

Discussion Paper

A Global Overview of Tropical Marine, Coastal and Small Island Ecosystems and the World Heritage List

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Introduction

An Overview of the World Heritage Convention¹

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 adhered to the Convention, making it one of the most universal international legal instruments for the protection of the cultural and natural heritage. UNESCO provides the Convention's Secretariat.

What the Convention contains

The Convention defines the kind of natural or cultural sites which can be considered for inscription on the World Heritage List, and sets out the duties of State Parties in identifying potential sites and their role in protecting and preserving them. By signing the Convention, each country pledges to conserve not only the World Heritage sites situated on its territory, but also to protect its national heritage. The Convention further describes the function of the World Heritage Committee, how its members are elected and their terms of office, and specifies the professional advisory bodies to which it can turn for advice in selecting the sites to be listed. The Convention explains how the World Heritage Fund is to be used and managed and under what conditions international financial assistance may be provided.

How the Convention works

The application for a site to be inscribed on the World Heritage List must come from the country itself. UNESCO makes no recommendations for listing. The application has to include a plan detailing how the site is managed and protected in national legislation. The World Heritage Committee meets once a year and examines the applications on the basis of technical evaluations. These independent evaluations of proposed cultural and natural sites are provided by two advisory bodies, the International Council on Monuments and Sites (ICOMOS) and the World Conservation Union (IUCN) respectively. A third advisory body, the International Centre for the Study of the Preservation and Restoration of Cultural Property, (ICCROM) provides expert advice on restoring monuments and organises training courses. Once a site is selected, its name and location are placed on the World Heritage List.

The criteria for selection

To be included on the World Heritage List, sites must satisfy cultural and natural selection criteria. These criteria are explained in the Operational Guidelines which, besides the text of the Convention, is the main document on World Heritage. The criteria have been revised regularly by the Committee to match the evolution of the World Heritage concept itself.

For a property to be included on the World Heritage List as natural heritage, the World Heritage Committee must find that it meets one or more of the following :

(i) be outstanding examples representing major stages of the earth's history, including the record of life, significant ongoing geological processes in the development of landforms, or significant geomorphic or physiographic features; or

¹ Source - <http://www.unesco.org/whc/nwhc/pages/home/pages/index.htm>

- (ii) be outstanding examples representing significant ongoing ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals; or
- (iii) contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance; or
- (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.

The protection, management and integrity of the site are also important considerations. Mixed sites have both outstanding natural and cultural values. Since 1992 significant interactions between people and the natural environment have been recognised as cultural landscapes.

Protecting endangered sites

World Heritage conservation is a continuous process. Listing a site does little good if it subsequently falls into a state of disrepair or if a development project risks destroying the qualities that made the site suitable for World Heritage status in the first place. The credibility of World Heritage stems from countries' regular reporting on the condition of sites, on measures taken to preserve them, and on their efforts to raise public awareness of cultural and natural heritage. If a country is not fulfilling its obligations under the Convention, it risks having its sites deleted from the World Heritage List. In practice, countries take their responsibility very seriously, and the World Heritage Committee will be alerted - by individuals, governments, non-governmental organisations, or other groups - to possible dangers to a site. If the alert is justified, and the problem serious enough, the site will be placed on the List of World Heritage in Danger. This list is designed to call the world's attention to natural or human-made conditions which threaten the characteristics for which the site was originally inscribed on the World Heritage List. Endangered sites on this list are entitled to particular attention and emergency action. In urgent cases, such as outbreak of war, the Committee will make the listing itself without having received a formal request.

Background to this report

A Global Strategy for a balanced and representative World Heritage List was adopted by the World Heritage Committee in 1994. Its aim is to ensure that the List reflects the world's cultural and natural diversity of outstanding universal value. Conferences and studies aimed at developing and implementing the Global Strategy have been held or are planned in Africa, the Pacific region, the Arab region, the Andean region, the Caribbean, central Asia and south-east Asia, and various thematic studies have also been carried out.

The IUCN World Commission on Protected Areas (WCPA), under the leadership of the US National Oceanic and Atmospheric Administration (NOAA), is directing efforts to review the coverage coastal marine and small island ecosystems by the WHC using innovative multi-site based cluster and trans-border approaches to prepare World Heritage area nominations. In support of this work UNEP-WCMC has conducted this assessment of currently listed sites, to assist the identification of potential tropical coastal, marine and small island ecosystems for nomination as World Heritage sites. The findings of this assessment will be reviewed by a panel of experts in a workshop to be held in September 2001. These experts will examine current World Heritage listings and determine gaps and constraints for the nomination of trans-border and cluster sites, as well as, expanding the listing to include more sites that represent the natural and biodiversity significance in the tropical region. Results from the workshop will be compiled in a report to states party to the World Heritage Convention and the World Heritage Committee.

This effort will lead to a scientifically-based consensus for potential World Heritage sites in the tropical realm with emphasis on cluster, trans-border, and multi-site based approaches for further nomination consideration. A pilot project that will prepare a strategy for executing a cluster and trans-border nomination will be developed. In collaboration with the UNESCO, IUCN, the donor community, and states party to the Convention, country participation will be sought to execute nomination of a multi-site nomination to the World Heritage Committee.

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Electronic copies of this document, including maps, are available on-line at <http://>

Tropical Marine, Coastal And Small Island Ecosystems In World Heritage Sites

Working definition of tropical, coastal and small island ecosystems

In preparing this document a working definition of 'tropical marine and coastal' was used which defined:

- (i) marine components as those areas from deep ocean to areas immediately below high water level;
- (ii) coastal components as those areas of land and brackish and fresh water immediately adjacent or in close proximity to the sea;
- (iii) tropical areas to include sub-tropical areas approximately within latitudes 30° N and 30° S.

This broad working definition was adopted in the interest of completeness. It includes some World Heritage Sites which have minimal marine or coastal components, or sites for which the marine and coastal components were not the major considerations for nomination. However it has the advantage of not excluding some sites which would have occurred with a more rigorous definition. For example the Everglades National Park would have been excluded under a strict geographical definition of 'tropical' whereas it clearly in the spirit of the Global Strategy it should be included. The expert panel at the September workshop can decide whether this definition, and the sites which have been included under it, are appropriate.

Present coverage under the convention

There are presently 139 sites listed under natural criteria, and 23 under mixed natural and cultural criteria. Of these 50 have a marine component and 33 contain a tropical marine, coastal or small island component. Details of these 33 sites are listed in Table 1. Six are also recognised under the Ramsar Convention² and nine are Biosphere Reserves³. No new marine sites have been nominated since 1999, when four were added to the list, bringing the total number of designations in the 1990s to 16. Eleven sites were designated in the 1980s and two in the 1970s. The oldest World Heritage Site to contain a tropical marine, coastal or small island component is the Galápagos Islands which was designated in 1978.

The most frequent natural criteria for selection has been N (iv), which has been used in 23 (79%) of the World Heritage Sites in Table 1. Other criteria have been used thus: N (i) 9 sites, 31%, N (iii) 17 sites, 59% and N (ii) 19 sites (66%).

The marine or coastal component of one World Heritage Sites in Table 1, the Hawaii Volcanoes National Park in the USA, is not clear. The principal reasons for the designation of this site are geological, and although it lies within the tropics, adjacent to the sea, it may be that the marine and coastal components are incidental. However in the absence of further information and for the sake of completeness it has been included in this report.

Map 1 displays the distribution of the tropical marine, coastal and small island ecosystems sites currently on the World Heritage list. Large areas of ocean have few or no World Heritage Sites. There are no sites in the Red Sea and Gulf of Arabia, or on the western coast of South America. There is only

² <http://www.ramsar.org/>

³ <http://www.unesco.org/mab/>

one site in western Africa (Banc d'Arguin National Park) and one site in eastern Africa (the Greater St. Lucia Wetland Park). By comparison with the Caribbean and South East Asia/Australia, the Indian and Pacific Oceans are poorly covered.

Future coverage under the Convention

Table 2 lists the details of sites which are either (i) included in a State Party indicative list, or (ii) which have been nominated but not inscribed. There are eight sites in eight countries and their distribution (Map 2) goes some way to addressing the gaps in existing coverage with two in west Africa, one in the Red Sea and a further site in the Pacific Ocean. However there are none on the western coast of South America or the eastern coast of Africa. Of the sites in Map 2 one site has been withdrawn from consideration for nomination and a further four have been deferred for more than a decade, so it is unlikely that the distribution of existing tropical marine, coastal and small island sites will be changed significantly by the addition of any sites in Table 2.

Sites in danger

If serious and justifiable concern exists then a site can be listed by the World Heritage Committee on the List of World Heritage in Danger, in accordance with Article 11 (4) of the Convention which states⁴:

The 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 the property appearing in the World Heritage List for the conservation of which major operations are necessary and for which assistance has been requested under this Convention. This list shall contain an estimate of the cost of such operations. The list may include only such property forming part of the cultural and natural heritage as is 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; calamities and cataclysms; serious fires, earthquakes, landslides; volcanic eruptions; changes in water level, floods and tidal waves. The Committee may at any time, in case of urgent need, make a new entry in the List of World Heritage in Danger and publicise such entry immediately.

Two of the 29 existing World Heritage Sites containing tropical marine, coastal or small island components have been placed on the List of World Heritage in Danger. They are the Río Plátano Biosphere Reserve in Honduras and the Everglades National Park in the USA (Table 3 and Map 3).

Present coverage of tropical marine, coastal and small island ecosystems under other international conventions and programmes

Twenty-five Biosphere Reserves in 14 countries contain tropical marine, coastal and small island ecosystems (Table 4). The total area of these is approximately 40 million ha, of which 30.5 million ha is known to be marine (only 1% of this is core area, 25% is buffer area and the remaining 74%, most of which is in the Seaflower Reserve, Colombia, as transition area). The distribution of these Biosphere Reserves is plotted in Map 4. Nine Biosphere Reserves are also World Heritage Sites and are therefore listed in Table 1.

⁴ <http://www.unesco.org/whc/nwhc/pages/doc/main.htm>

Forty-five Ramsar Sites in 24 countries contain tropical marine, coastal and small island ecosystems (Table 5). The total area of these is 5.7 million ha, but the area of the marine component is unknown. The distribution of these Ramsar Sites is also plotted in Map 4. Six Ramsar Sites are also World Heritage Sites and are therefore listed in Table 1.

The coverage of tropical marine, coastal and small island ecosystems under the Unesco Man and the Biosphere Programme and the Ramsar Convention is extensive in the Caribbean and western Africa north of the equator. There are also several Biosphere Reserves and Ramsar Sites in south-east Asia, though only one in the Indonesian archipelago. As is the case with the World Heritage Convention the coverage of tropical marine, coastal and small island ecosystems under these two international agreements is poor on the western coast of South America, and in the Red Sea and southern Asia.

The relative distribution and size of tropical marine, coastal and small island World Heritage Sites

Udrady's Biogeographical Realms⁵ have been used here to preserve consistency with existing thematic studies of the Convention⁶ and the classification of World Heritage Sites. These are defined as a continent or sub-continent-sized area with unifying features of geography and fauna/flora/vegetation. Boundary information is not available. Five realms are relevant to this report in that they include tropical areas:

Afrotropical Realm

An African realm, the majority of which is covered by tropical vegetation and faunation. It includes all of the African continent south of the Sahara, including its shelf islands, the islands of St. Helena and Ascension, Madagascar and the islands surrounding it (with the exception of the Seychelles and Amirantes).

Indomalayan Realm

This consists of the mainland of South-East Asia, south of the temperate-Palaeartic Himalayas chain and the continuing Szechwan Mountains.

Oceanian Realm

This large realm comprises the island groups of the Tropical Pacific. Essentially this includes Papua New Guinea, Micronesia, Hawaii, Southeastern Polynesia, Central Polynesia, New Caledonia and East Melanesia.

Australian Realm

This realm only contains the continent of Australia (including Tasmania).

Neotropical Realm

The northern limits of the Neotropical Realm comprise three main areas, the coastal areas of Baja California and Sinaloa. Southern Florida, and the Caribbean Archipelago, Central America, South America and all its islands on the continental shelf (with the exception of the archipelago of Tierra del Fuego) and the islands of Fernando de Noronha and South Trinidad.

As Figure 1 shows a total of 40 million ha is protected in areas listed under the World Heritage Convention in the Australian realm, an area more than three times as large as the Neotropical realm. The latter has twice as many World Heritage Sites but these are smaller. The dominance of the Australian realm is due to the size of the Great Barrier Reef World Heritage Area (Table 1). The Indomalayan realm contains a number (8) of World Heritage Sites comparable to the Neotropical, but these cover a much smaller area, of which only 2% is known to be marine.

⁵ Miklos D.F. Udvardy, A Classification of the Biogeographical Provinces of the World. Prepared as a contribution to UNESCO's Man and the Biosphere Programme Project No. 8. IUCN Occasional Paper No. 18. IUCN, Morges, Switzerland, 1975.

⁶ e.g. Thorsell, J. et al., 1997. A Global Overview of Forest Protected Areas on the World Heritage List. IUCN, Gland, Switzerland.

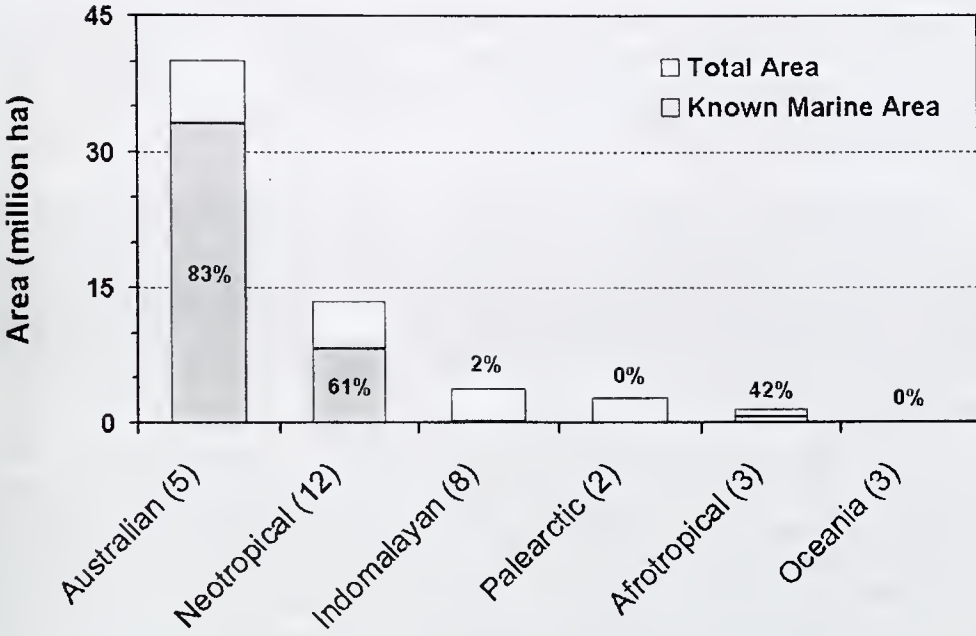


Figure 1. The relative distribution of tropical marine, coastal and small island World Heritage Sites. The proportion of total area known to be marine is given as a percentage, and the number of sites in each realm is given in parentheses. Therefore 61% of the total area within the 12 World Heritage Sites in the Neotropical realm is known to be marine.

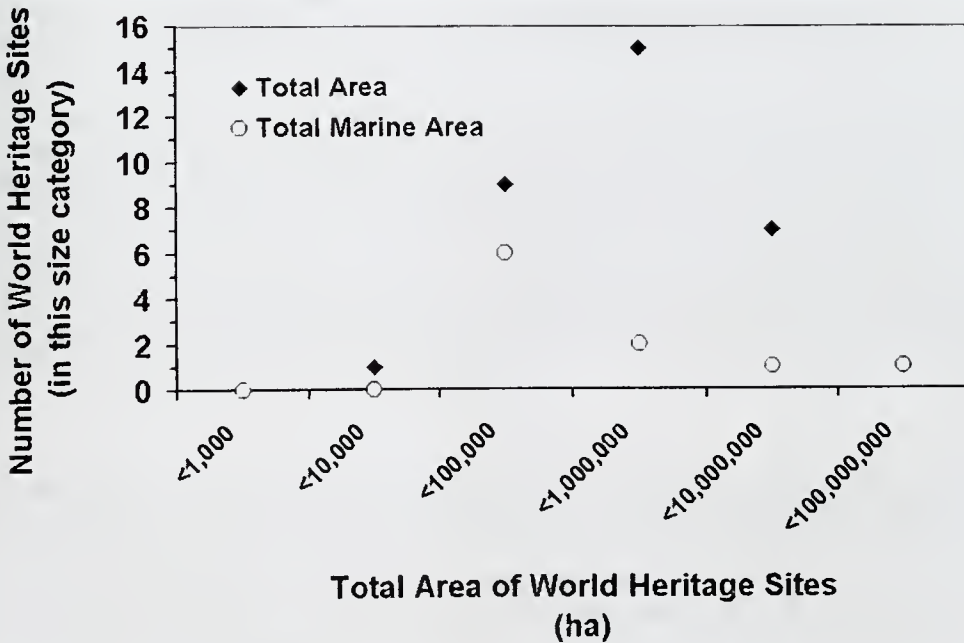


Figure 2. The size distribution of existing World Heritage Sites. The x-axis is logarithmic and labels indicate the maximum size of the category. Y-axis labels indicate the number of existing World Heritage Sites in that size class. Therefore there is one existing World Heritage Site of between 1,000-10,000 ha in total area. The size distribution of known marine area in existing World Heritage Sites is also plotted.

Most (15) tropical marine, coastal and small island World Heritage Sites are between 100,000 and 1 million ha in total area (Figure 2). However the size distribution is somewhat different if only the known marine area is taken into account – the majority of World Heritage Sites include 10,000-100,000 ha of known marine area. The Great Barrier Reef World Heritage Area is the largest World Heritage Site, and the only one in excess of 10 million ha (both in total and total marine area). Henderson Island is the smallest, at 3,700 ha.

Figure 1 suggests that priority for any future tropical marine, coastal and small island site nominations should be in the Indomalayan, Palearctic, Afrotropical or Oceania realms. Although at present these four realms include half of the World Heritage Sites with tropical marine, coastal and small island components these cover a relatively small area of which an even smaller fraction is known to be marine. While the relatively large size of the Great Barrier Reef accounts for some of this discrepancy this is not the only cause. The other major factor is the relatively large number of World Heritage Sites in the Neotropical realm (Map 1).

The size distribution plotted in Figure 2 is presumably a consequence, amongst other factors, of the ecosystems at these locations and various political and practical decisions taken when these sites were established as protected areas. It may suggest an overall need for more tropical marine, coastal and small island World Heritage Sites with larger (100,000 – 10,000,000 ha) marine areas, but the size of any future nominations should clearly be determined by the specific situation at each site. A key consideration would be the types of tropical marine and coastal ecosystem included in a nominated site. The following section provides a preliminary overview of the existing coverage of coral reefs, mangroves, marine turtle nesting and feeding areas and seagrasses by the World Heritage Convention, although any such overview is necessarily dependant on the availability of information.

The Distribution of existing World Heritage Sites in Relation to Important Tropical Marine Ecosystems and Species

Coral Reefs

The distribution of World Heritage sites which include coral reefs is plotted in Map 5. It is not possible to calculate the total area of coral reef covered by the World Heritage Convention: this data was not available for any of the 15 sites in Map 5. Although unknown the total is likely to be large in that the Great Barrier Reef World Heritage Site contains more than 10% of world's coral reefs. However comparison of Map 5 with the following table of coral reef area by region⁷ may be useful in the development of the Global Strategy:

Region	Area (km ²)	% of world total
Caribbean	20,000	7.0
Atlantic	1,600	0.6
Red Sea and Gulf of Aden	17,400	6.1
Arabian Gulf and Arabian Sea	4,200	1.5
Indian Ocean	32,000	11.3
Southeast Asia	91,700	32.3
Pacific	115,900	40.8
Eastern Pacific	1,600	0.6
Total	284,300	

The eastern Pacific contains a small proportion of the world's coral reefs but 3 of the 15 World Heritage Sites which include coral reefs. This may be indicative that the WHC is effectively covering coral reefs in this region. The Red Sea and Gulf of Aden, and the Arabian Gulf and Arabian Sea, contain 7.6% of the world's coral reefs but none of these occur within a World Heritage Site (indeed as stated previously there are no World Heritage Sites in these two regions). The Indian Ocean contains 11.3% of the world's coral reefs but only one World Heritage Site which includes coral reefs (Aldabra Atoll). This indicates that the WHC is not effectively covering coral reefs in these regions. The same conclusion can be drawn for the wider Pacific with 40.8% of the world's reefs and just 2 of the 15 World Heritage Sites which include coral reefs.

Mangroves

The distribution of the 23 World Heritage sites which include mangroves is plotted in Map 6. Large areas of mangrove occur in World Heritage Sites such as the Everglades National Park, the Sundarbans, the Sundarbans National Park and the Darien National Park but as Map 6 illustrates there are no World Heritage Sites which contain mangroves in South America. With the exception of Banc d'Arguin National Park in Mauritania, which is the northernmost extent of mangroves in the western Atlantic, the same situation applies to continental Africa. The World Heritage Convention is therefore not covering mangroves in either South America or Africa despite globally significant mangroves forests on these continents.

⁷ Source: Spalding, M., Ravilious, C. and Green, E. 2001. World Atlas of Coral Reefs. University of California Press, 416pp.

Marine Turtles

The distribution of the 12 World Heritage sites known to include marine turtle nesting beaches is plotted in Map 7. As has been noted already for coral reefs and mangroves, turtle nesting beaches in South America, Africa, the Middle East and Indian Ocean are poorly covered by the Convention. There are globally important nesting beaches along the western coast of central America *Lepidochelys olivacea* (olive ridley turtle) and *Dermochelys coriacea* (leatherback turtle) and Gulf of Mexico where for *Lepidochelys kempii* (Kemp's ridley turtle) which may merit attention under the Global Strategy.

Seagrasses

The distribution of the 9 World Heritage sites known to include seagrass beds⁸ is plotted in Map 8. However the global distribution of seagrasses is so poorly known that little can be concluded from this map.

⁸ Source for the seagrass distribution: Coral World: produced by National Geographic Society, Committee for Research and Exploration, grant number 6097-97.

Data Sources

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Table 1. Tropical Marine, Coastal and Small Island Ecosystem Sites Currently on the World Heritage List.

Country	Site Name	Size (ha)	Date of Inscription	Natural Criteria for Inscription	General Description	Ramsar	Coral	Mangrove	Seagrass	Turtle nesting site
NEARCTIC REALM										
Mexico	Whale Sanctuary of El Vizcaino (also a Biosphere Reserve)	370,950ha	1993	(iv)	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 <i>Eschrichtius robustus</i> , harbour seal <i>Phoca vitulina</i> , California sea-lion <i>Zalophus californianus</i> , northern elephant-seal <i>Mitrounga angustirostris</i> and blue whale <i>Balaenoptera musculus</i> . The lagoons also offer shelter to four species of endangered marine turtle.	X	X	✓	X	✓
USA	Everglades National Park (also a Biosphere Reserve)	592,920ha	1979	(i) (ii) (iv)	This site at the southern tip of Florida has been called "a river of grass flowing imperceptibly from the hinterland into 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. The Everglades National Park is an area of exceptional conservation value. Resources include: the largest continuous stand of sawgrass prairie in North America; the largest mangrove ecosystem in the Western Hemisphere; the most significant breeding grounds for tropical wading birds in North America; the only subtropical preserve in North America; and the habitat of some 14 endangered species. Mangrove forests contain red mangrove <i>Rhizophora mangle</i> , black mangrove <i>Avicennia nitida</i> , and white mangrove <i>Laguncularia racemosa</i> . Turtle species include hawksbill turtle <i>Eretmochelys imbricata</i> , green turtle <i>Chelonia mydas</i> and loggerhead turtle <i>Caretta caretta</i>	✓ Tp, Ts, Sp, A, F , G, H, I, J, M, O, P, Q, R, U, Xf (see note 1)	X	✓	X	✓

PALEARCTIC REALM						
Japan	Yakushima (also a Biosphere Reserve)	10,747ha	1993	(ii) (iii)	Yakushima island is almost 2,000m high and is the highest mountain in southern Japan. Topography from coastline to the mountainous summits is extremely steep. Yakushima occupies a strategic situation on the boundary between Holoarctic and Palaearctic biogeographical regions.	X X X X X
Sultanate of Oman	Arabian Oryx Sanctuary	2,750,000ha	1994	(iv)	The Arabian Oryx Sanctuary is an area in the biogeographical province of Arabian Desert. 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. The eastern and southern borders of the property lie on the shoreline of the Arabian sea, which is part of the Indian Ocean. The coastal beaches and lagoons are the habitat of flocks of resident and migrating waders including gulls <i>Larus sp.</i> , terns, flamingoes <i>Phoenicopterus sp.</i> , herons and several species of ducks winter on the lagoons.	X X X X X
AFROTROPICAL REALM						
Mauritania	Banc d'Arguin National Park	1,200,000ha; 50% marine and 50% terrestrial (the Ramsar site covers 1,173,000ha)	1989	(ii) (iv)	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 can also be found. The park's vast expanses of mudflats provide home for over two million migrant shorebirds from northern Europe, Siberia and Greenland.	✓ A, G, B, E, I, M (see note 1)
Seychelles	Aldabra Atoll	35,000ha (terrestrial: 18,800ha; mangrove: 2,000ha; marine: 14,200ha)	1982	(ii) (iii) (iv)	The atoll 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 <i>Geochelone gigantea</i> , the world's largest population of this reptile. Green turtle <i>Chelonia mydas</i> and Hawksbill turtle <i>Eretmochelys imbricata</i> also breed here. There are large seabird colonies including thousands of nesting terns on the atoll.	X ✓ ✓ ✓ ✓
South Africa	Greater St. Lucia Wetland	234,566ha	1999	(ii) (iii) (iv)	The ongoing fluvial, marine and aeolian processes in the site have produced a variety of landforms including coral reefs, long sandy beaches, coastal dunes, lake systems, swamps, and extensive reed	✓ E,F,L, M,O,I

	Park					p, Ts, U, W, Xf, Xp, Y (see note 1)				
INDOMALAYAN REALM										
Bangladesh	The Sundarbans	595,000ha	1997	(ii) (iv)	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. It is located adjacent to the border of India's Sundarbans World Heritage site, inscribed in 1987. The forests and waterways support a wide range of fauna, including a number of species threatened with extinction. As one of the most biologically productive of all natural ecosystems, it is of great economic importance as a source of timber, fish and numerous other products. The area is known for its wide range of fauna including four species of marine turtle, olive ridley <i>Lepidochelys olivacea</i> being the most abundant. Green turtle <i>Chelonia mydas</i> is rare due to excessive fishing, while loggerhead <i>Caretta caretta</i> and hawksbill <i>Eretmochelys imbricata</i> are not common although there have been some reported on the beaches. Crustacea account for by far the largest proportion of animal biomass, with an estimated 40 million kilograms of fiddler crabs and 100 million kilograms of mud crabs (Hendrichs, 1975). The nutrient-rich waters of the Sundarbans also yield a considerable harvest of shrimps, prawns and lobsters.	✓ F, G, I, M (see note 2)	X	✓	X	✓
India	Sundarbans National Park	133,010ha	1987	(ii) (iv)	The Sundarbans covers 10,000 square kilometres of land and water (more than half of it in India, the rest in Bangladesh), in the Ganges delta. It contains the world's largest region of mangrove forests. It is located adjacent to the border of Bangladesh's Sundarbans World Heritage site, inscribed in 1997. A number of rare or endangered species live in the park, including tigers, aquatic mammals, birds and reptiles. The entire mangrove forest extends over an area of 4,262 sq. km, of which 2,320 sq. km is forest and	X	X	✓	X	✓

Indonesia	Komodo National Park (also a Biosphere Reserve)	219,322ha	1991	(iii) (iv)	<p>the rest is water. The only species of turtle known to nest in the Sundarbans is the olive ridley <i>Lepidochelys olivacea</i> but hawksbill <i>Eretmochelys imbricata</i> has been caught in fishermen's nets. The creeks are spawning grounds for some 90 species of fish, 48 species of crabs and a large variety of molluscs.</p> <p>These volcanic islands are inhabited by a population of around 5 700 giant lizards called "Komodo dragons". 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. Upwelling of nutrient-rich water from deeper areas of the archipelago is responsible for the rich reef ecosystem of which only isolated patches remain due to anthropogenic disturbance. The rich marine environment provides the basis for the local fishing industry. Marine mammals include blue whale <i>Balaenoptera musculus</i> and sperm whale <i>Physeter catodon</i>, 10 species of dolphin and dugong <i>Dugong dugon</i>. Marine reptiles include five species of turtle.</p>	X	✓	✓	✓	✓
Indonesia	Lorentz National Park	2,505,600ha.	1999	(i) (ii) (iv)	<p>Lorentz National Park is the largest protected area in Southeast Asia. It incorporates a continuous, intact transect from snow cap to tropical marine environment, including extensive lowland wetlands. Five mangrove communities have been described: <i>Avicennia/Sonneratia</i> community, <i>Rhizophora</i>-dominated community, <i>Bruguiera</i>-dominated forest, <i>Nypa</i>-dominated forest, and landward mixed mangrove forest.</p>	X	✓	✓	X	X
Indonesia	Ujung Kulon National Park	Ujung Kulon National Park 120,551ha (terrestrial: 76,214ha; marine: 44,337ha)	1991	(iii) (iv)	<p>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 it encompasses the natural reserve of Krakatoa. The coastal coral reef environment ranks among the richest in Indonesia. Green turtle <i>Chelonia mydas</i> is known to nest within the park.</p>	X	✓	✓	X	✓

Philippines	Puerto-Princesa Subterranean River National Park	20,202 ha. This includes the land area of the national park, a core zone of 5,753 ha, plus a buffer zone of 14,449ha.	1999	(iii) (iv)	<p>The Puerto-Princesa Subterranean River National Park features a spectacular limestone karst landscape with its underground river. A distinguishing feature of the river is that it emerges directly into the sea, and the lower portion of the river is subject to tidal influences. The area also represents a significant habitat for biodiversity conservation. The site contains a full "mountain-to-the-sea" ecosystem and protects some of the most significant forests in Asia. Mangroves are an important feature in Ulugan Bay. Mossy forest and savannahs, offshore sea grass beds and coral reefs are also found. Fauna include the oriental small-clawed otter <i>Amblyonyx cinerea</i> and Dugong <i>Dugong dugon</i> have been recorded in the marine sectors of the park. Marine turtles are also present.</p>	X	✓	✓	✓	X
Philippines	Tubbataha Reef Marine Park (also a Biosphere Reserve)	Tubbataha Reef Marine Park comprises 33,200ha (forms part of the Palawan Biosphere Reserve, 1,150,000ha.)	1993	(ii) (iii) (iv)	<p>The park covers 33,200 hectares, including the North and South Reefs, and 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 100m perpendicular wall, extensive lagoons and two coral islands. It is the most biologically diverse coral reef system in the Philippines, and is of great importance for the sustenance of fisheries. Despite the fishing effort there remains a high diversity of fish species including four threatened Tridacnid clams. Forty six bird species have been recorded from the site including a colony of brown boobies <i>Sula leucogaster</i> and some red-footed boobies <i>S. sula</i>.</p>	✓	✓	✓	✓	X
Viet Nam	Ha Long Bay	150,000ha	1994	(i) (iii)	<p>Ha Long Bay, located in the Gulf of Tonkin, includes some 1600 islands and islets forming a spectacular seascape of limestone pillars. Because of their precipitous nature, most of the islands are uninhabited and unaffected by man. The principal conservation values appear to be scenic, landscape values; geological interest; biological diversity, especially in marine species; and archaeological remains.</p>	X	X	X	X	X

OCEANIAN REALM										
Solomon Islands	East Rennell	37,000ha	1998	(ii)	<p>East Rennell makes up the southern third of Rennell Island, the southernmost island in the Solomon Island group in the western Pacific. Rennell, 86 km long and 15 km wide, is the largest raised coral atoll in the world. The site covers approximately 37,000 hectares plus a marine area extending three nautical miles to sea. A major feature of the island is Lake Tegano which was the former lagoon on the atoll. The lake, the largest in the insular Pacific (15,500 hectares), is brackish and contains many rugged limestone islands and endemic species. Rennell is mostly covered with dense forest with a canopy averaging 20 m in height. Rennell is famous for having developed many unique species and races of birds because of its isolation. Lake Tegano is the only known location for the endemic sea krait <i>Laticauda crockeri</i>.</p>	X	✓	✓	X	X
UK (Pitcairn Islands)	Henderson Island	Land area 3,700ha	1988	(iii) (iv)	<p>In the eastern South Pacific, Henderson Island is one the few atolls in the world with its ecology practically unaltered by man. Its isolated location permits the study of the dynamics of insular evolution and natural selection. There is a fringing reef at least 200m wide to the north, north-west and north-east sides of the island, backed by a wide beach. Species of particular note include the coconut crab <i>Birgus latro</i> and spiny lobster <i>Panulirus penicillatus</i>. Nine seabirds are thought to breed on the island; Murphy's petrel <i>Pterodroma ultima</i>, phoenix petrel <i>P. alba</i>, herald petrel <i>P. arminjoniana</i>, Kermadec petrel <i>P. neglecta</i>, shearwater <i>Puffinus pacificus</i>, masked booby <i>Sula dactylatra</i>, red-tailed tropic bird <i>Phaethon rubricauda</i>, brown noddy <i>Anous stolidus</i>, blue-grey noddy <i>Procelsterna caerulea</i>, and fairy tern <i>Gygis alba</i>.</p>	X	✓	X	X	X
USA	Hawaii Volcanoes National Park (also a Biosphere Reserve)	92,934ha	1987	(ii)	<p>Two of the most active volcanoes in the world, Mauna Loa (4,170 metres high) and Kilauea, tower over the Pacific Ocean at this site. Volcanic eruptions have created a continually-changing landscape, and the lava flows reveal surprising geological formations. The site extends from 6,096m below sea-level to a maximum of 4,103m above sea-level. Rare birds and endemic species can be found there, as well as forests of giant ferns. Threatened species include the Hawaiian petrel <i>Pterodroma sandwichensis</i>.</p>	X	X	X	X	X

AUSTRALIAN REALM										
Australia	Fraser Island	Approximately 166,283ha	1992	(ii) (iii)	<p>Along the eastern coast of Australia lies Fraser Island. At 122 kilometres long, it is the largest sand island in the world. Majestic remnants of tall rainforest growing on sand and half the world's perched freshwater dune lakes are found inland from the beach. The combination of shifting sand dunes, tropic, humid forests and lakes make it an exceptional site. The boundary of the region is given as 500m below high water mark, in order to include important areas of beaches, wetlands and mangroves, and part of the extensive seagrass beds in the Great Sandy Strait, which extend to more than 12,500ha. There are breeding colonies of loggerhead turtle <i>Caretta caretta</i> and green turtle <i>Chelonia mydas</i>. The island has nationally important populations of fish: honey blue-eye <i>Pseudomugil mellis</i> and Oxleyan pygmy perch <i>Nannoperca oxleyana</i>.</p>	X	X	✓	✓	✓
Australia	Great Barrier Reef	World Heritage Area 34,870,000ha (includes Far North, Cairns, Central and Mackay Capricorn Sections), Marine Park 33,126,500ha.	1981	(i) (ii) (iii) (iv)	<p>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. The site includes major feeding grounds for dugong <i>Dugong dugon</i>. Several cetaceans are present, including humpback whale <i>Megaptera novaengliae</i>, minke whale <i>Balaenoptera acutorostrata</i> and killer whale <i>Orcinus orca</i>. Dolphins include bottle nose <i>Tursiops truncatus</i>, Irrawaddy <i>Orcaella brevirostris</i> and Indo-Pacific humpback <i>Sousa chinensis</i>. Offshore, spinner dolphin <i>Stiennella longirostris</i> is also occasionally seen. There are nesting grounds of world significance for green turtle <i>Chelonia mydas</i> and loggerhead <i>Caretta caretta</i>, and habitat for four other species of marine turtle.</p>	X	✓	✓	✓	✓

Australia	Kakadu National Park	1,980,400ha	1981 extended 1987, 1992	(ii) (iii) (iv)	The park covers almost the entire catchment of a major tropical monsoonal river system. Due to its large size, it can be recognised as Australia's most significant national park. The numerous Aboriginal art sites not only represent a unique artistic achievement, but also provide an outstanding record of human interaction with the environment over tens of thousands of years. It is a unique example of a complex of ecosystems, including those of tidal flats, floodplains, lowlands and plateau, providing habitat for a wide range of rare or endemic species of plants and animals. Those animals listed as globally threatened include estuarine crocodile <i>Crocodylus porosus</i> , loggerhead turtle <i>Caretta caretta</i> , green turtle <i>Chelonia mydas</i> and hawksbill turtle <i>Eretmochelys imbricata</i> .	✓ M, N, P, A, B, E, F, G, H, I, R, Sp, Tp, Xp (see note 1)	✓	✓	✓	✓
Australia	Shark Bay	2,197,300ha.	1991	(i) (ii) (iii) (iv)	Shark Bay is a complete marine ecosystem containing many important features, including the Wooramel seagrass bank, the Faure sill and ecosystems dominated by benthic microbial communities which flourish in the hypersaline embayments, and living fossil stromatolites. Other features include a diversity of endemic and threatened plant and animal species and areas of great natural beauty. Mangroves occur in small, relatively isolated areas in southern and western Bay, only becoming abundant towards Carnarvon. The marine flora is dominated by seagrass beds covering 4,000 sq. km. with twelve species of seagrass occurring in the Bay. Shark bay is renowned for its marine fauna including a large population of dugong <i>Dugong dugon</i> , Humpback whale <i>Megaptera novaeangliae</i> and southern right whales use the bay as a migratory staging post.	X	✓	✓	✓	✓
Australia	Wet Tropics of Queensland	894,420ha.	1988	(i) (ii) (iii) (iv)	The wet tropics of north-east Queensland is regarded as one of the most significant regional ecosystems in the world, being of outstanding scientific importance and natural beauty. The area is made up largely of tropical humid forests. Fringing reefs occur in the northern section of the region and are most extensively developed between Daintree and Bloomfield rivers. The association between coastal rainforest and fringing coral reef to the extent it occurs off Cape Tribulation and environs appears to be undocumented elsewhere in the world. The reefs are part of the Great Barrier Reef World Heritage Site.	X	✓	✓	✓	X

NEOTROPICAL REALM

Belize	Belize Barrier Reef Reserve system	96,300ha	1996	(ii) (iii) (iv)	<p>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 serial nomination illustrate the evolutionary history of reef development and provide spectacular underwater scenery. There are over 500 species of fish, 65 scleractinian corals, 45 hydroids and 350 molluscs in the area, plus a great diversity of sponges, marine worms and crustaceans. The area harbours probably the largest population (300-700 individuals) of West Indian manatee <i>Trichechus manatus</i> in the world. Three species of sea turtles nest in Belize: loggerhead <i>Caretta caretta</i>, green <i>Chelonia mydas</i>, and hawksbill <i>Eretmochelys imbricata</i>.</p>	X	✓	✓	✓	✓
Brazil	Discovery Coast Atlantic Forest Reserves	111,930ha	1999	(ii) (iv)	<p>The Discovery Coast Atlantic Forest Reserves in the states of Bahia and Espirito Santo consist of eight separate protected areas containing 112,000 ha of Atlantic forest and associated shrub (restingas). The rainforests of the Atlantic Coast of Brazil are the world's richest in terms of biodiversity. The site reaches the coast, where there is an irregular coastal stretch of sand plains and dunes, and extends six nautical miles off shore at its eastern boundary. On sand coastal soils, there is restinga vegetation which, depending on the distance to the shore, includes from humid prairies and shrubs to low forests. Bare sand areas are colonised by very specialised vegetation. Restinga forests contain lianas, orchids and epiphytes. Other types present in the site include seasonally inundated vegetation (endemic to the south of Bahia and north of Espirito Santo) and coastal mangroves.</p>	X	✓	X	X	X
Brazil	Atlantic Forest Southeast Reserves (part of this site is also a Biosphere Reserve)	1,691,750ha (core area of 468,193ha and a buffer zone of 1,223,557ha.	1999	(i) (ii) (iii) (iv)	<p>The site is home to one of the most representative remnant samples of the highly endangered Atlantic Forest, of which only 7% of its original area exists in Brazil. The site also comprises part of the Estuarine Lagoon Complex of Iguape-Cananéira-Paranagua, which includes a great variety of wetlands, from the flooded plains of the Ribeira de Iguape River to saline waters of the lagoon Complex itself. There is also a great extension of beaches showing a succession of opened ocean-sand dunes-sandy strings. The centre of the Estuary is the region of Cananéira. These lands are separated from the ocean by an archipelago that runs parallel to the shoreline. Along the coast, there are extensive areas of mangroves and shrubland.</p>	X	✓	X	X	X

Costa Rica	Area de Conservación Guanacaste	total 88,000ha of land plus 43,000ha of marine habitats.	1999	(ii) (iv)	<p>The Area de Conservación Guanacaste contains maybe the largest well-preserved and representative sample of the highly endangered tropical dry forest in the Neotropics and includes entire watersheds, adjacent areas of cloud forest and coastal/marine interfaces. The site demonstrates significant ecological processes in both its terrestrial and marine-coastal environments including the development of coral colonies and reefs. The nominated World Heritage Site comprises the Guanacaste Cordillera and surrounding flatlands and coastal areas. Mangroves species include <i>Rhizophora</i> sp., <i>Avicennia nitida</i>, <i>Conocarpus erectus</i> and <i>Laguncularia racemosa</i>. During the breeding and mating season (August to December), over 250,000 turtles arrive to nest. The majority of them are olive ridley turtle <i>Lepidochelys olivacea</i>. The green turtle <i>Chelonia mydas</i>, leatherback turtle <i>Dermochelys coriacea</i> and hawksbill turtle <i>Eretmochelys imbricata</i> also use the beaches quite extensively to nest.</p>	X	✓	✓	✓	✓
Costa Rica	Cocos Island National Park	Totals 99,700ha, of which 2,400ha corresponds to Isla del Coco, and 97,300ha comprising surrounding marine ecosystems.	1997	(ii) (iv)	<p>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 myriad of interactions between the island and the surrounding marine ecosystem make the area an ideal laboratory for the study of biological processes. The underwater world of the national park has become famous due to the attraction it has for divers who rate it as one of the best places in the world to view large pelagic species such as sharks, rays, tuna and dolphins. Isla de Coco includes swamps, waterfalls and coral reefs. Hawksbill turtle <i>Eretmochelys imbricata</i>, Green turtle <i>Chelonia mydas</i> and Olive Ridley turtle <i>Lepidochelys olivacea</i> inhabit the surrounding waters and use the beaches occasionally.</p>	✓ A,C,D, M,N,T P,Y (see note 2)	✓	✓	X	✓
Cuba	Desembarco del Granma National Park	The nominated World Heritage site comprises 26,180ha of terrestrial area, 6,396ha of marine area and 9,287ha of terrestrial buffer zone.	1999	(i) (iii)	<p>With its uplifted marine terraces and associated ongoing development of karst topography and features, Desembarco del Granma National Park represents a globally significant example of geomorphologic and physiographic features and ongoing geological processes. The area, in and around Cabo Cruz in southwestern Cuba, includes spectacular terraces and cliffs, as well as some of the most pristine and impressive coastal cliffs bordering the western Atlantic. There are well-developed coral formations with associated fauna. These corals are visited by loggerhead turtle <i>Caretta caretta</i>, green turtle <i>Chelonia mydas</i>, olive ridley <i>Lepidochelys olivacea</i> and hawksbill turtle</p>	X	✓	✓	X	✓

Ecuador	Galapagos Islands (also a Biosphere Reserve)	766,514ha, comprising 96.6% of the land area of the archipelago. The marine reserve covers some 7,990,000ha	1978	(i) (ii) (iii) (iv)	<p><i>Eretmochelys imbricata</i>. There is also a colony of queen conch <i>Strombus gigas</i> and the Caribbean manatee <i>Trichechus manatus</i> is found there.</p> <p>Located some 1,000 kilometres from the South American continent in the Pacific Ocean, these nineteen volcanic islands have been called a unique "living museum and showcase of evolution". The presence of unusual animal life - such as land iguana, the giant tortoise, and many types of finches - inspired Charles Darwin in his theory of evolution, following his visit there in 1835. Long stretches of shoreline are only slightly eroded, but in many places faulting and marine erosion have produced steep cliffs and lava, coral or shell sand beaches. Native mammalian fauna includes the Galapagos fur seal <i>Arctocephalus galapagoensis</i> and Galapagos sea lion <i>Zalophus californicum wolfebacki</i>. Marine fauna includes several species of sharks, rays and Cetaceans. Green turtle <i>Chelonia mydas</i> and hawksbill turtle <i>Eretmochelys imbricata</i> are common in surrounding waters, with the former nesting on sandy beaches.</p>	X	✓	✓	X	✓
Honduras	Río Plátano Biosphere Reserve (also a Biosphere Reserve)	500,000ha. 350,000ha constitute the biosphere reserve and 150,000ha a buffer zone.	1982	(i) (ii) (iii) (iv)	<p>Located in the watershed of the Río Platano, the reserve is one of the few remains of a humid tropical forest in Central America and contains abundant and varied plant- and wildlife. In its mountainous landscape sloping down to the Caribbean coast, over 2,000 indigenous people continue to live their traditional lifestyle. The coastal area is flat or undulating with a number of lagoons such as Ibanas and Cartina and grasslands subject to winter flooding. Threatened species include green turtle <i>Chelonia mydas</i>, loggerhead turtle <i>Caretta caretta</i>, and leatherback turtle <i>Dermochelys coriacea</i>.</p>	X	✓	✓	X	✓
Mexico	Sian Ka'an (also a Biosphere Reserve)	528,000ha: 408,000ha are terrestrial; and 120,000ha are marine	1987	(iii) (iv)	<p>Located on the east coast of the Yucatan peninsula, this biosphere reserve contains tropical forests, mangroves and marshes, as well as a large marine section intersected by a barrier reef, and provides a habitat for an abundance of fauna and flora. Threatened species include the green turtle <i>Chelonia mydas</i>, hawksbill turtle <i>Eretmochelys imbricata</i>, loggerhead turtle <i>Caretta caretta</i>, and leatherback <i>Dermochelys coriacea</i> as well as the Caribbean manatee <i>Trichechus manatus</i>.</p>	X	✓	✓	X	✓
Panama	Darién National Park (also a	597,000ha.	1981	(ii) (iii) (iv)	<p>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. Two Indian tribes live in the park.</p>	X	✓	✓	X	✓

Table 2. Tropical Marine, Coastal and Small Island Ecosystem Sites that have been Nominated but not Inscribed.

Country	Site Name	Size	Details	Reasons for nomination	Reasons for rejection	Withdrawal or referral	Year received
AFROTROPICAL REALM							
Congo	Faunal Reserve of Konkouati	300,000ha (marine component to be added)	The reserve covers three major geographic regions. The coast itself consists of a white sand beach, bordering a narrow coastal plain several hundred metres wide of marine origin featuring chains of alluvial sand dunes. The dunes impede the passage of water to the sea, creating numerous lagoons and swamps. Fully marine area to be added but funding lacking. Four species of threatened marine turtle occur along the shore of the reserve: loggerhead <i>Caretta caretta</i> (V), green turtle <i>Chelonia mydas</i> (E), leatherback <i>Dermochelys coriacea</i> (E), and olive ridley <i>Lepidochelys olivacea</i> (E). Some of these nest.	Faunal Reserve of Konkouati is considered to meet natural criteria (iv)	At the 19 th Session in 1995 the Bureau recommended that the World Heritage Committee not inscribe the nominated property, as the site is of national importance and does not possess distinguishing features of universal value. It noted furthermore, that the site has been degraded over the past ten years.	Withdrawn. No record after 1995	1995
Senegal	Maddeleine Islands National Park	486ha	Situated west of Dakar, 3km (1.7 miles) from the coast, this small archipelago is a protected marine park of approximately 486ha. The rocky nature of the archipelago, thought to be of volcanic origins, has favoured the establishment of numerous colonies of sea birds. http://www.wtgonline.com/data/sen/sen140.asp	No information available	At the 3 rd Session in 1979 the Committee decided not to inscribe this site on the World Heritage List.	No record after 1979	1979
Sudan	Sanganeb Atoll	26,000ha	The Bureau requests that the authorities declare this property a "Marine National Park" and provide for its extension towards the south to include the Wingate reef, towards the West to include the fringe reefs which begin at Mersa Watai, and towards the North to include the Mersa Darur reef.	No information available	At the 7 th Session in 1983 the Committee decided to defer examination of the nomination until it receives the necessary information.	Deferred. No record after 1983	1983

INDOMALAYAN REALM							
Thailand	Tarutao National Park	149,000ha	The Park is an archipelago of 51 islands, divided into two main parts, i.e., Tarutao and Mu Ko Adang-Rawi, and situated in Tambon Ko Sarai, Amphoe Muang. It's the first marine national park of Thailand. Sandy beaches, coral reefs and turtle nesting sites. http://www.geocities.com/TheTropics/Cabana/1654/ta_rutao.htm	No information available	At the 15 th Session in 1991 the Bureau urged the authorities of Thailand to strengthen the management of this area possibly by using the marine biosphere reserve approach of UNESCO-MAB which would be most appropriate for addressing marine resources conservation.	Deferred. No record after 1991	1991
OCEANIAN REALM							
USA	Pu'uhonua o Honaunau, Hawaii	73ha	The 73ha park, established in 1961, includes the pu'uhonua and a complex of archeological sites including: temple platforms, royal fishponds, sledding tracks, and some coastal village sites. The Haleo o Keawe temple and several thatched structures have been reconstructed. http://www.nps.gov/puho/	No information available	At the 11 th Session in 1987 the Bureau recommended that the examination of this site be deferred until comparative studies concerning the whole of the Polynesian area have shown more clearly the present state of conservation of the most outstanding sites in the archipelagos of the Pacific Ocean.	Deferred. No record after 1987	1987
NEOTROPICAL REALM							
Brazil	Fernando de Noronha Marine National Park and Rocas Atoll	11,270ha (of which 85% is marine) and 32,000ha	The nominated World Heritage site encompasses the existing National Marine Park of Fernando de Noronha (comprised of 18 islands) and the Biological Marine Reserve of Rocas Atoll (comprised of 2 islands). A buffer zone of 140,713ha, following the contour of the 2,000m isobath, is also proposed.	Fernando de Noronha/Rocas Atoll is considered to meet natural criteria (i) to (iv)	At the 24 th Session in 2000 the State Party of Brazil requested a postponement of the nomination.	Postponement. New nomination received 2001	1999
Cuba	Alejandro de Humboldt National Park	66,700ha of terrestrial area, 2,646ha marine and 34,330ha terrestrial	The nominated World Heritage site has the highest plant diversity of the Cuban archipelago and the Insular Caribbean. In the marine part of the park, there is a numerous colony of Caribbean manatee <i>Trichechus manatus</i> .	Alejandro de Humboldt National Park is considered to meet natural criteria (ii) and (iv)	At the 23 rd Session in 1999 the Bureau noted that Alejandro de Humboldt National Park is considered to meet natural criteria (ii) and (iv) but decided to	Deferred. No record after 1999	1998

Venezuela	National Park of Medanos de Coro	225,264ha	buffer zone.	Located north of the city of Coro, in Falcon State this is the largest of the four National Parks covering 225,264ha on the Isthmus of Paraguaná and the sea on either side, with the highway in between. The famous sand dunes shift over the road at the city's edge, whipped by constant trade winds. http://www.coroweb.com/coroe2.htm#muscat_highlighter_first_match	No information available	No information available	No information available	No information available	No information available
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Table 3. Tropical Marine, Coastal and Small Island Ecosystem Sites that are on the List of World Heritage in Danger.

Country	Site Name	Date of Inscription	Date of Inscription on the List of World Heritage in Danger	Reason for Listing	Actions Taken and Results
NEARCTIC REALM					
USA	Everglades National Park	1979	1993	The site was inscribed on the List of the World Heritage in Danger in 1993 after the park's Superintendent informed the Committee of extensive damage to Everglades' ecology due to a number of causes including nearby urban growth, pollution from fertilisers, mercury poisoning of fish and wildlife, and a fall in water levels caused by flood protection measures. In addition, on 24 August 1992, Hurricane Andrew altered much of Florida Bay and its ecological systems and destroyed the park's visitor centre.	The inscription on the List of World Heritage in Danger led to an increased federal funding for the restoration of the site. A major rehabilitation effort is currently underway with \$US 8 million budgeted for ecosystem research. This is the largest budget allocation ever voted for research in a park in any part of the world. Legal actions and negotiations were undertaken to reduce pollution by fertiliser, an addition of 107,000 acres has been incorporated to protect the north- eastern part of the Park and structural changes in the water management system have been undertaken to restore the water level in this area.
NEOTROPICAL REALM					
Honduras	Rio Plátano Biosphere Reserve	1982	1996	At both its 19th and 20th sessions, the World Heritage Committee heard reports of commercial and agricultural intrusions into the site, threatening the World Heritage values for which it had been inscribed. The advancing agricultural frontier at the west side of the reserve, pushed by small farmers and cattle ranchers, is already reducing the reserve's forest area. The southern and western zones of the Reserve are subject to massive extraction of precious wood such as Caoba (<i>Swietenia macrophylla</i>). Uncontrolled commercial hunting of wild animals is also practised. The introduction of exotic species is threatening to undermine the complex ecosystem of the Reserve. The absence of any management plan and the fact that there is almost no park staff to manage the 525,100 ha site has compounded the problem.	An eleven-point corrective action plan, recommended by a 1996 IUCN conservation status report, has been endorsed by the Minister for the Environment of Honduras and the elaboration of a management plan for Rio Platano is being carried out with a World Heritage Fund contribution, as part of a large-scale project for strengthening the conservation of the site financed by the German agency GTZ-KFW. A hydroelectric development project, Patuca II, is currently proposed for implementation near the reserve with potential negative impacts on the site. According to reports, the Government is promoting the rapid implementation of this project. Matters are further complicated by the fact that communications with relevant authorities in Honduras have become difficult following recent damages caused to the country's infrastructure by Hurricane Mitch.

Table 4. Sites Recognised under the UNESCO Man and the Biosphere Programme.

Map No. ¹	Country	Site Name	Size	Year designated	Habitat Description
AFROTROPICAL REALM					
1	Guinea Bissau	Boloma Bijagos	Total: 110,000ha [Core area: Under revision]	1996	Major ecosystem type: Marine archipelago Major habitats & land cover types: Mangroves; palm forests; mixed dry and semi-dry forests; secondary or degraded forests; coastal savanna; wet savanna; sand banks; rocky aquatic zones.
2	Kenya	Kiunga	Total: 60,000ha	1980	Major ecosystem type: Tropical coastal/marine zone Major habitats & land cover types: Sub-littoral zone with microscopic marine plants; intertidal sand and mud with marine angiosperms; dwarf shrub thicket areas with salt-tolerant species; mangrove swamps.
3	Kenya	Malindi-Watamu	Total: 19,600ha	1979	Major ecosystem type: Tropical coastal/marine zone Major habitats & land cover types: Sub-littoral zone with microscopic marine plants; corals; intertidal sand and mud with marine angiosperms such as <i>Cymodocea rotundata</i> , <i>Halodule wrightii</i> , <i>Thalassia hempridii</i> etc.; mangroves with <i>Rhizophora mucronata</i> , <i>Bruguiera cylindrica</i> and <i>Ceriops</i> sp.; intertidal rock zones with brown algae such as <i>Bosynrychia binderi</i> .
4	Madagascar	Mananara Nord	Total: 140,000ha [Core area: 24,000 (of which marine: 1,000) Buffer zone: 15,000 Transition area: 101,000]	1990	Major ecosystem type: Tropical humid forests including marine/coastal component Major habitats & land cover types: Tropical humid forest including sandy coastal plains with littoral vegetation such as <i>Terminalia catappa</i> , <i>Calophyllum</i> sp., <i>Canarium</i> sp. and <i>Heritiera</i> sp., and on lateritic soils species such as <i>Weinmannia</i> spp., <i>Tambourissa</i> spp., <i>Diospyros</i> spp. etc.; mangrove formations dominated by <i>Rhizophora mucronata</i> and <i>Avicennia marina</i> ; marshlands; around river courses species such as <i>Aponogeton</i> and <i>Hydrostachis</i> spp.; coral reefs.
5	Senegal	Delta du Saloum	Total: 180,000ha [Core area: 76,000]	1980	Major ecosystem type: Tropical dry or deciduous forest / tropical coastal/marine zone with mangroves Major habitats & land cover types: Mangrove dominated by <i>Rhizophora racemosa</i> , <i>R. mangle</i> , <i>R. harrisonii</i> and <i>Avicennia nitida</i> ; open flat areas ("tanns"); islands with halophile species such as <i>Sesuvium portulacastrum</i> , <i>Philoxyerus vermicularis</i> and <i>Paspalum vaginatum</i> ; dry forest; sand dunes.
INDOMALAYAN REALM					
6	Indonesia	Siberut	Total: 405,070ha [Core area: 46,533 Buffer zone: 314,145 (of which traditional use zone: 99,555 ha, and intensive use zone: 20 ha) Transition area: 44,392 (Park Village zone)]	1981	Major ecosystem type: Sub-tropical and temperate rainforest with coastal/marine component (coral reefs) Major habitats & land cover types: mangrove forests with <i>Rhizophora</i> spp., <i>Bruguiera</i> spp. and <i>Casuarina equisetifolia</i> ; coral reefs.
7	Philippines	Palawan	Total: 1,150,800ha [Core area: 55,625 Buffer zone: 636,550 Transition area: 458,625]	1990	Major ecosystem type: Tropical humid forests with coastal/marine component. Major habitats & land cover types: mangrove dominated by <i>Rhizophora mucronata</i> , <i>R. apiculata</i> , <i>Nypa fruticans</i> etc.; coral reefs.

8	Philippines	Puerto Galera	Total: 23,247ha	1977	Major ecosystem type: Tropical humid forests with coastal/marine component Major habitats & land cover types: marine ecosystems.
9	Thailand	Ranong	Total:~30,309ha [Core area: 19,148 (of which marine: 12,626) Buffer zone: 4,279 Transition area:~6,882]	1997	Major ecosystem type: Tropical humid forests incl. coastal mangrove forests Major habitats & land cover types: Avicennia-Sonneratia mangrove communities dominated by <i>Avicennia alba</i> , <i>A. officinalis</i> and <i>Sonneratia alba</i> ; mixed Rhizophora-Bruguiera-Xylocarpus mangrove communities dominated by <i>Rhizophora apiculata</i> , <i>R. mucronata</i> , <i>Bruguiera cylindrica</i> , <i>Xylocarpus granatum</i> etc.; coastal hill forest with <i>Dipterocarpus spp.</i> , <i>Anisoptera glabra</i> and <i>Shorea spp.</i> ; sea grass beds at 2-3 meters depth with patchy beds of <i>Enhalus acoroides</i> , <i>Halophila ovalis</i> , <i>Halodule uninervis</i> and <i>Cymodocea serrulata</i> .
10	Vietnam	Can Gio Mangrove	Total:~75,740ha [Core area: 4,721 Buffer zone:~41,139 (of which marine: ~3,800) Transition area: ~29,880 (of which marine: ~570)]	2000	Major ecosystem type: Mangrove Major habitats & land cover types: Mangroves with saline water species such as <i>Sonneratia alba</i> , <i>Avicennia alba</i> , mixed communities of <i>Rhizophora apiculata</i> - <i>Sonneratia alba</i> , as well as <i>Xylocarpus granatum</i> , <i>Kandelia candel</i> , <i>Rhizophora mucronata</i> etc., and with brackish water species such as <i>Sonneratia caseolaris</i> , communities of <i>Cryptocoryne ciliata</i> - <i>Acanthus ebrateatus</i> , <i>Nypa fruticans</i> , <i>Aerostichum aureum</i> etc.; seagrass beds dominated by <i>Halophylla</i> sp., <i>Halodule</i> sp. and <i>Thalassia</i> sp.
OCEANIAN REALM					
11	USA	Hawaiian Islands	Total: 99,545ha	1980	Major ecosystem type: Coastal ecosystems, volcanic islands Major habitats & land cover types: No information
NEOTROPICAL REALM					
12	Brazil	Maia Atlantica (including Sao Paulo City Green Belt)	Total: 29,473,484ha [Core area: 4,052,544 Buffer zone:12,646,302 Transition area:12,774,638]	1993	Major ecosystem type: Tropical humid forests with coastal/marine component. Major habitats & land cover types: coastal forest of several types; mangrove with <i>Rhizophora mangle</i> , <i>Avicennia tomentosa</i> , <i>Laguncularia racemosa</i> and <i>Hibiscus tiliaceus</i> ; lagoons with <i>Typha domingensis</i> , <i>Cladium jamaicense</i> . <i>Scirpus spp.</i> etc. beaches, sand dunes; mountains; caves; islands.
13	Colombia	Cienaga Grande de Santa Marta	Total: 432,950ha [Core area: 54,000 Buffer zone: 109,500 Transition area: 269,450(of which marine: 44,550)]	2000	Major ecosystem type: Coastal wetlands with freshwater, brackish and saline components; coral reefs and mangroves. Major habitats & land cover types: mangroves including <i>Rhizophora mangle</i> , <i>Avicennia germinans</i> , <i>Laguncularia racemosa</i> , <i>Conocarpus erectus</i> etc; wetlands (citénagas); sandy bottoms; beaches; coral reefs with <i>Cladophora</i> spp., <i>Caulerpa mexicana</i> , <i>C. prolifera</i> , <i>Codium isthmocladum</i> etc.
14	Colombia	Seaflower	Total: 4,897ha(+ marine preliminary area: 29,999,145) [Core area: 1,143 (+ marine preliminary area: 160,530) Buffer zone: 3,120 (+ marine preliminary zone: 7,389,005) Transition area: 634 (+ marine preliminary area: 22,449,610)] ²	2000	Major ecosystem type: Marine areas including coral reefs and mangroves; islands; dry tropical forest. Major habitats & land cover types: Coral reefs; mangroves with <i>Rhizophora mangle</i> , <i>Avicennia germinans</i> , <i>Laguncularia racemosa</i> and <i>Conocarpus erectus</i> ; seagrassbeds characterized by <i>Thalassia testudinum</i> and <i>Syringodium filiforme</i> ; tropical forest including <i>Ceiba petandra</i> , <i>Chlorophora tinctoria</i> , <i>Ficus</i> sp., <i>Pimenta dioica</i> , <i>Cecropia peltata</i> etc.; beaches with species such as <i>Tournefortia gnaphalodes</i> , <i>Batis maritima</i> , <i>Typha angustifolia</i> , <i>Clitoria ternatea</i> etc.

15	Cuba	Buenvista	Total: 313,500ha [Core area: 76,518 (of which marine: 58,099) Buffer zone: 19,570 (of which marine: 10,304) Transition area: 217,412 (of which marine: 156,148)	2000	Major ecosystem type: Coastal and marine components / Mangrove Major habitats & land cover types: mangrove including <i>Rhizophora mangle</i> , <i>Avicennia germinans</i> , <i>Conocarpus erecta</i> and <i>Laguncularia racemosa</i> ; coastal and sub-coastal forests with xeromorphic matorral including <i>Aloe barbadensis</i> , <i>Agave legrilleana</i> , <i>Brya ebenus</i> etc.; matorral on sandy beaches with <i>Bourneria ovata</i> , <i>Casasia elusiaeifolia</i> , <i>Erihalis fruticososa</i> etc.; halophile communities with elements of mangrove with species such as <i>Avicennia germinans</i> , <i>Batis maritima</i> , <i>Conocarpus erecta</i> etc.; rocky beaches with <i>Jacquinia keyensis</i> , <i>Lantana involucrata</i> , <i>Rachicallis americana</i> etc.; sandy beaches including <i>Canavalia maritima</i> , <i>Chamaesyce buxifolia</i> , <i>Coccoloba uvifera</i> etc.; semi-deciduous forest with <i>Bursera simaruba</i> , <i>Cedrela odorata</i> and <i>Cordia gerascanthus</i> ; coral reefs.
16	Cuba	Baconao	Total: 92,360ha [Core area: 12,810 Buffer zone: 51,870 (of which marine: 7,380) Transition area: 27,680]	1987	Major ecosystem type: Tropical humid forests including coastal/marine component Major habitats & land cover types: Coastal and sub-coastal xeromorphic bush forest with tree and column cactii; coastal rocky and sandy habitats; mangroves.
17	Cuba	Cienaga de Zapata	Total: 625,354ha [Core area: 196,828 (of which marine: 28,700) Buffer zone: 317,337 (of which marine: 102,037) Transition area: 111,189]	2000	Major ecosystem type: Coastal, marine component / Mangrove Major habitats & land cover types: mangrove forest with the four mangrove species existing in Cuba: <i>Rhizophora mangle</i> , <i>Avicennia germinans</i> , <i>Laguncularia racemosa</i> and <i>Conocarpus erecta</i> ; Ciénaga forest dominated by <i>Bucida buceras</i> , <i>Tabebuia angustata</i> , <i>Calophyllum antillanum</i> and <i>Rauwolfia cubana</i> ; semi-deciduous forest dominated by <i>Lisiloma latisiliqua</i> , <i>Bursera simaruba</i> , <i>Ceiba pentandra</i> etc.; evergreen coastal and sub-coastal forest; coastal and sub-coastal matorral, coral reefs; coastal lagoons.
18	Cuba	Cuchillas del Toa	Total: 208,305ha [Core area: 89,741 (of which marine: 2,642) Buffer zone: 49,284 (of which marine: 3,371) Transition area: 69,280]	1987	Major ecosystem type: Tropical humid forests including coastal/marine component Major habitats & land cover types: mangrove; rocky and sandy habitats; coral reef.
19	Cuba	Peninsula de Guanahacabibes	Total: 119,189ha [Core area: 34,856 (of which marine: 16,400) Buffer zone: 73,635 (of which marine: 3,424) Transition area: 10,698]	1987	Major ecosystem type: Tropical dry or deciduous forest including coastal/marine component Major habitats & land cover types: evergreen forest; mangrove; marshland; coastal scrublands; rocky habitats; sand dunes; coral reefs; marine habitats.
20	Mexico	El Vizcaino	Total: 2,546,790ha (of which marine: 539,763) [Core area: 363,439 Buffer zone: 2,183,351 Transition area: 0]	1993	Major ecosystem type: Desert and semi-desert; coastal lagoons; coastal and marine ecosystems Major habitats & land cover types: coastal dunes; marine and coastal ecosystems; mangrove.
21	Mexico	Alto Golfo de California	Total: 1,649,312ha [Core area: 434,285 Buffer zone: 1,215,027 Transition area: 0]	1993, and extension 1995	Major ecosystem type: Warm deserts and semi-deserts including coastal/marine component; subtropical sea and river delta Major habitats & land cover types: Shallow coastal water of the upper Gulf of California; halophylous vegetation; coastal and Colorado river delta wetlands; Gran Desierto dunes.

22	Mexico	Islas del Golfo California	Total: 150,000ha (124 major islands; if the islets are considered, the number increases to 900)	1995	Major ecosystem type: Sonoran desert; Marine archipelago of 124 major islands Major habitats & land cover types: coastal dune vegetation; sand dune systems; coastal mangroves.
23	Panama	La Amistad	Total: 655,558ha [Core area: 309,047 (of which marine: 19,438) Buffer zone: 253,713 (of which marine: 5,000) Transition area: 92,798 (of which marine: 10,000)]	2000	Major ecosystem type: Tropical humid forest / Mangrove and coral reefs Major habitats & land cover types: Coral reefs with 25 species of soft corals and 54 species of hard corals; sea-grass beds dominated by <i>Thalassia testudinum</i> , <i>Syringodium filiforme</i> , <i>Halophila decipiens</i> and <i>Halodule wrightii</i> ; mixed inundated forest characterized by <i>Campnosperma panamensis</i> , <i>Pitoria copaiifera</i> , <i>Pterocarpus officinalis</i> etc.; mangrove dominated by <i>Rhizophora mangle</i> , <i>Avicennia germinans</i> and <i>Laguncularia racemosa</i> .
24	USA	Guanica	Total: 4,000ha	1981	Major ecosystem type: Marine archipelago Major habitats & land cover types: No information
25	USA	Virgin Islands	Total: 6,130ha	1976	Major ecosystem type: Marine archipelago Major habitats & land cover types: No information

Notes for Table 4

1 - refers to the symbols on Map 4

2 - values taken directly from <http://www.unesco.org/mab/br/brdir/latin-am/col5.htm>. No units were given for the marine preliminary area but it was assumed they were also hectares

Table 5. Sites Recognised under the Ramsar Convention on Wetlands.

Map No.	Country	Site Name	Size	Year designated	Reasons for Inclusion ²	Habitat Description ³
AFROTROPICAL REALM						
27	Cote d'Ivoire	Parc national d'Azagny	19,400 ha	1996	Criteria: 1a, 1c, 1d, 2a, 2b, 2d, 3b Many vegetation formations typical of the littoral area have disappeared or are present as relicts, following forest operations. This is particularly the case for littoral forest and raphiales. <i>Pandanus candelebrum</i> which form crater-shaped islets up to 100 m in diameter in the interior of the <i>Cyclosoorus striatus</i> swamps are unique to and typical of the park. Mangroves, which are exploited in the unprotected littoral areas, are well preserved in the Park. The Park wildlife includes a broad variety of species typical of Guinea forests. Several threatened large mammal species include: <i>Loxodonta africana</i> , <i>Trichechus senegalensis</i> , <i>Hexaprotodon liberiensis</i> . Vulnerable mammals include Pan troglodytes.	Wetland Types: 1, 1p, 1s, Sp, Ss, Xf (dominance unspecified). Parc National d'Azagny's uniqueness lies in its hydrology: it is a coastal wetland, made up for the most part of freshwater. The Azagny National Park consists of a vast low-lying swamp (southern sector) overlooked in the north by low plateaux.
28	Democratic Republic of Congo	Parc national des Mangroves	66,000 ha	1996	Criteria: 1c, 2a The park is a representative example of a wetland which plays an important ecological role in the coastal system. It contains a variety of vulnerable or endangered plant and animal species, as well as a wide variety of bird species.	Wetland Types: F, J The site consists of two plateaux, one at 20-30 m elevation, the other at 110 m, which are bordered by swamps along the Zaire River and mangroves.

29	Egypt	Lake Burullus	46,200 ha	1988	Criteria: 1b, 1c, 2a, 3a, 4b Large numbers of waterbirds visit the site for wintering and staging. The site is an important fishery resource.	Wetland Types: J, Q, 1 Lake Burullus is a brackish coastal lagoon, with several drainage channels entering the lagoon.
30	Gambia	Baobolon Wetland Reserve	20,000 ha	1996	Criteria: 1c, 2c The Baobolon Wetland Reserve provides the rural population with food, thatch grass and fencing materials and supports the maintenance of cultural practices whilst remaining within the framework of sustainable use and habitat conservation. The area's mangrove ecosystem provides an important fish breeding ground. The Baobolon complex forms an important habitat for many resident and migratory species at a critical stage of their biological cycle. The area also provides important habitats for the <i>Anyx capensis</i> , <i>Trichechus senegalensis</i> and <i>Tragelaphus spekei</i> .	Wetland Types: F, G, H, I, M, Ss, Sp, Ts, 3 (dominance unspecified) The most important habitats wetland types are: tidal estuary, mangroves, salt marsh, tidal flats and occasionally flooded savanna woodlands adjacent to the salt marshes.
31	Ghana	Densu delta	4,620 ha	1992	Criteria: 1a, 2b This site is a good representative example of a coastal wetland on the south coast of West Africa.	Wetland Types: F, E, I, J, M, Ss, 5 (dominant type listed first) The site is broadly comprised of a deltaic estuary containing sand dunes, scattered mangrove stands, lagoons, saltpans, marsh and scrub. Coconut trees fringe the dunes, and the site contains extensive areas of open water interspersed with <i>Paspalum vaginatum</i> .
32	Ghana	Muni Lagoon	8,670 ha	1992	Criteria: 1a, (3a) This coastal wetland has a high diversity of mammals, making it important to the area. It also serves as feeding, breeding and roosting grounds for waterbirds such as terns, waders, and herons. The Muni lagoon supports an estimated population of 23,000 waterbirds, comprising 27 species of waders, 8 terns and 7 herons/egrets. The site is particularly important for terns.	Wetland Types: E, H, J, Ss (dominance unspecified) The site comprises sand dunes, an open saline lagoon, areas of marshland subject to tidal and seasonal inundation, degraded forest and scrubland.
33	Ghana	Sakumo Lagoon	1,340 ha	1992	Criteria: 1a, 2b The site is a good representative example of a wetland on the south coast of West Africa. It is an important wetland for many species of waterbirds.	Wetland Types: J, (I, H, Ts) (dominant types listed first) The site is broadly comprised of a coastal brackish-saline lagoon with a narrow connection to the sea. The main habitats are the open lagoon, surrounding floodplains, freshwater marsh, and coastal savanna grasslands.

34	Guinea	Ile Blanche (Iles de Loos)	10 ha	1992	<p>Criteria: 2a, 2c The site is used as a resting and laying area for green turtles <i>Lepidochelys olivacea</i>, and is its last substantial refuge in Guinea. Part of the site is, unusually, a coral reef with some rare species of fish.</p>	<p>Wetland Types: A, C, D, E (dominance unspecified) A lateritic rocky islet, covered in sand. The site is unusual for the occurrence of coral (on Ile Corail). Some mangroves were found in January 1989.</p>
35	Mauritania	Parc National du Diauwling	15,600 ha	1994	<p>Criteria: 1b, 1c, 2a, 3b This coastal site lies across the border from Senegal. In 1994 there were no recent bird census data but the following species and groups had been recorded: <i>Phoenicopterus ruber</i>, <i>P. minor</i>, <i>Pelecanus onocrotalus</i>, <i>Balaenica pavonina</i>, Phalacrocoracidae, Ciconiidae, Threskiornithidae, Ardeidae, African and European Anatidae, Charadriiformes and Ardeotis species. Mammals present included: warthogs, jackals and patas monkeys. The last gazelles have disappeared recently.</p>	<p>Wetland Types: F, I, J, K, L, M (dominance unspecified) This site along the Senegal River contains three coastal lagoons: the Bassin du Diauwling (7,200 ha), the Bassin du Bell (4,500 ha) and the Bassin du Gambar (3,900 ha). Freshwater flowing through the park creates an estuary in the basin of the Ntiallakht (peripheral zone). Currently there are large expanses of Typha in the Diama reservoir.</p>
36	Morocco	Baie de Khmifiss	6,500 ha	1980	<p>Criteria: 1a, 2b, 2c, 3a, 3b, 3c Baie de Khmifiss is one of the rare nesting sites of the Morocco subspecies of the cormorant <i>Phalacrocorax carbo maroccanus</i>. Furthermore, it includes nesting birds, such as the endangered bustard <i>Chlamydotis undulata</i>, but also the duck <i>Tadorna ferruginea</i>, the gull <i>Larus genei</i>, the wader <i>Himantopus himantopus</i> and the tern <i>Sterna hirundo</i>. The lagoon's strategic position on the East Atlantic Flyway, together with its abundant invertebrate and fish fauna and seagrass beds, give rise to internationally important numbers of staging and wintering birds. The most numerous species (both staging and wintering) are waders <i>Limosa lapponica</i>, <i>Calidris canutus</i> and <i>C. alpina</i>, with substantial numbers also of <i>Charadrius hiaticula</i>, <i>Numenius phaeopus</i>, <i>N. arquata</i> and <i>Calidris alba</i>. Other shorebird species include <i>Charadrius alexandrinus</i>, <i>Actitis hypoleucos</i> and <i>Arenaria interpres</i>. Other common wintering birds include the spoonbill <i>Platalea leucorodia</i>, the flamingo <i>Phoenicopterus ruber roseus</i> (>1,000), ducks <i>Anas penelope</i>, <i>A. acuta</i> and <i>A. chapeata</i>, the coot <i>Fulica atra</i> and the gull <i>Larus audouinii</i></p>	<p>Wetland Types: J, A, G, H (dominant type listed first) Baie de Khmifiss consists of a shallow coastal lagoon with saltflats, sandflats, mudflats, saltmarsh with muddy creeks, dunes, desert and a rocky island.</p>

37	South Africa	Turtle Beaches/Coral Reefs of Tongaland	39,500 ha	1986	<p>Criteria: 1d, 2a, 2b, 2c This is the only subtropical part of the South African coastline, where conditions favour the presence of a variety of Indo-Pacific fauna and flora. This coastline is unique in acting as home to two species of marine reptiles that migrate through the Indian Ocean. The turtle beaches host the only nesting populations of leatherback turtles <i>Dermochelys coriacea</i> in the Indian Ocean south of Sri Lanka and Sumatra. The loggerhead turtle <i>Caretta caretta</i> also nests on this coast. The nearest loggerhead nesting ground is in southeast Madagascar and this population is seriously threatened. The only other known populations are in Burma and Oman.</p>	<p>Wetland Types: C, A, B, E (dominant type listed first) This site includes an extensive area of coastal waters, and also includes sandstone reefs and sandy beaches.</p>
38	South Africa	Kosi Bay Nature Reserve	10,982 ha	1991	<p>Criteria: 1a, 2a, 2b, 2c, 3a Kosi is the best-preserved large estuary system in Natal. Kosi differs from most other southern African estuaries in having a rocky reef inside the estuary mouth. Kosi is a large, but relatively isolated, estuarine system which is over 100 km north or south to any other major estuarine system. Kosi probably provides the only recruitment for several species of marine juveniles found along Natal coast. The site is the only area in South Africa with five species of mangrove and the only place where <i>Certops tagal</i> and <i>Lumnitzera racemosa</i> (at their southernmost limit of their distribution) are found in South Africa. Various Red Data species are found in the dryland community. There are 8 known Red Data fish of which most have their largest known populations in the Kosi System. Crocodiles <i>Crocodylus niloticus</i> breed there in small numbers and there are several pairs of palmnut vultures <i>Gypohierax angolensis</i> a Red Data species, which depend on the giant palm <i>Raphia australis</i> for nesting</p>	<p>Wetland Types: A, C, E, F, G, H, I, J, K, L, O, P, Q, R, Sp, Ts (dominance unspecified) The Kosi system is an estuary-linked lake system composed of four interconnected lakes, a broad channel leading to an estuary which opens to the Indian Ocean and three extensive areas of swamp. Principal habitats include swamp forest, Phragmites beds, mangrove forest and coastal grassland/open woodland/palm communities and algae. The lakes are separated from the ocean by a strip of forested sand dunes 600 – 2,000 m in width. Numerous sandy mudbanks, emergent at low tide, occur in the lower part of the system.</p>
INDOMALAYAN REALM						
39	India	Chilka Lake	116,500 ha	1981	<p>Criteria: 1a, 2a, 2b, 2c, 3a, 3b, 3c The site supports a rich fauna and flora. Mammals include the threatened <i>Anillope cervicarpa</i> and there are occasional reports of the threatened <i>Dugong</i></p>	<p>Wetland Types: E, J, K, M (dominance unspecified). The site encompasses the lake and many small islands, particularly in the southeast section. The lake is largely separated</p>

40	Philippines	Olango Island Wildlife Sanctuary	5,800 ha	1994	<p>The site is an important area for wintering and staging waterbirds such as <i>Nettapus coromandelianus</i> (3,600), <i>Anas penelope</i> (4,000), <i>A. strepera</i> (10,000), <i>A. crecca</i> (8,000), <i>A. acuta</i> (6,000), <i>A. querquedula</i> (11,000), <i>A. clypeata</i> (28,000), <i>Aythya ferina</i> (15,000), <i>A. fuligula</i> (3,900), including the threatened <i>Pelecanus philippensis</i> (115). The lake also supports over 118 species of fish, including the commercially important species <i>Mugil cephalus</i>, <i>Liza macrolepis</i>, <i>Lates calcarifer</i>, <i>Sparus serba</i> and <i>Eleutheronema tetradactylum</i>. Similarly, the lake supports commercially important populations of Crustacea, including <i>Penaeus indicus</i>, <i>P. monodon</i>, <i>Scylla serrata</i> and <i>Neptunus pelagicus</i>.</p> <p>Criteria: (3a), 3b Olango Island Wildlife Sanctuary is one of the most important areas for migratory waterbirds in the Philippines. The island is an important staging and wintering ground for shorebirds. Over 10,000 shorebirds have been recorded at one time, and the total number using the site may be as many as 50,000. <i>Numenius arquata</i> is particularly common. Up to 48 <i>Limnodromus semipalmatus</i> were recorded in autumn 1987, making Olango Island the most important site for this rare threatened species in the Philippines.</p>	<p>from the Bay of Bengal by sands, but a narrow, 35 km-long channel allows the outflow of freshwater during the monsoon and the inflow of seawater during the dry season. This results in extreme seasonal changes in salinity in the northern and central sections of the lake.</p> <p>Wetland Types: A, B, C, E, F, G, I (dominance unspecified) A low-lying island with extensive coralline intertidal sandflats to the south, with some mangrove areas and seagrass beds, offshore coral reefs and islets.</p>
41	Vietnam	Xuan Thuy Natural Wetland Reserve	12,000 ha	1988	<p>Criteria: 1a, (1c), 2a, 2b, 2c, 3b The estuary contains the last significant remnant of mangrove and mudflat habitat along the coast of Viet Nam. These mangroves are undoubtedly of considerable importance in maintaining fisheries production in the area. The estuary provides critical habitat for large numbers of migratory waterbirds, especially from the Ardeidae, Anatidae and Laridae, and from the Charadriiformes. There are at least eight Red Data Book species of waterbirds (<i>Pelecanus crispus</i>, <i>Egretta eulophotes</i>, <i>Platalea minor</i>, <i>Tringa guttifer</i>, <i>Limnodromus semipalmatus</i>, <i>Eurynorhynchus pygmeus</i> and <i>Larus saundersi</i>).</p>	<p>Wetland Types: F, G, I, E, M, H, Q, I, 9 (dominant type listed first) There are three major wetland zones in the site. The area inside the sea dyke contains an intricate network of canals and river channels with fringing marshes (as well as non-wetland areas). The coastal zone consists of extensive intertidal mudflats, mangrove swamps, saltmarshes and sandy beaches. Recently areas of mudflats and mangroves have been impounded for shrimp ponds. The mudflats tend to grow outwardly by 500-600 m per year due to accretion. Lastly, there are several large, low-lying islands which have</p>

					formed from accretion in the mouth of the river (e.g. Con Ngan, Con Lu and Con Vanh). The landward protected side of the mangroves has been colonized by (over 3,000 ha of) mangroves, while the exposed seaward side of the islands consists of sandy beaches.
OCEANIAN REALM					
42	Papua New Guinea	Tonda Wildlife Management Area	590,000 ha	1993	<p>Criteria: 1a, 1c, 2a, 3b Southernmost New Guinea Island (including Tonda) contains some of the least disturbed, most extensive and diverse wetlands in the world. The area contains a high diversity of habitats and, in contrast to the rest of lowland New Guinea, the dry, albeit seasonally inundated, vegetation of this area is more typical of northern Australia. The area is one of the most important wetlands for both resident and migratory waterbirds. Over 250 species of birds have been observed in the area. During droughts in northern Australia the area becomes an important refuge for Australian waterbirds. The plains are also an important staging area for much of the world population of <i>Numenius minutus</i> on its migration between Australia and Siberia.</p> <p>Wetland Types: Ts, Xf, Tp, I, M, N, P, E (dominant types listed first) Seasonal freshwater inundation transforms the Tonda site into a vast area of grassland and savannah swamps, and lagoons. Swamp forest is also present. Rivers (e.g. Bensbach and Morehead) drain into the Torres Strait, and are tidal in their lower reaches where they are lined with mangroves.</p>
AUSTRALIAN REALM					
43	Australia	Bowling Green Bay	35,500 ha	1993	<p>Criteria: 1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b Bowling Green Bay is a large coastal wetland system, representative of the Queensland coastal area. The varied floral communities present at this wetland provide a representation of the major coastal communities of the north Australian tropics. Two plant species are classified as globally threatened: <i>Bonamia dietrichiana</i> and <i>Livistona drudei</i>. Globally threatened fauna at the site includes two endangered sea turtle species, <i>Chelonia mydas</i> and <i>Caretta caretta</i>, and dugong <i>Dugong dugon</i>. One of the most noteworthy aspects of the avifauna of the site is the richness and local abundance of species present. The site regularly hosts over 20,000 waterfowl.</p> <p>Wetland Types: G, H, I, A, B, D, E, F, J, L, M, N, R, Tp, Xf, 2, 5 (dominant types listed first) The Ramsar site is a diverse complex of coastal wetland systems. The coastal dunes host forests and swamps, while mangrove forests dominate the coastline. Inland they give way to the highly saline habitats of the salt pans, and the brackish and freshwater marshes at the lower lying coastal plain further inland. Many of the freshwater marshes have been modified by the construction of earth walls to increase the extent of freshwater habitat. Extensive areas of open forest and woodland and some closed forest occur on mountainous areas.</p>

44	Australia	Cobourg Peninsula	220,700 ha	1974	<p>Criteria: 1a, 2a, 3a, 3b Cobourg Peninsula is a predominantly unmodified peninsula. It supports a number of threatened animal species including Dugong dugon and marine turtles <i>Chelonia mydas</i>, <i>Dermochelys coriacea</i>, <i>Nator depressus</i>, <i>Eretmochelys imbricata</i> and <i>Lepidochelys olivacea</i>. Threatened plants species include <i>Gossypium cunninghamii</i> and <i>Pandanus spiralis</i>. The site is also important for large numbers of waterbirds, including migratory waders and mangrove associated passerine species.</p> <p>Approximately 58 waterbird species were recorded, including <i>Egretta sacra</i> and <i>Ninonitus madagascariensis</i>. Noteworthy breeding waterbird species which occur in the area, include <i>Butorides striatatus</i>, <i>Esacus magnirostris</i>, <i>Dendrocygna arcuata</i>, <i>Haematopus longirostris</i>, <i>Haliaeetus leucogaster</i>, <i>Pandion haliaetus</i>, <i>Sterna bergii</i>, <i>S. sumatrana</i>, <i>S. dougallii</i>, <i>S. anaethetus</i> and <i>S. albigrons</i>.</p>	<p>Wetland Types: C, D, E, F, G, I, N, Sp (dominance unspecified). The site is a marine and coastal wetland, which covers most of Cobourg Peninsula down to low water mark and includes an extensive intertidal area.</p>
45	Australia	Eighty-mile Beach	125,000 ha	1990	<p>Criteria: 1a, 2c, 3a, 3c Eighty-mile Beach is a good representative example of a coastal wetland in northwestern Australia. In Salt Creek the site hosts the most inland stand of mangroves in Western Australia, and the springs in the hinterland also support unusual vegetation. The site is in the top three of areas in Australia that are of importance to shorebirds. More than 300,000 migratory waders have been counted on the mudflats in spring, including over 1% of the populations of <i>Charadrius leschenaultii</i>, <i>C. veredus</i>, <i>C. ruficapillus</i>, <i>Tringa nebularia</i>, <i>Limosa lapponica</i>, <i>Calidris canutus</i>, <i>C. tenuirostris</i>, <i>C. ruficollis</i> and <i>C. ferruginea</i>.</p>	<p>Wetland Types: E, G, H, I, R, Sp, Tp, U, Y (dominant types listed first) Almost the entire Eighty-mile Beach consists of a white siliceous sandy beach of about 100 meters wide, with a 0.5 meters drop to tidal mudflats on the western side. Sand dunes occur behind the beach. There are a few small bays where mud collects and mangroves are established. In Mandora Salt Marsh there are a number of permanent or almost permanent freshwater swamps supplied by springs. The most spectacular of these is Mandora Soak, one of the Eil Eil Springs, which is a classical raised peat bog. Salt Creek, an old watercourse lined with mangroves of about 5 km long, may be connected to the sea by an aquifer.</p>
46	Australia	Moreton Bay	113,314 ha	1993	<p>Criteria: 1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 3c Moreton Bay is a semi-enclosed basin with two of the largest sand islands in the world on its east side. The Bay forms a large coastal wetland, characteristic for the Queensland coast, and special</p>	<p>Wetland Types: C, E, G, H, I, A, B, D, F, M, O, Q, Sp, Tp, Xf (dominant types listed first) Moreton Bay is one of the largest estuarine bays in Australia. It is enclosed by two barrier islands of vegetative sand dunes. The</p>

				<p>in its size and importance as a refuge for flora and fauna. It is one of only three extensive intertidal areas of seagrass, mangroves and saltmarsh on the eastern coast of Australia. Three species of globally threatened turtles inhabit Moreton Bay year round. They are <i>Eretmochelys imbricata</i>, <i>Chelonia mydas</i> and <i>Caretta caretta</i>. <i>C. caretta</i> occurs in thousands, feeding on molluscs, crabs and sponges. <i>Dugong dugon</i> also occurs in large numbers. The Moreton Bay region is an important habitat for many species of birds and is one of only four recognised sites of significance to wintering migratory wading birds along the eastern Australian coast. More than 50,000 wintering and staging waders depend on Moreton Bay, including over 1% of the <i>Numenius madagascariensis</i> population</p>	<p>coastline of Fraser Island is characterised by sandy beaches and rocky headlands. Fringing coral reef has formed around the islands in the centre of the Bay. Along the mainland shore, the Bay is bordered by extensive estuarine flats. Saltmarsh and saltpan areas are integral with, and generally adjacent to, extensive mangrove areas. Behind the saltmarshes, there are patches of freshwater marshes and lakes along river deltas.</p>
47	Australia	Roebuck Bay	55,000 ha	<p>1990</p> <p>Criteria: 1a, 3a, 3c Roebuck Bay represents a superb example of a tropical marine embayment. The site is within the top three sites of Australia that support migratory wader species. Up to 170,000 waders have been counted, including over 1% of the populations of <i>Charadrius leschenaultii</i>, <i>C. veredus</i>, <i>C. ruficapillus</i>, <i>Limosa lapponica</i>, <i>Calidris canutus</i>, <i>C. tenuirostris</i>, <i>C. ruficollis</i> and <i>C. ferruginea</i>.</p>	<p>Wetland Types: G, I Roebuck Bay comprises a marine embayment with extensive intertidal mudflats. Between Fisherman's Bend and Fall Point there is a narrow beach of pindan red sand with mudflats on the seaward side and a 2-5 m high red sand cliff on the landward side. On the flats south of Fall Point a mangrove belt grows.</p>
48	Anstralia	Pulu Keeling National Park	122 ha	<p>1996</p> <p>Criteria: 1a, 1d, 2a, 2b, 2c, 2d Pulu Keeling represents an island atoll in its most natural state, and it may represent the best example of the original vegetation typical to the Cocos Islands. Globally threatened species occurring at this site are the turtles <i>Chelonia mydas</i> and <i>Eretmochelys imbricata</i>. The Cocos buff-banded rail <i>Rallus philippensis andrewsi</i> is both globally threatened and endemic, while the Cocos sub-species of pandanus <i>Pandanus tectorius</i> is considered to be endemic, too. North Keeling represents a significant biological resource and is internationally important for the conservation of biodiversity. It supports colonies of internationally important seabirds.</p>	<p>Wetland Types: B, C, D, E (dominant type listed first) Pulu Keeling (North Keeling) is a single uninhabited atoll. It is almost continuous around the perimeter of a shallow lagoon, which drains almost completely at low tide. Numerous patches of seagrass occur within the lagoon. A reef crest surrounds the majority of the island, except for the northwest corner. A highly mobile broad sandy beach, rising 4m above sea level occurs on the northern shore of the island, becoming more coarse with shingle to the west. The southern shore is a steep shingle beach, while the eastern shore is composed of a series of shingle berms.</p>

49	Australia	Shoalwater and Corio Bays	239,100 ha	1996	<p>Criteria: 1a, 1c, 2a, 2b, 2c, 2d, 3a, 3b, 3c The Shoalwater and Corio Bays area comprises one terrestrial and five major estuarine and marine environments, and as such it represents the largest area in central east Queensland containing representative coastal, subcoastal, aquatic landscapes and ecosystems. They are relatively undisturbed habitat areas with significant floral and faunal assemblages. Globally rare and threatened species include the plants <i>Marsdenia coronata</i>, <i>Xylosma ovatum</i>, <i>Sowerbaea subtilis</i>, <i>Pimelea umbratica</i>, <i>Comesperma oblongatum</i>, <i>Grevillea venusta</i>, and <i>Myriophyllum implicatum</i>. Species of globally threatened fauna that occur are birds <i>Erythrorhynchus radiatus</i> and <i>Calyptorhynchus lathamii</i>, bat <i>Chalinolobus dwyeri</i>, whale <i>Megaptera novaeangliae</i>, fish <i>Pseudomugil mellis</i> and <i>Nannoperca oxleyana</i>, turtles <i>Chelonia mydas</i>, <i>Eretmochelys imbricata</i>, <i>Natator depressus</i>, and <i>Caretta caretta</i>, and dugong <i>Dugong dugon</i>. There is evidence of endemism in the fish fauna with an undescribed species of weedfish S</p>	<p>Wetland Types: B, F, G, M, A, C, D, E, Tp, I, K, Xp (dominant types listed first) Shoalwater Bay has a large tidal range, which has given rise to a diverse range of mangrove community types that cover over half the intertidal area. Besides this, there are fringing coral reefs, shallow open water systems including seagrass beds, rocky marine shores, sand beaches flanked by coastal cliffs, sand bars, dunes, estuarine inlets, lower intertidal mudflats and sand flats, and supratidal flats. On the inland side of this site fresh water lagoons, riverine plains, swamps, streams, perched lakes, springs, sinkholes and peat swamps occur. There are also extensive lowland areas of open forest and woodlands.</p>
NEOTROPICAL REALM						
50	Bahamas	Inagua National Park	32,600 ha	1997	<p>Criteria: 2a, 2c, 2d, 3a, 3c The wetlands within the Inagua National Park are significant. The turtle <i>Chrysemys malonei</i>, endemic to Great Inagua Island, is restricted to a few fresh or brackish pools. The threatened parrot <i>Amazona leucocephala bahamensis</i>, an endemic subspecies occurs only in Inagua and on the northern island of Abaco. Lake Rosa is important for its large breeding colony of the flamingo <i>Phoenicopterus ruber ruber</i>. The population was estimated at about 21,000 birds in the early 1970s, but under close protection, the population has risen to an estimated 40,000 to 50,000 birds. The flock has repopulated neighbouring islands.</p>	<p>Wetland Types: H, I, J, O, Sp, Ts, W (dominance unspecified) Inagua National Park is an inter-connected system with open water, swamps, pools, seasonal marshes and scattered areas of mangroves.</p>

51	Brasil	Reentrâncias Maranhenses Environmental Protection Area	2,680,911 ha	1993	<p>Criteria: 1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 4a, 4b</p> <p>Reentrâncias Maranhenses Environmental Protection Area is an area of unparalleled beauty with remarkable natural features. Difficulties in access and low population account for the continuing natural or near-natural spaces in areas occupied by man. The site is representative of both littoral and pre-Amazon regions. Vast mangroves support an abundance of fish, crustacean and mollusc species which are an important food source, especially for birds. They also act as an important protection barrier and contribute to increased fish production which is a major source of food and income for the people living along the coast and rivers. The area supports a great variety of animal species including rare and endangered species such as birds <i>Eudocimus ruber</i> and <i>Jacana jacana</i>; mammals <i>Sotalia fluviatilis</i> and <i>Trichechus manatus</i>; and marine turtles. The region is one of the key shorebird areas in South America. Surveys have demonstrated this area to be of major international imp</p>	<p>Wetland Types: A, B, C, D, E, F, G, H, I, M, N, R, 5, 7 (dominance unspecified) The coastline is very irregular with estuaries covered extensively by mangrove forests accounting for 60% of the total mangrove area of the whole state. The presence of numerous bays (at least 14 principal) characterise a large estuarine area. In addition to the bays and estuaries, there are sandy beaches, coastal dunes, many low lying islands and rivers.</p>
52	Colombia	Sistema Delta Estuarino del Río Magdalena, Ciénaga Grande de Santa Marta	400,000 ha	1998	<p>Criteria: 1a, 2b, 2c, (2d), 3b, 4a, 4b</p> <p>The estuary is of special importance since it is the largest mangrove ecosystem on the Caribbean coast of Colombia. The biodiversity of the site is high. More than 100 fish species occur in the area. The site is also important for breeding birds (over 200 species), for reptiles like <i>Caiman crocodilus fuscus</i>, <i>Crocodylus acutus</i> and <i>Iguana iguana</i>, and for mammals like <i>Alouatta seniculus</i>, <i>Cebus</i> spp., <i>Hydrochaeris hydrochaeris</i> and <i>Trichechus manatus</i>. There are at least two endemic bird species, <i>Lepidopygia lilliae</i> and <i>Molothrus armenta</i>. It is an important wintering area for migratory waterbirds, amongst them several Anatidae (e.g. <i>Anas discors</i>, <i>A. americana</i>, <i>A. clypeata</i> and <i>Aythya affinis</i>). For many fish species, this area is an important spawning ground.</p>	<p>Wetland Types: I, J, K, F, L, M, Tp, Xf (dominant types listed first) The site consists of an coastal estuarine system with 20 lagoons of varying salinity. Several rivers run through the area. There are freshwater, brackish and saline components. There are extensive zones of mangrove.</p>

53	Costa Rica	Gandoca-Manzanillo	9,445 ha	1995	<p>Criteria: (1c), 1d, 2a, 2b, 2c, 2d, (4b) The floodplains of the Río Sixaola, the basin of Middle Creek and the Punta Mona swamp are important as storage area for the water supplied to the towns in southeastern Costa Rica. The site comprises the only coastal lagoon in the Caribbean coast of Costa Rica. The region is part of the Talamanca-Caribe Biological Corridor and is rich of ecosystems, creating a varied flora in Gandoca-Manzanillo. The small reserve has a rich diversity in fauna. The endangered plant species <i>Pithecellobium pseudo-tamarindus</i> occurs in the site. The threatened jaguar <i>Pantera onca</i>, and the threatened crocodile <i>Crocodylus acutus</i>, anteater <i>Myrmecophaga tridactyla</i>, tapir <i>Tapirus bairdii</i>, and primates <i>Cebus capucinus</i> and <i>Ateles geoffroyi</i> are also found. In Laguna Gandoca, the manatee <i>Trichechus manatus</i> can still be spotted. The area is an important nesting site for the threatened <i>Caretta caretta</i>, <i>Chelonia mydas</i>, <i>Dermochelys coriacea</i> and <i>Eretmochelys imbricata</i>, four of the five sea turtles inhabiting</p>	<p>Wetland Types: A, B, C, D, E, J, K, Xf (dominance unspecified) Wetland Types: A, B, C, D, E, J, K, Xf (dominance unspecified) The seashore flood plain includes sandy beaches and low cliffs, and in the marine portion there are coral reefs and sea-grass beds. The site comprises also mangroves, freshwater and brackish marshes and a coastal lagoon permanently open to the sea.</p>
54	Costa Rica	Tamarindo	500 ha	1993	<p>Criteria: (2a), 3b Part of the site, Playa Grande, is one of the world's most important nesting sites of the endangered turtle <i>Dermochelys coriacea</i>, the largest of the world's sea turtles. Threatened species recorded in Tamarindo include the crocodile <i>Crocodylus acutus</i> and bat <i>Vampyrum spectrum</i>. The site provides a special ecosystem where a large number of freshwater and saltwater waterbirds as well as mammals and reptiles live.</p>	<p>Wetland Types: E, F, H, I (dominance unspecified) Tamarindo includes an estuary with small pools, fords, and marshes, and coastal mangrove forest.</p>
55	Costa Rica	Terraba-Sierpe	30,654 ha	1995	<p>Criteria: 1a, 1d, 2c This reserve is an important habitat of many species of birds, fish, mammals and reptiles. The mangroves play an important direct and indirect role in maintaining the fish stock. Some species depend on these sites for their life cycle or for an important part of this cycle (reproduction, growth or feeding).</p>	<p>Wetland Types: F, G, I The area includes the estuary of the Rivers Terraba and Sierpe, and adjacent lagoons (Laguna Sierpe, Laguna Porvenir), periodically inundated mangrove and "yolillo" palm <i>Raphia taedigera</i> swamp forest, sandy beaches and cliffs.</p>

56	Ecuador	Parque Nacional Machalilla	14,430 ha	1990	<p>Criteria: 2a,2c,2d The site serves as a staging area on a main shorebird migration route. One of the islands within the site, Isla de la Plata, is fringed by coral reefs and supports a major breeding colony for seabirds including <i>Sula sula</i>, <i>S. nebowxii</i>, <i>Diomedea irrorata</i> and <i>Fregata magnificens</i>. The site also contains nesting beaches for the globally threatened marine turtle <i>Lepidochelys olivacea</i>.</p>	<p>Wetland Types: E,A,C,B,D,N (dominant type listed first) A complex of shallow coastal marine waters, sand and pebble beaches, offshore islands (Isla de la Plata, Isla Salango) with small areas of coral reef, islets, estuaries of several (mainly seasonal) rivers and smaller water courses, marine subtidal aquatic beds and remnant dry tropical forest.</p>
26	France	Grand Cul-de-Sac Marin de Guadeloupe	20,000 ha	1993	<p>Criteria: 1a, 2b, 2c, 3b The Grand Cul-de-Sac Marin de Guadeloupe is one of the most important mangrove and lake forest areas in the Lesser Antilles. The site is highly important as spawning and nursery grounds for fish species, and as a staging site during waterfowl migration. The main groups of waterbirds that make use of this site are seabirds, ducks, herons, egrets and pelicans.</p>	<p>Wetland Types: A, C, I, R, Ss, Ts, B, E, F, G, J (dominant types listed first) The site comprises a vast lagoon, bounded to the north by a coral reef. Marine wetland types are coral reefs, mudflats and seagrass beds. The associated littoral zone consists of many types of coastal "terrestrial" wetland. They include mangrove forest, with coastal mangroves and shrub mangroves, freshwater swamp forests, freshwater marshes, brackish marshes, and wet meadows.</p>
57	Guatemala	Manchón-Guamuchal	13,500 ha	1995	<p>Criteria: 1a, 1c, 2a, 2c, 3b, 4b The site is important for the reproduction and growth of marine species of invertebrates and fish. The wetland is perhaps the only remaining site in the country for migrating birds using the western flyway from Canada and the United States. Of the 427 resident and migratory bird species that could theoretically be present, 147 (35%) have been identified by the Fundación Interamericana de Investigación (FIIT). Of these, 14 species of ducks have been seen in relatively large numbers, including 12 that are migratory. A total of 20 species of herons and wading birds were sighted between June 1992 and May 1993.</p>	<p>Wetland Types: E, F, G, I, J, K, Sp, Ss, Tp, I, 5 (dominance unspecified) The main rivers draining the area are the Ocos and the Naranjo. Both rivers are met by tributaries towards the end of their course, and these too contribute to the formation of the wetland. However, they do not form true estuarine deltas. The wetland is characterized by a combination of different plant communities which include coastal dune flora, dry forest, mangrove forest, palm forest and freshwater marsh vegetation.</p>
58	Honduras	Barras de Cuero y Salado	13,225 ha	1993	<p>Criteria: 1a, 1c, 2a, 2b, 2c, 3b, (4a) Endangered fauna include the crocodilians <i>Crocodylus acutus</i> and <i>Caiman sclerops fuscus</i>, and a small population of manatees <i>Trichechus manatus</i>. The area supports a rich fish fauna and a wide variety of resident and migratory waterbirds, e.g. <i>Ardea herodias</i>, <i>Casmerodius albus</i>, <i>Egretta thula</i>, <i>Mycteria americana</i>, <i>Jabiru mycteria</i>, <i>Ajaia ajajia</i>.</p>	<p>Wetland Types: E, F, I, K, M, Ts, Xf, O, 9 (dominance unspecified) An extensive complex of coastal, estuarine, riverine and palustrine wetlands. Much of the area is composed of flooded forest dissected by numerous rivers and channels which link many lagoons of various sizes. Major sand bar systems have developed at the mouths of</p>

59	Honduras	Parque Nacional Jeannette Kawas	78,150 ha	1995	<p>Criteria: 1a, 2a, 2c. The marine ecosystem has a high diversity of fauna and includes endangered species such as the various turtles, dolphins and the grouper. The threatened turtle <i>Eretmochelys imbricata</i> lays eggs on the site's beaches. Many other (nationally or internationally) rare or threatened species occur in the park including the fish <i>Agosomus monticolor</i> and Joturus pilchard; the reptiles <i>Crocodylus acutus</i>, <i>Caretta caretta</i>, <i>Chelonia mydas</i>, <i>Dermochelys coriacea</i>, <i>Iguana iguana</i>, <i>Ctenosaura similis</i>, <i>Boa constrictor</i> and <i>Loxocemus bicolor</i>; the highly threatened bird <i>Jaribu myceteria</i>; and threatened and other mammal species such as <i>Panthera onca</i>, <i>Felis concolor</i>, <i>F. wiedii</i>, <i>Mazama americana</i>, <i>Tayassu tajacu</i>, <i>Trichechus manatus</i>, <i>Ateles geoffroyi</i>, <i>Cebus capuchinus</i>, <i>Allouata palliata</i>, <i>Lutra longicaudis</i> and <i>Agouti paca</i>.</p>	<p>Wetland Types: A, C, E, I, J, M, Sp, 9 (dominance unspecified) The site contains mangrove forests, lagoons, coral reefs and beaches.</p>
60	Honduras	Punta Izopo	11,200 ha	1977	<p>Criteria: 2a, 2b, 2c, 2d, 4a, 4b This wetland contains remnants of the original humid tropical forest in unaltered pristine condition which are the last existing samples of this type of broad-leaved forest on the coast of Valle de Leán, Hicaque, Platano and the Lagunas de Hicaque. The patches of local primary forest in the site are the habitat for a large range of species of plants and animals uniquely important for the maintenance of regional biodiversity. This includes threatened mammal species such as <i>Trichechus manatus</i> and <i>Panthera onca</i>. The site is very rich in bird life and includes species such as the Jabiru myceteria, a rare bird threatened with extinction throughout its range. Of the 55 species of birds included in the list of threatened species in Honduras, 20 have been recorded in Bahía de Tela. In the area of the Bahía de Tela, nine species of reptiles are considered to be threatened with extirpation in Honduras: the American crocodile <i>Crocodylus acutus</i>, four species of sea turtles <i>Caretta caretta</i></p>	<p>Wetland Types: C, D, E, F, I, J, M, P, Ts, Xf, 3 (dominance unspecified) There are flooded savannas, marshes, lakes, mangroves, rocky beaches, channels, lakes, coral reefs and lagoons.</p>

61	Mexico	Marismas Nacionales	200,000 ha	1995	<p>Criteria: 1a, 1b, 2b, 2c, 3a, 3b The site includes 113,000 ha of mangroves and estuaries, constituting approximately 15 - 20% of all the mangroves in the country. It is the most extensive area of mangroves in the Mexican Pacific. The site is important for a large number of endemic plant and animal species as well as migratory waterbirds. At least 12 duck species occur.</p> <p>Wetland Types: F, Q, Sp, Ss, Is, E, G, H, I, J, M, N, R, Tp, 1, 2, 4, 6, 9 (dominant types listed first) The area consists of a large network of brackish coastal lagoons, mangroves, swamps and saltmarshes. The site is fed by seven rivers and other watercourses, including the delta of the Río San Pedro.</p>
62	Mexico	Reserva de la Biosfera La Encrucijada	144,868 ha	1996	<p>Criteria: 1a, 2a, 2b, 2c, 2d, 3b Reserva de la Biosfera La Encrucijada is an excellent representative of an American Pacific coastal wetland system due to its area, structure and productivity. The site has the largest mangrove forest in Central America and the tallest specimens in North America. Communities of the plant <i>Pachira acuatica</i>, which are unique to central America, occur. Globally endangered animal species include the reptiles <i>Crocodylus acutus</i> and <i>Lepidochelys olivacea</i>. The area is an important habitat for up to 183 species of resident or migratory birds. Important species come from the Ardeidae and the Ciconiidae.</p> <p>Wetland Types: F, A, I, J, Q, Sp, W (dominant type listed first) The wetland is composed of three systems of coastal lagoons and marshes surrounded by large areas of mangroves. There is an important river system with several secondary and tertiary streams that supply the lakes with freshwater.</p>
63	Panama	Golfo de Montijo	80,765 ha	1990	<p>Criteria: 1a, 2c, 3b, (4b) This area is an important habitat for waterfowl and serves as a stop-over, wintering and nesting area for waterfowl including <i>Pelecanus occidentalis</i>, <i>Fregata magnificens</i>, <i>Egretta caerulea</i>, <i>Bubulcus ibis</i>, <i>Butorides striatus</i>, <i>Tinamus mayor</i>, <i>Dendrocygna autumnalis</i>, <i>Heterocanus mexicanus</i> and <i>Jacama spinosa</i>. Other notable fauna include the mammals <i>Lutra longicaudis</i>, <i>Ateles geoffroyi</i> and <i>Bradypus variegatus</i>, and the reptiles <i>Crocodylus acutus</i>, <i>Caiman crocodilus</i>, <i>Kinosternom</i> sp. and <i>Trachemys</i> sp. The area is an important area for fish species including <i>Lutianus jordani</i>, <i>L. guttatus</i>, <i>L. chrysurus</i>, <i>Scomberomorus</i> sp., <i>Panulirus</i> sp. and <i>Panaeus sylviosiris</i>.</p> <p>Wetland Types: E, F, G, I, M, Tp, Ts, 3, (dominance unspecified) This area is situated in the transitional zone between marine and terrestrial ecosystems with a wide variety of landscapes. These coastal ecosystems include estuaries and deltas, beaches, mud and sandflats, mangroves, rapidly flowing rivers, seasonally flooded grasslands, and irrigated fields and rice paddies. Other habitats include woodlands, marshes, savannas and secondary vegetation.</p>

64	Panama	Punta Patiño	13,805 ha	1993	<p>Criteria: 1b,1c,2b,2c,3b. There are 68 species of birds of which 4 are protected by law but threatened with extinction and 5 which are threatened. Reptiles are represented by the <i>Iguana iguana</i> and <i>Ctenosaura similis</i> and the crocodilians <i>Caiman crocodilus</i> and the threatened <i>Crocodylus acutus</i>. Sea turtles including the threatened <i>Dermochelys coriacea</i> and <i>Eretmochelys imbricata</i> have been recorded at the Patiño beach. There are 15 species of mammals recorded of which 12 are protected by law but threatened with extinction. Among the mammals are <i>Procyon lotor</i> and <i>P. cancrivorus</i>. The site also supports large felines (<i>Felis</i> sp.), <i>Agouti paca</i> and several species of deer. There is a large virgin forest at Punta Patiño and a region of mangroves that has not been completely explored that serves as a sanctuary for a wide range of fauna. The area shelters a large number of resident and migratory bird species.</p>	<p>Wetland Types: A,B,D,E,F,G,I,J,M, (dominance unspecified). The site can be characterised as a rocky ecosystem, with mud and sand areas. These include beaches and estuaries with mangroves and clearings.</p>
65	Panama	San San-Pond Sak	16,414 ha	1993	<p>Criteria: 1a,2a,2b,2c,2d,3b The wetland of San San-Boca del Drago recharges the aquifers which provide water for human consumption and use in the banana plantations. It also traps sediments, therefore improving water quality and reducing the effects of coastal erosion. This wetland is an important area for the conservation of 133 bird species of which 36 are threatened including <i>Amazona achrocephala</i>, <i>Cairina moschata</i>, <i>Dendrocygna autumnalis</i>, <i>Harpia harpyja</i> and <i>Pharomachus mocino</i>. There are 55 species of mammals of which 24 are threatened including <i>Agouti paca</i>, <i>Hydrochaeris hydrochaeris</i>, <i>Mazama americana</i>, <i>Trichechus manatus</i> and 54 species of reptiles of which 7 are threatened. Reptiles include <i>Caiman crocodilus</i>, <i>Caretta caretta</i>, <i>Chelonia mydas</i>, <i>Dermochelys coriacea</i> and <i>Eretmochelys imbricata</i>. There are 20 species of amphibians. The wetlands are a very important habitat for palustrine and marine birds.</p>	<p>Wetland Types: A,B,E,F,G,H,I,J,K,M,Sp,U,Xp,6,9, (dominance unspecified) This site is an aggregation of channels and shallow brackish and freshwater lakes in the lower basin of the Changuinola and San San Rivers. Other habitats include coastal plains and bays formed by the accumulation of sand in littoral strands with sandy beaches and bars along the coast. There are mangroves and an 80 sq km peat swamp.</p>

66	Suriname	Coppenamemonding	12,000 ha	1985	<p>Criteria: 2c, 3a, 4b The area is internationally important for breeding, passage and wintering waterbirds. <i>Eudocimus ruber</i> breeds occasionally (there were 5,000 pairs in 1992) but numbers outside the breeding season may reach 40,000 birds. The most abundant shorebird is <i>Calidris pusilla</i>, numbers of which may exceed 3 million individuals during the northern winter. Mixed breeding colonies of herons and egrets may hold up to 3,000 pairs. The site serves as an important nursery ground for shrimps and fishes.</p>	<p>Wetland Types: G, F, H, I, J, K (dominant type listed first) The site encompasses a wetland complex which has developed on the young coastal plain of Suriname. Most of the shoreline is dominated by mudflats, the higher parts are covered by mangrove forests. Sand and shell ridges alternate with swamps underlain by heavy clay. There are some narrow sandy beaches. Further inland, saline and brackish lagoons have developed in areas where <i>Avicennia</i> forest has been killed by long periods of saltwater inundation.</p>
67	Venezuela	Archipiélago de Los Roques	213,220 ha	1996	<p>Criteria: 1a, (2a), 3b This is a unique nature area in the Caribbean Sea and the Atlantic Ocean because three tropical marine ecosystems interact: coral reefs, beds of marine phanerogams and mangroves. The site harbours sea turtles which are threatened with extinction in the Caribbean and protected within the archipelago including <i>Eretmochelys imbricata</i>, <i>Chelonia mydas</i> and <i>Caretta caretta</i> and <i>Dermochelys coriacea</i>. The sea snail botuto (<i>Strombus gigas</i>), a protected species (over-exploitation has drastically reduced its population) occurs within the site. Sea snails are seriously threatened in the Caribbean and in the shallow waters of the Atlantic Ocean.</p>	<p>Wetland Types: A, B, C, G, H, (I), J (dominance unspecified) In the southern part, an area of shallow water (80 cm to 1 m deep) forms a lagoon similar to the coral atolls of the Pacific. The 45 islands and keys of the archipelago are scattered around this lagoon. More than 250 sandbanks and reefs form the archipelago. There are two large coral barriers: Oriental (also known as Cabeceira de Los Roques or Gran Arrecifal del Este) and the Gran Barrera del Sur. Mangroves occur in the site.</p>
68	Venezuela	Ciénaga de Los Olivitos	26,000 ha	1996	<p>Criteria: 1a, 2a, (2c), 2d Ciénaga de Los Olivitos is of great ecological and social importance because it is the home for many species of aquatic vertebrates and invertebrates which are the basis for the local economy based on fishing. The site harbours a large number of species of migratory and resident birds such as the flamingo <i>Phoenicopterus ruber</i> and aquatic shorebirds that use the site for reproduction, feeding and resting. This region is also a reserve for species threatened with extinction such as <i>Crocodylus acutus</i>, the manatee <i>Trichechus manatus</i> and sea turtles.</p>	<p>Wetland Types: J, E, G, H, I (dominant type listed first) There are four habitats represented here; lagoon (20,000 ha), mangrove (covering approximately 4,000 ha), salt marsh and sand beaches and dunes (1,880 ha). Pools and estuaries also occur.</p>
69	Venezuela	Cuare	9,968 ha	1988	<p>Criteria: 1a, (1c), 2c, (3a), 3b The site plays a very important role in absorbing floodwaters and increasing retention times. Cuare is particularly</p>	<p>Wetland Types: A, (C), (E), H, I, J (dominance unspecified) The site includes both marine and inland habitats; amongst the</p>

70	Venezuela	Laguna de la Restinga	5,248 ha	1996	<p>important for waterbirds, species include <i>Egretta tricolor</i>, <i>Eudocimus ruber</i>, <i>Anas discors</i> (60,000), <i>Himantopus himantopus</i> and <i>Caliidris</i> spp. (staging and wintering). The site is particularly important for the southern Caribbean flamingo <i>Phoenicopterus ruber ruber</i>. Other fauna include the marine turtles <i>Chelonia mydas</i> and <i>Eretmochelys imbricata</i>, while the mangrove areas support the endangered <i>Crocodylus acutus</i>. The marshes support a rich flora and fauna, including commercially important species.</p> <p>Criteria: (1a), (2a), 2b, 2d, (3c), (4a) This area is of special importance for biodiversity and the ecology of the region owing to the quality and the uniqueness of the fauna and flora. On the Island of Margarita, ten endemic subspecies of birds have been recorded. At least seven are found within the national park which is the principal or exclusive habitat for three of them. These include the <i>Aratinga acuticaudata neoxena</i>, a parrot seriously threatened with extinction with a population of less than 110 specimens, <i>Rallus longirostris margaritae</i> and <i>Butorides striatus robinsoni</i>. The national park is the most important part of the island for aquatic birds, including several threatened species such as the <i>Ajaja ajaja</i> and <i>Phoenicopterus ruber</i>. Mammal species include the only two wild carnivores known on the Caribbean islands, <i>Felis pardalis</i> and <i>Conepatus semistriatus</i>. The most important of the reptiles are the sea turtles of which four species are said to be found in the lagoon: <i>Chelonya mydas</i>, <i>Eretmochelys</i> sp.</p>	<p>former are coral reefs, sandy beaches, small stands of mangroves and scattered low forest. The terrestrial part of the refuge is penetrated by a small gulf, 12 km in length, covering an area of some 1,929 ha. A network of channels flows into the gulf through the surrounding mangroves. The site also includes extensive and highly productive fluvio-marine marshes, larger stands of mangrove surrounding the gulf and a deciduous forest.</p>
<p>Wetland Types: A, (B), (F), I, (J), L, M (dominance unspecified) The area is part of the flat coastal lowlands of the Isla de Margarita and encompasses a shallow lagoon separated from the sea by a coastal barrier. Mangroves occur in the shallow waters.</p>						

71	Venezuela	Laguna de Tacarigua	9,200 ha	1996	<p>Criteria: 1a, 2a, 2c, 3a, 3b, (4b) The Laguna de Tacarigua harbours a large number of species and subspecies of rare, threatened or vulnerable plants and animals such as the sea turtles <i>Chelonyx midas</i>, <i>Eretmochelys imbricata</i>, <i>Caretta caretta</i> and <i>Dermochelys coriacea</i>. The lagoon is an especially important habitat for migrating waterfowl species. There are often up to 20,000 waterfowl here including pelicans, storks, ducks etc. The lagoons are a very important breeding ground for fish. There are 33 families with 43 genera and 52 species of which 5 are saltwater fish, 27 are estuarine or marine and 18 freshwater.</p>	<p>Wetland Types: A, F, (H), (I), (J), N (dominance unspecified) The Laguna de Tacarigua is a coastal lagoon approximately 30 km long and 6 km wide. It is separated from the Caribbean sea by the coastal barrier that has created the lagoon. The lagoon is joined to the sea by an outlet. The lagoon harbours mangroves (forming large islands of dense vegetation) and open spaces of water.</p>
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Notes for Table 5

- 1 – refers to the symbols on Map 4
- 2 – numbers refer to the criteria for identifying wetlands of international importance. See http://www.ramsar.org/key_criteria_old.htm for more details.
A wetland should be considered internationally important if it meets:
 1. Criteria for representative or unique wetlands
 - (a) it is a particularly good representative example of a natural or near-natural wetland, characteristic of the appropriate biogeographical region; or
 - (b) it is a particularly good representative example of a natural or near-natural wetland, common to more than one biogeographical region; or
 - (c) it is a particularly good representative example of a wetland which plays a substantial hydrological, biological or ecological role in the natural functioning of an major river basin or coastal system, especially where it is located in a trans-border position; or
 - (d) it is an example of a specific type of wetland, rare or unusual in the appropriate biogeographical region.
 2. General criteria based on plants or animals
 - (a) it supports an appreciable assemblage of rare, vulnerable or endangered species or subspecies of plant or animal, or an appreciable number of individuals of any one or more of these species; or
 - (b) it is of special value for maintaining the genetic and ecological diversity of a region because of the quality and peculiarities of its flora and fauna; or
 - (c) it is of special value as the habitat of plants or animals at a critical stage of their biological cycle; or
 - (d) it is of special value for one or more endemic plant or animal species or communities.
 3. Specific criteria based on waterfowl
 - (a) it regularly supports 20,000 waterfowl; or
 - (b) it regularly supports substantial numbers of individuals from particular groups of waterfowl, indicative of wetland values, productivity or diversity; or
 - (c) where data on populations are available, it regularly supports 1% of the individuals in a population of one species or subspecies of waterfowl.
 4. Specific criteria based on fish
 - (a) it supports a significant proportion of indigenous fish subspecies, species or families, life-history stages, species interactions and/or populations that are representative of wetland benefits and/or values and thereby contributes to global biological diversity; or
 - (b) it is an important source of food for fishes, spawning ground, nursery and/or migration path on which fish stocks, either within the wetland or elsewhere, depend.
- 3 – letters refer to the Ramsar classification for wetland type. See http://www.ramsar.org/key_ris_types.htm for more details.
 - A -- Permanent shallow marine waters in most cases less than six metres deep at low tide; includes sea bays and straits.
 - B -- Marine subtidal aquatic beds; includes kelp beds, sea-grass beds, tropical marine meadows.
 - C -- Coral reefs.
 - D -- Rocky marine shores; includes rocky offshore islands, sea cliffs.
 - E -- Sand, shingle or pebble shores; includes sand bars, spits and sandy islets; includes dune systems and humid dune slacks.
 - F -- Estuarine waters; permanent water of estuaries and estuarine systems of deltas.
 - G -- Intertidal mud, sand or salt flats.
 - H -- Intertidal marshes; includes salt marshes, salt meadows, saltings, raised salt marshes

- I -- Intertidal forested wetlands; includes mangrove swamps, nipah swamps and tidal freshwater swamp forests.
- J -- Coastal brackish/saline lagoons; brackish to saline lagoons with at least one relatively narrow connection to the sea.
- K -- Coastal freshwater lagoons; includes freshwater delta lagoons.
- Zk(a) --Karst and other subterranean hydrological systems, marine/coastal