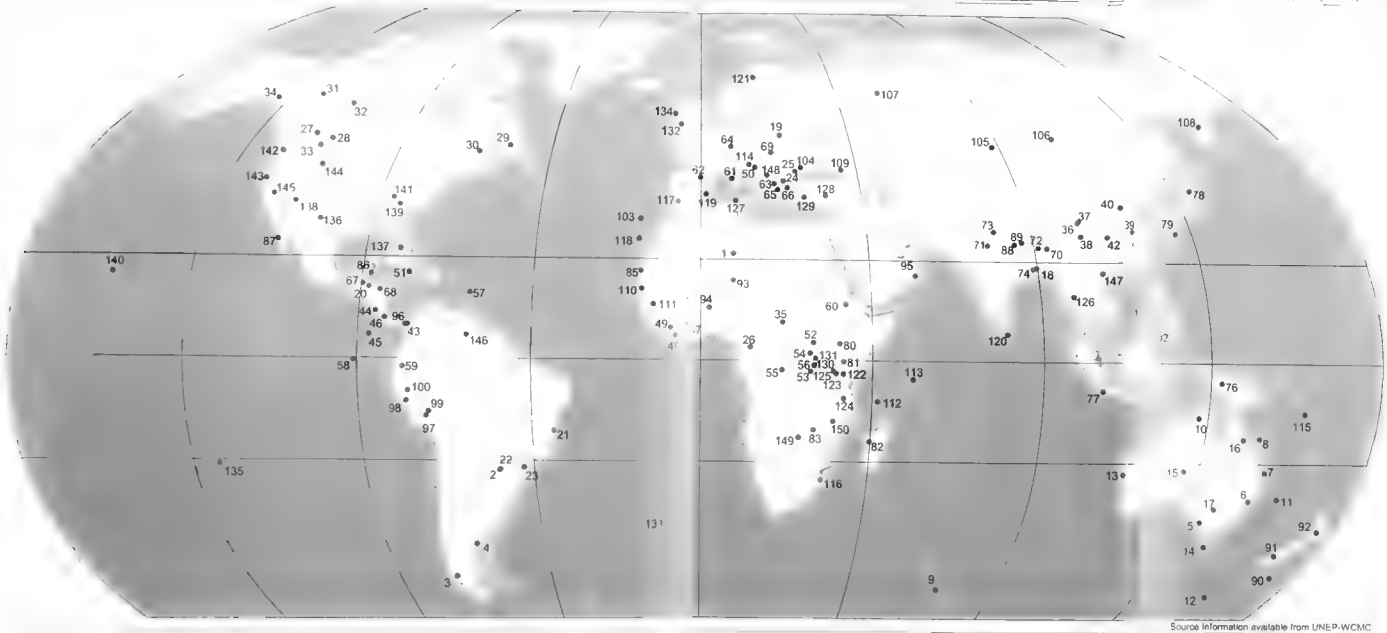

Source information available from UNEP-WCMC

Of all the marine reptiles the sea turtles are the most well known They are almost entir marine dwelling and migrate great distances between the nest g and feeding grounds The females come ashore once every two to four years to lay clutches of eggs All spec are listed on the IUCN Red List and many populations have plummeted in recent years Fifteen Natural World Heritage Sites contain sea turtle nesting beaches.

Map 18

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Coral Reefs and

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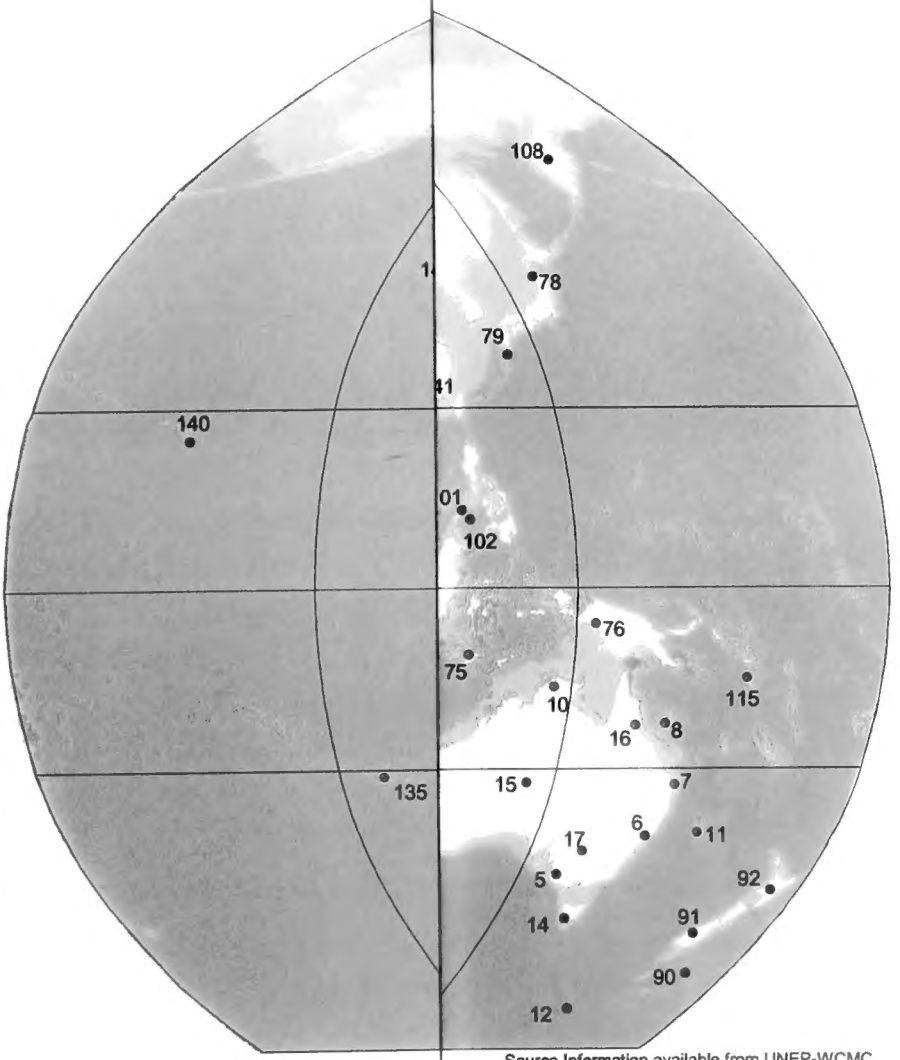

Source Information available from UNEP-WCMC

Coral reefs and mangroves are es S. The coral reef is considered as diverse as the s including cyanide and dynamite fishing. The most World Heritage Sites include coral reefs. Mangroves learance for aquaculture. The most important area for ma

Natural World Heritage Sites, Coral Reefs and Mangroves

Map 18

Coral Reefs and Mangroves

- Natural World Heritage Sites containing Coral Reefs and Mangroves
- Other Natural World Heritage Sites

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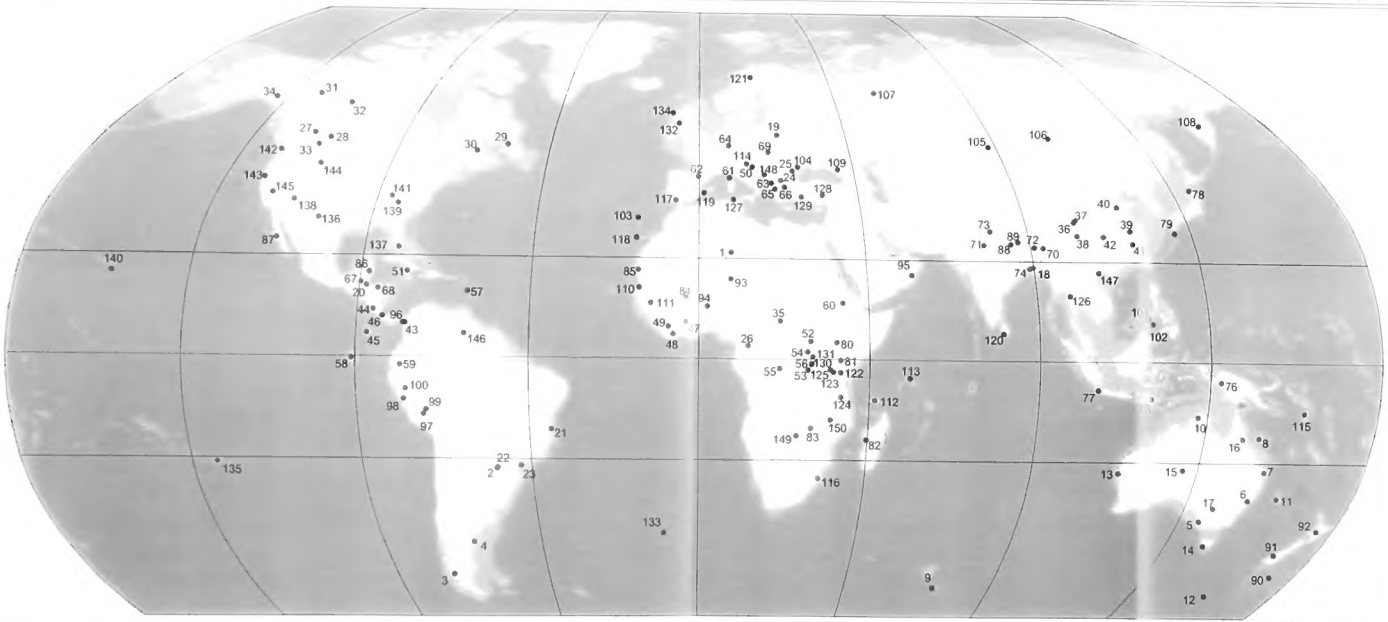

Source Information available from UNEP-WCMC

Coral reefs and mangroves are animal and plant communities respectively and are essentially restricted to the tropics between 30 degrees N and 30 degrees S. The coral reef is considered as diverse as the terrestrial rainforest, providing habitat for a vast number of species. Reef systems are threatened by many human activities including cyanide and dynamite fishing. The most diverse coral reefs occur around Australia, the Philippines, Indonesia, Papua New Guinea, Fiji and the Maldives. Fourteen World Heritage Sites include coral reefs. Mangroves provide habitat for both marine dwelling and terrestrial animals giving them a high biodiversity value. Threats include the clearance for aquaculture. The most important area for mangroves is the Indo-Pacific ragion. Eighteen Natural World Heritage Sites fall on mangrove systems.

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