**OUTSTANDING UNIVERSAL VALUE – WORLD HERITAGE MARINE SITES**

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**Aldabra Atoll**

Site: Aldabra Atoll

Country: Seychelles

Region: Indian Ocean

Year of Inscription: 1982

Size: 350 km²

Retrospective Statement of Outstanding Universal Value (2010)

Source: 34COM 8E: <http://whc.unesco.org/archive/2010/whc10-34com-8Ee.pdf>

**Brief synthesis**

Located in the Indian Ocean, the Aldabra Atoll is an outstanding example of a raised coral atoll. Due to its remoteness and inaccessibility, the atoll has remained largely untouched by humans for the majority of its existence. Aldabra is one of the largest atolls in the world, and contains one of the most important natural habitats for studying evolutionary and ecological processes. It is home to the largest giant tortoise population in the world. The richness and diversity of the ocean and landscapes result in an array of colours and formations that contribute to the atoll’s scenic and aesthetic appeal.

**Criterion (vii):** Aldabra Atoll consists of four main islands of coral limestone separated by narrow passes and enclosing a large shallow lagoon, providing a superlative spectacle of natural phenomena. The lagoon contains many smaller islands and the entire atoll is surrounded by an outer fringing reef. Geomorphologic processes have produced a rugged topography, which supports a variety of habitats with a relatively rich biota for an oceanic island and a high degree of endemism. Marine habitats range from coral reefs to seagrass beds and mangrove mudflats with minimal human impact.

**Criterion (ix):** The property is an outstanding example of an oceanic island ecosystem in which evolutionary processes are active within a rich biota. Most of the land surface comprises ancient coral reef (~125,000 years old) which has been repeatedly raised above sea level. The size and morphological diversity of the atoll has permitted the development of a variety of discrete insular communities with a high incidence of endemicity among the constituent species. The top of the terrestrial food chain is, unusually, occupied by an herbivore: the giant tortoise. The tortoises feed on grasses and shrubbery, including plants which have evolved in response to its grazing patterns. The atoll’s isolation has also allowed the evolution of endemic flora and fauna. Due to minimal human interference, these ecological processes can be clearly observed in their full complexity.

**Criterion (x):** Aldabra provides an outstanding natural laboratory for scientific research and discovery. The atoll constitutes a refuge for over 400 endemic species and subspecies (including vertebrates, invertebrates and plants). These include a population of over 100,000 Aldabra Giant Tortoise. The tortoises are the last survivors of a life form once found on other Indian Ocean islands and Aldabra is now their only remaining habitat. The tortoise population is the largest in the world and is entirely self-sustaining: all the elements of its intricate interrelationship with the natural environment are evident. There are also globally important breeding populations of endangered green turtles, and critically endangered hawksbill turtles are also present. The property is a significant natural habitat for birds, with two recorded endemic species (Aldabra Brush Warbler and Aldabra Drongo), and another eleven birds which have distinct subspecies, amongst which is the White-throated Rail, the last remaining flightless bird of the Western Indian Ocean. There are vast waterbird colonies including the second largest frigatebird colonies in the world and one of the world’s only two oceanic flamingo populations. The pristine fringing reef system and coral habitat are in excellent health and distinguished by their intactness and the sheer abundance and size of species contained within them.

**Integrity**

The property includes the four main islands which form the atoll plus numerous islets and the surrounding marine area. It is sufficiently large to support all ongoing biological and ecological processes essential for ensuring continued evolution in the atoll. The remoteness and inaccessibility of the atoll limit extensive human interference which could otherwise jeopardize ongoing processes. As such, Aldabra displays an almost intact ecosystem, sustaining naturally viable populations of all key species.

**Protection and management requirements**

The property is legally protected under national legislation and is managed by a public trust, the Seychelles Islands Foundation, with daily operations guided by a management plan. Boundaries are ecologically viable but the extension of the seaward boundary some 20 km into the sea would provide additional protection to the marine fauna. While the remoteness of the property has limited human interference, thus contributing for the protection of the biological and ecological processes, it also poses tremendous logistical challenges. Tourism is limited and carefully controlled. Whilst the property displays an almost intact ecosystem, protection and management need to address the constant threats posed by invasive alien species, climate change and oil spills, particularly in the event that oil exploration increases in the wider region.

**Area de Conservación Guanacaste**

Site: Area de Conservación Guanacaste

Country: Costa Rica

Region: Pacific Ocean

Year of Inscription: 1999, extended in 2004

Size: 1 470 km²

Retrospective Statement of Outstanding Universal Value (2013)

Source: 37COM 8E: <http://whc.unesco.org/archive/2013/whc13-37com-8E-en.pdf>

**Brief synthesis**

The Area de Conservación Guanacaste comprises 147,000 hectares of land and sea in the Northwest of Costa Rica. Encompassing several contiguous protected areas of various categories, the property is a mosaic of diverse ecosystems. The 104,000 hectares of land encompass a continuum of roughly 100 kilometres from the shore of the Pacific to the lowland rainforests in the Caribbean basin. Along the way, the gradient passes a varied coastline, the Pacific coastal lowlands and much of the western side of the Guanacaste Range peaking at Rincón de la Vieja at 1,916 m.a.s.l. The many forest types comprise a large tract of tropical dry forest, an often overlooked, highly vulnerable global conservation priority. Furthermore, there are extensive wetlands, numerous water courses, as well as oak forests and savannahs. The largely intact coastal-marine interface features estuaries, rocks, sandy and cobble beaches rimming the 43,000 hectares of marine area with its various, mostly uninhabited near-shore islands and islets. Major nutrient-rich cold upwelling currents offshore result in an exceptionally high productivity of this part of the Pacific. The visually dramatic landscape mosaic is home to an extraordinary variety of life forms. Next to the approximately 7,000 plant species, more than 900 vertebrate species have been confirmed. Some notable mammals include the endangered Central American Tapir, at least 40 species of bat, numerous primate species and several felids, namely Jaguar, Margay, Jaguarundi and Ocelot. Among some 500 bird species are the endangered Mangrove Hummingbird and Great Green Macaw, as well as the vulnerable Military Macaw and Great Curassow. Diversity of reptiles and amphibians is likewise high with charismatic representatives like the

vulnerable American Crocodile and Spectacled Caiman. Several species of sea turtles occur in the property, with a nesting population of the critically endangered Leatherback and a massive breeding population of the vulnerable Olive Ridley. Invertebrate diversity is extraordinary with an estimated 20,000 species of beetles, 13,000 species of ants, bees and wasps and 8,000 species of butterflies and moths.

**Criterion (ix):** A striking feature of Area de Conservación Guanacaste is the wealth of ecosystem and habitat diversity, all connected through an uninterrupted gradient from the Pacific Ocean across the highest peaks to the lowlands on the Caribbean side. Beyond the distinction into land and sea, the many landscape and forest types comprise mangroves, lowland rainforest, premontane and montane humid forest, cloud forest, as well as oak forests and savannahs with evergreen gallery forests along the many water courses. Along the extraordinary transect the property allows migration, genetic exchange and complex ecological processes and interactions at all levels of biodiversity, including between land and sea. The vast dry forest is a rare feature of enormous conservation value, as most dry forests elsewhere in the region are fragmented remnants only. Conservation has permitted the natural restoration of the previously degraded forest ecosystem, today serving again as a safe haven for the many species depending on this acutely threatened ecosystem. Major nutrient-rich cold upwelling currents offshore result in a high marine productivity and are the foundation of a diverse coastal-marine ecosystem containing important coral reefs, algal beds, estuaries, mangroves, sandy and cobble beaches, shore dunes and wetlands.

**Criterion (x):** The property is globally important for the conservation of tropical biological diversity as one of the finest examples of a continuous and well-protected altitudinal transect in the Neotropics along a series of marine and terrestrial ecosystems. The enormous variation in environmental conditions favours a high diversity, with two thirds of all species described for Costa Rica occurring within the relatively compact area. Coexisting in the property, there are more than 7,000 species of plants, as diverse as Mahogany in the lush forests and several species of agaves and cacti in drier areas. Over 900 vertebrates have been confirmed. Some notable mammals include the endangered Central American Tapir, at least 40 species of bat, Jaguar, Margay, Jaguarundi and Ocelot, as well as numerous primate species. Among some 500 bird species are the endangered Mangrove Hummingbird and Great Green Macaw, and the vulnerable Military Macaw. Charismatic representatives of

reptiles include the vulnerable American Crocodile and the Spectacled Caiman. Several species of sea turtles occur in the property, with the critically endangered Leatherback nesting and a massive breeding population of the vulnerable Olive Ridley. Invertebrate diversity is extraordinary with an estimated 20,000 species of beetles, 13,000 species of ants, bees and wasps and 8,000 species of butterflies and moths.

**Integrity**

The transect from the waters of the Pacific across more than 100 kilometres inland constitutes an impressive altitudinal and climatic range, making the Area de Conservacion Guanacaste an ideal place for the conservation of dynamic ecological and biological processes at the scale of a landscape. This is critical for the range, migration and life cycles of many animal species but also for plants and entire communities expected to respond to changing environmental conditions. The largely intact coastal-marine interface is remarkable, particularly in a region where coasts have disproportionally suffered from human pressure. The Pacific and the connected coastal ecosystems like mangroves, wetlands and estuaries mutually protect each other and the associated biological and ecological processes. The remoteness and the rocky, swampy terrain provide a high degree of natural protection of this interface. The ongoing natural regeneration of the large, previously exploited tropical dry forest ecosystem within the property is an indicator of intact processes, favoured by the size, conservation efforts and functioning interaction with neighbouring ecosystems. Adding to the integrity are several connected protected areas in the vicinity of the property, which help avoid genetic isolation, buffer disturbance and facilitate conservation and natural regeneration. Small peripheral areas are regularly bought and added to the protected area and lend themselves for future incorporation into the property.

**Protection and Management Requirements**

Area de Conservacion Guanacaste is a conservation complex comprised of contiguous protected areas which has expanded over time. The property continues to have potential for further extension, which is an explicit management objective. The formal conservation history goes back to 1971 when Santa Rosa National Park was created to conserve a stretch of land and sea of high conservation valuable. Over the years new national parks, a wildlife refuge and an Experimental Forest Station were established and added. Most of the property is stateowned, except for a corridor owned by the parastatal foundation Fundacion de Parques Nacionales. The administrative unit is headed by a Director and under the overall authority of the Ministry of Environment and Energy. Oversight and participation is foreseen through technical, local, as well as regional councils. The integrated management has the dual long-term objective of conservation and restoration. More specifically, management objectives include incorporation of adjacent areas of conservation interest, payment for environmental services schemes; ecological research and outreach programs. The property enjoys a diverse funding structure with both governmental and non-governmental sources. Entrance fees likewise contribute in addition to a heritage fund established through a debt-for-nature swap. Despite the diverse funding structure, additional and sustainable funding schemes are needed to enhance the operational management capacity in the face of mounting challenges.

After historic use by local indigenous groups, the remote and economically marginalised region was exploited for around four centuries in opportunistic form. Past human impacts include clearing of forests for pasture, logging and indiscriminate hunting. However, the poor soils, erratic climate and geographic isolation set natural limits to resource use and land conversion which is why no transformation beyond the natural restoration capacity appears to have occurred. On land, current threats stem from agriculture outside the property, namely pollution by pesticides, deviation of water for irrigation and introduced exotic grasses. Other possible developments outside the property requiring careful balancing between negative impacts and benefits include increasing tourism, road construction and hydropower. Catches by local fishermen have shown a decrease in the size of fish and an increase in the effort required per catch, a clear indication of declining populations. Stronger efforts in marine conservation are needed to respond to uncontrolled commercial and sport fishing but also to regulate tourism along the coast.

**Banc d'Arguin National Park**

Site: Banc d'Arguin National Park

Country: Mauritania

Region: Atlantic Ocean

Year of Inscription: 1989

Size: 12 000 km²

Retrospective Statement of Outstanding Universal Value (2010)

Source: 34COM 8E: <http://whc.unesco.org/archive/2010/whc10-34com-8Ee.pdf>

**Brief synthesis**

The Banc d’Arguin is one of the most important zones in the world for nesting birds and Palearctic migratory waders. Located along the Atlantic coast, this Park is formed of sand dunes, areas of coastal swamps, small islands and shallow coastal waters. The austerity of the desert and the biodiversity of the marine area results in a land and seascape of exceptional contrasting natural value.

**Criterion (ix):** Banc d’Arguin National Park is an ecosystem rich in biodiversity of nutrients and organic matter due to the vast expanse of marshes covered with seagrass beds, and an important windblown sediment addition from the continent and the result of the permanent upwelling of the Cap Blanc. This wealth ensures the maintenance of a marine and coastal environment sufficiently rich and diverse to support important communities of fish, birds and marine mammals.

**Criterion (x):** Banc d’Arguin National Park comprises the most important habitat of the Western Atlantic for nesting birds of west Africa and the Palearctic migratory waders. The vast expanses of marshes provide shelter to more than two million limicolous migrant birds from northern Europe, Siberia and Greenland. The nesting bird population is also remarkable in terms of diversity and number: between 25,000 and 40,000 pairs belonging to 15 bird species. The shallows and island area is also the centre of intense biological activity: there are 45 fish species, 11 species of shellfish and several species of mollusks. The property also contains several species of marine turtles, notably the green seaturtle (*Chelonia mydas*) on the IUCN Red List of Threatened Species. Among the mammals, there are still some remnant populations of Dorcas gazelle (*Gazella dorcas*). The bottlenose dolphin and the Atlantic hump-backed dolphin are frequently sighted in the property.

**Integrity**

The rectilinear boundaries of the property suggest that they were not based on ecological parameters, but more likely correspond to administrative requirements. The eastern limit extends inwards to a desert zone, in places up to 50 metres, and constitutes a wide band where activities incompatible with the conservation of the property may be conducted. Certain revisions to the southern limit, to exclude the village of Cape Timiris and the military base, would not detract from the value of the property and could eventually be envisaged. The marine boundary forms, also, a straight line and crosses the shallows of the property through the centre. It would be particularly justifiable that the whole shallows zone be included in the property. The satellite reserve of 200ha located at Cap Blanc constitutes the habitat for a monk seal colony and presents issues as regards its integrity. First, the reserve boundaries encompass the habitat of the 100 monk seals found in the region, the remainder using the area to the north known as the Côte des Phoques. This means that the condition of integrity that requires sufficient area to ensure continuity for the species is not satisfied. Second, the extension of the Cap Blanc Reserve to encompass the key breeding and nursery area at Côte des Phoques, is not possible as the international boundary in this area of the Western Sahara remains to be determined. For this reason, the World Heritage Committee decided to inscribe the property and exclude the Cap Blanc Reserve, the inscription of which can only be envisaged after the resolution of the issue of boundary limits and when the part of the Côte des Phoques could be included. The main threat to the property are projects likely to alter the traditional activities of local fishing. The introduction of new technologies and an increased catch could affect and seriously disturb the fish life of the region.

**Protection and management requirements**

Protection of the property is regulated by the statute for protected reserves. The property has a management plan. The main threats to the property are most linked to unregulated development of maritime activities and coastal infrastructures. Fishing activities have considerably increased and the material and methods of fishing have changed as have the species targeted. Consequently, protection of the marine resources against over-exploitation is essential. To mitigate the problem, implementation of a surveillance programme on the risks to marine resources, including illegal commercial fishing. The risk of pollution by hydrocarbons on the international maritime route of western Africa and from the petroleum industries is also considerable. Urgent planning to cope with the eventuality of an oil spill, is required for the property and its surrounds. Another important issue in the management of the property is the prevention of poaching and logging causing the degradation of the terrestrial part of the property. As for the maritime part of the property, a full terrestrial surveillance programme is required. The possible impacts of climate change must also be studied.

**Belize Barrier Reef Reserve System**

Site: Belize Barrier Reef Reserve System

Country: Belize

Region: Caribbean Sea

Year of Inscription: 1996

Size: 963 km²

Retrospective Statement of Outstanding Universal Value (2014)

Source: 38COM 8E: <http://whc.unesco.org/archive/2014/whc14-38com-8E-en.pdf>

**Brief synthesis**

The Belize Barrier Reef System (BBRS), inscribed as a UNESCO World Heritage Site in 1996, is comprised of seven protected areas; Bacalar Chico National Park, Bacalar Chico Marine Reserve, Blue Hole Natural Monument, Half Moon Caye Natural Monument, South Water Caye Marine Reserve, Glover’s Reef Marine Reserve, Laughing Bird Caye National Park and Sapodilla Cayes Marine Reserve. The largest reef complex in the Atlantic-Caribbean region it represents the second largest reef system in the world. The seven protected areas that comprise the BBRS comprise 12% of the entire Reef Complex.

The unique array of reef types within one self-contained area distinguishes the BBRS from other reef systems. The site is one of the most pristine reef ecosystems in the Western Hemisphere and was referred to ‘as the most remarkable reef in the West Indies’ by Charles Darwin. Outside of the reef complex the property contains three atolls; Turneffe Island, Lighthouse Reef and Glover’s Reef. The Barrier Reef and atolls exhibit some of the best reef growth in the Caribbean. The reef complex is comprised of approximately 450 sand and mangrove cayes.

The property provides important habitat for a number of threatened marine species, harbouring a number of species of conservation concern including the West Indian manatee (*Trichechus manatus*), green turtle (*Chelonia mydas*), hawksbill turtle (*Eretmochelys imbricata*), loggerhead turtle (*Caretta caretta*), and the American crocodile (*Crocodylus acutus*) as well as endemic and migratory birds which reproduce in the littoral forests of cayes, atolls and coastal areas. Major bird colonies include the red-footed booby (*Sula sula*) on Half-Moon Caye, brown booby (*Sula leucogaster*) on Man O’War Caye and the common noddy (*Anous stolidus*) on Glover’s Reef. Approximately 247 taxa of marine flora have been described within the complex and over 500 fish, 65 sceleritian coral, 45 hydroid and 350 mollusc species have also been identified, in addition to a great diversity of sponges, marine worms and crustaceans.

**Criterion (vii):** The Belize Barrier Reef Reserve System (BBRRS) is unique in the world for its array of reef types contained in a relatively small area. As the longest barrier reef in the Northern and Western Hemispheres and distinctive on account of its size, array of reef types and the luxuriance of corals thriving in a pristine condition it provides a classic example of the evolutionary history of reefs and reef systems. The rise and fall of sea level over the millennia, coupled with natural karst topography and clear waters, results in a diverse submarine seascape of patch reefs, fringing reefs, faros, pinnacle reefs, barrier reefs as well as off-shelf atolls, rare deep water coral reefs and other unique geological features such as the Blue Hole and Rocky Point where the barrier reef touches the shore. The spectacular picturesque natural setting of brilliant white sand cayes and verdant green mangrove cayes is in dramatic contrast to the surrounding azure waters.

**Criteria (ix):** Illustrating a classic example of reef types, including fringing, barrier and atoll reef types, the BBRRS contains an intact ecosystem gradient ranging from the terrestrial to the deep ocean. Including littoral, wetland, and mangrove ecosystems, to seagrass beds interspersed with lagoonal reefs, to the outer barrier reef platform and oceanic atolls, this ecological gradient provides for a full complement of life-cycle needs, supporting critical spawning, nesting, foraging, and nursery ecosystem functions. Maintaining these ecological and biological processes ensures robust and resilient reefs, which are them selves one of the world’s most ancient and diverse ecosystems.

**Criteria (x):** Home to a diverse array of top predators, on land, sea and in the air, the jaguars of Bacalar Chico, the great hammerheads of the Blue Hole, and the ospreys of Glovers Reef are a testament to the property’s importance and its ecological integrity. A total of 178 terrestrial plants and 246 taxa of marine flora have been described from the area while over 500 species of fish, 65 scleractinian corals, 45 hydroids and 350 molluscs have been recorded. Numerous endangered species are protected within the boundaries of the BBRRS including; the West Indian manatee, the American crocodile and three species of sea turtle. The property also provides valuable habitat for three species of groupers, and the red-footed booby. The BBRRS is also home to endemic species including several Yucatan birds, island lizards, several fishes, tunicates, and sponges, making it an area with one of the highest levels of marine biodiversity in the Atlantic.

**Integrity**

The Belize Barrier Reef Reserve System is one interconnected system comprised of seven marine protected areas located along the length of the barrier reef, the shelf lagoon and offshore atolls. It is the largest barrier reef in the Northern hemisphere and represents all the main reef and coastal habitats, including rare littoral forest on sand cayes that are home to endangered flora and fauna. The network of protected areas is large enough to maintain the necessary ecological processes and support the BBRRS for the long term. Its geographic spread and diversity enhance it resilience, an essential factor in this time of climate change with its risks of coral bleaching, stronger and more frequent hurricanes and sea level rise.

Management challenges and threats that impact on the integrity of the property include; overharvesting of marine resources, coastal development, tourism, industrial development and proposed oil and gas exploration and exploitation. These threats, common to marine protected areas in general are less intense due to relatively low population pressure, however, careful management is required to ensure growing population pressures do not lead to significant impacts on the integrity of the property.

**Protection and management requirements**

Extending from the border with Mexico to the north, to near the Guatemalan border to the south the geographical spread of this serial property poses a number of management challenges. The component sites of the serial property have been gazetted as protected areas with legal protection measures provided under the national constitution, the Fisheries Act and the National Parks Act. Oversight of all protected areas, including the BBRRS, is governed through various pieces of legislation administered by various Government of Belize Departments spread across various Ministries.

The National Protected Areas Policy is Belize’s policy on protected areas and provides the overarching policy framework, whereas the National Protected Areas System Plan details inter alia specific requirements for protected areas resource management, planning and management effectiveness evaluations. In addition to entrance fees, financial support for all protected areas in Belize can be accessed through the national Protected Areas Conservation Trust. Those sites and co-managers that constitute the BBRRS can also access funds under the Community Management of Protected Areas for Conservation (COMPACT) and other international funding sources.

Government authorities have approached the management challenges posed by the size and nature of the property strategically, establishing innovative co-management agreements with various non-governmental organizations. This helps to ensure successful on-the-ground supervision, backed up by national legislation and guided by official management plans that are available for each of the component protected areas and include resource protection, research and monitoring, surveillance and enforcement, community outreach and education, and financial sustainability. However, the complexities of managing a number of protected areas spread over a considerable area requires detailed institutional coordination mechanisms to ensure the protection of the property and its Outstanding Universal Value.

Coordination amongst government agencies responsible for coastal development, including activities such as mangrove clearance and dredging, is required for conservation and effective management of the property. Revitalization of the Coastal Zone Management Authority and Institute (CZMAI), will strengthen this crucial element of integrated coastal management, particularly through the completion and legal adoption of the Coastal Zone Management Plan. Implementation of this Plan will assist with control, regulation, mitigation and minimizing threats such as uncontrolled development, unsustainable tourism and fishing, and declining water quality. Belize's long history of marine species conservation, trans-boundary coastal management cooperation, and involvement in several regional conservation initiatives is based on a recognition of the fact that the seas and resident wildlife are not confined to protected areas or within political boundaries, further enhances the conservation of the BBRRS WHS.

Strengthening of mangrove regulations, the fisheries and marine reserve regulations, and the EIA process will lead to more sustainable use of resources both within the BBRRS and the surrounding areas. Policy development and contingency planning are required for impacts of possible oil and gas exploration located outside the property, impacts from tourism and to address climate change concerns. Along with these regulatory and policy improvements, strengthened enforcement will also assist in management and long-term protection of the property. Added protection and management measures, and the ongoing dedication and coordinated work of government and non-government organizations, will ensure the outstanding values of the BBRRS will remain intact.

# Brazilian Atlantic Islands: Fernando de Noronha and Atol das Rocas Reserves

# Site: Brazilian Atlantic Islands: Fernando de Noronha and Atol das Rocas Reserves

Country: Brazil

Region: Atlantic Ocean

Year of Inscription: 2001

Size: 422,70 km²

Buffer zone: 1 407,13 km²

Description of Outstanding Universal Value (2001)
Source: CONF 208 X.A: <http://whc.unesco.org/en/decisions/2319>

The Committee inscribed the Brazilian Atlantic Islands: Fernando de Noronha and Atol das Rocas Reserves on the World Heritage List on the basis of criterion (ii), (iii) and (iv):

**Criterion (ii)**: Fernando de Noronha / Rocas Atoll represents over half the insular coastal waters of the Southern Atlantic Ocean. These highly productive waters provide feeding ground for species such as tuna, billfish, cetaceans, sharks, and marine turtles as they migrate to the Eastern Atlantic coast of Africa. An oasis of marine life in relatively barren, open ocean, the islands play a key role in the process of reproduction, dispersal and colonisation by marine organisms in the entire Tropical South Atlantic.

**Criterion (iii)**: Baía dos Golfinhos is the only known place in the world with such a high population of resident dolphins and Rocas Atoll demonstrates a spectacular seascape at low tide when the exposed reef surrounding shallow lagoons and tidal pools forms a natural aquarium. Both sites have also exceptional submarine landscapes that have been recognised worldwide by a number of specialised diving literatures.

**Criterion (iv)**: Fernando de Noronha / Rocas Atoll is a key site for the protection of biodiversity and endangered species in the Southern Atlantic. Providing a large proportion of the insular habitat of the South Atlantic, the site is a repository for the maintenance of marine biodiversity at the ocean basin level. It is important for the conservation of endangered and threatened species of marine turtles, particularly the hawksbill turtle. The site accommodates the largest concentration of tropical seabirds to be found in the Western Atlantic Ocean, and is a Global Centre of Bird Endemism. The site also contains the only remaining sample of the Insular Atlantic Forest and the only oceanic mangrove in the South Atlantic region.

The site consists of the Archipelago of Fernando de Noronha and Atol das Rocas, a reef approximately 150 km to the west of the Archipelago.

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| AREA | LOCATION | SIZE |
| National Marine Park of Fernando de Noronha | State of Pernambuco | 11,270 ha |
| Biological Marine Reserve of Rocas Atoll | State of Rio Grande do Norte | 32,000 ha |

**Cocos Island National Park**

Site: Cocos Island National Park

Country: Costa Rica

Region: Pacific Ocean

Year of Inscription: 1997, extended in 2002

Size: 1 997,90 km²

Description of Outstanding Universal Value (1997)

Source: CONF 208 VIII.A: <http://whc.unesco.org/en/decisions/2853>

The Committee inscribed Cocos Island National Park under natural criteria (ii) and (iv) because of the critical habitats the site provides for marine wildlife including large pelagic species, especially sharks. The Committee commended the Government of Costa Rica for its initiative to incorporate the marine environment into the Park and encouraged it to extend management from 8km to the 15km legal limit around the island.

**Coiba National Park and its Special Zone of Marine Protection**

Site: Coiba National Park and its Special Zone of Marine Protection

Country: Panama

Region: Pacific Ocean

Year of Inscription: 2005

Size: 2 701,25 km²

Retrospective Statement of Outstanding Universal Value (2014)

Source: 38COM 8E: <http://whc.unesco.org/archive/2014/whc14-38com-8E-en.pdf>

**Brief synthesis**

Coiba National Park and its Special Zone of Marine Protection, is located in the Republic of Panama in the Gulf of Chiriqui, in the western sector of the country. The property protects Coiba Island along with 38 smaller islands and the surrounding marine area and is immersed in the Tropical Eastern Pacific, forming part of the Tropical Eastern Pacific Marine Corridor (CMAR). It is the last refuge for a number of threatened animals and an essential area for migratory species, including the essentials for the maintenance of the ecological balance of the oceanic masses, and valuable habitat for cetaceans, sharks, sea turtles and a large variety of pelagic fish species of high importance to regional level fisheries.

The property contains marine environments that have characteristics of both a continental and oceanic influence, and include insular marine coastal and terrestrial island ecosystems. This wide range of environments and resulting habitats is a result of the property’s location, close to the edge of the continental platform and at the same time to the mainland. These features combine to produce landscapes of incomparable beauty that are home to an exceptionally high level of endemism for mammals, birds and plants. An outstanding natural laboratory, the property provides a key ecological link to the Tropical Eastern Pacific and an important area for scientific research.

The size and length of the property allows for the protection of a whole and healthy ecosystem that is one of the last major refuges for rare and endangered species of tropical America. The conservation of the property is the main objective of close cooperation between the several stakeholders that form the Coiba National Park’s Directors Board, the authority responsible for the governance and management of the property.

**Criterion (ix):** Despite the short time of isolation of the islands of the Gulf of Chiriquí on an evolutionary timeframe, new species are being formed, which is evident from the levels of endemism reported for many groups (mammals, birds, plants), making the property an outstanding natural laboratory for scientific research. Furthermore the Eastern Pacific reefs, such as those within the property, are characterized by complex biological interactions of their inhabitants and provide a key ecological link in the Tropical Eastern Pacific for the transit and survival of numerous pelagic fish as well as marine mammals.

**Criterion (x):** The forests of Coiba Island possess a high variety of endemic birds, mammals and plants. Coiba Island also serves as the last refuge for a number of threatened species that have largely disappeared from the rest of Panama, such as the Crested Eagle and the Scarlet Macaw. Furthermore the marine ecosystems within the property are repositories of extraordinary biodiversity conditioned to the ability of the Gulf of Chiriquí to buffer against temperature extremes associated to El Niño/Southern Oscilation phenomenon. The property includes 760 species of marine fishes, 33 species of sharks and 20 species of cetaceans. The islands within the property are the only group of inshore islands in the tropical eastern Pacific that have significant populations of trans-Pacific fishes, namely, Indo-Pacific species that have established themselves in the eastern Pacific.

**Integrity**

The boundaries of the property are legally defined and contain a core protection area, consisting of the Coiba National Park and a designated buffer area, providing an essential zoning system to safeguard the beauty of the area and protect its important natural values. It contains the necessary elements to ensure the permanence of the necessary processes for long-term conservation of the ecosystems and the unique biological diversity of the property. The property encompasses the Island of Coiba in its entirety, thus providing refuge for its endemic species as well as for species that have largely disappeared from mainland Panama. It is a large area whose boundaries encompass 430,825 ha, comprising a marine component covering oceanic ecosystems including continental environments, islands with abrupt topography and legal protection. Combined with difficult access in many areas the legal protection assists in keeping the property relatively unaltered and with minimal human intervention.

The existence and integration of other marine protected areas at both national and regional levels provides additional contributions to the protection of the special values that make the property exceptional. A number of factors could threaten the integrity of it property’s attributes and require attention, such as illegal fishing, both in regards to scale and equipment used, introduced species and ecotourism development projects. Additionally, climatic changes could also affect the conservation of the ecosystems within the property.

**Protection and management requirements**

Coiba National Park encompasses over 270,125 ha of which 216,500 ha are marine and 53,625 ha are insular and include Coiba Island along with 38 smaller islands. The Special Zone of Marine Protection is included within the boundaries of the property as a buffer area to the core area of the National Park and encompasses an additional 160,700 ha. Combined the National Park and the SZMP includes 53,761 ha of terrestrial habitats and 377,064 ha of marine area. The property is protected under National Law 44, signed by the Legislative Assembly of the Republic of Panama on 26th July 2004, establishing Coiba National Park and a Special Zone of Marine Protection within the Gulf of Chiriqui. National Law 44 established the boundaries of the National Park along with its Zone of Marine Protection as well as the protection and management regulations for both of these areas.

The property is subject to national level management which is supported by the legal and institutional framework that allows for the execution of an innovative governance model, through cooperative and coordinated participation of different stakeholders. The National Park was created by Resolution No. 021 (1991) of the National Authority of the Environment and the property is operationally managed by the National Environmental Authority and administratively by both national and local authorities along with members of civil society such as environmental NGOs and productive sectors. This approach to management works towards ensuring the property has the basic funding requirements for its management. It also assists in achieving the management objective of ensuring the conservation, protection and continuity of the ecological processes. In order to achieve this it is necessary to maintain and promote coordinated and participatory environmental management among communities, national authorities, users and stakeholders.

Fishing pressures on both the Coiba National Park and the Special Zone of Marine Protection is one of the threats and impacts on the property and along with infrastructure development, agriculture, forest cutting, human settlements and exploration and exploitation of mineral resources, while strictly prohibited remain potential threats. These issues have been extensively addressed by the management authority, along with NGOs that support continued conservation efforts and require ongoing investment in regards to monitoring.

Tourism interest in the property has grown and is expected to increase with the number of visitors growing rapidly. Tourism activities include use of the beaches and coastal areas as well as underwater activities and need to be monitored and managed so as to prevent significant impacts on the property and its values. As with other Marine Protected Areas, both in the region and world wide, the property faces the threats and impacts resulting from climate change such as coral bleaching, stronger and more frequent hurricanes and sea level rise.

**East Rennell**

Site: East Rennell

Country: Solomon Islands

Region: Pacific Ocean

Year of Inscription: 1998

Size: 370 km²

Retrospective Statement of Outstanding Universal Value (2012)

Source: 36COM 8E: <http://whc.unesco.org/archive/2012/whc12-36com-8Ee.pdf>

**Brief synthesis**

East Rennell is part of Rennell Island, the southernmost island of the Western Pacific, Solomon Islands Group. Rennell Island is the largest raised coral atoll in the world, covering an area of 87,500ha at 86km long and 15km wide and is located 250km due south of the Solomon’s capital, Honiara. The World Heritage property occupies the southern third of the island and includes approximately 37,000ha and a marine area that extends 3km offshore. A prominent feature of the property is Lake Tegano, the former lagoon of the atoll, which at 15,000ha is the largest lake in the insular Pacific. Containing many rugged limestone islets the lake’s brackish waters harbour numerous endemic species including an endemic sea snake. The surrounding karst terrain has a dense cover of indigenous forest. Remaining in its natural state, the forest has a rich biodiversity with many endemic species; four species and nine subspecies of land and water birds respectively, one bat and seven land snails.

The property was the first natural property inscribed on the World Heritage List with customary ownership and management. Approximately 1,200 people of Polynesian origin occupy four villages within the boundaries of the property, living mainly by subsistence gardening, hunting and fishing. Frequent cyclones can have severe consequences for the local people and the biota, and rising lake water levels from climatic change are adversely affecting some staple food crops.

**Criterion (ix):** East Rennell demonstrates significant on-going ecological and biological processes and is an important site for the science of island biogeography. The property is an important stepping stone in the migration and evolution of species in the western Pacific and for speciation processes, especially with respect to avifauna. Combined with the strong climatic effects of frequent cyclones, the property is a true natural laboratory for scientific study. The unmodified forest vegetation contains floral elements from the more impoverished Pacific Islands to the east and the much richer Melanesian flora to the west. For its size, Rennell Island has a high number of endemic species, particularly among its avifauna and also harbours 10 endemic plant species. The wildlife includes 11 species of bat (one endemic) and 43 species of breeding land and water birds (four species and nine subspecies endemic respectively). The invertebrate life is also rich with 27 species of land snail (seven endemics) and approximately 730 insect species, many of which are endemic. The flora of Lake Tegano is dominated by more than 300 species of diatoms and algae, some of which are endemic. There is also an endemic sea snake in the lake.

**Integrity**

East Rennell encompasses a number of marine, coastal and forest values, combined in one place and in a relatively undisturbed state. The clearly defined boundaries of the property encompass Lake Tegano as well as a continuous expanse of surrounding forest-covered karst terrain. The property also includes a marine area extending 3km offshore. Apart from subsistence garden cultivation, hunting, fishing and utilisation of forest products for building materials, the natural vegetation is little-modified by human impact and there are no serious invasive species of animals or plants. Both rats and alien land snails, which have decimated fauna of other islands, are absent.

The location of the western boundary, determined by community and administrative borders, is not optimal as it excludes important forest habitat for some species, particularly birds. Previously reported threats from mining and commercial fishing have passed. However, potential logging operations in the lands adjacent to the property, in West Rennell, could have severe adverse impacts on the forests within the property. These forests are intrinsically linked to those of West Rennell and are insufficient on their own to ensure the long-term survival of a number of endemic birds.

Increasing water levels and salinity in Lake Tegano, induced by sea level rise due to climate change, are adversely affecting plant growth in low-lying areas. Of particular concern is the reduced harvest of taro and coconut, both of which are vital staple foods for the local community. Of particular importance and significance is the support for conservation from the local community.

**Protection and management requirements**

All land, islands and marine reefs within the property are under customary ownership, which is acknowledged in the Constitution of the Solomon Islands and the 1995 Customs Recognition Act. East Rennell is also protected under a National Protected Areas Act, passed in 2010 and administered by a recently established Ministry of the Environment. The legislation is focused on biodiversity conservation and explicitly applies to World Heritage properties, but it requires a Provincial Ordinance and local regulations and by-laws to empower the traditional owners and make it fully effective at the local level. The property has a management plan as well as an action plan for implementation. The management plan requires more specific policies to address vulnerabilities and threats including mining, logging, over-exploitation of coconut crabs and marine resources and invasive species and has no timeline or budget. Customary values and traditional management practices are not detailed in the plan, though a recent scoping study has begun the task of addressing this gap.

The recently created Lake Tegano World Heritage Site Association, comprising some 250 community members, has established a representative committee to co-ordinate management activities. The committee, recognised by the Government, requires funding, office and communication facilities and a presence or counterpart focal point in either the provincial or national Governments to ensure it is effective.

Heritage management and capacity-building projects, conducted by foreign donor Governments and international NGO’s, have provided beneficial outcomes including: enhanced awareness and understanding of World Heritage obligations on the part of the community, Government officials and other stakeholders; better co-ordination and co-operation in community management activities; improved survey and monitoring of natural resources; a strengthened legal basis for protection and management; and initial arrangements for twinning East Rennell with an Australian property.

The ability of the traditional owners to adequately protect and manage the natural values and resources of the property is limited by a lack of funding, capacity and resources. In particular, they require funding and substantial rural development aid in the form of improved communication and transport facilities, health and medical services, education resources and income-generating small business enterprises based on sustainable uses of the natural resources. The isolation of the property and the consequent restricted access, requiring long- distance travel on infrequent and unreliable air services and extremely difficult overland travel assist in protection of the property but have also impacted on attempts to develop eco-tourism. Restricted transport links also hinder the ability of the community to obtain food and medical supplies, and to access markets for locally produced products.

Future priorities for management of the property include: full implementation of legal and planning provisions; community capacity-building and empowerment for managing projects and natural resources; and increased sources of sustainable funding, including income generation, to improve the standard of living of the traditional owners and enhance their ability to protect the property to World Heritage standards.

**Everglades National Park**

Site: Everglades National Park

Country: United States of America

Region: Atlantic Ocean

Year of Inscription: 1979

Size: 5 670,17 km²

Adoption of Statements of Significance (2006)

Source: 30 COM 11B: <http://whc.unesco.org/en/decisions/1196>

Everglades National Park is the largest designated sub-tropical wilderness reserve on the North American continent. Its juncture at the interface of temperate and sub-tropical America, fresh and brackish water, shallow bays and deeper coastal waters creates a complex of habitats supporting a high diversity of flora and fauna. It contains the largest mangrove ecosystem in the Western Hemisphere, the largest continuous stand of sawgrass prairie and the most significant breeding ground for wading birds in North America.

**Criterion (viii)**: The Everglades is a vast, nearly flat, seabed that was submerged at the end of the last Ice Age. Its limestone substrate is one of the most active areas of modern carbonate sedimentation.

**Criterion (ix)**: The Everglades contains vast subtropical wetlands and coastal/marine ecosystems including freshwater marshes, tropical hardwood hammocks, pine rocklands, extensive mangrove forests, saltwater marshes, and seagrass ecosystems important to commercial and recreational fisheries. Complex biological processes range from basic algal associations through progressively higher species and ultimately to primary predators such as the alligator, crocodile, and Florida panther; the food chain is superbly evident and unbroken. The mixture of subtropical and temperate wildlife species is found nowhere else in the United States.

**Criterion (x)**: Everglades National Park is a noteworthy example of viable biological processes. The exceptional variety of its water habitats has made it a sanctuary for a large number of birds and reptiles and it provides refuge for over 20 rare, endangered, and threatened species. These include the Florida panther, snail kite, alligator, crocodile, and manatee. It provides important foraging and breeding habitat for more than 400 species of birds, includes the most significant breeding grounds for wading birds in North America and is a major corridor for migration.

**Galápagos Islands**

Site: Galápagos Islands

Country: Ecuador

Region: Pacific Ocean

Year of Inscription: 1978, extended in 2001

Size: 140 665,17 km²

Retrospective statement of Outstanding Universal Value (2013)

Source: 37COM 8E: <http://whc.unesco.org/archive/2013/whc13-37com-8E-en.pdf>

**Brief synthesis**

The Galapagos Islands area situated in the Pacific Ocean some 1,000 km from the Ecuadorian coast. This archipelago and its immense marine reserve is known as the unique ‘living museum and showcase of evolution’. Its geographical location at the confluence of three ocean currents makes it one of the richest marine ecosystems in the world. Ongoing seismic and volcanic activity reflects the processes that formed the islands. These processes, together with the extreme isolation of the islands, led to the development of unusual plant and animal life – such as marine iguanas, flightless cormorants, giant tortoises, huge cacti, endemic trees and the many different subspecies of mockingbirds and finches – all of which inspired Charles Darwin’s theory of evolution by natural selection following his visit in 1835.

**Criterion (vii)**: The Galapagos Marine Reserve is an underwater wildlife spectacle with abundant life ranging from corals to sharks to penguins to marine mammals. No other site in the world can offer the experience of diving with such a diversity of marine life forms that are so familiar with human beings, that they accompany divers. The diversity of underwater geomorphological forms is an added value to the site producing a unique display, which cannot be found anywhere else in the world.

**Criterion (viii)**: The archipelago´s geology begins at the sea floor and emerges above sea level where biological processes continue. Three major tectonic plates—Nazca, Cocos and Pacific— meet at the basis of the ocean, which is of significant geological interest. In comparison with most oceanic archipelagos, the Galapagos are very young with the largest and youngest islands, Isabela and Fernandina, with less than one million years of existence, and the oldest islands, Española and San Cristóbal, somewhere between three to five million years. The site demonstrates the evolution of the younger volcanic areas in the west and the older islands in the east. On-going geological and geomorphological processes, including recent volcanic eruptions, small seismic movements, and erosion provide key insights to the puzzle of the origin of the Galapagos Islands. Almost no other site in the world offers protection of such a complete continuum of geological and geomorphological features.

**Criterion (ix)**: The origin of the flora and fauna of the Galapagos has been of great interest to people ever since the publication of the “Voyage of the Beagle” by Charles Darwin in 1839. The islands constitute an almost unique example of how ecological, evolutionary and biogeographic processes influence the flora and fauna on both specific islands as well as the entire archipelago. Darwin’s finches, mockingbirds, land snails, giant tortoises and a number of plant and insect groups represent some of the best examples of adaptive radiation which still continues today. Likewise, the Marine Reserve, situated at the confluence of 3 major eastern Pacific currents and influenced by climatic phenomena such as El Niño, has had major evolutionary consequences and provides important clues about species evolution under changing conditions. The direct dependence on the sea for much of the island’s wildlife (e.g. seabirds, marine iguanas, sea lions) is abundantly evident and provides an inseparable link between the terrestrial and marine worlds.

**Criterion (x):** The islands have relatively high species diversity for such young oceanic islands, and contain emblematic taxa such as giant tortoises and land iguanas, the most northerly species of penguin in the world, flightless cormorants as well as the historically important Darwin’s finches and Galapagos mockingbirds. Endemic flora such as the giant daisy trees Scalesia spp. and many other genera have also radiated on the islands, part of a native flora including about 500 vascular plant species of which about 180 are endemic. Examples of endemic and threatened species include 12 native terrestrial mammal species (11 endemic, with 10 threatened or extinct) and 36 reptile species (all endemic and most considered threatened or extinct), including the only marine iguana in the world. Likewise the marine fauna has an unusually high level of diversity and endemism, with 2,909 marine species identified with 18.2% endemism. High profile marine species include sharks, whale sharks, rays and cetaceans. The interactions between the marine and terrestrial biotas (e.g. sea lions, marine and terrestrial iguanas, and seabirds) are also exceptional. Recent exploration of deep sea communities continues to produce new additions to science.

**Integrity**

The Galapagos archipelago is located about 1,000 km from continental Ecuador and is composed of 127 islands, islets and rocks, of which 19 are large and 4 are inhabited. 97% of the total emerged surface (7,665,100 ha) was declared National Park in 1959. Human settlements are restricted to the remaining 3% in specifically zoned rural and urban areas on four islands (a fifth island only has an airport, tourism dock, fuel containment, and military facilities). The islands are surrounded by the Galapagos Marine Reserve which was created in 1986 (70,000 km2) and extended to its current area (133,000 km2) in 1998, making it one of the largest marine reserves in the world. The marine reserve includes inland waters of the archipelago (50,100 km2) in addition to all those contained within 40 nautical miles, measured from the outermost coastal islands. Airports on two islands (Baltra and San Cristobal) receive traffic from continental Ecuador with another airport on Isabela mostly limited to inter-island traffic. All the inhabited islands have ports to receive merchandise. The other uninhabited islands are strictly controlled with carefully planned tourist itineraries limiting visitation. Around 30,000 people live on the islands, and approximately 170,000 tourists visit the islands each year.

**Protection and management requirements**

The main threats to the Galapagos are the introduction of invasive species, increased tourism, demographic growth, illegal fishing and governance issues (i.e. who takes responsibility for decisions given the large number of stakeholders with conflicting interests involved in managing the islands). These issues are constantly analyzed and monitored to adequately manage them and reinforce strategies to minimize their impact. In 1986 a law was passed to control fishing and over-exploitation of Galapagos marine resources. Protection was further strengthened by the “Special Regime Law for the Conservation and Sustainable Development in the Province of the Galapagos” of 1998, and inscribed in the Constitution of the Republic of Ecuador. This law designated the current Galapagos Marine Reserve as a protected area under the responsibility of the Galapagos National Park Service. Among other issues, it provides the specific legal framework over which many aspects of island life are to be regulated, including provincial planning; inspection and quarantine measures; fisheries management; control and marine monitoring; residency and migration of people to the islands; tourism through a visitor management system, permits and quotas; agriculture; waste management; and “total control” of introduced species. This management imposes some limitations on the exercise of the rights of people living in this geographical area, but also provides them with preferential rights to use the natural resources sustainably. Within this framework the Galapagos National Park Service has periodically prepared Management Plans since 1974 to date, which have been developed in a participatory manner among the different social and economic groups through community representatives and local authorities to address the changing realities of the Galapagos ecosystem. This includes tools for development and conservation management of natural resources in harmony with international standards. For example, a zoning system has been implemented to establish areas of sustainable use and areas prohibited to the local population. Governmental institutions contribute to the funding of conservation and management in the archipelago. Other support comes from the entry fee paid by tourists and a small percentage from international donations.

**Gough and Inaccessible Islands**

Site: Gough and Inaccessible Islands

Country: United Kingdom of Great Britain and Northern Ireland

Region: Atlantic Ocean

Year of Inscription: 1995, extended in 2004

Size: 79 km²

Buffer zone: 3 900 km²

Retrospective Statement of Outstanding Universal Value (2014)

Source: 38COM 8E: <http://whc.unesco.org/archive/2014/whc14-38com-8E-en.pdf>

**Brief synthesis**

Gough and Inaccessible Islands are two extraordinary uninhabited oceanic islands that have remained relatively undisturbed, and are therefore of special conservation significance. Gough Island is one of the largest cool-temperate oceanic islands in the world that remains close to pristine, having been spared most introductions of invasive species that have decimated unique island biodiversity elsewhere. While Inaccessible Island is smaller, it is of no lesser significance, housing a number of species endemic to this tiny speck in the South Atlantic Ocean.

The spectacular cliffs of each island, towering above the ocean, host some of the most important seabird colonies in the world. These include albatrosses, petrels, and penguins, reliant on the rich marine life surrounding them. Gough Island is home to two endemic species of land birds as well as twelve endemic plant species. Inaccessible Island also boasts three endemic subspecies and one endemic species of land bird – the Inaccessible Rail, which is the smallest flightless bird in the world –, and some eight endemic plant species. This island is also the only place where the Spectacled Petrel breeds, while the Atlantic Petrel and the Tristan Albatross are almost entirely restricted to breeding on Gough. The islands’ undisturbed nature makes them particularly valuable for biological research.

**Criterion (vii):** Two eroded remnants of long-extinct volcanos, Gough and Inaccessible Islands display outstanding natural beauty. Their precipitous cliffs around much of the coastline, covered with breeding seabirds, are highly spectacular.

**Criterion (x):** Gough and Inaccessible Island represent two of the least disturbed cool-temperate island ecosystems in the South Atlantic Ocean, and are internationally important for their colonies of some 22 species of seabirds, several of which only breed here. They also support a number of endemic species and subspecies of land birds, including the Gough Moorhen (a flightless rail) and the Gough Bunting, both endemic to Gough, and the Inaccessible Rail, the smallest flightless bird in the world, endemic to Inaccessible Island. This island forms part of the Tristan Endemic Bird Area, and Gough has been designated as its own Endemic Bird Area by BirdLife International. Key seabird species include the Atlantic Petrel, Spectacled Petrel, Tristan Albatross, Sooty Albatross, the subspecies of Yellow-nosed Albatross, and the Northern Rockhopper Penguin. The islands also support some 40 plant species (including vascular plants, bryophytes and lichens), which are endemic to the Tristan da Cunha island group, including a number of which are endemic to Gough and/or Inaccessible Islands.

**Integrity**

Gough and Inaccessible Islands are one of the most pristine environments left on earth. These remote South Atlantic islands, surrounded by protected marine areas of 12 nautical miles, are home to unique assemblages of plants and animals effectively isolated from the rest of the world by 2,000 nm of open ocean and some of the world’s fiercest weather.

Inaccessible Island is one of the few oceanic islands with no introduced mammals, whereas Gough has introduced House Mice, significant predators of seabird chicks, and will, if uncontrolled, gradually reduce the biological value of the site. *Sagina procumbens*, an aggressive alien plant accidentally introduced during the 1990s, and a few other introduced plant species such as New Zealand Flax, could also degrade the integrity of the property if current control measures prove inadequate. However, the virtually undisturbed condition of Gough and Inaccessible Islands makes them particularly valuable for conservation and biological research. The islands are strictly managed as a Wildlife Reserve, IUCN Protected Area category 1, with research and weather monitoring the only activities permitted.

**Protection and management requirements**

Tristan da Cunha (including Gough and Inaccessible Islands) is a United Kingdom Overseas Territory forming part of the UK Overseas Territory of St Helena, Ascension, and Tristan da Cunha, and is administered by a UK-appointed representative, with support from an elected Island Council. The management authority is the Tristan Conservation Department, which employs permanent staff members supported by casual workers and the Tristan “Darwin team”. The Tristan da Cunha Environment Charter outlines the environmental management commitments of the UK Government and the Government of Tristan da Cunha, and serves as a framework policy to guide the development of management policies and plans. The Conservation of Native Organisms and Natural Habitats (Tristan da Cunha) Ordinance 2006 gives statutory force to the general protection of the property, which is classified as a Nature Reserve. This provides strict protection to all native organisms and makes it an offence to transport any native organisms between islands or to introduce any non-native organisms. In parallel to this, the Tristan da Cunha Fisheries Limits Ordinance 1983 provides for the control of commercial fishing activity within the Tristan da Cunha exclusive economic zone, up to 200 nm offshore from the islands.

The Gough and Inaccessible Islands World Heritage Site Management Plan focuses on identifying priority actions for the conservation of the property over a five year period, and does not supersede the two existing Management Plans for Gough and Inaccessible Islands. The Tristan da Cunha government has also developed a Biodiversity Action Plan that relates closely to the World Heritage Site Management Plan but covers the entire island group and its seas. A detailed operating/conduct code developed by the Tristan Government provides guidelines on best practice to be observed by visitors and managers of the two islands. Separate zoning strategies for Gough and Inaccessible Islands have been developed. On Gough, there are Logistic, Marine, Scientific research, and Conservation zones; on Inaccessible there are Accommodation, Natural, Wilderness, and Marine zones. Within these various areas, defined in detail in the respective Management Plans, certain activities are constrained or allowed. A single zoning strategy is needed covering the whole World Heritage property, including the marine area.

The UK is a State Party to the Ramsar and Bonn Conventions; the UN Convention on Biological Diversity; and the Agreement on the Conservation of Albatrosses and Petrels (ACAP).These conventions provide international obligations for the conservation of albatrosses and petrels, including the protection of important habitats and species. By agreement with the Tristan da Cunha government, these international conventions have been extended to cover Tristan da Cunha, and therefore the Tristan Government is obliged to fulfil their requirements locally.

In common with many island ecosystems around the world, alien invasive species are the most important immediate threat to the ecology of Gough and Inaccessible Islands. House Mice were introduced to Gough Island in the 19th century, and are known to have adverse impacts on both terrestrial and marine birds on Gough. In partnership with the Royal Society for the Protection of Birds, a mouse eradication programme as well as programmes to control or eliminate invasive plant species including *Sagina procumbens* and New Zealand Flax are underway. Protocols are in place to ensure that no new introductions occur.

# Great Barrier Reef

# Site: Great Barrier Reef

Country: Australia

Region: Pacific Ocean

Year of Inscription: 1981

Size: 348 700 km²

Retrospective Statement of Outstanding Universal Value (2012)

Source: 36COM 8E: <http://whc.unesco.org/archive/2012/whc12-36com-8Ee.pdf>

**Brief synthesis**

As the world’s most extensive coral reef ecosystem, the Great Barrier Reef is a globally outstanding and significant entity. Practically the entire ecosystem was inscribed as World Heritage in 1981, covering an area of 348,000 square kilometres and extending across a contiguous latitudinal range of 14º(10ºS to 24ºS). The Great Barrier Reef (hereafter referred to as GBR) includes extensive cross-shelf diversity, stretching from the low water mark along the mainland coast up to 250 kilometres offshore. This wide depth range includes vast shallow inshore areas, mid-shelf and outer reefs, and beyond the continental shelf to oceanic waters over 2,000 metres deep.

Within the GBR there are some 2,500 individual reefs of varying sizes and shapes, and over 900 islands, ranging from small sandy cays and larger vegetated cays, to large rugged continental islands rising, in one instance, over 1,100 metres above sea level. Collectively these landscapes and seascapes provide some of the most spectacular maritime scenery in the world.

The latitudinal and cross-shelf diversity, combined with diversity through the depths of the water column, encompasses a globally unique array of ecological communities, habitats and species. This diversity of species and habitats, and their interconnectivity, make the GBR one of the richest and most complex natural ecosystems on earth. There are over 1,500 species of fish, about 400 species of coral, 4,000 species of mollusk, and some 240 species of birds, plus a great diversity of sponges, anemones, marine worms, crustaceans, and other species. No other World Heritage property contains such biodiversity. This diversity, especially the endemic species, means the GBR is of enormous scientific and intrinsic importance, and it also contains a significant number of threatened species. At time of inscription, the IUCN evaluation stated "… if only one coral reef site in the world were to be chosen for the World Heritage List, the Great Barrier Reef is the site to be chosen".

**Criterion (vii):** The GBR is of superlative natural beauty above and below the water, and provides some of the most spectacular scenery on earth. It is one of a few living structures visible from space, appearing as a complex string of reefal structures along Australia's northeast coast. From the air, the vast mosaic patterns of reefs, islands and coral cays produce an unparalleled aerial panorama of seascapes comprising diverse shapes and sizes. The Whitsunday Islands provide a magnificent vista of green vegetated islands and spectacular sandy beaches spread over azure waters. This contrasts with the vast mangrove forests in Hinchinbrook Channel, and the rugged vegetated mountains and lush rainforest gullies that are periodically cloud-covered on Hinchinbrook Island. On many of the cays there are spectacular and globally important breeding colonies of seabirds and marine turtles, and Raine Island is the world’s largest green turtle breeding area. On some continental islands, large aggregations of over-wintering butterflies periodically occur.

Beneath the ocean surface, there is an abundance and diversity of shapes, sizes and colours; for example, spectacular coral assemblages of hard and soft corals, and thousands of species of reef fish provide a myriad of brilliant colours, shapes and sizes. The internationally renowned Cod Hole near Lizard Island is one of many significant tourist attractions. Other superlative natural phenomena include the annual coral spawning, migrating whales, nesting turtles, and significant spawning aggregations of many fish species.

**Criterion (viii):** The GBR, extending 2,000 kilometres along Queensland's coast, is a globally outstanding example of an ecosystem that has evolved over millennia. The area has been exposed and flooded by at least four glacial and interglacial cycles, and over the past 15,000 years reefs have grown on the continental shelf. During glacial periods, sea levels dropped, exposing the reefs as flat-topped hills of eroded limestone. Large rivers meandered between these hills and the coastline extended further east. During interglacial periods, rising sea levels caused the formation of continental islands, coral cays and new phases of coral growth. This environmental history can be seen in cores of old massive corals. Today the GBR forms the world’s largest coral reef ecosystem, ranging from inshore fringing reefs to mid-shelf reefs, and exposed outer reefs, including examples of all stages of reef development. The processes of geological and geomorphological evolution are well represented, linking continental islands, coral cays and reefs. The varied seascapes and landscapes that occur today have been moulded by changing climates and sea levels, and the erosive power of wind and water, over long time periods. One-third of the GBR lies beyond the seaward edge of the shallower reefs; this area comprises continental slope and deep oceanic waters and abyssal plains.

**Criterion (ix):** The globally significant diversity of reef and island morphologies reflects ongoing geomorphic, oceanographic and environmental processes. The complex cross-shelf, longshore and vertical connectivity is influenced by dynamic oceanic currents and ongoing ecological processes such as upwellings, larval dispersal and migration.

Ongoing erosion and accretion of coral reefs, sand banks and coral cays combine with similar processes along the coast and around continental islands. Extensive beds of Halimeda algae represent active calcification and accretion over thousands of years.

Biologically the unique diversity of the GBR reflects the maturity of an ecosystem that has evolved over millennia; evidence exists for the evolution of hard corals and other fauna. Globally significant marine faunal groups include over 4,000 species of molluscs, over 1,500 species of fish, plus a great diversity of sponges, anemones, marine worms, crustaceans, and many others. The establishment of vegetation on the cays and continental islands exemplifies the important role of birds, such as the Pied Imperial Pigeon, in processes such as seed dispersal and plant colonisation. Human interaction with the natural environment is illustrated by strong ongoing links between Aboriginal and Torres Strait Islanders and their sea-country, and includes numerous shell deposits (middens) and fish traps, plus the application of story places and marine totems.

**Criterion (x):** The enormous size and diversity of the GBR means it is one of the richest and most complex natural ecosystems on earth, and one of the most significant for biodiversity conservation. The amazing diversity supports tens of thousands of marine and terrestrial species, many of which are of global conservation significance.

As the world's most complex expanse of coral reefs, the reefs contain some 400 species of corals in 60 genera. There are also large ecologically important inter-reefal areas. The shallower marine areas support half the world's diversity of mangroves and many seagrass species. The waters also provide major feeding grounds for one of the world's largest populations of the threatened dugong. At least 30 species of whales and dolphins occur here, and it is a significant area for humpback whale calving.

Six of the world’s seven species of marine turtle occur in the GBR. As well as the world’s largest green turtle breeding site at Raine Island, the GBR also includes many regionally important marine turtle rookeries. Some 242 species of birds have been recorded in the GBR. Twenty-two seabird species breed on cays and some continental islands, and some of these breeding sites are globally significant; other seabird species also utilize the area. The continental islands support thousands of plant species, while the coral cays also have their own distinct flora and fauna.

**Integrity**

The ecological integrity of the GBR is enhanced by the unparalleled size and current good state of conservation across the property. At the time of inscription it was felt that to include virtually the entire Great Barrier Reef within the property was the only way to ensure the integrity of the coral reef ecosystems in all their diversity.

A number of natural pressures occur, including cyclones, crown-of-thorns starfish outbreaks, and sudden large influxes of freshwater from extreme weather events. As well there is a range of human uses such as tourism, shipping and coastal developments including ports. There are also some disturbances facing the GBR that are legacies of past actions prior to the inscription of the property on the World Heritage list.

At the scale of the GBR ecosystem, most habitats or species groups have the capacity to recover from disturbance or withstand ongoing pressures. The property is largely intact and includes the fullest possible representation of marine ecological, physical and chemical processes from the coast to the deep abyssal waters enabling the key interdependent elements to exist in their natural relationships.

Some of the key ecological, physical and chemical processes that are essential for the long-term conservation of the marine and island ecosystems and their associated biodiversity occur outside the boundaries of the property and thus effective conservation programs are essential across the adjoining catchments, marine and coastal zones.

**Protection and management requirements**

The GBR covers approximately 348,000 square kilometres. Most of the property lies within the GBR Marine Park: at 344,400 square kilometres, this Federal Marine Park comprises approximately 99% of the property. The GBR Marine Park's legal jurisdiction ends at low water mark along the mainland (with the exception of port areas) and around islands (with the exception of 70 Commonwealth managed islands which are part of the Marine Park). In addition the GBR also includes over 900 islands within the jurisdiction of Queensland, about half of which are declared as 'national parks', and the internal waters of Queensland that occur within the World Heritage boundary (including a number of long-established port areas).

The World Heritage property is and has always been managed as a multiple-use area. Uses include a range of commercial and recreational activities. The management of such a large and iconic world heritage property is made more complex due to the overlapping State and Federal jurisdictions. The Great Barrier Reef Marine Park Authority, an independent Australian Government agency, is responsible for protection and management of the GBR Marine Park. The Great Barrier Reef Marine Park Act 1975 was amended in 2007 and 2008, and now provides for “the long term protection and conservation ... of the Great Barrier Reef Region” with specific mention of meeting "... Australia's responsibilities under the World Heritage Convention".

Queensland is responsible for management of the Great Barrier Reef Coast Marine Park, established under the Marine Parks Act 2004 (Qld). This is contiguous with the GBR Marine Park and covers the area between low and high water marks and many of the waters within the jurisdictional limits of Queensland. Queensland is also responsible for management of most of the islands.

The overlapping jurisdictional arrangements mean that the importance of complementary legislation and complementary management of islands and the surrounding waters is well recognised by both governments. Strong cooperative partnerships and formal agreements exist between the Australian Government and the Queensland Government. In addition, strong relationships have been built between governments and commercial and recreational industries, research institutions and universities. Collectively this provides a comprehensive management influence over a much wider context than just the marine areas and islands.

Development and land use activities in coastal and water catchments adjacent to the property also have a fundamental and critical influence on the values within the property. The Queensland Government is responsible for natural resource management and land use planning for the islands, coast and hinterland adjacent to the GBR. Other Queensland and Federal legislation also protects the property’s Outstanding Universal Value addressing such matters as water quality, shipping management, sea dumping, fisheries management and environmental protection.

The Federal Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) provides an overarching mechanism for protecting the World Heritage values from inappropriate development, including actions taken inside or outside which could impact on its heritage values. This requires any development proposals to undergo rigorous environmental impact assessment processes, often including public consultation, after which the Federal Minister may decide, to approve, reject or approve under conditions designed to mitigate any significant impacts. A recent amendment to the EPBC Act makes the GBR Marine Park an additional 'trigger' for a matter of National Environmental Significance which provides additional protection for the values within the GBR.

The GBR Marine Park and the adjoining GBR Coast Marine Park are zoned to allow for a wide range of reasonable uses while ensuring overall protection, with conservation being the primary aim. The zoning spectrum provides for increasing levels of protection for the 'core conservation areas' which comprise the 115,000 square kilometres of ‘no-take’ and ‘no-entry’ zones within the GBR.

While the Zoning Plan is the 'cornerstone' of management and provides a spatial basis for determining where many activities can occur, zoning is only one of many spatial management tools and policies applied to collectively protect the GBR. Some activities are better managed using other spatial and temporal management tools like Plans of Management, Special Management Areas, Agreements with Traditional Owners and permits (often tied to specific zones or smaller areas within zones, but providing a detailed level of management not possible by zoning alone). These statutory instruments also protect the Outstanding Universal Value of the property.

Many Aboriginal and Torres Strait Island peoples undertake traditional use of marine resource activities to provide traditional food, practice their living maritime culture, and to educate younger generations about traditional and cultural rules and protocols. In the GBR these activities are managed under both Federal and Queensland legislation and policies including Traditional Use of Marine Resource Agreements (TUMRAs) and Indigenous Land Use Agreements (ILUAs). These currently cover some 30 per cent of the GBR inshore area, and support Traditional Owners to maintain cultural connections with their sea country.

Similarly non-statutory tools like site management and Industry Codes of Practice contribute to the protection of World Heritage values. Some spatial management tools are not permanently in place nor appear as part of the zoning, yet achieve effective protection for elements of biodiversity (e.g. the temporal closures that are legislated across the GBR prohibit all reef fishing during specific moon phases when reef fish are spawning).

Other key initiatives providing increased protection for the GBR include the comprehensive Great Barrier Reef Outlook Report (and its resulting 5-yearly reporting process); the Reef Water Quality Protection Plan; the GBR Climate Change Action Plan; and the Reef Guardians Stewardship Programs which involve building relationships and working closely with those who use and rely on the GBR or its catchment for their recreation or their business.

The 2009 Outlook Report identified the long-term challenges facing the GBR; these are dominated by climate change over the next few decades. The extent and persistence of damage to the GBR ecosystem will depend to a large degree on the amount of change in the world’s climate and on the resilience of the GBR ecosystem to such change. This report also identified continued declining water quality from land-based sources, loss of coastal habitats from coastal development, and some impacts from fishing, illegal fishing and poaching as the other priority issues requiring management attention for the long-term protection of the GBR.

Emerging issues since the 2009 Outlook Report include proposed port expansions, increases in shipping activity, coastal development and intensification and changes in land use within the GBR catchment; population growth; the impacts from marine debris; illegal activities; and extreme weather events including floods and cyclones.

Further building the resilience of the GBR by improving water quality, reducing the loss of coastal habitats and increasing knowledge about fishing and its effects and encouraging modified practices, will give the GBR its best chance of adapting to and recovering from the threats ahead, including the impacts of a changing climate.

**Gulf of Porto: Calanche of Piana, Gulf of Girolata, Scandola Reserve**

Site: Gulf of Porto: Calanche of Piana, Gulf of Girolata, Scandola Reserve

Country: France

Region: Mediterranean Sea

Year of Inscription: 1983

Size: 118 km²

## Description of Outstanding Universal Value (1983)Source: CONF 009 VIII: <http://whc.unesco.org/en/decisions/3967>

**N(ii)(iii)(iv)**

**Ha Long Bay**

Site: Ha Long Bay

Country: Viet Nam

Region: South China Sea

Year of Inscription: 1994, extended in 2000

Size: 1 500 km²

Retrospective Statement of Outstanding Universal Value (2012)

Source: 36COM 8E: <http://whc.unesco.org/archive/2012/whc12-36com-8Ee.pdf>

 **Brief synthesis**

Ha Long Bay, located in the Gulf of Tonkin, within Quang Ninh Province, in the northeast of Vietnam, is165 km from the capitol of Ha Noi. Covering an area of 43,400 ha and including over 1600 islands and islets, most of which are uninhabitated and unaffected by humans, it forms a spectacular seascape of limestone pillars and is an ideal model of a mature Karst landscape developed during a warm and wet tropical climate. The property’s exceptional scenic beauty is complemented by its great biological interest.

The outstanding value of the property is centered around the drowned limestone karst landforms, displaying spectacular pillars with a variety of coastal erosional features such as arches and caves which form a majestic natural scenery. The repeated regression and transgression of the sea on the limestone karst over geological time has produced a mature landscape of clusters of conical peaks and isolated towers which were modified by sea invasion, adding an extra elemant to the process of lateral undercutting of the limstone towers and islands.

**Criterion (vii)**: Comprised of a multitude of limestone islands and islets rising from the sea, in a variety of sizes and shapes and presenting picturesque, unspoiled nature, Ha Long Bay is a spectacular seascape sculpted by nature. The property retains a high level of naturalness, and despite its long history of human use, is not seriously degraded. Outstanding features of the property include the magnificent towering limestone pillars and associated notches, arches and caves, which are exceptionally well-developed and among the best presented of their type in the world.

**Criterion (viii)**: As the most extensive and best known example of marine-invaded tower karst in the world Ha Long Bay is one of the world’s most important areas of Fengcong (clusters of conical peaks) and Fenglin (isolated tower features) karst. Abundant lakes, occupying drowned dolines, are one of the distinctive features of the Fencong karst, with some appearing to be tidal. Possessing a tremendous diversity of caves and other landforms derived from the unusual geomorphological process of marine invaded tower karst the caves are of three main types: remnants of phreatic caves; old karstic foot caves and marine notch caves. The property also displays the full range of karst formation processes on a very large scale and over a very long period of geological time, possessing the most complete and extensive exzample of its type in the world and providing a unique and extensive reservoir of data for the future understanding of geoclimatic history and the nature of karst processes in a complex environment.

**Integrity**

All elements necessary to sufficiently protect the outstanding scenic and geological values of the Ha Long Bay property are included within the boundaries of the property and its size and area provide sufficient integrity for the large scale geomorphological processes to operate unhindered. It benefits from being completely surrounded by a large and extensive buffer zone with both the size and area providing sufficient integrity for the large scale geomorphic processes to operate unhindered.

Located within an area of high tourism, marine transport, fisheries and the daily activities of people living and conducting their business on Ha Long Bay, management of the area, instituted since inscription of the property, applies strict regulation and control of activities in an attempt to minimize impacts on the integrity of the property. There is a continuing challenge to improve the integrity and quality of the environment. The natural scenic features, geomorphology, landform values and cultural heritage along with key features such as islands, caves and grottoes remain intact and the property retains a high level of naturalness despite the long history of human use in the area.

**Protection and management requirements**

Ha Long Bay was established as a historical and cultural relict and classified as a National Landscape Site in 1962. Subsequently designated as a Special National Landscape Site under the Cultural Heritage Law amended in 2009, land tenure is held by the Provincial Government. The property is protected effectively by a number of relevant provincial and national laws as well as governmental decrees including; the Cultural Heritage Law, the Bio-Diversity Law, the Tourism Law, the Environmental Protection Law, the Fishery Law and Marine Transport Law. Under these laws, any proposed action within the property that could have significant impact on the property’s values must have official approval from the Ministry of Culture, Sports and Tourism, along with other relevant ministries.

The Ha Long Bay Management Department was established after the inscription of Ha Long Bay on the World Heritage List, with the main functions of management, conservation and promotion of the property’s values. The Department takes into account the requirements of the World Heritage Convention, recommendations of the World Heritage Committee and other regulations issued by both the Vietnamese Government and the Quang Ninh Province. Day-to-day management involves collaboration with various relevant stakeholders at different levels, especially local communities, to maintain the integrity of the property and monitor socio-economic activities.

Socio-economic activities on Ha Long Bay are well regulated, carefully observed and effectively managed. Management and protection are further strengthened through regulations, master planning, and action plans at the provincial level. These include regulations on operation of tourist boats, mud dredging, land filling, fishermen and floating house management. They also provide for education and promotion, and enhancing community awareness of heritage values and their protection. There are several specific plans dealing with environmental protection, tourism development and management and conservation planning. These include Ha Long Bay to 2020, the master plan on conservation, management and development of the values of World Natural Heritage approved by the Prime Minister in 2001, and the Comprehensive Management Plan for the Ha Long Bay World Heritage Site 2010 - 2015 approved by the provincial authority in 2010.

In the long-term, management of the property will focus on: ensuring the integrity of the scenic, geological and geomorphologic values, as well as the property’s environment; strengthening the legislative provisions; carefully monitoring of the socio-economic activities on Ha Long Bay; increasing the use of technology in heritage management; undertaking research to gain better understanding of the property’s values; improving the staff capacity and enhancing community awareness and involvement.

Increasing visitor numbers and associated impacts continue to impact on the management of the property. The sensitivity, aesthetic quality and attention to public safety of infrastructure such as pathways, steps and boardwalks is of a high standard and with steadily increasing visitor numbers the quality of visitor management is also steadily improving. Development pressures associated with growing tourist numbers continue to be an issue for government authorities and an appropriate balance between conservation and development, while difficult to maintain, is important to ensure the protection of the natural values of the property.

**Heard and McDonald Islands**

Site: Heard and McDonald Islands

Country: Australia

Region: Southern Ocean

Year of Inscription: 1997

Size: 6 589,03 km²

Retrospective Statement of Outstanding Universal Value (2012)

Source: 36COM 8E: <http://whc.unesco.org/archive/2012/whc12-36com-8Ee.pdf>

**Brief synthesis**

Heard and McDonald Islands are remote sub-Antarctic volcanic islands located in the southern Indian Ocean about half-way between Australia and South Africa, and just over 1,600 kilometres from Antarctica. The property covers a total area of 658,903 hectares of which about 37,000 hectares is terrestrial, and the remainder marine. The islands are a unique wilderness, containing outstanding examples of biological and physical processes continuing in an environment essentially undisturbed by humans.

Heard Island is dominated by Big Ben (an active volcano rising to a height of 2,745 metres), and is largely covered by snow and glaciers. McDonald Island is much smaller, covering only 100 hectares at the time of inscription, and is surrounded by several smaller rocks and islands. The only active sub-Antarctic volcanos are found on these islands, with the volcano on McDonald Island erupting after inscription and doubling the size of the island. The island group’s physical processes provide valuable indicators of the role of crustal plates in the formation of ocean basins and continents, of dynamic glacial changes in the coastal and submarine environment, and of atmospheric and oceanic warming. The large populations of marine birds and mammals, combined with a virtual absence of introduced species, provide a unique arena for the maintenance of biological and evolutionary processes.

**Criterion (viii)**: The islands contain outstanding examples of significant on-going geological processes occurring in an essentially undisturbed environment, particularly physical processes which provide an understanding of the role of crustal plates in the formation of ocean basins and continents, and of atmospheric and oceanic warming. The islands are distinctive among oceanic islands in being founded upon a major submarine plateau which in this case deflects Antarctic circumpolar waters northwards, with striking consequences for geomorphological processes. They also offer an active example of plume volcanism, providing direct geological evidence of the action of the longest operational plume system known in the world. This includes information about plume interaction with overlying crustal plates, as well as insights into mantle plume composition due to the widest range of isotopic compositions of strontium, neodymium, lead and helium known from any oceanic island volcano system. Big Ben on Heard Island is the only known continuously active volcano on a sub-Antarctic island, whereas the volcano on MacDonald Island recently became active again after a 75,000 year period of dormancy, increasing significantly in size since inscription.

Heard Island’s relatively shallow and fast-flowing glaciers respond quickly to climate change, faster than any glaciers elsewhere, making them particularly important in monitoring climate change. They have fluctuated dramatically in recent decades and have retreated significantly.

**Criterion (ix)**: Heard Island and McDonald Islands are outstanding examples representing significant on-going ecological, biological, and evolutionary processes. As the only sub-Antarctic islands virtually free of introduced species and with negligible modification by humans, they are a classic example of a sub-Antarctic island group with large populations of marine birds and mammals numbering in the millions, but low species diversity. These intact ecosystems provide opportunities for ecological research investigating population dynamics and interactions of plant and animal species, as well as monitoring the health and stability of the larger southern oceans ecosystem. Areas of newly deglaciated land as well as areas isolated from each other by glaciers provide unparalleled opportunities for the study of the dispersal and establishment of plants and animals.

The islands also furnish crucial, alien-free habitat for large populations of marine birds and mammals, including major breeding populations of seals, petrels, albatrosses and penguins. Endemic species demonstrating ongoing evolutionary processes include the Heard Island cormorant, the endemic subspecies of the Heard Island sheathbill, and a number of endemic invertebrates (some endemic to Heard and McDonald Islands, and some endemic to the Heard and McDonald Islands-Kerguelen region).

**Integrity**

The islands form a discrete entity of sufficient size to fulfil the conditions of integrity, plus are of very high wilderness quality and are the least disturbed of all sub-Antarctic islands. They are subject to low anthropogenic pressures except for the largely unknown impact of commercial fisheries on the marine ecosystem. However, commercial fishing is not permitted within the property, or in the Marine Reserve within which it is located. Heard Island’s remoteness and harsh climate have ensured that human occupation, notably 19th century sealing, and research activity from 1947 to 1955, has been very restricted. The McDonald Islands have only had two brief visits, and there has been no protracted stay ashore on Heard Island since a winter research programme in 1992, the first winter occupation of the island since 1954.

**Protection and management requirements**

The area is managed as a strict nature reserve (IUCN Category 1a) by the Australian Antarctic Division through the Australian Government’s Heard Island and McDonald Islands Marine Reserve Management Plan that covers marine reserves in the same region as well as the World Heritage Area.

The main management requirements are the maintenance of strict visitation and quarantine controls to maintain natural conditions and ecological integrity, and to prevent the introduction of pathogens and non-native species. Human activity in the reserve is expected to continue to slowly increase in line with interest in the region for science, tourism and fisheries. The management goal must be to prevent the introduction of alien species by minimising the risk of introductions occurring. Fisheries in the region require careful management to minimise the potential of adverse impacts on the marine-dependent fauna of the islands.

All World Heritage properties in Australia are ‘matters of national environmental significance’ protected and managed under national legislation, the Environment Protection and Biodiversity Conservation Act 1999. This Act is the statutory instrument for implementing Australia’s obligations under a number of multilateral environmental agreements including the World Heritage Convention. By law, any action that has, will have or is likely to have a significant impact on the World Heritage values of a World Heritage property must be referred to the responsible Minister for consideration. Substantial penalties apply for taking such an action without approval. Once a heritage place is listed, the Act provides for the preparation of management plans which set out the significant heritage aspects of the place and how the values of the site will be managed.

Importantly, this Act also aims to protect matters of national environmental significance, such as World Heritage properties, from impacts even if they originate outside the property or if the values of the property are mobile (as in fauna). It thus forms an additional layer of protection designed to protect values of World Heritage properties from external impacts. In 2007 the Heard and McDonald Islands World Heritage Area was added to the National Heritage List in recognition of its national heritage significance.

**High Coast / Kvarken Archipelago**

Site: High Coast / Kvarken Archipelago

Country: Finland and Sweden

Region: Baltic Sea

Year of Inscription: 2000, extended in 2006

Size: 3 369 km²

Retrospective Statement of Outstanding Universal Value (2013)

Source: 37COM 8E: <http://whc.unesco.org/archive/2013/whc13-37com-8E-en.pdf>

**Brief synthesis**

The High Coast in Sweden and the Kvarken Archipelago in Finland are situated on opposite sides of the Gulf of Bothnia, in the northern part of the Baltic Sea. This vast area of 346,434 ha (of which about 100,700 ha are terrestrial) is where high meets low: the High Coast’s hilly scenery with high islands, steep shores, smooth cliffs, and deep inlets is a complete contrast to the Kvarken Archipelago with its thousands of low‐lying islands, shallow bays, moraine ridges and massive boulder fields. This part of the world has experienced several Ice Ages during the last 2‐3 million years and has been under the centre of the continental ice sheet a number of times. Present land uplift started when the ice began to melt about 18,000 years ago and the earth’s crust was gradually released from the weight of the ice.

The landscape of the High Coast/Kvarken Archipelago today is mainly the result of the last Ice Age and the impact of the sea and the succession of vegetation. After the last glaciation, the land has elevated a total of 800 metres, with the highest uplift in the world after the last Ice Age recorded here. For the past 10,500 years, the land has been rising at around 0.9 m per century, a phenomenon that can be observed in a human lifetime and is expected to continue. Continual elevation of the land results in the emergence of new islands and distinctive glacial landforms, while inlets become progressively cut off from the sea, transforming them into estuaries and ultimately lakes.

The Baltic Sea has undergone dramatic changes since the last Ice Age, including a series of transitions from marine water to freshwater and then to brackish water, consequently causing subsequent changes in plant and animal life. This serial transboundary property serves as an outstanding example of the continuity of this change with dynamic ongoing geological processes forming the land- and seascape, including interesting interactions with biological processes and ecosystem development.

**Criterion (viii):** The High Coast/Kvarken Archipelago is of exceptional geological value for two main reasons. First, both areas have some of the highest rates of isostatic uplift in the world, meaning that the land still continues to rise in elevation following the retreat of the last inland ice sheet, with around 290 m of land uplift recorded over the past 10,500 years. The uplift is ongoing and is associated with major changes in the water bodies in post-glacial times. This phenomenon was first recognized and studied here, making the property a key area for understanding the processes of crustal response to the melting of the continental ice sheet. Second, the Kvarken Archipelago, with its 5,600 islands and surrounding sea, possesses a distinctive array of glacial depositional formations, such as De Geer moraines, which add to the variety of glacial land- and seascape features in the region. It is a global, exceptional and diverse area for studying moraine archipelagos. The High Coast and the Kvarken Archipelago represent complementary examples of post-glacial uplifting landscapes.

**Integrity**

The boundaries of this serial property comprise the areas with the most outstanding geological and geomorphological attributes of the site. The boundaries of the High Coast in Sweden encompass the principal area of national conservation interest, extending inland to include the full zonation of uplifted land and some of the highest shoreline, while excluding areas under large-scale forestry management. Seaward, the boundary incorporates key offshore islands and marine areas that are a logical extension of the topographic continuum of uplifted land surface, thus taking account of ongoing geological processes. The Kvarken Archipelago in Finland includes two separate areas of land and sea: the most superlative geological terrestrial formations, formations lying in the shallow sea, as well as the majority of the moraine features are included. While the geological boundaries of the property do not coincide with legal or administrative boundaries, the science behind their selection is justified. Note that about 71% of the property is sea. In the High Coast the sea is deep (as much as 293 m), while in the Kvarken Archipelago the sea is very shallow (with mean depth less than 10 m). Underwater geological formations have not been widely affected by erosion or processes such as colonization by vegetation or human activity. For the terrestrial portion, however, several large-scale development projects have been noted as issues which could affect the integrity of the property. While there is a small resident human population in the property (around 4,500 in the High Coast and 2,500 in the Kvarken Archipelago), people are engaged in small-scale traditional farming, forestry and fishing, all of which have negligible impact on geological values.

**Protection and management requirements**

In both Sweden and Finland, World Heritage management issues are dealt with at regional level, by established bodies with representatives from authorities, municipalities and local stakeholders. The relevant regional authorities and municipalities in Sweden and Finland have established a transnational consultative body, mainly to ensure that all three core areas of this serial transnational site have a joint management strategy for the property as a whole.

There is no particular legislation that directly protects the Outstanding Universal Values of the High Coast/Kvarken Archipelago, but the general environmental national legislation gives a satisfactory indirect protection of the entire property. About 37% of the property is either nature reserve or national park, and the site also belongs to the Natura 2000 European network of protected areas. All these different kinds of protected areas have regulations restricting land use, which provide a good level of protection to geological formations, as well as to flora and fauna. The remaining parts, about 63% of the property, do not have the same level of protection, but the national legislation gives possibilities for safeguarding the integrity of the property. Furthermore, the High Coast is a landscape of national interest, which gives the recreational and nature conservation values of the property additional legal protection and serves as guidance for societal development. In the Kvarken Archipelago, a regional land use plan protects its Outstanding Universal Value, as well as recognizes geological values in the zone between the two core areas on the Finnish side.

The effective management of the property needs to further develop an ecosystem approach that integrates the management of the protected areas with other key activities taking place on the property, such as infrastructural development of communities and industries, tourism, fishery and shipping. Potential threats in the future are major building projects that could destroy some part of outstanding geological features or have a severe impact on the important views of the property. Increasing visitor pressure and an oil or chemical spill in the sea are potential threats to the biological and cultural values. Global warming is not a threat to the land uplift phenomenon itself, as it will not affect the geological process. However, rising sea levels would influence the visible effects of land uplift in the coastal landscape, by reducing the area of new land emerging from the sea each year. Natural catastrophes, such as violent earthquakes or volcanic eruptions, are unlikely in Sweden and Finland.

All threats are addressed by implementing the national legislation, strategic planning measures and actions that aim to improve knowledge and awareness of the property values among authorities, stakeholders and the local population.

**Ibiza, Biodiversity and Culture**

Site: Ibiza, Biodiversity and Culture

Country: Spain

Region: Mediterranean Sea

Year of Inscription: 1999

Size: 112,31 km²

Description of Outstanding Universal Value (1999)

Source: CONF 209 VIII.B.1: <http://whc.unesco.org/en/decisions/2557>

The Committee decided to inscribe the site on the basis of natural *criteria (ii)* and *(iv)* and cultural *criteria (ii), (iii)* and *(iv)*.

**Natural criteria (ii) and (iv):**

The marine component of this site is characterised by the presence of dense and very well preserved prairies of oceanic Posidonia (seagrass) and coral reefs. Oceanic Posidonia only occurs in the Mediterranean basin and this site is the best preserved example within this region. The area also contains the most diverse community of *Cladocora caespitosa*, supporting 220 species, in the Mediterranean basin and habitat for three globally endangered species, including the Monk Seal. The area also contains an important community of *Ecteinascidia turbinata*, a marine species with recognised value to prevent and combat different types of cancer. Parts of the site are included in the List of Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) for migratory birds.

The Committee noted that since the twenty-third session of the Bureau, IUCN was informed about an EC-funded proposal to modify the port of Ibiza. IUCN has reviewed the EIA for this project and noted that it will not impact on the natural values of the site.

**Cultural criteria (ii), (iii) and (iv):**

**Criterion (ii)**: The intact 16th century fortifications of Ibiza bear unique witness to the military architecture and engineering and the aesthetics of the Renaissance. This Italian-Spanish model was very influential, especially in the construction and fortification of towns in the New World.

**Criterion (iii)**: The Phoenician ruins of Sa Caleta and the Phoenician-Punic cemetery of Puig des Molins are exceptional evidence of urbanization and social life in the Phoenician colonies of the western Mediterranean. They constitute a unique resource, in terms of volume and importance, of material from the Phoenician and Carthaginian tombs.

**Criterion (iv)**: The Upper Town of Ibiza is an excellent example of a fortified acropolis which preserves in an exceptional way in its walls and in its urban fabric successive imprints of the earliest Phoenician settlements and the Arab and Catalan periods through to the Renaissance bastions. The long process of building the defensive walls has not destroyed the earlier phases or the street pattern, but has incorporated them in the ultimate phase.

Several delegates and observers commended the State Party for this nomination and reminded it about the great challenges that growing tourism will pose to the protection of the site.

 **iSimangaliso Wetland Park**

Site: iSimangaliso Wetland Park

Country: South Africa

Region: Indian Ocean

Year of Inscription: 1999

Size: 2 395,66 km²

Retrospective Statement of Outstanding Universal Value (2011)

Source: 35COM 8E: <http://whc.unesco.org/archive/2011/whc11-35com-8Ee.pdf>

**Brief synthesis**

The iSimangaliso Wetland Park is one of the outstanding natural wetland and coastal sites of Africa. Covering an area of 239,566 ha, it includes a wide range of pristine marine, coastal, wetland, estuarine, and terrestrial environments which are scenically beautiful and basically unmodified by people. These include coral reefs, long sandy beaches, coastal dunes, lake systems, swamps, and extensive reed and papyrus wetlands, providing critical habitat for a wide range of species from Africa's seas, wetlands and savannahs. The interaction of these environments with major floods and coastal storms in the Park’s transitional location has resulted in continuing speciation and exceptional species diversity. Its vivid natural spectacles include nesting turtles and large aggregations of flamingos and other waterfowl.

**Criterion (vii)**: iSimangaliso is geographically diverse with superlative scenic vistas along its 220 km coast. From the clear waters of the Indian Ocean, wide undeveloped sandy beaches, a forested dune cordon and a mosaic of wetlands, grasslands, forests, lakes and savannah, the park contains exceptional aesthetic qualities. Three natural phenomena are judged outstanding. One is the shifting salinity states within Lake St. Lucia which are linked to wet and dry climatic cycles, with the lake responding accordingly with shifts from low to hyper-saline states. A second is the spectacle of large numbers of nesting turtles on the beaches and the abundance of dolphins and migration of whales and whale sharks off-shore. Finally, the huge numbers of waterfowl and large breeding colonies of pelicans, storks, herons and terns are impressive and add life to the wild natural landscape of the area.

**Criterion (ix)**: The combination of fluvial, marine and aeolian processes initiated in the early Pleistocene in iSimangaliso has resulted in a variety of landforms and continues to the present day. The Park’s transitional geographic location between sub-tropical and tropical Africa as well as the coastal setting have resulted in exceptional species diversity. Past speciation events in the Maputaland Centre of Endemism are also ongoing and contribute another element to the diversity and interplay of evolutionary processes at work in iSimangaliso. In the marine component of the site, the sediments being transported by the Agulhas current are trapped by submarine canyons on the continental shelf allowing for remarkably clear waters for the development of coral reefs. The interplay of this environmental heterogeneity is further complicated by major floods and coastal storms, events which are regularly experienced in iSimangaliso. The site is also of sufficient size and retains most of the key elements that are essential for long-term functioning of the ecosystems.

**Criterion (x)**: The five interlinked ecosystems found in iSimangaliso provide habitat for a significant diversity of African biota, including a large number of threatened and/or endemic species. The species lists for iSimangaliso are the lengthiest in the region and population sizes for most of them are viable. Of the over 6,500 plant and animal (including 521 bird) species recorded from the Park1, populations of species of conservation importance include 11 species endemic to the park, 108 species endemic to South Africa, while 467 species are listed as threatened in South Africa. The outstanding diversity of habitats (terrestrial, wetland, coastal and aquatic) supports a wide variety of animal species, some at the northern and many at the southern limit of their range.

**Integrity**

The property consists of 13 separate but contiguous conservation units totalling 239,566 ha including some 85,000 ha of marine reserves. Its history of conservation management dates back to 1895 when the first reserves were created by the Zululand Government, and later proposals for titanium sand mining were rejected. Ongoing integrity issues include the protection of catchment area and regional development (upstream water abstraction, agricultural practices and road construction); land claims (which may result in further boundary issues); resource harvesting and local community issues; and restoration of degraded habitats. A unified management system for all 13 components was also requested.

The park is not inhabited by people apart from six small townships in the Kosi Bay Coastal Forest Reserve (insert current number of inhabitants). There are also two villages (Makakatana and St Lucia Estuary) which are enclaves within the Park but not part of it. About 100,000 people from 48 tribal groups live in villages surrounding the Park and community conservation programmes are key to minimising conflicts and maximizing benefits. A progressive neighbour-relations policy fosters good relations with communities who live near the Park to ensure that they derive direct benefits from the protected area such as free access, business and employment.

**Protection and management requirements**

Management of the Park at the provincial level is by the KwaZulu-Natal Nature Conservation Service working with the provincial administration in accordance with national and provincial legislation. South Africa has solid legislation that affords iSimangaliso the necessary legal protection, such as the World Heritage Convention Act, 1999. iSimangaliso contains four Ramsar sites [St. Lucia Lake System (Ramsar Site # 345) (ii) Turtle Beaches/Coral Reefs of Tongaland (Ramsar Site # 344) (iii) Kosi Bay Lake System (Ramsar Site #527), and (iv) Lake Sibaya (Ramsar Site # 528)] that recognise the ecological functions of wetlands as well as their importance as resources of economic, cultural, scientific and recreational value. All human uses of iSimangaliso are subject to intensive management, research and monitoring. They are also confined to about a third of the total area while the remainder is free from extractive uses. Some funds to assist in community conservation have come from WWF, but the main funding to ensure that iSimangaliso management is adequately supported comes from the Province. A major threat to the Park is damage to the hydrology and salinity of the wetland system including reduction in the water supply by the transformation of the upper Mfolozi Swamps by agriculture. Serious droughts have raised salinity and killed off shoreline vegetation, causing bank erosion and silting of the lake. The Umfolozi River has also threatened to break into the lake, again raising the likelihood of sedimentation and invasion by sand and sea-water following breaching of the sand bar. Catastrophic events such as the grounding of an oil tanker near the park in 2002 also threaten the site. Other threats include damage by over-use (tourism and over-exploitation of resources such as unsustainable fishing). The park has high visitation rates and has been zoned into three ecotourism use-zones: a zone of low intensity use in the wilderness core of the Park where access is by foot except for staff; a moderate use zone where visitors can view wildlife from vehicles and from scattered camps and hides; and high intensity use zones where, at seven development nodes, there are roads, interpretative and educational displays, guided walks, accommodation and other facilities. Infestation by alien invasive plants is a problem, although limited in area at present. The worst invaders are *Chromolaena odorata*, *Psidium guajava*, *Pereckia acuelata* and *Melia azedarach*. Programmes by the Plant Protection Research Institute have used biological control, especially to remove plant infestations from important water-producing catchment areas. In addition pine and eucalyptus plantations around the lake have been removed to improve water seepage. In the past several land claims by impoverished communities have been lodged before the Land Claims Court. These areas include the Eastern Shores State Forest, Cape Vidal State Forest and Sodwana State Forest. One solution has been reached with the Mbuyazi whose rights near Cape Vidal have been recognised, not to settle, but to develop ancestral lands for tourism. More recently, there has been conflict over other large hotel developments launched in environmentally sensitive areas without contact with local stakeholders, environmental impact assessments or adequate infrastructure. However by 2004 it was stated that the land claimants and local communities were accepted as partners in the development of the Park.

**Islands and Protected Areas of the Gulf of California**

Site: Islands and Protected Areas of the Gulf of California

Country: Mexico

Region: Pacific Ocean

Year of Inscription: 2005, extended in 2007 and 2011

Size: 6 885,58 km²

Buffer zone: 12 104,77 km²

Retrospective Statement of Outstanding Universal Value (2013)

Source: 37COM 8E: <http://whc.unesco.org/archive/2013/whc13-37com-8E-en.pdf>

**Brief synthesis**

The Gulf of California in Northwestern Mexico, once famously dubbed the "Aquarium of the World", is recognized as an area of global marine conservation significance. Less known but equally spectacular are the terrestrial conservation values of the islands and coastal areas most of which are part of the Sonoran Desert. As a serial property, Islands and Protected Areas of the Gulf of California includes representative components of all major oceanographic zones of the biogeographically diverse Gulf, thereby capturing a broad spectrum of landscapes and conservation values. Extending from the Colorado River Delta in the north to 270 kilometres southeast of the tip of the Baja California Peninsula, the property includes 244 islands and islets clustered in eight major groups and another nine protected areas with coastal and marine zones. The total area is 1,837,194 hectares, of which about one quarter are terrestrial and the remainder marine. The rugged islands and coastal desert contrasting with the surrounding turquoise waters are of striking natural beauty. Speciation both on land in the many islands and in the Gulf has resulted in a notable diversity of life forms with a high degree of endemism. The productivity of the Gulf also leads an extraordinary natural abundance of many marine species. There are some 900 species of fish, around 90 of them endemic, and roughly one third of the World's marine mammals occur within the property. The islands and islets are mostly of volcanic origin. There are numerous species of succulents, including some of the World's tallest cacti, exceeding 25 meters in height. Overall, some 700 species of vascular plants have been recorded. There are many species and impressive numbers of resident and migratory birds with some small islands hosting major proportions of the global population of Heermann's Gulls, Blue-footed Booby and Black Storm Petrel.

**Criterion (vii):** The serial property is of stunning landscape beauty with dramatic contrasts between the rugged and seemingly inhospitable islands, coastal deserts and the brilliant reflection from the surrounding turquoise waters. High rocky cliffs and sandy beaches in countless forms and colours rim the islands and coasts. The beauty of the desert landscape is complemented by the fascinating and highly diverse desert vegetation and the ubiquitous birds. To the south, the islands are covered with deciduous vegetation and stand out from the vast blue sea. The diversity and abundance of marine life associated with spectacular submarine terrain and unusual water transparency turn the underwater seascape into a globally renowned diver’s paradise.

**Criterion (ix):** A major foundation of the Gulf of California's phenomenal marine productivity are nutrient-rich upwelling oceanic currents supporting abundant phytoplankton and zooplankton, which in turn provide nurseries for larval reef fish. However, many other oceanographic processes, such as wind-driven currents, tidal mixing and thermohaline circulation, occur in the property, giving it extraordinary importance for conservation and the study of marine and coastal processes. The Gulf of California is notable for containing ecologically distinct bridge islands, populated across past land bridges, and oceanic islands populated by sea and air. The multitude and diversity of islands in terms of origin, size, environmental conditions and distance to the mainland has enabled an ongoing evolutionary speciation and endemism of major significance for conservation and science. The many components of the property are both part of a vast landscape and distinctive in many ways, ranging from a variety of pelagic and benthic environments to coral reefs, as well as mudflats, coastal wetlands and various types of desert and deciduous forest.

**Criterion (x)**: The diversity of terrestrial and marine life in the property is extraordinary and constitutes a global priority for biodiversity conservation. On land, the close to 700 species of vascular plants are notable within a desert environment. There are 115 species of reptiles, almost half of them endemic, in some cases even to individual islands. 154 land bird species have been recorded and the property is of particular importance to migratory species. Almost 900 species of fish have been documented with some 90 species occurring exclusively in the Gulf of California or parts of it. These include the critically endangered species Black Sea Bass and Totoaba, as well as the vulnerable Basking Shark. The serial property provides habitat for roughly one third of the world’s total number of marine mammals, sometimes in impressive numbers, for example huge colonies of California Sea Lion. The five species of dolphin include the critically endangered Gulf Porpoise or "Vaquita". Eleven species of whale visit the northern Gulf, such as the endangered Blue Whale and Fin Whale and the vulnerable Sperm Whale. The coral reef at Cabo Pulmo is one of the most important in the Gulf of California and in the eastern Pacific. The marine habitats also harbour large concentrations of macro-invertebrate life with many endemic species, especially in the intertidal zones.

**Integrity**

All of the marine area and most of the 244 islands of the serial property are federally owned with only very few in private hands. Private owners typically do not live on the islands and the majority of the islands have no inhabitants, with some containing small settlements and camps of fishermen. Isla Maria Madre has been a state penitentiary since 1905. One particularity is the uninhabited Isla Tiburon (Shark Island), which is communally owned by the Seri indigenous peoples. The Seri consider the island a sacred site and carry out eremonies.

Overall, the past human impacts on land, for example from guano extraction and egg collection, are moderate. The serial approach is an adequate reflection of the biogeographic range and diversity of the Gulf of California and its islands. The great challenges to the integrity of the marine and coastal areas mostly stem from developments outside the protected areas, most importantly excessive fisheries, tourism and coastal development. Further extensions, including of vulnerable coastal areas and additional islands is an explicit

element of the regional conservation strategy and would help consolidate the integrity of the property and the entire Gulf of California.

**Protection and management requirements**

The vast serial property has a step-wise formal conservation history going back at least to the 1950s. All of the islands within the property have a formal protection status under Mexican environmental legislation. While all of the marine area and most of the islands are federally owned, even the privately owned islands are bound to conservation and management requirements determined for each protected area at the time of its declaration and refined in management plans. All islands are protected and managed by the National Commission for Natural Protected Areas (CONANP), a specialized agency of the Mexican Ministry of the Environment and Natural Resources cooperating with several other involved governmental agencies. CONANP being a decentralized agency, management activities are implemented by the pertinent regional branch and their local operational units. Conservation, management and research are financially and technically supported by a number of local, national and international non-governmental organisations. There is an Integrated Management Program guiding conservation and management activities in the entire serial property and co-management arrangements with local communities are sought. Major challenges in the operational management are the securing of long-term funding, as well as coordination and cooperation across five different states and differing formal conservation status of components.

The coasts of the Gulf of California and the larger islands close to the shore were historically settled before imported diseases severely decimated the indigenous cultures. More recently, guano and egg collection, hunting of sea lions and whaling occurred in the Gulf of California. Most such activities have long been phased out leaving the affected areas to recover naturally. Threats today include, on land, alien invasive species with herbivores and predators menacing the delicate small island systems. The biggest, ongoing impact on the marine conservation values stems from artisanal, industrial and sport fishing. Fisheries and shrimp trawling play an important role in the local economy but put ever more pressure on the resources. Management responses are needed to ensure that harvesting levels are adapted to the productivity in the entire Gulf. Looming potential threats include plans for large-scale tourism development. While adapted forms of tourism can have important benefits in terms of awareness-raising and conservation funding, some proposed projects appear incompatible with long-term conservation and local development objectives. From the coasts pollution from agriculture, industry and sewage are increasing. The Gulf of California is a global conservation gem, invaluable to science and as a resource for local economic development, namely fisheries and tourism. Investing in the property's conservation is an investment in the maintenance of its productivity and economic potential.

**Kluane / Wrangell-St. Elias / Glacier Bay / Tatshenshini-Alsek**

Site: Kluane/Wrangell-St. Elias/Glacier Bay/Tatshenshini-Alsek

Country: Canada and United States of America

Region: Pacific Ocean

Year of Inscription: 1979, extended in 1992 and 1994

Size: 98 391,21 km²

Adoption of Statements of Significance (2006)

Source: 30 COM 11B: <http://whc.unesco.org/archive/2006/whc06-30com-11B.adde.pdf>

The Kluane/Wrangell-St. Elias/Glacier Bay/Tatshenshini-Alsek national parks and protected areas along the boundary of Canada and the United States of America are the largest non-polar icefield in the world and contain examples of some of the world’s longest and most spectacular glaciers. Characterized by high mountains, icefields and glaciers, the property transitions from northern interior to coastal biogeoclimatic zones, resulting in high biodiversity with plant and animal communities ranging from marine, coastal forest, montane, sub-alpine and alpine tundra, all in various successional stages. The Tatshenshini and Alsek river valleys are pivotal because they allow ice-free linkages from coast to interior for plant and animal migration. The parks demonstrate some of the best examples of glaciation and modification of landscape by glacial action in a region still tectonically active, spectacularly beautiful, and where natural processes prevail.

**Criterion (vii)**: The joint properties encompass the breadth of active tectonic, volcanic, glacial and fluvial natural processes from the ocean to some of the highest peaks in North America. Coastal and marine environments, snow-capped mountains, calving glaciers, deep river canyons, fjord-like inlets and abundant wildlife abound. It is an area of exceptional natural beauty.

**Criterion (viii):** These tectonically active joint properties feature continuous mountain building and contain outstanding examples of major ongoing geologic and glacial processes. Over 200 glaciers in the ice-covered central plateau combine to form some of the world’s largest and longest glaciers, several of which stretch to the sea. The site displays a broad range of glacial processes, including world-class depositional features and classic examples of moraines, hanging valleys, and other geomorphological features.

**Criterion (ix)**: The influence of glaciation at a landscape level has led to a similarly broad range of stages in ecological succession related to the dynamic movements of glaciers. Subtly different glacial environments and landforms have been concentrated within the property by the sharp temperature and precipitation variation between the coast and interior basins. There is a rich variety of terrestrial and coastal/marine environments with complex and intricate mosaics of life at various successional stages from 500 m below sea level to 5000 m above.

**Criterion (x)**: Wildlife species common to Alaska and Northwestern Canada are well represented, some in numbers exceeded nowhere else. The marine components support a great variety of fauna including marine mammals and anadromous fish, the spawning of which is a key ecological component linking the sea to the land through the large river systems. Populations of bears, wolves, caribou, Dall sheep and mountain goats that are endangered elsewhere are self regulating here. This is one of the few places remaining in the world where ecological processes are governed by natural stresses and the evolutionary changes in a glacial and ecological continuum.

**Komodo National Park**

Site: Komodo National Park

Country: Indonesia

Region: Indian Ocean

Year of Inscription: 1991

Size: 2 193,22 km²

Retrospective Statement of Outstanding Universal Value (2013)

Source: 37COM 8E: <http://whc.unesco.org/archive/2013/whc13-37com-8E-en.pdf>

**Brief synthesis**

Komodo National Park, located in the center of the Indonesian archipelago, between the islands of Sumbawa and Flores, is composed of three major islands (Rinca, Komodo, and Padar) and numerous smaller ones, all of them of volcanic origin. Located at the juncture of two continental plates, this national park constitutes the “shatter belt” within the Wallacea Biogeographical Region, between the Australian and Sunda ecosystems. The property is identified as a global conservation priority area, comprising unparalleled terrestrial and marine ecosystems and covers a total area of 219,322 ha. The dry climate has triggered specific evolutionary adaptation within the terrestrial flora that range from open grass-woodland savanna to tropical deciduous (monsoon) forest and quasi cloud forest. The rugged hillsides and dry vegetation highly contrast with the sandy beaches and the blue coralrich waters.

The most remarkable inhabitant of Komodo National Park is the Komodo Lizard, *Varanus komodoensis*. These giant lizards, existing no-where else in the world, are of great scientific interest, especially for their evolutionary implications. Most commonly known as 'Komodo Dragons', due to its appearance and aggressive behavior, the Komodo Lizard, is the largest living species of lizard, growing to an average length of 2 to 3 meters. The species is the last representative of a relic population of large lizards that once lived across Indonesia and Australia. As well as being home to the Komodo dragon, the Park provides a refuge for many other notable terrestrial species such as the orange-footed scrub fowl, an endemic rat, and the Timor deer. The rich coral reefs of Komodo host a great diversity of species, and the strong currents of the sea attract the presence of sea turtles, whales, dolphins and dugongs.

**Criterion (vii)**: Komodo National Park is a landscape of contrasts between starkly rugged hillsides of dry savanna, pockets of thorny green vegetation, brilliant white sandy beaches and blue waters surging over coral, unquestionably one of the most dramatic landscapes in all of Indonesia. Demonstrating exceptional natural beauty that is all the more remarkable as a counterpoint to the dominant lushness of vegetation which characterizes vast areas of forested Indonesia, and with which most of the world associates the archipelago. An irregular coastline characterized by bays, beaches and inlets separated by headlands, often with sheer cliffs falling vertically into the surrounding seas which are reported to be among the most productive in the world adds to the stunning natural beauty of landscapes dominated by contrasting vegetation types, providing a patchwork of colours.

**Criterion (x)**: Komodo National Park contains the majority of the world’s areas in which wild populations of the Komodo dragon lizard still exist. The largest and heaviest of the world’s lizards, the species is widely known for its impressive size and fearsome appearance, its ability to effectively prey on large animals, and a tolerance of extremely harsh condition. The population, estimated at around 5,700 individuals is distributed across the islands of Komodo, Rinca, Gili Motong and some coastal regions of western and northern Flores. Other fauna recorded in the park are characteristic of the Wallacean zoogeographic region with seven species of terrestrial mammal, including an endemic rat (*Rattus rintjanus*) and the crab-eating macaque (*Macaca fascicularis*) and 72 species of birds, such as the lesser sulphur-crested cockatoo (*Cacatua sulphurea*), the orange-footed scrub fowl (*Megapodius reinwardt*), and noisy friarbird (*Philemon buceroides*). The coral reefs fringing the coast of Komodo are diverse and luxuriant due to the clear water, intense sunlight and rapid exchange of nutrient-rich water from deeper areas of the archipelago. The marine fauna and flora are generally the same as that found throughout the Indo Pacific area, though species richness is very high, notable marine mammals include blue whale (*Balaenoptera musculus*) and sperm whale (*Physeter catodon*) as well as 10 species of dolphin, dugong (*Dugong dugon*) and five species of sea turtles.

**Integrity**

Encompassing the rugged topography that reflects the position of the park within the active volcanic “shatter belt” between Australia and the Sunda shelf, the boundaries of the Komodo National Park encircle the main park features, including the outstanding scenery and the unique species it hosts; komodo monitor, birds, marine mammals, coral reef-species, and others. The boundaries are considered adequate to secure the habitat and the main ecological processes to preserve them. The extensive marine buffer zone surrounding the park is key to maintaining the integrity and intactness of the property and the number of exceptional species that it hosts. Illegal fishing and poaching remain the main threats to the values of the property and its overall integrity. There is an extensive marine buffer zone to the park, in which management authority staff has authority to regulate the type of fishing permitted and to some extent the presence of fishermen from outside the area. This buffer zone, which assists in controlling poaching of the terrestrial species that provide the prey species for the komodo lizard, will become significant in the overall long-term protection of the property.

**Protection and management requirements**

Komodo National Park is managed by the central government of Indonesia through the Directorate General of Forest Protection and Natural Conservation of the Ministry of Forestry. The history of protection afforded the site goes back to 1938 while official protection began when Ministerial Decree declared the area as a 72,000 ha National Park in March 1980. This area was subsequently extended to 219,322 ha in 1984 to include an expanded marine area and the section of mainland Flores. Comprised of Komodo Game Reserve (33,987 ha), Rinca Island Nature Reserve (19,625 ha), Padar Island Nature Reserve (1,533 ha), Mbeliling and Nggorang Protection Forest (31,000 ha), Wae Wuul and Mburak Game Reserve (3,000 ha) and surrounding marine areas (130,177 ha) the Komodo Biosphere Reserve was accepted under the UNESCO Man and the Biosphere Programme in January 1977. In 1990 a national law, elevating the legislative mandate for conservation to the parliamentary and presidential level significantly empowered the legal basis for protection and management. In order to ensure the effective management and protection of the park and its exceptional landscapes and biota, the park is governed through the 2000-2025 Management Plan and a 2010-2014 Strategic Plan, which will require revision and updating. These plans are important for ensuring the effective zoning system of the park and guaranteeing the sustainability of the ecosystems of the property. The management authority is known for designing specific plans to guide management decisions which will require updating in line with changes to priorities and threats, in particular expected increases in visitor numbers and impacts from tourism. The Park receives strong support and resources from the central government of Indonesia. As a tourism location known worldwide, the Indonesian Government has a specific program for ecotourism management to promote the park at the international level and to ensure the sustainability of tourism activities. Additionally, in order to address illegal fishing and poaching, regular patrolling of the marine and terrestrial areas is carried out for law enforcement and a number of the problems and impacts associated with these activities have decreased. Community awareness and empowerment programs are being implemented to engage the local villagers regards to the sustainable use of natural resources and park conservation. Research and study of the unique biological features of the park is also being promoted and supported by the management authority. Increasing levels of tourism and matters related specifically to the komodo lizard are the major management issues that have been focused on to date. A broadening of the management focus to address issues within the marine area of the park along with other terrestrial species is required to ensure the long-term effective conservation of the property. A focus on the issue of depletion of Komodo monitor prey species stocks has resulted in some success and the same efforts need to be focused on the issues of damaging fishing practices and impacts on other unique species contained within the property.

# Lagoons of New Caledonia: Reef Diversity and Associated Ecosystems

# Site: Lagoons of New Caledonia: Reef Diversity and Associated Ecosystems

Country: France

Region: Pacific Ocean

Year of Inscription: 2008

Size: 15 743 km²

Buffer zone: 12 871 km²

Statement of Outstanding Universal Value (2008)

Source: 32COM 8B.10: <http://whc.unesco.org/archive/2008/whc08-32com-8Be.pdf>

 **Values**

The tropical lagoons and coral reefs of New Caledonia are an outstanding example of high diversity coral reef ecosystems and form one of the three most extensive reef systems in the world. They are the location for the world’s most diverse concentration of reef structures, with an exceptional diversity of coral and fish species and a continuum of habitats from mangroves to seagrasses and a wide range of reef forms, extending over important oceanic gradients. They still display intact ecosystems, with healthy populations of top predators, and a large number and diversity of large fish. They are of exceptional natural beauty, and contain diverse reefs of varying age from living reefs through to ancient fossil reefs, providing an important source of information on the natural history of Oceania.

**Criterion (vii)**: Superlative natural phenomena or natural beauty: The tropical lagoons and coral reefs of New Caledonia are considered to be some of the most beautiful reef systems in the world due to their wide variety of shapes and forms within a comparatively small area. This ranges from extensive double barrier systems, offshore reefs and coral islands, to the nearshore reticulate reef formations in the west coast zone. The richness and diversity of landscapes and coastal backdrops gives a distinctive aesthetic appeal of exceptional quality. This beauty continues below the surface with dramatic displays of coral diversity, massive coral structures, together with arches, caves and major fissures in the reefs.

**Criterion (ix)**: Ongoing biological and ecological processes: The reef complex within this serial property is globally unique in that it is "free-standing" in the ocean and encircles the island of New Caledonia, providing a variety of different kinds of oceanographic exposure, including both warm and cold currents. The coral reef complex has a great diversity of forms including all the major reef types from fringing reefs to atolls, as well as associated ecosystems in both coastal and oceanic situations. Extending over important oceanic gradients, it is one of the planet's best examples of the ecological and biological processes underlying tropical lagoon and coral reef ecosystems, themselves one of the most ancient and complex ecosystem types.

**Criterion (x)**: Biological diversity and threatened species: The property is a marine site of exceptional diversity with a continuum of habitats from mangroves to seagrasses and a wide range of reef forms. The barrier reefs and atolls in New Caledonia form one of the three most extensive reef systems in the world, and together with the reefs of Fiji, are the most significant coral reefs in Oceania. They are the location for the world’s most diverse concentration of reef structures, 146 types based on a global classification system, and they equal or even surpass the much larger Great Barrier Reef in coral and fish diversity. They provide habitat to a number of threatened fish, turtles, and marine mammals, including the third largest population of dugongs in the world.

**Integrity**

The serial property comprises six marine clusters which are also protected by marine and terrestrial buffer zones that are not part of the inscribed property. It includes all the key areas that are essential for maintaining its natural beauty and the long term conservation of its remarkable reef diversity, and it is of sufficient size to maintain associated biological and ecological processes. The property still displays intact ecosystems with top predators, and a large number and diversity of large fish.

**Requirements for Protection and Management**

The property is currently protected by fisheries legislation, which is being further improved, and comanagement arrangements with the Kanak communities are currently being established for all clusters. Management plans are currently being prepared for all clusters with full involvement of stakeholders. Continued efforts to protect and manage the property and its surroundings are required to maintain the present intactness of the coral reef ecosystems. Protecting and managing large areas in the form of no-take zones and proactive management of water quality and fisheries regulations will help maintain reef resilience in the face of climate change. Enhanced surveillance and monitoring are required to address potential impacts from fishing and mining and, to a lesser extent, from agriculture and aquaculture. Tourism is likely to increase in the future and needs to be well planned and managed. Sustainable financing strategies are required to ensure the necessary equipment, human and financial resources for the long term management of the property.

# Lord Howe Island Group

# Site: Lord Howe Island Group

Country: Australia

Region: Pacific Ocean

Year of Inscription: 1982

Size: 1 463 km²

Retrospective Statement of Outstanding Universal Value (2012)

Source: 36 COM 8E: <http://whc.unesco.org/archive/2012/whc12-36com-8Ee.pdf>

**Brief synthesis**

The Lord Howe Island Group is an outstanding example of oceanic islands of volcanic origin containing a unique biota of plants and animals, as well as the world’s most southerly true coral reef. It is an area of spectacular and scenic landscapes encapsulated within a small land area, and provides important breeding grounds for colonies of seabirds as well as significant natural habitat for the conservation of threatened species. Iconic species include endemics such as the flightless Lord Howe Woodhen (*Gallirallis sylvestris*), once regarded as one of the rarest birds in the world, and the Lord Howe Island Phasmid (*Dryococelus australis*), the world’s largest stick insect that was feared extinct until its rediscovery on Balls Pyramid.

About 75% of the terrestrial part of the property is managed as a Permanent Park Preserve, consisting of the northern and southern mountains of Lord Howe Island itself, plus the Admiralty Islands, Mutton Bird Islands, Balls Pyramid and surrounding islets. The property is located in the Tasman Sea, approximately 570 kilometres east of Port Macquarie. The entire property including the marine area and associated coral reefs covers 146,300 hectares, with the terrestrial area covering approximately 1,540 hectares.

**Criterion (vii)**: The Lord Howe Island Group is grandiose in its topographic relief and has an exceptional diversity of spectacular and scenic landscapes within a small area, including sheer mountain slopes, a broad arc of hills enclosing the lagoon and Balls Pyramid rising abruptly from the ocean. It is considered to be an outstanding example of an island system developed from submarine volcanic activity and demonstrates the nearly complete stage in the destruction of a large shield volcano. Having the most southerly coral reef in the world, it demonstrates a rare example of a zone of transition between algal and coral reefs. Many species are at their ecological limits, endemism is high, and unique assemblages of temperate and tropical forms cohabit.

The islands support extensive colonies of nesting seabirds, making them significant over a wide oceanic region. They are the only major breeding locality for the Providence Petrel (*Pterodroma solandri*), and contain one of the world’s largest breeding concentrations of Red-tailed Tropicbird (*Phaethon rubricauda*).

**Criterion (x)**: The Lord Howe Island Group is an outstanding example of the development of a characteristic insular biota that has adapted to the island environment through speciation. A significant number of endemic species or subspecies of plants and animals have evolved in a very limited area. The diversity of landscapes and biota and the high number of threatened and endemic species make these islands an outstanding example of independent evolutionary processes. Lord Howe Island supports a number of endangered endemic species or subspecies of plants and animals, for example the Lord Howe Woodhen, which at time of inscription was considered one of the world’s rarest birds. While sadly a number of endemic species disappeared with the arrival of people and their accompanying species, the Lord Howe Island Phasmid, the largest stick insect in the world, still exists on Balls Pyramid. The islands are an outstanding example of an oceanic island group with a diverse range of ecosystems and species that have been subject to human influences for a relatively limited period.

**Integrity**

The boundary of the property includes all areas that are essential for maintaining the ecosystems and beauty of the property. It includes all of the above water remains of the ancient shield volcano and surrounding reefs and a substantial proportion of the Lord Howe Island and Balls Pyramid seamounts. The island component of the property is largely Permanent Park Preserve (PPP) and the surrounding waters are Marine Parks. The land area not included in the PPP is managed to ensure that the property’s values are maintained. The inscribed property would be strengthened by the inclusion of the entire Commonwealth Marine Park.

At time of inscription concern was raised with respect to a proposal to construct four telecommunications masts without thorough assessment by way of an Environmental Impact Statement. These were then built, although today no longer exist. Other potential threats to the integrity of the property include development pressures, introduced plants and animals and visitor / tourism pressures. Since inscription, a programme improving the conservation status of the Lord Howe Woodhen, and the successful eradication of feral pigs, cats and almost eradication of goats has contributed significantly to the enhancement of World Heritage values beyond their status at listing.

**Protection and management requirements**

The property is subject to a comprehensive protection, management and monitoring regime which is supported by adequate human and financial resources.

All World Heritage properties in Australia are ‘matters of national environmental significance’ protected and managed under national legislation, the Environment Protection and Biodiversity Conservation Act 1999. This Act is the statutory instrument for implementing Australia’s obligations under a number of multilateral environmental agreements including the World Heritage Convention. By law, any action that has, will have or is likely to have a significant impact on the World Heritage values of a World Heritage property must be referred to the responsible Minister for consideration. Substantial penalties apply for taking such an action without approval. Once a heritage place is listed, the Act provides for the preparation of management plans which set out the significant heritage aspects of the place and how the values of the site will be managed.

Importantly, this Act also aims to protect matters of national environmental significance, such as World Heritage properties, from impacts even if they originate outside the property or if the values of the property are mobile (as in fauna). It thus forms an additional layer of protection designed to protect values of World Heritage properties from external impacts.

In 2007 the Lord Howe Island Group was added to the National Heritage List in recognition of its national heritage significance. On-ground management of the terrestrial component of the property is by the Lord Howe Island Board under the statutory framework of the Lord Howe Island Local Environment Plan (2010), which emphasises World Heritage values. Planning for the Permanent Park Preserve is the responsibility of the New South Wales Department of Environment, Climate Change and Water. Management of the marine areas (both State and Commonwealth waters) is the responsibility of the New South Wales Marine Park Authority.

Key threats requiring ongoing attention include fishing, tourism, invasive animals, plants and pathogens, and anthropogenic climate change. Visitor numbers are limited to control impacts and new Marine Park management and zoning plans are being developed for state and Commonwealth waters. Measures are being taken to prevent the introduction of new invasive plant species while significant resources are being directed towards the management and eradication of weeds. A proposal to eradicate introduced rodents is being developed.

**Macquarie Island**

Site: Macquarie Island

Country: Australia

Region: Southern Ocean

Year of Inscription: 1997

Size: 5 400 km²

Retrospective Statement of Outstanding Universal Value (2012)

Source: 36 COM 8E: <http://whc.unesco.org/archive/2012/whc12-36com-8Ee.pdf>

**Brief synthesis**

Macquarie Island lies almost 1,500 kilometres to the southeast of Tasmania, about half-way between Australia and Antarctica. The property includes Macquarie Island, Judge and Clerk Islets 11 kilometres to the north, the Bishop and Clerk Islets 37 kilometres to the south, rocks, reefs and the surrounding waters to a distance of 12 nautical miles. The main island is approximately 34 kilometres long and 5.5 kilometres wide at its broadest point, covering an area of approximately 12,785 hectares. The property covers an area of 557,280 hectares.

Macquarie Island has outstanding universal value for two reasons. First, it provides a unique opportunity to study, in detail, geological features and processes of oceanic crust formation and plate boundary dynamics, as it is only place on earth where rocks from the earth’s mantle (6 kilometres below the ocean floor) are being actively exposed above sea level. These unique exposures include excellent examples of pillow basalts and other extrusive rocks. Second, its remote and windswept landscape of steep escarpments, lakes, and dramatic changes in vegetation provides an outstanding spectacle of wild, natural beauty complemented by vast congregations of wildlife including penguins and seals.

**Criterion (vii)**: Macquarie Island provides an outstanding spectacle of wild, natural beauty with huge congregations of penguins and seals populating what has been described as a small speck thrust up into the vast Southern Ocean. The island lies in latitudes known as the ‘Furious Fifties’ because of the frequency of very strong winds and stormy seas, which have sculpted the island. A coastal terrace supports vast waterlogged and heavily vegetated areas, forming a mire based on deep peat beds known as ‘featherbed’. This is framed by steep escarpments which rise spectacularly to a plateau surface dotted with innumerable lakes, tarns and pools. The continual westerly winds, which increase in force as they rise over the barrier of the island, and changes in topography result in dramatic changes in the vegetation cover which can vary from lush grassland to sparse feldmark within the space of a few metres.

Among the most aesthetically appealing features of the island are the vast congregations of wildlife, particularly penguins, during the breeding season. The breeding population of Royal Penguins (*Eudyptes schlegeli*), a species endemic to Macquarie Island and nearby Bishop and Clerk Islets, is estimated at over 850,000 pairs, one of the greatest congregations of seabirds in the world. The breeding population of King Penguins (*Aptenodytes patagonicus*), estimated at around 150,000–170,000 breeding pairs in 2000, is still expanding. As the King Penguin chicks do not leave the vicinity of the nest for a year, they survive the rigours of winter by huddling together on the windy and snow-swept beaches. Four species of albatross nest on steep and rugged cliffs and are easily viewed when nesting. Elephant Seals (*Mirounga leonina*) also form impressive colonies during the breeding season.

**Criterion (viii)**: Macquarie Island and its outlying islets are geologically unique in being the only place on earth where rocks from the earth’s mantle are being actively exposed above sea level. The island is the exposed crest of the undersea Macquarie Ridge, raised to its present position where the Indo-Australian tectonic plate meets the Pacific plate. These unique exposures provide an exceptionally complete section of the structure and composition of both the oceanic crust and the upper mantle, and provide evidence of ‘sea-floor spreading’ and tectonic processes that have operated for hundreds of millions of years. The geological evolution of Macquarie Island began 10 million years ago and continues today with the island experiencing earthquakes and a rapid rate of uplift, all of which are related to active geological processes along the boundary between the two plates. Sequences from all crustal levels, down to 6 kilometres below the ocean floor, are exposed as a result of tilting and differential uplift on Macquarie Island. This provides rare evidence for sequences that are common from the bottom of the oceans to the upper mantle, but not seen elsewhere in surface outcrops. The lack of deformation of this exposed crust is highly significant as it exhibits key interrelated and interdependent oceanic crustal elements in their natural relationship.

Macquarie Island is the only ophiolite (a well-developed and studied geological complex) recognised to have been formed within a major ocean basin. The geology of the island is therefore considered to be the connecting link between the ophiolites of continental environments and those located within the oceanic crust.

**Integrity**

The property is of sufficient size and contains the necessary elements to demonstrate the key aspects of the geological processes of Macquarie Island and the outlying Bishop and Clerk and Judge and Clerk islets. All major elements of the Macquarie deformational zone are included in the property. Human impacts, commencing on Macquarie Island in 1810, have resulted in major changes to the biota of the reserve. The commercial exploitation of seals and penguins, together with the introduction of alien species, resulted in the extinction of some native species and major declines in others. Resultant modifications to vegetation associations and nutrient cycles severely impacted on some species while benefiting others.

Active management programmes, commenced in the 1960s, are aimed at stopping and/or reversing some of these trends. Some of these programmes have resulted in very rapid changes, including the eradication of feral cats and wekas from the island. However, the recovery of natural ecosystem processes as a result of these management programmes may take centuries. Macquarie Island is remote and well protected and managed.

**Protection and management requirements**

The property is vulnerable to the consequences of anthropogenic climate change. The other threat to the integrity of the property, which is monitored and managed, is the spread of introduced species and pathogens. A project to eradicate the remaining mammalian pest species (rabbits, black rats and mice) is underway, and is expected to be completed in 2016. Macquarie Island, the adjacent islets of Judge and Clerk and Bishop and Clerk, and all surrounding waters out to three nautical miles, is managed as a nature reserve by the Tasmanian Parks and Wildlife Service (PWS). Management of the reserve is guided by the Macquarie Island Nature Reserve and World Heritage Area Management Plan 2006. Most of the waters out to 200 nautical miles to the east of the reserve are within the Macquarie Island Commonwealth Marine Reserve, which is managed by the Australian Government in cooperation with the PWS.

Overarching management of the World Heritage values occurs under national legislation, the Environment Protection and Biodiversity Conservation Act 1999 (the Act). All World Heritage properties in Australia are ‘matters of national environmental significance’ protected and managed under the Act. This Act is the statutory instrument for implementing Australia’s obligations under a number of multilateral environmental agreements, including the World Heritage Convention. By law, any action that has, will have or is likely to have a significant impact on the World Heritage values of a World Heritage property must be referred to the responsible Minister for consideration. Substantial penalties apply for taking such an action without approval. Once a heritage place is listed, the Act provides for the preparation of management plans which set out the significant heritage aspects of the place and how the values of the site will be managed. Importantly, this Act also aims to protect matters of national environmental significance, such as World Heritage properties, from impacts even if they originate outside the property or if the values of the property are mobile (as in fauna). It thus forms an additional layer of protection designed to protect values of World Heritage properties from external impacts.

**Malpelo Fauna and Flora Sanctuary**

Site: Malpelo Fauna and Flora Sanctuary

Country: Colombia

Region: Pacific Ocean

Year of Inscription: 2006

Size: 8 575 km²

Description of Outstanding Universal Value (2006)

Source: 30 COM 8B.28: <http://whc.unesco.org/en/decisions/997>

**Criterion (ii)**: As the largest no-fishing zone in the Eastern Tropical Pacific, the Malpelo Fauna and Flora Sanctuary is a globally significant and largely pristine marine protected area with unaltered and non-threatened ecosystems, free of invasive species, that is essential to maintain and replenish the population of sharks, giant grouper and billfish in the Eastern Tropical Pacific, whilst providing unique opportunities for ecosystem conservation, research, and recreational diving.

**Criterion (iii)**: Malpelo's pristine underwater environment is of striking natural beauty because of the incredibly rich and diverse marine life; and major aggregations of large predator fish. Visitation to this site is an exhilarating experience for divers, and has been featured in specialized diving periodicals around the world.

 **Natural System of Wrangel Island Reserve**

Site: Natural System of Wrangel Island Reserve

Country: Russian Federation

Region: Arctic Ocean

Year of Inscription: 2004

Size: 19 163 km²

Buffer zone: 37 453 km²

Description of Outstanding Universal Value (2004)

Source: 28 COM 14B.14: <http://whc.unesco.org/en/decisions/97>

**Criterion (ix):** The Wrangel Island Reserve is a self-contained island ecosystem and there is ample evidence that it has undergone a long evolutionary process uninterrupted by the glaciation that swept most other parts of the Arctic during the Quaternary period. The number and type of endemic plant species, the diversity within plant communities, the rapid succession and mosaic of tundra types, the presence of relatively recent mammoth tusks and skulls, the range of terrain types and geological formations in the small geographic space are all visible evidence of Wrangel’s rich natural history and its unique evolutionary status within the Arctic. Furthermore, the process is continuing as can be observed in, for example, the unusually high densities and distinct behaviours of the Wrangel lemming populations in comparison with other Arctic populations or in the physical adaptations of the Wrangel Island reindeers, where they may now have evolved into a separate population from their mainland cousins. Species interaction strategies are highly-honed and on display throughout the island, especially near Snowy owl nests which act as protectorates for other species and beacons for migratory species and around fox dens.

**Criterion (x)**: The Wrangel Island Reserve has the highest level of biodiversity in the high Arctic. The island is the breeding habitat of Asia’s only Snow goose population which is slowly making a recovery from catastrophically low levels. The marine environment is an increasingly important feeding ground for the Gray whale migrating from Mexico (some from another World Heritage site, the Whale Sanctuary of El Vizcaino). The islands have the largest sea-bird colonies on the Chukchi Sea, are the northernmost nesting grounds for over 100 migratory bird species including several that are endangered such as the Peregrine falcon, have significant populations of resident tundra bird species interspersed with migratory Arctic and non-Arctic species and have the world’s highest density of ancestral polar bear dens. Wrangel Island boasts the largest population of Pacific walrus with up to 100,000 animals congregating at any given time at one of the island’s important coastal rookeries. Since Wrangel Island contains a high diversity of habitats and climates and conditions vary considerably from one location to another, total reproductive failure of a species in any given year is practically unheard of. Given the relatively small size of the area, this is very unusual in the high Arctic.

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The property consists of the following land and marine areas:

|  |  |  |
| --- | --- | --- |
| Name of Island | Land Area (ha) | Marine Sanctuary (ha) |
| Wrangel Island | 760,870 | 1,096,600 |
| Herald Island | 1,130 | 57,700 |
| TOTAL | 762,000 | 1,154,300 |
| TOTAL PROTECTED AREA | 1,916,300 ha |

**New Zealand Sub-Antarctic Islands**

Site: New Zealand Sub-Antarctic Islands

Country: New Zealand

Region: Southern Ocean

Year of Inscription: 1998

Size: 764,58 km²

Retrospective Statement of Outstanding Universal Value (2012)

Source: 36COM 8E: <http://whc.unesco.org/archive/2012/whc12-36com-8Ee.pdf>

**Brief synthesis**

The New Zealand Sub-antarctic Islands (NZSAI) encompasses five island groups that lie between latitudes 47°and 53°south; Snares Islands/Tini Heke, Bounty Islands, Antipodes Islands, Auckland Islands/Motu Maha and Campbell Island/Motu Ihupuku and the islands surrounding it. The World Heritage status also applies to the marine environment out to 12 nautical miles from each group. Including a total land area of 76,458 ha, the marine area takes in 1,400,000 ha and constitutes one of New Zealand’s remotest protected natural areas, including some of the world’s least-modified islands.The property lies between the Antarctic and Subtropical Convergences and the seas have a high level of productivity, biodiversity, wildlife population densities and endemism. While the NZSAI’s are all located on the Pacific Tectonic Plate, the different geological history and age of each island group, and their geographical isolation from mainland New Zealand and from each other, has shaped the unique and remarkable biodiversity of the islands including distinctive plants, birds, invertebrates, marine mammals, fish and marine algae assemblages. The biota contains numerous endemic and/or rare elements, and some extraordinary examples of adaptation.

Particularly notable is the abundance and diversity of pelagic seabirds and penguins that utilise the islands for breeding. The property supports the most diverse community of breeding seabirds in the Southern Ocean. There are 126 species of birds, including 40 seabirds, eight of which breed nowhere else in the world. The islands support major populations of 10 of the world’s 22 species of albatross and almost 2 million sooty shearwaters nest on Snares Island alone. Land birds also display a surprising diversity, considering the limited land area available, with a large number of threatened endemics including one of the world’s rarest ducks. More than 95% of the world’s population of New Zealand sea lion (formerly known as Hooker’s sea lion) breed here and the marine environment provides critical breeding areas for the southern right whale.

The plant life of the NZSAI is notable for its diversity, special forms and unique communities, yet another outstanding example of the biological and ecological processes significant in the property. The Snares Islands and two islands in the Auckland group (Adams and Disappointment), are among the last substantial areas in the world harbouring vegetation essentially unmodified by humans or alien species. Another notable feature about the NZSAI is the land-sea interface and the close inter-dependence of both environments for many of the species – the inclusion of the marine environment out to 12 nautical miles in the world heritage property recognises this.

**Criterion (ix)**: Isolation, climatic factors, and seven degrees of latitudinal spread have combined to significantly influence the biota of the islands. Consequently they provide scientific insights into the evolutionary processes affecting widely-spread oceanic islands, varying from relatively mature endemic forms to relatively immature taxa, constituting a fascinating laboratory for the study of genetic variation, speciation and adaptation, particularly in the insulantarctic biogeographic province.

Evolutionary processes, such as the loss of flight in birds and invertebrates, offer unique opportunities for research into island dynamics and ecology. Another outstanding feature is the preponderance of ‘megaherbs’ within the plant biodiversity. These large herbs, often with brightly coloured flowers are considered to display unique evolutionary adaptation to the distinctive sub-antarctic climate – with its cloud cover (and lack of solar radiation), lack of frosts, strong winds, and high nutrient levels (derived from seabird transference of nutrients).

**Criterion (x)**: The NZSAI, and the ocean that surrounds and links them, support an extraordinary and outstanding array of endemic and threatened species among the marine fauna, land birds, and invertebrates. As a group they are distinct from all other island groups, having the highest diversity of indigenous plants and birds. Of particular significance: the most diverse community of seabirds in the world with eight species endemic to the region; including four species of albatross, three species of cormorants (one of which, the Bounty Island Shag, is the world’s rarest cormorant) and one species of penguin; 15 endemic land birds including snipe, parakeets and teal; breeding sites of the world’s rarest sea lion (the New Zealand (or Hooker’s) sea lion); and a significant breeding population of the southern right whale. Together with neighbouring Macquarie Island, the NZSAI represent a Centre of Plant Diversity and have the richest flora of all the sub-antarctic islands with 35 endemic taxa. The “megaherbs’ are unique to the NZSAI and Macquarie Island. The Snares Group and two of the Auckland Islands are of particular biodiversity conservation significance due to the absence of any human and exotic species modification.

**Integrity**

The NZSAI have benefited from their remoteness providing them with a high degree of natural protection. With their geographical isolation from mainland New Zealand and from each other, the NZSAI include some of the world’s most unmodified islands. In particular; the Snares and two islands in the Auckland group (Adams and Disappointment), are among the last substantial areas in the world harbouring vegetation essentially unmodified by human impacts. Many of the islands remain in virtually pristine condition, being rat and cat free and rarely visited by humans. The Antipodes group have undergone minimal modification from a pristine state despite sealers once being active there. The boundaries of the property include all land area of these island groups and are sufficient to protect the core natural values of the property. The geological and biological integrity of the terrestrial component of the NZSAI is considered high with conservation actions underway to reduce the impact of exotic species. One of the island groups (Auckland Islands) is surrounded by an overlapping no-take marine reserve and marine mammal sanctuary out to 12 nautical miles. In 2008, a stakeholder forum was convened to consider additional marine protection measures in the Sub-Antarctic region. As a result of that process, three new marine reserves have been approved and are awaiting implementation. These reserves will protect 100% of the territorial sea surrounding Antipodes Island, approximately 58% of the territorial sea around the Bounty Islands and approximately 39% of the territorial sea around Campbell Island. In addition, restrictions on fishing methods will be in place in the remaining territorial sea areas around these island groups. These protection measures significantly enhance the integrity of the islands' marine environments, and complement the protection afforded to the islands themselves. Bycatch of pinnipeds and seabirds remain important issues in the Subantarctic marine environment, and the fishing industry, New Zealand Government and environmental groups continue to work together to address these issues.

**Protection and management requirements**

Managed by the Department of Conservation on behalf of the Government and the people of New Zealand the comprehensive application of legal, administrative and management systems in place ensure the areas of the NZSAI that are above mean high water have the highest level of protection under New Zealand legislation, being classified as Nature Reserves under the Reserves Act 1977. In addition, the five island groups have each been identified as National Reserves, which acknowledges “values of national or international significance” (section 13 Reserves Act 1977). The islands are also covered under the Wildlife Act 1953; the Wild Animal Control Act 1977; the Resource Management Act 1991; the Marine and Coastal Area (Takutai Moana) Act 2011; the Marine Mammals Protection Act 1978; and the Fisheries Act 1996. The existing no-take marine reserve and marine mammal sanctuary around the Auckland Islands are managed by the Department of Conservation. Proposed marine reserves around Antipodes, Bounty and Campbell Islands will also be managed by the Department of Conservation.

Under section 4 of the Conservation Act 1987 the Department is required to give effect to the principles of the Treaty of Waitangi. In practice this implies a partnership agreement with tängata whenua (Iwi or hapū that has customary authority in a place) that have manawhenua (prestige, authority) over the area. As a part of the Crown’s settlement with Ngāi Tahu, protocols have been developed on how the Department and Ngāi Tahu will work together on specified matters of cultural significance to Ngāi Tahu. Ngāi ai Tahu ki Murihiku are kaitiaki (guardians) of the Southland region, including the Sub-antarctic Islands. They have prepared a management plan: Te Tangi a Tauira—the Cry of the People, which consolidates Ngāi Tahu ki Murihiku values, knowledge and perspectives on natural resource and environmental management issues.

The range of legislation relating to the NZSAI is aimed at the protection and conservation of the species and ecosystems within the property. The Resource Management Act 1991 requires a Regional Coastal Plan to be developed, with the aim of promoting the sustainable management of natural and physical resources of the islands (jurisdiction is mean high water springs to outer limits of the territorial sea). A Regional Coastal Plan for the Sub-antarctic and Kermadec Islands (Coastal Plan) was notified on 15 January 2011. While yet to be operative, the rules took immediate legal effect on the date of notification. The key issues the plan seeks to address are to minimise the risk of oil spills and biosecurity breaches. The NZSAI are managed in accordance with a Conservation Management Strategy (CMS), which is a statutory document prepared under the Conservation Act 1987 that aims for integrated management of the natural and historic resources of the islands and specifies what activities are considered appropriate.

The integrity of the marine area and the conservation of the marine resources is a key management issue for the property. Work to further assess the risk to protected wildlife from fisheries impacts is in progress. Studies have revealed the status and significance of the (formerly endangered) southern right whale population in the waters surrounding the Campbell and Auckland islands. The New Zealand subantarctic waters are also on the migratory path of several additional whale species, including minke, sei, fin, blue and humpback whales, highlighting the importance of the marine environment and adding further weight to the natural values of the property.

The impacts of alien mammal species, currently restricted to pigs, cats and mice on Auckland Island and mice on Antipodes Island, along with a range of alien plant and invertebrate species have in most cases been addressed though the management plans. Previous eradication programmes have removed cattle, sheep, goats, rabbits, rats and mice from several of the islands. New Zealand authorities plan to eventually remove all alien mammal species from the islands and once achieved this will provide a model for oceanic islands elsewhere.

Increased tourism demand has resulted in a significant increase in tourist numbers and activity within the property and the challenge is to manage this increased demand while protecting the experience tourists are seeking and most importantly ensuring the longer term protection of the islands and the immediate marine environment. The CMS and Coastal Plan work together to address these issues and recommend approaches to limit the impact of tourism activities while also enabling the benefits of access to the property.

**Ningaloo Coast**

Site: Ningaloo Coast

Country: Australia

Region: Indian Ocean

Year of Inscription: 2011

Size: 7 050,15 km²

Statement of Outstanding Universal Value (2011)

Source: 35COM 8B.7: <http://whc.unesco.org/archive/2011/whc11-35com-8Be.pdf>

**Brief synthesis**

The Ningaloo Coast is located on Western Australia's remote coast along the East Indian Ocean. The interconnected ocean and arid coast form aesthetically striking landscapes and seascapes. The coastal waters host a major near shore reef system and a directly adjacent limestone karst system and associated habitats and species along an arid coastline. The property holds a high level of terrestrial species endemism and high marine species diversity and abundance. An estimated 300 to 500 whale sharks aggregate annually coinciding with mass coral spawning events and seasonal localized increases in productivity. The marine portion of the nomination contains a high diversity of habitats that includes lagoon, reef, open ocean, the continental slope and the continental shelf. Intertidal systems such as rocky shores, sandy beaches, estuaries, and mangroves are also found within the property. The most dominant marine habitat is the Ningaloo reef, which sustains both tropical and temperate marine fauna and flora, including marine reptiles and mammals. The main terrestrial feature of the Ningaloo Coast is the extensive karst system and network of underground caves and water courses of the Cape Range. The karst system includes hundreds of separate features such as caves, dolines and subterranean water bodies and supports a rich diversity of highly specialized subterranean species. Above ground, the Cape Range Peninsula belongs to an arid ecoregion recognized for its high levels of species richness and endemism, particularly for birds and reptiles.

**Criterion (vii)**: The landscapes and seascapes of the property are comprised of mostly intact and large-scale marine, coastal and terrestrial environments. The lush and colourful underwater scenery provides a stark and spectacular contrast with the arid and rugged land. The property supports rare and large aggregations of whale sharks (*Rhincodon typus*) along with important aggregations of other fish species and marine mammals. The aggregations in Ningaloo following the mass coral spawning and seasonal nutrient upwelling cause a peak in productivity that leads approximately 300-500 whale sharks to gather, making this the largest documented aggregation in the world.

**Criterion (x)**: In addition to the remarkable aggregations of whale sharks the Ningaloo Reef harbours a high marine diversity of more than 300 documented coral species, over 700 reef fish species, roughly 650 mollusc species, as well as around 600 crustacean species and more than 1,000 species of marine algae. The high numbers of 155 sponge species and 25 new species of echinoderms add to the significance of the area. On the ecotone, between tropical and temperate waters, the Ningaloo Coast hosts an unusual diversity of marine turtle species with an estimated 10,000 nests deposited along the coast annually. The majority of subterranean species on land, including aquatic species in the flooded caves are rare, taxonomically diverse and not found elsewhere in the southern hemisphere. The combination of relict rainforest fauna and small fully aquatic invertebrates within the same cave system is exceptional. The subterranean fauna of the peninsula is highly diverse and has the highest cave fauna (troglomorphic) diversity in Australia and one of the highest in the world. Above ground, the diversity of reptiles and vascular plants in the drylands is likewise noteworthy.

**Integrity**

The property is embedded into a comprehensive legal framework for the various protected areas and all other land. As a National Heritage area, it is subject to the federal Environment Protection and Biodiversity Conservation Act of 1999 (EPBC) according to which all proposed activities with possible significant impacts on the values of the site require assessments. The EPBC is applicable to activities located outside of the boundaries of the property. While no formal buffer zones have been established for the property, the Act therefore serves as a legal buffer zone. The boundaries encompass the key marine and terrestrial values with the exclusions being small in size and not conflicting with the maintenance of the values if managed adequately. Both the marine and the terrestrial areas may face a number of threats to the property's integrity. Learmonth Air Weapons Range Facility, located within the property, includes an ancient reef-complex and cave fauna of exceptional importance. It was one of Australia's most active bombing ranges until around 1990 and future bombing activities may pose a threat, in particular for the Bundera sinkhole which is located on Defence Land. Tourism is on the increase leading to associated threats such as damage to vegetation, illegal fishing, sewage and waste disposal and disturbance to wildlife. Comprehensive management programs and an overall tourism development strategy are functioning and appropriate responses which require consolidation in anticipation of further increasing visitation. Future concerns include increased water demand leading to water abstraction with potential effects on the groundwater systems as well documented in arid areas with abruptly increasing numbers of visitors.

Fire, historically part of local indigenous management, is a potential threat to the terrestrial vegetation and requires monitoring and control. Livestock raising on pastoral leases continues to be an important land use which is compatible with nature conservation when managed appropriately.

Potential off-shore hydrocarbon extraction in the region surrounding the property requires careful consideration in order to prevent potential pollution and disturbance. The coastline's significant length and remoteness poses major challenges to responses to pollution incidents suggesting a need for further investments in emergency response.

Sea level rise and increases in seawater temperatures associated with climate change have had comparatively little effect on the property. The good overall integrity suggests a higher resilience that in disturbed systems under additional stress. Still, careful monitoring is highly recommended.

A concern affecting both marine and terrestrial parts of the property and requiring permanent monitoring and management are invasive alien species, most importantly foxes, cats, goats and weeds on land and some marine species.

**Protection and management requirements**

The Ningaloo Coast benefits from its remoteness and low population density affording it a high degree of natural protection. The entire, mostly state-owned property is comprehensively protected and managed, including by an overarching strategic management framework. Given the various governmental levels and agencies involved and the differentiation between terrestrial and marine parts of the property, effective coordination of the multiple plans in an overall management framework is critical. Full cooperation between agencies, including fisheries, are necessary to ensure management and law enforcement in the vast and remote marine and terrestrial areas. Funding from federal and state levels and staffing as of the time of inscription would benefit from increases.

There is a need for ongoing management of fisheries and careful planning of resource extraction and corresponding monitoring and disaster preparedness to protect the values of the property.

Communication, consultation and joint efforts with local and indigenous stakeholders, including negotiation of native title claims and pastoral leases, are indispensable elements of effective management and local acceptance of conservation efforts. Given the vastness of the area and the limited human and financial resources, co-management approaches with local stakeholders are a promising option. The establishment of a "Ningaloo Coast World Heritage Advisory Committee" or a similar body bringing together representatives from the traditional owners, local government, scientific experts and members of the community, has an important role to play in this regard.

Tourist numbers are expected to rise which will require additional management efforts. Increased water abstraction, including from demand from increased tourism may affect fragile subterranean aquatic habitats and species communities will require constant monitoring and management.

**Ogasawara Islands**

Site: Ogasawara Islands

Country: Japan

Region: Pacific Ocean

Year of Inscription: 2011

Size: 79,39 km²

Statement of Outstanding Universal Value (2011)
Source: 35 COM 8B.11: <http://whc.unesco.org/en/decisions/4282>

**Brief synthesis**

The Ogasawara Islands are located in the North-Western Pacific Ocean roughly 1,000 km south of the main Japanese Archipelago. The serial property is comprised of five components within an extension of about 400 km from north to south and includes more than 30 islands, clustered within three island groups of the Ogasawara Archipelago: Mukojima, Chichijima and Hahajima, plus an additional three individual islands: Kita-iwoto and Minami-iwoto of the Kazan group and the isolated Nishinoshima Island. These islands rest along the Izu-Ogasawara Arc Trench System. The property totals 7,939 ha comprising a terrestrial area of 6,358 ha and a marine area of 1,581 ha. Today only two of the islands within the property are inhabited, Chichijima and Hahajima.

The landscape is dominated by subtropical forest types and sclerophyllous shrublands surrounded by steep cliffs. There are more than 440 species of native vascular plants with exceptionally concentrated rates of endemism as high as 70% in woody plants. The islands are the habitat for more than 100 recorded native land snail species, over 90% of which are endemic to the islands.

The islands serve as an outstanding example of the ongoing evolutionary processes in oceanic island ecosystems, as evidenced by the high levels of endemism; speciation through adaptive radiation; evolution of marine species into terrestrial species; and their importance for the scientific study of such processes.

**Criterion (ix)**: The property's ecosystems reflect a range of evolutionary processes illustrated through its rich assemblage of plant species from both a Southeast Asian and a Northeast Asian origin. There is also a very high percentage of endemic species in selected taxonomic groups, resulting from these evolutionary processes. Within the flora it is an important centre for active, ongoing speciation.

The Ogasawara Islands provide valuable evidence of evolutionary processes through their significant on-going ecological processes of adaptive radiation in the evolution of the land snail fauna as well as in their endemic plant species. The examples of fine-scale adaptive radiation between and sometimes within the different islands of the archipelago are central to the study and understanding of speciation and ecological diversification. This is further enhanced by the relatively low extinction rates in taxa such as the land snails.

It is the combination of both the concentration of endemism and extent of adaptive radiation evident in the Ogasawara Islands which sets the property apart from other places illustrating evolutionary processes. When taking into account their small area, the Ogasawara Islands show exceptionally high levels of endemism in land snails and vascular plants.

**Integrity**

The boundaries of the serial property cover the key values of the property and are well designed. The zonation and the legal protection provide an appropriate framework, while the boundaries of Ogasawara National Park serve as a functional overall buffer zone. Marine protected areas are partly included, contributing to more effective management of the terrestrial-marine interface and thus integrity. Integrity issues are mostly related to external threats, most importantly invasive alien species. The effects of invasive alien species and historic logging have already altered many of the archipelago's habitats. Future invasions have the potential to compromise the very values the Ogasawara Islands have been recognized for and therefore need careful and continuous attention. Possible future air access, as well as increased visitation and corresponding development potentially have strong and even irreversible effects in a fragile island environment. Control of access to the islands and of alien invasive species, two in part overlapping issues, is of critical importance for the conservation of the archipelago.

**Protection and management requirements**

The majority of the property is state-owned and under the authority of various agencies. Some land is owned by Ogasawara Village with some other areas privately owned. The property contains five legally designated categories of protected area managed by three national Government agencies and is surrounded by the much larger Ogasawara National Park serving as a functional buffer zone. The property is protected through seven pieces of national legislation which overlap in jurisdiction and objectives specifying the mandate of the Ministry of the Environment, the Forestry Agency and the Cultural Agency. Any jurisdictional conflicts are resolved through an interagency Regional Liaison Committee structure.

The 2010 multi-agency Ogasawara Islands Management Plan and companion Ogasawara Islands Ecosystem Conservation Action Plan cover a wide area of 129,360 ha and include controls beyond the property such as ship navigation routes. The plans deal with critical issues such as access to the islands and control of alien invasive species. Management activities are detailed for the different island groups within the property with clear coordination mechanisms and monitoring plans prescribed. The plan is based on scientific knowledge and includes timetabled and prioritized actions.

The property benefits from strong links and dialogue between researchers, managers and community. Particularly commendable is the role of the Scientific Council and the approach to research which is adaptive and management-oriented. Local involvement and the maintenance of community benefits are crucial elements in the management of this remote archipelago.

**Papahānaumokuākea**

Site: Papahānaumokuākea

Country: United States of America

Region: Pacific Ocean

Year of Inscription: 2010

Size: 362 074,99 km²

Statement of Outstanding Universal Value (2010)

Source: 34 COM 8B.10: <http://whc.unesco.org/en/decisions/3990>

**Brief synthesis**

Papahānaumokuākea is the name given to a vast and isolated linear cluster of small, low lying islands and atolls, with their surrounding ocean, extending some 1,931 kilometres to the north west of the main Hawaiian Archipelago, located in the north-central Pacific Ocean. The property comprises the Papahānaumokuākea Marine National Monument, which extends almost 2000 km from southeast to northwest.

The property includes a significant portion of the Hawai'i-Emperor hotspot trail, constituting an outstanding example of island hotspot progression. Much of the property is made up of pelagic and deepwater habitats, with notable features such as seamounts and submerged banks, extensive coral reefs, lagoons and 14 km2 emergent lands distributed between a number of eroded high islands, pinnacles, atoll islands and cays. With a total area of around 362,075 km2 it is one of the largest marine protected areas in the world. The geomorphological history and isolation of the archipelago have led to the development of an extraordinary range of habitats and features, including an extremely high degree of endemism. Largely as a result of its isolation, marine ecosystems and ecological processes are virtually intact, leading to exceptional biomass accumulated in large apex predators. Island environments have, however, been altered through human use, and although some change is irreversible there are also examples of successful restoration.  The area is host to numerous endangered or threatened species, both terrestrial and marine, some of which depend solely on Papahānaumokuākea for their survival.

The pristine natural heritage of the area has deep cosmological and traditional significance for living Native Hawaiian culture, as an ancestral environment, as an embodiment of the Hawaiian concept of kinship between people and the natural world, and as the place where it is believed that life originates and where the spirits return to after death.

On two of the islands, Nihoa and Makumanamana, there are archaeological remains relating to pre-European settlement and use, including a large ensemble of shrines, heiau, of a type specific to Papahānaumokuākea, but which resemble those of inland Tahiti. These, together with the sites of stone figures that show a strong relationship to similar carvings in the Marquesas, can be said to contribute to an understanding of Hawaiians strong cultural affiliation with Tahiti and the Marquesas.

**Criterion (iii)**: The well preserved heiau shrines on Nihoa and Mokumanamana, and their associated still living traditions are both distinctive to Hawai'i but, positioned within a wider 3,000 year old Pacific/Polynesian marae-ahu cultural continuum, they can be seen as an exceptional testimony to the strong cultural affiliation between Hawai'i, Tahiti and the Marquesas, resulting from long periods of migration.

**Criterion (vi)**: The vibrant and persistent beliefs associated with Papahānaumokuākea are of outstanding significance as a key element in Pacific socio-cultural evolutionary patterns of beliefs and provide a profound understanding of the key roles that ancient marae-ahu, such as those found in Raiatea, the 'centre' of Polynesia, once fulfilled. These living traditions of the Hawaiians that celebrate the natural abundance of Papahānaumokuākea and its association with sacred realms of life and death, are directly and tangibly associated with the heiau shrines of Nihoa and Mokumanamana and the pristine islands beyond to the north-west.

**Criterion (viii)**: The property provides an illustrating example of island hotspot progression, formed as a result of a relatively stationary hotspot and stable tectonic plate movement.  Comprising a major portion of the world's longest and oldest volcanic chain, the scale, distinctness and linearity of the manifestation of these geological processes in Papahānaumokuākea are unrivalled and have shaped our understanding of plate tectonics and hotspots. The geological values of the property are directly connected to the values in Hawai'i Volcanoes National Park and World Heritage property and jointly present a very significant testimony of hotspot volcanism.

**Criterion (ix)**: The large area of the property encompasses a multitude of habitats, ranging from 4,600 m below sea level to 275 m above sea level, including abyssal areas, seamounts and submerged banks, coral reefs, shallow lagoons, littoral shores, dunes, dry grasslands and shrublands and a hypersaline lake.  The size of the archipelago, its biogeographic isolation as well as the distance between islands and atolls has led to distinct and varied habitat types and species assemblages. Papahānaumokuākea constitutes a remarkable example of ongoing evolutionary and bio-geographical processes, as illustrated by its exceptional ecosystems, speciation from single ancestral species, species assemblages and very high degree of marine and terrestrial endemism.  For example, a quarter of the nearly 7,000 presently known marine species in the area are endemic. Over a fifth of the fish species are unique to the archipelago while coral species endemism is over 40%. As many species and habitats remain to be studied in detail these numbers are likely to rise.  Because of its isolation, scale and high degree of protection the property provides an unrivalled example of reef ecosystems which are still dominated by top predators such as sharks, a feature lost from most other island environments due to human activity.

**Criterion (x)**: The terrestrial and marine habitats of Papahānaumokuākea are crucial for the survival of many endangered or vulnerable species the distributions of which are highly or entirely restricted to the area.  This includes the critically endangered Hawaiian Monk Seal, four endemic bird species (Laysan Duck, Laysan Finch, Nihoa Finch and Nihoa Millerbird, and six species of endangered plants such as the Fan Palm. Papahānaumokuākea is a vital feeding, nesting, and nursery habitat for many other species, including seabirds, sea turtles and cetaceans.  With 5.5 million sea birds nesting in the monument every year and 14 million residing in it seasonally it is collectively the largest tropical seabird rookery in the world, and includes 99% of the world's Laysan Albatross (vulnerable) and 98% of the world's Black-footed Albatross (endangered). Despite relatively low species diversity compared to many other coral reef environments, the property is thus of very high in situ biodiversity conservation value.

**Integrity**

The boundaries of the property are all located in the ocean, but nevertheless have been clearly defined, demarcated on navigational charts and communicated widely.  The large size of the property ensures inclusion of a wide variety of habitat types, including a highly significant area of marginal reef environment as well as submerged banks and deepwater habitat. It also ensures a high degree of replication of habitat type.  Although past use has altered some terrestrial environments the property is still predominantly in a natural state: its nature conservation status is exceptional. This is largely due to its isolation as well as a combination of management and protection efforts, some dating back more than 100 years, including national natural resource protection legislation as well as internationally adopted restrictions.  The integrity of the property and its ecological processes are in excess of most other island archipelagos and most other tropical marine environments in the world.

All the cultural attributes that reflect Outstanding Universal Value are within the boundaries of the property. The archaeological sites remain relatively undisturbed by cultural factors.  Although none of the attributes are under severe threat, some of the archaeological sites need further conservation and protection against damage from plants and wildlife.

**Authenticity**

The unique arrangement of the collections of shrines of Mokumanamana and Nihoa islands need to be read in detail for their sacred and religious associations, linked to other similar sites across the Pacific.  The strong spiritual religious associations of Mokumanamana island are living and relevant.  Damage due to natural processes of decay, and disturbance by wildlife could also disturb their layout and ability to display clearly their meaning.

**Protection and management requirements**

Papahānaumokuākea is a highly protected area established through Presidential Proclamation in 2009, which adds to pre-existing state, federal and international legal mandates.  The multiple layers of Federal and State legislation and regulation protect Papahānaumokuākea's natural heritage and also its cultural heritage: both monuments and landscape. The property was declared a Marine National Monument under the national Antiquities Act, and is further protected by other national legislation including as the National Historic Protection Act, Historic Sites Act, and the Archaeological Resources Protection Act. There are also traditional Native Hawaiian protocols protecting the property's physical and intangible cultural heritage.

The multiple jurisdictions have created a complex institutional environment for management of the property, but management planning and intervention practices are appropriate.  The three management Agencies for the property are the US Fish and Wildlife Service, National Oceanic and Atmospheric Administration and the State of Hawaii Department of Land and Natural Resources.  There is a need to establish and maintain effective natural, archaeological and cultural heritage skills in managing the property.  An archaeologist/cultural heritage specialist is required for the property, to complement the management of its natural values.  The multiple jurisdictions have created a complex institutional environment for management of the property, but management planning and intervention practices are well conceived.  In view of the threats facing the property, well-governed multi-agency involvement and participation is a strength, provided the complexity does not compromise operational capacities and the ability to quickly respond to challenges.  It is a particular strength in relation to addressing the threats to the property that originate beyond its boundaries.

A Monument Protection Plan has been drawn up by key stakeholders, which will act as the guiding document for the property over the next 15 years. This includes strategic objectives and detailed thematic action plans that address priority needs. It is important that these efforts are sustained with the aim to increase streamlining, including to achieve more effective mechanisms for stakeholder participation and outreach. There is a need to ensure that the management system achieves effective, equitable and integrated management that protects and conserves both the cultural attributes and natural features of the property that are the basis for its Outstanding Universal Value.

Threats to the natural values of the property emanating outside its boundaries include marine litter, hazardous cargo, future exploration and mining, military operations, Illegal, Unregulated and Unreported (IUU) fishing, commercial fishing, anchor damage, vessel strikes and Invasive Alien Species.

A key issue in relation to threats to cultural attributes is the need to ensure archaeological sites are not disturbed by burrowing animals or plants, and that monitoring indicators address the impact of natural processes on the archaeological resources.  There is also a need for management to be underpinned by clear documentation of the physical cultural resource, based on the outcomes of the current archaeological investigations.

**Península Valdés**

Site: Península Valdés

Country: Argentina

Region: Atlantic Ocean

Year of Inscription: 1999

Size: 3 600 km²

Retrospective Statement of Outstanding Universal Value (2014)

Source: 38COM 8E: <http://whc.unesco.org/archive/2014/whc14-38com-8E-en.pdf>

**Brief synthesis**

Peninsula Valdes is located in the Argentinean Province of Chubut. The peninsula of approximately 360,000 hectares reaches more than 100 kilometres eastwards into the South Atlantic Ocean. Its roughly 400 kilometres of shoreline include a series of gulfs, including the extensive Golfo San Matias to the North and Golfo Nuevo to the South, both covering several thousand square kilometres. The dynamic coastal zone features rocky cliffs of up to 100 metres in height, shallow bays and shifting coastal lagoons with extensive mudflats, sandy and pebble beaches, active sand dunes, and small islands. The wetlands, some of them today also recognized as a Wetland of International Importance under the Ramsar Convention, are associated with the tidal areas of the Peninsula and provide significant nesting and resting sites for numerous migratory shorebirds. The diverse terrestrial, coastal and marine ecosystems of Peninsula Valdes contain natural habitats of extraordinary value from both a scientific and a conservation perspective.

Connected to the mainland only through a narrow strip of land, the mushroom-shaped peninsula and its shore are almost insular in nature. Its calm gulfs, sheltered from the rough South Atlantic, are key breeding, calving and nursing areas of the Southern Right Whale and many other marine mammals, such as Southern Elephant Seal, Southern Sea Lion and Orca. There are important breeding colonies of shorebirds and tens of thousands of nesting Magellanic Penguin. The land ecosystem is dominated by Patagonian Desert Steppe, representing more than half of the plant communities distinguished in Argentinean Patagonia despite its relatively modest size. Terrestrial wildlife includes Guanacos, one of South America's native camelid species, and the Patagonian Mara, a rodent endemic to Argentina. There are 181 recorded bird species, including the Lesser Rhea, the White-headed Steamer Duck, endemic to Argentina, and the migratory Snowy Sheathbill.

**Criterion (x)**: With more than 1,500 specimens visiting the area annually Peninsula Valdes contains the globally most important breeding grounds of the Southern Right Whale, a species that had severely suffered from commercial whaling. The conservation efforts in Peninsula Valdes have been playing and continue to play an important role in the ongoing recovery of this whale species, an encouraging success story in global conservation. The property is also noteworthy for several other marine mammals, in particular major breeding populations of Southern Sea Lion and Southern Elephant Seal. As for the latter species, Peninsula Valdes harbors the northernmost colonies, and the only breeding population of this species in continental Argentina. The small local population of Orca has developed a spectacular hunting method by intentionally stranding on the shores to catch offspring of Southern Sea Lion and Southern Elephant Seals. Both the coastal areas, a diverse mosaic of wetlands, mudflats, dunes and cliffs, and the land area, a distinct and relatively intact part of the Patagonian Desert Steppe, harbour diverse flora and fauna of high conservation value.

**Integrity**

The peninsula is a naturally defined unit of the Patagonian landscape. It covers the terrestrial habitats with its remarkable flora and fauna in its entirety, including the particularly valuable coastal habitats. The original habitants of the area were the Tehuelche, which lived off the land and sea prior to colonization. Later on sheep farming emerged as a dominant land use to this day with heavy exploitation of marine mammals as an additional source of employment and income. Despite ongoing sheep grazing and related competition between livestock and native herbivores, as well as persecution of native predators, the property continues to support diverse communities of native vegetation and wildlife. The property is sparsely populated and infrastructure is modest. No industrial development has occurred with the exception of an aluminium smelter in the town of Puerto Madryn, located on the mainland but on the shore of Golfo Nuevo.

Historically, the Southern Right Whale population had almost collapsed due to excessive whaling but eventually its global protection was achieved in 1935. Southern Sea Lion was also heavily hunted for oil and skins on the peninsula, legally until 1953 and illegally into the 1970s. The populations of both species have responded to the conservation measures with impressive recoveries.

The marine areas are similarly intact. Despite the good overall state of conservation the property illustrates some inherent limitations of protected areas. All of the charismatic species Peninsula Valdes is globally renowned for are seasonal visitors only. While the property adequately conserves critical and sensitive habitat it is clear that the future of the populations also depends on suitable and intact habitat elsewhere.

**Protection and management requirements**

The formal conservation history of Peninsula Valdes started in the 1960s when provincial legislation established the first Touristic Nature Reserves, Punta Norte and Isla de los Pájaros. Several other provincial protected areas have since been established in particularly valuable areas, including Golfo San Jose Provincial Marine Park in 1974. In 1983, a comprehensive Nature Reserve for Integrated Tourism Development was declared to guide responsible tourism development, integrating all previously designated protected areas. A strict marine reserve was created in Golfo Nuevo in 1995 to strengthen the protection of the Southern Right Whale, extending five nautical miles from the shore around most of the peninsula. The Chubut Provincial Tourism Organisation is in charge of the reserves. Since the 1970s, there are wildlife guards supporting local police and the National Coast Guard. Most of the land is privately owned in large "estancias". Decision-making requires a dialogue with representatives of all stakeholders, of which landowners are a major group. The management of the property encompasses a strong research component involving the National Centre for Patagonia and many national and international academic and non-governmental partners. In-situ conservation measures are complemented by national and international instruments applicable to the Southern Right Whale. The species not only received international protection from commercial whaling but was also declared a natural monument by the National Congress of Argentina in 1985.

On land adapted livestock numbers are needed to prevent further degradation and to restore habitats. Tourism, a vital sector of the local economy, is a central management issue with major potential for securing conservation finance. At the same time, tourism has complex environmental impacts in the property. Uncontrolled whale watching and other forms of wildlife viewing can result in disturbances of sensitive breeding populations both on land and water. Careful monitoring and where required limitation is indispensable. Tourism increases the consumption of scarce freshwater in the arid environment and inevitably augments solid waste and wastewater. Pollution from sewage treatment facilities, fish processing plants, and industry around the town of Puerto Madryn needs adequate environmental management. Solid waste management is required to prevent impacts from artificial inflation of gulls and rat populations which predate key species within the property.

The Peninsula System Management Plan, with a participatory strategic planning methodology, was undertaken since 1998. Completion, effective implementation and ongoing monitoring of management plans for the property is essential.

The leading causes of human-induced mortality of Southern Right Whales are ship strikes and entanglements in fishing gear. Consequently, increased vessel traffic through whale-watching, the aluminium smelter in Puerto Madryn and commercial fishing are concerns requiring ongoing protection and management measures. Passing marine traffic bears the additional great risk of spills that can only be mitigated by appropriate disaster preparedness.

A more complex challenge is the fact that all the marine mammals mating, calving and nursing in Peninsula Valdes are vulnerable to pollution, accidents and the direct and indirect effects of excessive fishing throughout their vast ranges – this challenge can only be addressed through international cooperation.

**Phoenix Islands Protected Area**

Site: Phoenix Islands Protected Area

Country: Kiribati

Region: Pacific Ocean

Year of Inscription: 2010

Size: 408 250 km²

Statement of Outstanding Universal Value (2010)

Source: 34 COM 8B.10: <http://whc.unesco.org/en/decisions/3982>

**Brief Synthesis**

As a vast expanse of largely pristine mid-ocean environment, replete with a suite of largely intact uninhabited atolls, truly an oceanic wilderness, the Phoenix Islands Protected Area (PIPA) (408,250 sq km), the largest marine protected area in the Pacific, is globally exceptional and as such is a superlative natural phenomenon of global importance.

PIPA contains an outstanding collection of large submerged volcanoes, presumed extinct, rising direct from the extensive deep sea floor with an average depth of more than 4,500 metres and a maximum depth of over 6,000 metres. Included are no less than 14 recognised seamounts, submerged mountains that don't penetrate to the surface. The collection of atolls and reef islands represent coral reef capping on 8 other volcanic mountains that approach the surface. The large bathymetric range of the submerged seamount landscape provides depth defined habitat types fully representative of the mid oceanic biota.

Due to its great isolation, PIPA occupies a unique position in the biogeography of the Pacific as a critical stepping stone habitat for migratory and pelagic/planktonic species and for ocean currents in the region. PIPA embraces the full range of marine environments in this area and displays high levels of marine abundance as well as the full spectrum of age and size cohorts, increasingly rare in the tropics, and especially in the case of apex predator fish, sea turtles, sea birds, corals, giant clams, and coconut crabs, many of which have been depleted elsewhere. The overall marine tropic dynamics for these island communities across this archipelago are better functioning (relatively intact) compared with other island systems where human habitation and exploitation has significantly altered the environment. The complete representation of ocean and island environments and their connectivity, the remoteness and naturalness are important attributes which contribute to the outstanding universal value.

**Criterion (vii)**: PIPA, an oceanic wilderness, is sufficiently remote and inhospitable to human colonisation as to be exceptional in terms of the minimal evidence of the impacts of human activities both on the atolls and in the adjacent seas. PIPA is a very large protected area, a vast wilderness domain where nature prevails and man is but an occasional visitor. PIPA is distinguished by containing a large suite of seamounts complete with a broad expanse of contextual abyssal plain with a natural phenomenon of global significance. The essentially pristine environment, outstanding underwater clarity, the spectacle of large groups of charismatic aquatic animals (e.g. bumphead parrotfish, Napolean wrasse, surgeonfishes, parrotfishes, groupers, maori wrasse, sharks, turtles, dolphins, manta rays, giant clams) in quantities rarely found elsewhere in the world, aesthetically outstanding coral reef features (e.g. giant clams, large coral heads) together with the spectacle of huge concentrations of seabirds on remote atolls, makes PIPA a truly kaleidoscopic natural "oceanscape" exhibiting exceptional natural beauty of global significance.

**Criterion (ix)**: With its rich biota, as a known breeding site for numerous nomadic, migratory and pelagic marine and terrestrial species, and the known and predicted high level of biodiversity and endemicity associated with these isolated mid-ocean atolls, submerged reefs and seamounts, PIPA makes an outstanding contribution to ongoing ecological and biological processes in the evolution and development of global marine ecosystems and communities of plants and animals.

PIPA has exceptional value as a natural laboratory for the study and understanding of the significant ongoing ecological and biological processes in the evolution and development of marine ecosystems of the Pacific, the world's largest ocean, indeed all oceans. PIPA is of crucial scientific importance in identifying and monitoring the processes of sea level change, growth rates and age of reefs and reef builders, (both geologically and historically) and in evaluating effects from climate change.

**Integrity**

PIPA's boundaries are clearly defined. The boundaries are mostly straight lines with some adjustments to the boundaries to align with the Exclusive Economic Zone (200NM) of Kiribati. There are various clearly delimited zones within PIPA as described in the Management Plan. PIPA's large size and full inclusion of oceanic and island habitats in this area and coverage of numerous examples of key habitats (coral reefs, islands, seamounts) together with its predominantly natural state give exceptional conservation importance. Despite some human impacts (fishing, invasive species) the integrity of the property and oceanic ecosystems processes at scale are globally outstanding for island archipelagos and most other tropical marine environments found worldwide.

**Protection and Management requirements**

PIPA is a highly protected area fully legally established under the PIPA Regulations 2008. These regulations include provision of a management plan and clear permitting processes and rules for activities allowable within the site. The 2010-2014 PIPA Management Plan, endorsed by Kiribati's cabinet in 2009 is under implementation. Management capacity and success is steadily building and Kiribati is using a "whole of government approach with partners" to ensure a management system that is sustainable and suitable to the circumstances of a small developing state. Of particular note is the success in capture and fining of illegal fishing vessels and in the removal of invasive species from globally important islands for seabird conservation.

For long term sustainability Kiribati and its partners are committed to a PIPA Trust Fund. The Fund's legislation, the Board and by-laws are all now in place and 2.5 million USD secured for the endowment with fundraising now a primary focus. Kiribati has recognized the need to further build management capacity, particularly for surveillance and enforcement, and continues to do so through site, national, regional and bilateral partnerships. The link to the Nauru Agreement (8 Pacific Island States) to manage tuna fishing in the region are important and provide, through license provisions, the first active linkage to management of the neighbouring high seas for a World Heritage site. Kiribati licenses for fishing in the Kiribati EEZ, including PIPA, is only allowable if the licensee agrees not to fish in the adjacent high seas. This is enforceable through the mandatory 100% observer coverage.

**Puerto-Princesa Subterranean River National Park**

Site: Puerto-Princesa Subterranean River National Park

Country: Philippines

Region: Pacific Ocean

Year of Inscription: 1999

Size: 222,02 km²

Retrospective Statement of Outstanding Universal Value (2012)

Source: 36COM 8E: <http://whc.unesco.org/archive/2012/whc12-36com-8Ee.pdf>

**Brief synthesis**

Puerto-Princesa Subterranean River National Park encompasses one of the world’s most impressive cave systems, featuring spectacular limestone karst landscapes, pristine natural beauty, and intact old-growth forests and distinctive wildlife. It is located in the south-western part of the Philippine Archipelago on the mid western coast of Palawan, approximately 76 km northwest of Puerto Princesa and 360 km southwest of Manila.

The property, comprising an area of approximately 5,753ha, contains an 8.2km long underground river. The highlight of this subterranean river system is that it flows directly into the sea, with its brackish lower half subjected to tidal influence, distinguishing it as a significant natural global phenomenon. The river’s cavern presents remarkable, eye catching rock formations. The property contains a full mountain-to-sea ecosystem which provides significant habitat for biodiversity conservation and protects the most intact and noteworthy forests within the Palawan biogeographic province. Holding the distinction of being the first national park devolved and successfully managed by a local government unit, the park’s effective management system is a symbol of commitment by the Filipino people to the protection and conservation of their natural heritage.

**Criterion (vii)**: The Puerto-Princesa Subterranean River National Park features a spectacular limestone or karst landscape. It contains an underground river that flows directly to the sea. The lower half of the river is brackish and subject to ocean tide. The associated tidal influence on the river makes this a significant natural phenomenon. The river’s cavern exhibits dramatic speleothems and several large chambers of as much as 120m wide and 60m high. Its accessibility and navigability up to 4.5km inland allows it to be experienced by the general public, who can view the magnificent rock formations on a river cruise unequalled by any other similar experience elsewhere in the world.

**Criterion (x)**: The property contains globally significant habitat for biodiversity conservation. It includes a full mountain-to-sea ecosystem, protecting the most significant forest area within the Palawan Biogeographic Province. There are eight intact forest formations: forest on ultramafic soil, forest on limestone soil, montane forest, freshwater swamp forest, lowland evergreen tropical rainforest, riverine forest, beach forest, and mangrove forest, included in the property. It contains outstanding biodiversity with the Palawan Moist Forest recognized by the WWF’s Global Report as containing the richest tree flora, with high levels of regional and local endemism and as being the largest and most valuable limestone forest in Asia.

**Integrity**

The property, including the karst mountain landscapes and the underground river, is in excellent condition. Integrity of the property is also expressed in the complete "mountain-to-the-sea" ecosystem that protects one of the most significant forests in Asia. The uniqueness of the mangrove forests in the Bay along with the flora and fauna they harbour, and the bioecological connection with the caves and surrounding forest is protected within the core area of the property ensuring the local key inter-related and inter-dependant elements of their natural relationships are protected.

The Puerto-Princesa Subterranean River National Park, comprising 5753ha and covering three barangays, encompasses the natural values of the property and is of adequate size to protect all the various landforms and the estuarine ecosystem that conveys the Outstanding Universal Value of the property. The boundaries of the property cover the entire watershed of the underground river, thus protecting water quality and quantity and ensuring the long-term viability of the outstanding natural values contained within the property. The biodiversity values of the property are highlighted in Barangay Marufinas which is included in the property along with the adjacent barangays which also contain significant biodiversity values and habitats important to their integrity. Management guidelines are needed to address threats to the property including pollutants impacting on water quality in the underground river. Threats to the property are mainly from adverse activities in adjacent catchment areas, primarily forest clearing and agricultural activities. Tourism activities require careful planning and management to ensure the natural values are not impacted.

**Protection and management requirements**

Effective site protection is provided at a local rather than a national level through agreements that place legal ownership with the City Government of Puerto Princesa. This arrangement for local ownership ensures the property’s national values are maintained even after changes in local management perspectives. The property is also covered by the National Integrated Protected Area System (NIPAS) Act of 1992 which ensures legal protection and conservation of protected areas in the Philippines. It decrees that all management decisions for the property are made in consultation with the Protected Areas Management Board (PAMB). Multilateral agreement provisions between national government agencies and local stakeholders have been considered throughout the planning and management of the site to ensure protection and conservation of its natural values.

Management of the park is conducted within the boundary as two zones: a core comprising the Park and a surrounding buffer. The Management Plan for the park sets out relevant objectives and programs and provides zoning within the park’s boundaries wherein different management regimes apply. Management of the property is very effective, reflecting strong local political support and enabling the provision of reasonable funding and staffing. Its key directive is to conserve the underground river and the forest ecosystem in their most natural state possible.

Management of the buffer is covered by guidelines that seek to regulate activities that may impact on the property. They also provide for the establishment of sustainable protective measures for agricultural lands within the buffer. Thus, not only conserving the natural resources of the area, but also improving the quality of life of its residents. However, more resources are required for the full implementation of the management plan and guidelines.

Tourism, identified as a potential threat, adversely impacting the natural values of the property, is being addressed through tourism management objectives set out in the Management Plan. But as tourist visits are increasing, more staff training in park planning and management is required to ensure effective management of tourism activities. The property’s tourism program aims to enhance visitor’s experience with nature while protecting the natural values. The threats posed by uncontrolled access from outside developments are being addressed through the implementation of a limit of 600 visitors per day. Wildlife population surveys are conducted annually to monitor the effects of tourism on wildlife.

Threats from activities such as forest clearing and agriculture also need to be addressed in the Management Plan. Water quality in the underground river, invariably affected by upstream activities in the catchment area, as well as concerns about pollution inputs to the river, need to be addressed in the management guidelines. Regular awareness campaigns at the level of the barangays are needed to ensure natural values of the property are conserved within their jurisdictions and the establishment of an integrated land use plan is required to ensure long term conservation of the natural values of the property.

**Rock Islands Southern Lagoon**

Site: Rock Islands Southern Lagoon

Country: Palau

Region: Pacific Ocean

Year of Inscription: 2012

Size: 1 002 km²

Statement of Outstanding Universal Value (2012)

Source: 36 COM 8B.12: <http://whc.unesco.org/en/decisions/4783>

**Brief synthesis**

The Rock Islands Southern Lagoon consists of numerous large and small forested limestone islands, scattered within a marine lagoon protected by a barrier reef. The property lies within Koror State, immediately to the south of Palau’s main volcanic island Babeldaob in the western Pacific Ocean.

The marine site covers 100,200 ha and is characterized by coral reefs and a diversity of other marine habitats, as well as 445 coralline limestone islands uplifted due to volcanism and shaped over time by weather, wind and vegetation. This has created an extremely high habitat complexity, including the highest concentration of marine lakes in the world, which continue to yield new species discoveries. The terrestrial environment is lush and at the same time harsh, supporting numerous endemic and endangered species. Although presently uninhabited, the islands were once home to Palauan settlements, and Palauans continue to use the area and its resources for cultural and recreational purposes. This is regulated through a traditional governance system that remains an important part of national identity.

The islands contain a significant set of cultural remains relating to an occupation over some five thousand years that ended in abandonment. Archaeological remains and rock art sites are found in two island clusters - Ulong and Negmelis, and on three islands - Ngeruktabel, Ngeanges, and Chomedokl.

Remains of former human occupation in caves, including rock art and burials, testifies to seasonal human occupation and use of the marine ecosystem, dating back to 3,100 BP and extending over some 2,500 years. Permanent stone villages on a few islands, some dating back to between 950 and 500 BP, were occupied for several centuries before being abandoned in the 17th-18th centuries, when the population moved to larger islands. The villages include the remains of defensive walls, terraces and house platforms. The settlements reflect distinctive responses to their local environment and their abandonment demonstrates the consequences of population growth and climate change impacting on subsistence in a marginal environment.

The descendants of the people who moved from the Rock Islands to the main islands of Palau identify with their ancestral islands through oral traditions that record in legends, myths, dances, and proverbs, and traditional place names the land- and seascape of their former homes.

The abandoned islands now provide an exceptional illustration of the way of life of small island communities over more than three millennia and their dependence on marine resources. They also are seen as ancestral realms by the descendants of those who migrated to the main island of Palau and this link is kept alive through oral traditions.

**Criterion (iii)**: The Rock Islands cave deposits, burials, rock art, abandoned remains of stonework villages and middens bear exceptional testimony to the organisation of small island communities and their harvesting of marine resources over some three millennia.

**Criterion (v)**: The abandonment of Rock Island villages in the 17th and 18th centuries demonstrated by the remains of human settlement and evidence of marine harvesting activity in the Rock Islands Southern Lagoon is an exceptional illustration of the intersection and consequences of climate change, population growth, and subsistence behaviour on a society living in a marginal marine environment.

**Criterion (vii)**: The Rock Islands Southern Lagoon contains an exceptional variety of habitats within a relatively limited area. Barrier and fringing reefs, channels, tunnels, caves, arches, and coves, as well as the highest number and density of marine lakes in the world, are home to diverse and abundant marine life. The maze of dome-shaped and green Rock Islands seemingly floating in the turquoise lagoon surrounded by coral reef is of exceptional aesthetic beauty.

**Criterion (ix)**: The Rock Islands Southern Lagoon contains 52 marine lakes, more than at any other site in the world. Furthermore, the marine lakes of the property are at different stages of geological and ecological development, ranging from lakes with high connectivity to the sea to highly isolated lakes with notably different species composition, including unique and endemic species. These features represent an outstanding example of how marine ecosystems and communities develop, and make the lakes valuable as “natural laboratories” for scientific study of evolution and speciation. Five new subspecies of the Mastigias papua jellyfish have been described from these marine lakes, and new species discoveries continue to be made both in the marine lakes as well as in the complex reef habitats of the property.

**Criterion (x)**: The Rock Islands Southern Lagoon has exceptionally high biological and marine habitat diversity. The marine lakes are unique in terms of number, the density at which they occur, and their varying physical conditions. With low fishing pressure, limited pollution and human impact, as well as an exceptional variety of reef habitat, the resilience of reefs of the property makes it a critical area for protection, including as an area important for climate change adaptation of reef biota, and potentially as a source of larvae for reefs in the region. All the endangered megafauna of Palau, 746 species of fish, over 385 species of corals, at least 13 species of sharks and manta rays, 7 species of giant clams, and the endemic nautilus are found in the property, and the forests of the islands include all of Palau’s endemic birds, mammals, herpetofauna and nearly half of Palau’s endemic plants. This makes the area of exceptional conservation value.

**Integrity**

The property has clear boundaries and includes a large part of the lagoonal and reef habitat surrounding the main islands of Palau, as well as most land of coralline origin occurring within Koror State. This ensures a high degree of replication of habitat type. Although past and present use has altered both marine and terrestrial environments, or at least the abundance of resource species, the present conservation status of the property is good. Activities in and around the property that may impact on it are subject to specific management regulations and/or interventions. The inclusion of waters outside the barrier reef and within Koror State jurisdiction in a buffer zone further increases its ecological integrity.

The property contains a complete representation of the features and processes that convey the value of the property. Most of these elements do not suffer inordinately from development or neglect and are in good condition. However a conservation programme is required to ensure ongoing conservation and maintenance. The property has been largely isolated from human interference since pre-European occupation ceased. They are nevertheless highly vulnerable to uncontrolled tourism activities.

**Authenticity**

The form and materials of village settlements, burial caves and their setting continue to convey the cultural value of the property. Excavated deposits have been recorded and reburied, and the reports of these campaigns have been lodged with the Koror State Government. To achieve a full understanding of the remains on all the islands will need more survey work.

Oral histories and ongoing cultural traditions in the main island of Palau keep alive the memories of the migration away from the Rock Islands and the histories associated with them.

**Protection and management requirements**

The legislative framework regulating use and management of the environment and its resources is comprehensive and clear. The area falls in its entirety in Koror State, and the management jurisdiction of Koror State Rangers is well known and respected. Management authorities are operating on relatively reliable revenue from tourism. The strength of traditional value systems including resource governance systems is an asset, and can enable management and zoning that accommodate both cultural/traditional and biodiversity conservation needs. Management objectives and priorities are defined in the Rock Islands Southern Lagoon Management Plan. Both legislative framework and management arrangements are conducive to protecting and maintaining the values of the property.

Cultural sites within the Rock Islands Southern Lagoon are protected under Title 19 ‘Cultural Resources’ by the Historical and Cultural Preservation Act of the Republic of Palau. Underwater archaeological and historical remains are protected under Title 19 as the ‘Palau Lagoon Monument’. All the designated sites within the property should be included on Palau’s National Register of historic places.

The Koror State Department of Conservation and Law Enforcement collaborates with the Palau Historic Preservation Office, Bureau of Arts and Culture in working with locally based agencies and organisations on management and research activities within the property. Koror State Regulations (1994) cover general resource use, recreational activities and the designation of protected areas within the Rock Islands Southern Lagoon. The Rock Islands Use Act was legislated in 1997 to regulate tourist activity in the islands. The laws and regulations are enforced by the Koror State Rangers.

The Rock Islands Southern Lagoon Area Management Plan 2004-2008 was adopted by the Koror State Legislature and Governor in 2005 and is currently under review.

Long term protection and management requirements for the property include the need to prevent negative impacts from tourism, including maintaining access restrictions to vulnerable areas, ensuring visitor numbers are within the capacity of the property, and mitigating adverse effects from development of infrastructure and facilities in Koror. Subsistence and recreational fishing taking place within the property and in designated zones require constant monitoring. However, the property may also be constructively used for research on and preservation of traditional knowledge of the marine environment. Additional needs include maintaining restrictions on development, including aquaculture, within the property and in the vicinity of property boundaries. An adaptive approach to management of the property and the provision for effective long term monitoring including ecosystem health and water quality are necessary in order to maintain the resilience of the property in the face of climate change.

**Shark Bay, Western Australia**

Site: Shark Bay, Western Australia

Country: Australia

Region: Indian Ocean

Year of Inscription: 1991

Size: 22 009,02 km²

Retrospective Statement of Outstanding Universal Value (2013)

Source: 37 COM 8E: <http://whc.unesco.org/archive/2013/whc13-37com-8E-en.pdf>

**Brief synthesis**

On the Indian Ocean coast at the most westerly point of Australia, Shark Bay’s waters, islands and peninsulas covering a large area of some 2.2 million hectares (of which about 70% are marine waters) have a number of exceptional natural features, including one of the largest and most diverse seagrass beds in the world. However it is for its stromatolites (colonies of microbial mats that form hard, dome-shaped deposits which are said to be the oldest life forms on earth), that the property is most renowned. The property is also famous for its rich marine life including a large population of dugongs, and provides a refuge for a number of other globally threatened species.

**Criterion (vii)**: One of the superlative natural phenomena present in this property is its stromatolites, which represent the oldest form of life on Earth and are comparable to living fossils. Shark Bay is also one of the few marine areas in the world dominated by carbonates not associated with reef-building corals. This has led to the development of the Wooramel Seagrass Bank within Shark Bay, one of the largest seagrass meadows in the world with the most seagrass species recorded from one area. These values are supplemented by marine fauna such as dugong, dolphins, sharks, rays, turtles and fish, which occur in great numbers.

The hydrologic structure of Shark Bay, altered by the formation of the Faure Sill and a high evaporation, has produced a basin where marine waters are hypersaline (almost twice that of seawater) and contributed to extensive beaches consisting entirely of shells. The profusion of peninsulas, islands and bays create a diversity of landscapes and exceptional coastal scenery.

**Criterion (viii)**: Shark Bay contains, in the hypersaline Hamelin Pool, the most diverse and abundant examples of stromatolites (hard, dome-shaped structures formed by microbial mats) in the world. Analogous structures dominated marine ecosystems on Earth for more than 3,000 million years. The stromatolites of Hamelin Pool were the first modern, living examples to be recognised that have a morphological diversity and abundance comparable to those that inhabited Proterozoic seas. As such, they are one of the world’s best examples of a living analogue for the study of the nature and evolution of the earth’s biosphere up until the early Cambrian. The Wooramel Seagrass Bank is also of great geological interest due to the extensive deposit of limestone sands associated with the bank, formed by the precipitation of calcium carbonate from hypersaline waters.

**Criterion (ix)**: Shark Bay provides outstanding examples of processes of biological and geomorphic evolution taking place in a largely unmodified environment. These include the evolution of the Bay’s hydrological system, the hypersaline environment of Hamelin Pool and the biological processes of ongoing speciation, succession and the creation of refugia.

One of the exceptional features of Shark Bay is the steep gradient in salinities, creating three biotic zones that have a marked effect on the distribution and abundance of marine organisms. Hypersaline conditions in Hamelin Pool have led to the development of a number of significant geological and biological features including the ‘living fossil’ stromatolites. The unusual features of Shark Bay have also created the Wooramel Seagrass Bank. Covering 103,000 ha, it is the largest structure of its type in the world. Seagrasses are aquatic flowering plants that form meadows in nearshore brackish or marine waters in temperate and tropical regions, producing one of the world’s most productive aquatic ecosystems. Australia has one of the highest diversity of seagrasses globally, with 12 species occurring in the Bay.

**Criterion (x)**: Shark Bay is a refuge for many globally threatened species of plants and animals. The property is located at the transition zone between two of Western Australia’s main botanical provinces, the arid Eremaean, dominated by Acacia species and the temperate South West, dominated by Eucalyptus species, and thus contains a mixture of two biotas, many at the limit of their southern or northern range. The property contains either the only or major populations of five globally threatened mammals, including the Burrowing Bettong (now classified as Near Threatened), Rufous Hare Wallaby, Banded Hare Wallaby, the Shark Bay Mouse and the Western Barred Bandicoot. A number of globally threatened plant and reptile species also occur in the terrestrial part of the property. Shark Bay’s sheltered coves and lush seagrass beds are a haven for marine species, including Green Turtle and Loggerhead Turtle (both Endangered, and the property provides one of Australia’s most important nesting areas for this second species). Shark Bay is one of the world’s most significant and secure strongholds for the protection of Dugong, with a population of around 11,000. Increasing numbers of Humpback Whales and Southern Right Whales use Shark Bay as a migratory staging post, and a famous population of Bottlenose Dolphin lives in the Bay. Large numbers of sharks and rays are readily observed, including the Manta Ray which

is now considered globally threatened.

**Integrity**

At time of inscription in 1991 it was noted that human impacts, while not as pronounced as in other World Heritage properties due to the property’s relative remoteness, have had some effects including impacts from pastoralism and feral animals. The small, local centre of Denham, along with industrial activities such as salt and gypsum mining in the region, could comprise threats if not properly managed. Tourism and recreational boating also needs to be carefully managed. The marine environment has undergone some modification through historically intensive pearl shell, fishing, trawling and whaling activities. However, the ecosystems in Shark Bay appear relatively unaltered by human impact, although this could change if terrestrial mining of mineral sands were to take place. Other potential threats could be from improved technology in producing drinking water which would lead to increased tourism and residential density, the upgrading of road access, agricultural developments to the east (dependent on water supply), expansion of gypsum mining, and the introduction of intensive aquacultural or fishing technologies. Climate change could also impact on the complex marine ecosystem. While the property meets the required conditions of integrity and contains the components required to demonstrate all aspects of the natural processes, it is important that the property’s management arrangements provide the framework in which these integrity issues can be monitored and addressed.

**Protection and management requirements**

The Shark Bay World Heritage property encompasses a number of different land tenures and thus a variety of statutory and management arrangements protect its values. At the time of nomination of the property, existing conservation reserves totalled approximately 200,000 hectares and mainly consisted of small island nature reserves, Bernier and Dorre Islands and the Hamelin Pool Nature Reserve. Specific suggestions to increase the conservation tenure boundaries included expanding the northern boundary of the Hamelin Pool Class A Marine Nature Reserve; extending the southern boundary of the terrestrial park on the northern end of the Peron Peninsula; the inclusion of the Gladstone Embayment in the Hamelin Pool Marine Nature Reserve; the extension of the northern boundary line of the Marine Park in the Denham Sound area; securing reserve status for Dirk Hartog Island and the incorporation of the southern part of Nanga pastoral station into the reserve system. Since inscription, Francois Peron National Park (52,586 hectares), Shell Beach Conservation Park (517 hectares), Monkey Mia Reserve (446 hectares), Monkey Mia Conservation Park (5 hectares), Zuytdorp Nature Reserve (additional 58,850 hectares), Nanga pastoral lease (176,407 hectares), part Tamala pastoral lease (56,343 hectares), South Peron (53,408 hectares), part Carrarang pastoral lease (18,772 hectares), Bernier, Dorre and Koks Islands Nature Reserves (9,722 hectares) and Dirk Hartog Island National Park (61,243 hectares) have been added to the conservation estate. With the designation of the Shark Bay Marine Park (748,725 hectares) in 1990, incorporating the Hamelin Pool Marine Nature Reserve, the total formal conservation area of the World Heritage property is approximately 1.24 million hectares. In addition, the coastal portion of the Yaringa pastoral lease (19,396 hectares), part of Nerren Nerren pastoral lease (104,351 hectares) and part of Murchison House pastoral lease (37,578 hectares) have been added as a buffer. The Yaringa portion adjoins the Hamelin Pool Nature Reserve and in addition to having very high conservation value, is of strategic significance in bordering the World Heritage property.

A management agreement between the Australian Government and the State of Western ustralia provides for management of the property to be carried out by the Western Australian Government in accordance with Australia’s obligations under the World Heritage Convention. In addition, a comprehensive programme of management and administrative structures and planning processes has been implemented. Under the terms of the Agreement, a ministerial council and two advisory committees (scientific advisory and community consultative) were formed. The Shark Bay World Heritage Advisory Committee replaced the two previous Scientific Advisory and Community Consultative committees with a new committee consisting of community, scientific and Indigenous representatives. Owing to the diversity of land tenures and managing agencies and individual interests within the property, the Shark Bay World Heritage Property Strategic Plan 2008-2020 was prepared to develop a partnership between governments and the community. From July 2000, any proposed activity which may have a significant impact on the property became subject to the provisions of the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act),

which regulates actions that will, or are likely to, have a significant impact on World Heritage values. In 2007, Shark Bay was added to the National Heritage List, in recognition of its national heritage significance under the Act.

Management issues raised at the time of inscription included the control of human use through both zoning and designation of conservation areas, restrictions on public access to certain areas, the management of the trawl fishery to protect values, the purchase of land for conservation use, and increased staffing. Since then, climate change has emerged as an additional potential threat to the World Heritage values. Fire also represents a threat to species that are highly restricted in their distribution, particularly populations which only survive on islands which could be severely affected by a single large fire. Australia has introduced a range of measures at both the national, and property-specific, level to address these potential threats.

**Shiretoko**

Site: Shiretoko

Country: Japan

Region: Pacific Ocean

Year of Inscription: 2005

Size: 711 km²

Retrospective Statement of Outstanding Universal Value (2013)

Source: 37COM 8E: <http://whc.unesco.org/archive/2013/whc13-37com-8E-en.pdf>

**Brief synthesis**

Shiretoko is one of the richest integrated ecosystems in the world. Encompassing both terrestrial and marine areas the property is located in the northeast of Hokkaido and is comprised of a part of the Shiretoko Peninsula, which protrudes into the Sea of Okhotsk and the surrounding marine areas. The extraordinarily high productivity of the marine and terrestrial component of the property, produced and largely influenced by the formation of seasonal sea ice at the lowest latitude in the northern hemisphere, and the prominent interaction between the marine and terrestrial ecosystems are the key features of Shiretoko. The supply of nutrient-rich intermediate water resulting from the formation of sea ice in the Sea of Okhotsk allows successive primary trophic productions including blooms of phytoplankton in early spring, which underpins Shiretoko’s marine ecosystem. This in turn sustains the food sources for terrestrial species, including the brown bear and Blakiston’s fish-owl, through salmonid species swimming upstream to spawn. The property is globally important for a number of marine species, globally threatened seabirds and migratory birds.

The terrestrial ecosystem has various types of virgin vegetation reflecting the complex topography and weather conditions of the property, and serves as a habitat for a rich and diverse range of fauna and flora including endangered and endemic species such as *Viola kitamiana*.

**Criterion (ix)**: Shiretoko provides an outstanding example of the interaction of marine and terrestrial ecosystems as well as extraordinary ecosystem productivity, largely influenced by the formation of seasonal sea ice at the lowest latitude in the northern hemisphere, occurring earlier here than in other sea ice areas. Illustrating ecological processes, phytoplankton blooms develop on the nutrients supplied by the melting sea ice and from the deep ocean, entering the system through circulation of currents. The food webs starting from the phytoplankton blooms involve fish, birds and mammals, and form dynamic ecosystems over ocean, rivers and forests.

**Criterion (x)**: Shiretoko has particular importance for a number of marine and terrestrial species. Combining northern species from the continent and southern species from Honshu, the property supports a range of animal species. These include a number of endangered and endemic species, such as the Blackiston’s Fish owl and the plant species *Viola kitamiana*. The property has one of the highest recorded densities of brown bear populations in the world. The property has significance as a habitat for globally threatened sea birds and is a globally important area for migratory birds.

Shiretoko is also globally important for a number of salmonid species, encompassing habitat in many small watersheds and supporting several species of Pacific salmonids, including White spotted charr, masu salmon, chum salmon and pink salmon. Those watersheds have specific importance as it is the southernmost habitat in the world for the sea run of the Dolly varden.The property is a seasonal habitat for a number of marine mammals including the Steller’s sea lion, Spotted Seal, Killer Whale, Minke Whale, Sperm Whale, Dall’s Porpoise and the endangered Fin Whale.

**Integrity**

The boundaries of the property follow the existing legally designated protected areas and covering 71,100 ha in area, they embrace all of the conserved areas of the integrated ecosystem, comprising an extremely rich marine and terrestrial ecosystem, sufficiently encompassing all the key terrestrial values of the property and the key marine ecological area for marine biodiversity. The terrestrial boundaries are logical and protect key terrestrial features while the marine boundaries extend 3 km from the shoreline, corresponding to the depth of 200 meters, which encompasses the key marine ecological area for marine biodiversity. The region’s vitally important fishing industry has been undertaken in the area for a considerable amount of time and recent efforts to ensure sustainability will help to ensure valuable economic input to the region while attempting to ensure conservation of the natural values. Extensive consultation with local stakeholders and the development of the Multiple Use Integrated Marine Management Plan are also assisting management authorities

to achieve the goal of a sustainable industry and continued long-term conservation. The terrestrial boundaries of the property protect key features on the land, from the coastline to the mountain peaks, 1,600 m high. Most of the terrestrial area is in a natural or semi-natural condition and the property’s physical features continue to retain a high degree of natural integrity. Management agencies possess adequate resources to implement the provisions of the management plan including strategies to address the high density of both bear and sika deer populations.

**Protection and management requirements**

Shiretoko is protected by a number of national laws and regulations, including the Nature Conservation Law (1972), the Natural Parks Law (1957), the Law on Administration and Management of National Forests (1951) and the Law for the Conservation of Endangered Species of Wild Fauna and Flora (Species Conservation Law for short) (1992). In addition to these laws, the marine component is protected by regulations covering issues such as fishing and marine pollution, and is managed in accordance with, among others, the Regulation of Sea Fisheries Adjustment in Hokkaido based on the Fisheries Law. Rare and endangered species found within the property, such as the Steller’s Sea Eagle, White-tailed Eagle, and Blakiston’s Fish-Owl, are also designated and legally protected as National Endangered Species of Wild Fauna and Flora based on the Species Conservation Law and/or as Natural Monuments based on the Law for the Protection of Cultural Properties.

Most of the terrestrial area of the property lies within the national forest owned and managed by the national government and is designated in the following protected areas: Onnebetsudake Wilderness Area, Shiretoko National Park, Shiretoko National Wildlife Protection Area, and Shiretoko Forest Ecosystem Reserve. The property is classified into Area A (previously called a core area) and Area B (previously called a buffer area) for management purposes with Area A protecting and preserving wilderness and Area B maintaining the natural environment in harmony with human activities such as tourism and fisheries. Area A consists of specially protected areas including Onnebetsudake Wilderness Area, the Special Protection Zone of the Shiretoko National Park and Preservation Zone of Shiretoko Forest Ecosystem Reserve. Each of these designations represents an effective system of protection for Japan’s rich natural environment, and as a whole, constitutes a comprehensive administration system for the property with strict legal restrictions on development and other activities. The Ministry of the Environment, the Forestry Agency, the Agency for Cultural Affairs, and the Hokkaido prefectural government are responsible for their respective systems related to the conservation and administration of the property. They developed the Management Plan for the Shiretoko World Natural Heritage Site to ensure smooth management of the multi-tiered protected areas and species, and the property is managed as a unit based on this plan. In addition, relevant government agencies and local governments established the Shiretoko World Natural Heritage Site Regional Liaison Committee with the participation of various stakeholders, to promote conservation management of the property through effective collaboration and cooperation with the local community. Also, the Shiretoko World Natural Heritage Site Scientific Council, consisting of scientists and experts, was established and has been promoting adaptive conservation management of the property that reflects scientific knowledge.

Tourism is an increasingly important issue within the property. Large numbers of tourists visit the property in summer and the numbers of tourists are also increasing in winter to view the sea ice. A consolidated ecotourism strategy, based on the protection of the natural values of the property, the promotion of high quality nature based experiences for visitors and promotion of the local economic development is required to ensure conservation of the property values. For this reason, the local offices of the Ministry of the Environment and the Forestry Agency together with Hokkaido prefectural government established the Committee on the Proper Use of Nature and Ecotourism, which covers both the Regional Liaison Committee and the Scientific Council. They started formulation of Shiretoko Ecotourism Strategy in 2010.

Other issues impacting the property, such as the effect of the fishery industry on the marine ecosystem, the impact of river constructions including check dams and erosion control dams on salmon migration for spawning, the impact on vegetation of grazing pressure of the densely-populated sika deer, and conflicts between local residents or tourists and brown bears including agricultural and fishery damage are being addressed based on the scientific knowledge of working groups established under the Scientific Council. Measures to address these issues are being taken reflecting the views and opinions of local stakeholders who have shown a strong commitment at all levels to ensuring the Outstanding Universal Values of the property are maintained. The Sika Deer Management Plan in the Shiretoko Peninsula was established to address sika deer issues, and the Multiple Use Integrated Marine Management Plan for Shiretoko World Natural Heritage Site was developed, on the basis of fisheries-related laws and autonomous management by fishermen. Subsequently, the revised Management Plan for the Shiretoko World Natural Heritage Site (2009) was formulated to integrate all individual plans. Furthermore, the Conservation Management Policy for Brown Bears on the Shiretoko Peninsula and the Second Sika Deer Management Plan in the Shiretoko Peninsula were established in 2012. The Multiple Use Integrated Marine Management Plan is currently under review and the second Marine Management Plan is being formulated.

The long-term effects of climate change are unclear, but given the complex interactions within the property between the marine and terrestrial ecosystems and the reliance of the system on the seasonal sea ice, the effects of climate change are of concern. In order to respond to those effects, monitoring activities are ongoing based on advice from the Scientific Council. The bottom-up approach to management through the involvement of local communities and stakeholders, and the way in which scientific knowledge has been effectively applied to management of the property through the Scientific Council and working groups have been commended by IUCN and the UNESCO World Heritage Centre and provide an excellent model for the management of World Heritage properties elsewhere.

**Sian Ka'an**

Site: Sian Ka'an

Country: Mexico

Region: Caribbean Sea

Year of Inscription: 1987

Size: 5 280 km²

Retrospective Statement of Outstanding Universal Value (2013)

Source: 37COM 8E: <http://whc.unesco.org/archive/2013/whc13-37com-8E-en.pdf>

**Brief synthesis**

Thousands of years ago the original Maya inhabitants appreciated the exceptional natural beauty of this stretch of coastline, naming it Sian Ka´an, or “Origin of the Sky". Located on the Eastern coast of the Yucatan Peninsula in the State of Quintana Roo, Sian Ka´an is one of Mexico's largest protected areas, established to manage 528,148 hectares of intricately linked marine, coastal and terrestrial ecosystems. Along its roughly 120 kilometres of coastline, the property covers over 400,000 hectares of land ranging from sea level to only ten m.a.s.l. The property boasts diverse tropical forests, palm savannah, one of the most pristine wetlands in the region, lagoons, extensive mangrove stands, as well as sandy beaches and dunes. The 120,000 hectares of marine area protect a valuable part of the Mesoamerican Barrier Reef and seagrass beds in the shallow bays. The lush green of the forests and the many shades of blue of the lagoons and the Caribbean Sea under a wide sky offer fascinating visual impressions.

The diversity of life in Sian Ka'an is exceptional. The tropical forests are home to charismatic mammals such as Jaguar, Puma, Ocelot and Central American Tapir. The property also provides habitat for a large number of resident and migratory bird species. There is a great diversity of marine life, including the West Indian Manatee, four species of nesting marine turtles and hundreds of fish species. About a third of the property is comprised of highly diverse and productive mangrove communities, of vital importance to fisheries in the broader region Hundreds of forested islands, locally known as "Petenes", emerge from the flooded marshes, some reaching over a kilometre in diameter. A geological, biological and cultural particularity are the "Cenotes", deep natural sinkholes harbouring fascinating life forms, many of them endemic. This karst phenomenon results from collapsing limestone exposing groundwater.

**Criterion (vii)**: The aesthetics and beauty of Sian Ka´an derive from the relatively undisturbed interface of sea and land along a well-conserved coastline. The mosaic of landscape elements is diverse in shapes, forms and colours allowing intriguing views and impressions. Noteworthy and rare natural phenomena include the "Cenotes", water-filled natural sinkholes hosting specialised communities of life and the "Petenes", tree islands emerging from the swamps. Both are connected by underground freshwater systems, jointly forming an invaluable and fragile treasure for future generations.

**Criterion (x):** The scale and conservation status of Sian Ka'an and its ecosystem diversity support a fascinating range of life forms. Over 850 vascular plants, including 120 woody species, have been confirmed in what is assumed to be a still incomplete inventory. In terms of fauna, noteworthy representatives among the more than 100 documented mammals include endangered species like Black-handed Spider Monkey, Yucatan Black Howler Monkey and the Central American Tapir. A small population of the vulnerable West Indian Manatee occurs in the coastal waters. Some 330 bird species have been recorded, 219 of them breeding in Sian Ka'an. Amphibians and reptiles are represented by more than 40 recorded species, among them the vulnerable American Crocodile and four of the six turtle species found along the Mexican coast, all reproducing within the property. The isolation of some of the "Cenotes" led to the evolution of several species which are locally endemic to single sinkholes. With some 80 recorded species of reef-building coral the portion of the Mesoamerican Reef within the property is one of the richest in Mexico. Jointly with the many other aquatic habitats is harbours more than 400 species of fish and a wealth of other marine life.

**Integrity**

The extensive property covers a large wetland complex, tropical forests, a diverse coastline, mangroves and a fascinating marine area with noteworthy corals and seagrass beds, all in a good overall state of conservation. Large tracts of the dense forests, mangroves and marshland are difficult to access and the poor soils and the vulnerability to storms and flooding have contributed to maintaining the mosaic of ecosystems. Many of the boundaries coincide with landscape features, such as the natural edge of the marshes in the South-East or the limits of the Espiritu Santo Bay catchment in the South. In the ocean, a depth of 50 metres has been defined as the Eastern boundary of Sian Ka'an. The property is of great importance to support the continuity of the intricate connections between terrestrial, marine and freshwater ecosystems and their rich flora and fauna. Sian Ka'an embraces a self-protecting system that is characteristic of the coast of the Yucatan Peninsula: the Mesoamerican Reef shelters the landward mangroves and seagrass beds, while the mangroves trap sediments, filter pollution and serve as nurseries for many vertebrates and invertebrates in the reef. In other words, these major landscape and seascape features are of vital importance to each other. It is therefore indispensable to consider them jointly in management and conservation, as is the case in Sian Ka'an. The contiguity with the almost 90,000 hectares protected as Uaymil Flora and Fauna Protection Area to the South and other important marine and terrestrial protected areas nearby likewise contribute to the integrity of Sian Ka'an.

**Protection and management requirements**

After the historic abandonment of the area, inaccessibility, frequent flooding and poor soils allowed for centuries of natural regeneration, until governmental schemes encouraged timber extraction and land clearing for cattle pastures in the 20th Century. The undesired effects of uncontrolled development led to the creation of a nature reserve in 1982, consolidated in 1986 when the area was categorized a national biosphere reserve by Presidential Decree and also internationally recognised. More recently, Sian Ka'an was also recognised as part of

a vast Wetland of International Importance under the Ramsar Convention. The large property is federally owned with the exception of a small patch of private land of around one percent of the total area on the Northern coast. Today, Mexico's National Protected Areas Agency CONANP under the Ministry of the Environment (SEMARNAT) is in charge of management, cooperating with partners at all levels of government. A management programme is to guide all activities and zonation. The involvement of local communities, governmental representatives, Academia and non-governmental organisations in management is promoted through an Advisory Council.

Sian Ka'an is susceptible to frequent and heavy tropical storms. The barrier reef provides natural protection for the coast, a telling example of conservation contributing to disaster preparedness. As for human impacts, the inaccessibility protects large tracts of the property. Besides the coastal fishing villages of Punta Allen and Punta Herrero, there are few permanent residents in the property. Hunting, fishing and collection of forest products, however, are widespread. Sport fishing and commercial fishing to supply nearby tourism centres has resulted in marked declines of some species, notably the Spiny Lobster. Management responses are needed. Agriculture north of the property bears pollution risks pollution and fires set to clear land have repeatedly spread into the property. Alien invasive species are reported, mostly along the dirt tracks on land but also in the ocean. The main economic sector directly and indirectly impacting on the property, however, is tourism. Fishing lodges and clubs, small hotels, cabins and trailer parks are the visible manifestations within the property. Tourism has reached proportions of mass tourism along parts of the Yucatan Coast and the property is in the vicinity of Tulum and Cancun, two of Yucatan’s major tourist attractions. Associated coastal urbanisation with, for example, welldocumented

garbage and sewage problems, require monitoring and management responses. Attempts to

encourage low impact forms of tourism in the property to promote public awareness and visitor education but also as a source of conservation funding deserve consolidation.

**Socotra Archipelago**

Site: Socotra Archipelago

Country: Yemen

Region: Indian Ocean

Year of Inscription: 2008

Size: 4 104,60 km²

Buffer zone: 17 409,58 km²

Statement of Outstanding Universal Value (2008)

Source: 32 COM 8 B.5: <http://whc.unesco.org/en/decisions/1463>

**Values**

Socotra is globally important for biodiversity conservation because of its exceptionally rich and distinct flora and fauna. 37% of Socotra’s plant species, 90% of its reptile species and 95% of its land snail species do not occur anywhere else in the world. Socotra is of particular importance to the Horn of Africa’s biodiversity hotspot and, as one of the most biodiversity rich and distinct islands in the world, has been termed the “Galápagos of the Indian Ocean”.

**Criterion (x)**: Biological diversity and threatened species: Socotra is globally important for biodiversity conservation because of its exceptional level of biodiversity and endemism in many terrestrial and marine groups of organisms. Socotra is particularly important for its diversity of plants and has 825 plant species of which 307 (37%) are endemic. Socotra has high importance for bird species as underlined by the identification by Birdlife International of 22 Important Bird Areas on Socotra. Socotra also supports globally significant populations of other land and sea birds, including a number of threatened species. Extremely high levels of endemism occur in Socotra’s reptiles (34 species, 90% endemism) and land snails (96 species, 95% endemism). The marine life of Socotra is also very diverse, with 253 species of reef-building corals, 730 species of coastal fish and 300 species of crab, lobster and shrimp, and well represented in the property’s marine areas.

**Integrity**

The property is of sufficient size to adequately represent all the terrestrial and marine features and processes that are essential for the long term conservation of the archipelago’s rich and distinct biodiversity. The terrestrial nature sanctuaries, national parks and areas of special botanical interest included in the property encompass about 75% of the total land area. They protect all the major vegetation types, areas of high floral and faunal values, and important bird areas. The marine nature sanctuaries included in the property encompass the most important elements of marine biodiversity. The property’s integrity is further enhanced by terrestrial and marine buffer zones that are not part of the inscribed property.

**Requirements for Protection and Management**

All component areas of the property have legal protection; however there is a need to strengthen the legislative framework, and management and enforcement capacity. Whilst the property’s terrestrial and marine habitats are generally still in good condition, management planning needs to deal more effectively with current threats including roading, overgrazing and overharvesting of terrestrial and marine natural resources. Potential future threats include unsustainable tourism and invasive species. Impacts of these threats on Socotra’s biodiversity need to be closely monitored and minimized. A sustainable financing strategy is required to ensure the necessary human and financial resources for the long term management of the property. Appropriate linkages need to be developed between the management of the property, its buffer zones and the Socotra Biosphere Reserve.

**St Kilda**

Site: St Kilda

Country: United Kingdom of Great Britain and Northern Ireland

Region: Atlantic Ocean

Year of Inscription: 1986, extended in 2004 and 2005

Size: 242,01 km²

Retrospective Statement of Outstanding Universal Value (2013)
Source: 37 COM 8E: <http://whc.unesco.org/archive/2013/whc13-37com-8E-en.pdf>

**Brief synthesis**

The tiny archipelago of St Kilda, lying off the west coast of mainland Scotland, is breathtaking. Formed from the rim of an ancient volcano associated with the opening up of the North Atlantic some 65-52 million years ago, the intensely dramatic, jagged landscape of towering cliffs – some of the highest sea cliffs in Europe – and sea stacks present stark black precipitous faces plunging from steep grass-green slopes in excess of 375m. Scenically, every element appears vertical, except the smooth amphitheatre of VillageBay on Hirta with its relict historic landscape. Exposure to some of the greatest wave heights and strongest wind speeds in Europe plays a major role in shaping the coastal ecology.

With nearly one million seabirds present at the height of the breeding season, St Kilda supports the largest seabird colony in the north-east Atlantic, its size and diversity of global significance making it a seabird sanctuary without parallel in Europe. The very high bird densities that occur in this relatively small area, conditioned by the complex and different ecological niches existing in the site and the productivity of the surrounding sea, make St Kilda unique. Of particular significance are the populations of Northern Gannet, Atlantic Puffin and Northern Fulmar. The sight and sound of these myriad seabirds adds significantly to the scenic value and to the experience of the archipelago during the breeding season.

The islands’ isolation has led to two outstanding examples of remote island ecological colonisation and subsequent genetic divergence in the two endemic sub-species, the St Kilda Wren and St Kilda Fieldmouse. The feral Soay sheep, so much a feature of the landscape, represent an ancient breed, descendents of the most primitive domestic sheep found in Europe. They provide a living testament to the longevity of human occupation of St Kilda and, in addition, are a potentially significant genetic resource.

The combination of oceanic influences (proximity of deep ocean currents along the continental slope, extreme exposure to waves and oceanic swell, high water clarity) and local geology around the archipelago has created a marine environment of unparalleled richness and colour. The seabed communities are outstanding in terms of biodiversity and composition, including ‘northern’ and ‘southern’ species at the extremes of their range. The plunging underwater rock faces are festooned with sea life – a kaleidoscope of colour and form kept in constant motion by the Atlantic swell, creating an underwater landscape of breathtaking beauty. The complex ecological dynamic in the marine environment is essential to maintenance of both the terrestrial and marine biodiversity.

Overlaying the spectacular natural landscape and giving scale to it all, is a rich cultural landscape that bears exceptional testimony to millennia of human occupation. Recent research indicates that the archipelago has been occupied on and off for over 4000 years. The landscape including houses, large enclosures and cleits – unique drystone storage structures found, in their hundreds, across the islands and stacks within the archipelago – culminates in the surviving remains of the nineteenth and twentieth century cultural landscape of Village Bay. The time depth, preservation and completeness of the physical remains, provides a tangible and powerful link to the islands’ past history, its people and their way of life, a distinctive existence, shaped by the St Kildan’s response to the peculiar physical and geographic setting of the islands.

The islands provide an exceptionally well preserved and documented example of how, even in the most extreme conditions of storm-swept isolated island living, people were able to live for thousands of years from exploiting natural resources and farming. They bear physical witness to a cultural tradition that has now disappeared, namely reliance on seabird products as the main source of livelihood and sustenance, alongside subsistence farming. These age-old traditions and land uses that have so shaped the landscape, have also unquestionably contributed to its aesthetic appeal.

St Kilda represents subsistence economies everywhere – living off the resources of land and sea and changing them over time, until external pressures led to decline, and, in 1930, to the abandonment of the islands. The poignancy of the archipelago’s history, and the remarkable fossilised landscape, its outstanding and spectacular natural beauty and heritage, its isolation and remoteness, leave one in awe of nature and of the people that once lived in this spectacular and remarkable place.

**Criterion (iii)**: St Kilda bears exceptional testimony to over two millennia of human occupation in extreme conditions.

**Criterion (v)**: The cultural landscape of St Kilda is an outstanding example of land use resulting from a type of subsistence economy based on the products of birds, cultivating land and keeping sheep. The cultural landscape reflects age-old traditions and land uses, which have become vulnerable to change particularly after the departure of the islanders.

**Criterion (vii)**: The scenery of the St Kilda archipelago is particularly superlative and has resulted from its volcanic origin followed by weathering and glaciation to produce a dramatic island landscape. The precipitous cliffs and sea stacks as well as its underwater scenery are concentrated in a compact group that is singularly unique.

**Criterion (ix)**: St Kilda is unique in the very high bird densities that occur in a relatively small area, which is conditioned by the complex and different ecological niches existing in the site. There is also a complex ecological dynamic in the three marine zones present in the site that is essential to the maintenance of both marine and terrestrial biodiversity.

**Criterion (x)**: St Kilda is one of the major sites in the North Atlantic and Europe for seabirds with over 1,000,000 birds using the island. It is particularly important for gannets, puffins and fulmars. The maritime grassland turf and underwater habitats are also significant and an integral element of the total island setting. The feral Soay sheep are also an interesting rare breed of potential genetic resource significance.

**Integrity**

The islands encompass exemplary and well preserved remains of the distinctive way of life that persisted in this remote area, unaltered after the St Kildans abandoned the islands. They encompass the complete fossilised cultural landscape. The natural heritage of the archipelago is the result of natural processes coupled with its long history of human occupation and, more recently, external human influences. The marine environment is largely intact.

Ownership and stewardship of the archipelago by the National Trust for Scotland, the statutory designations in place, the archipelago’s remote location, the difficulty of accessing it and human activities almost entirely centred upon Hirta, have significantly contributed to retaining the integrity of the archipelago’s heritage.

However, both natural and cultural attributes are threatened to a degree by a range of remote and local environmental and anthropogenic factors such as climate change and unsustainable tourism. Climatic conditions and coastal erosion remain the main threat to the abandoned houses, cleits and other archaeological remains across the archipelago. Large-scale off-shore developments could pose a potential threat to the pristine setting of the islands. Accidental introduction of invasive species poses a significant threat to the natural heritage; and probably the most severe potential threat to the integrity of the marine environment comes from variations in the marine ecosystem, especially the plankton, caused by climate change. Lack of strong protection of the marine environment, unsustainable fishing methods and oil spills also pose a threat to the marine environment and seabird colonies.

The modern installations, the radar base and related buildings, associated with the UK Ministry of Defence (MOD) operations on Hirta, take up a relatively small footprint, although they do still have an impact on the landscape, as do the coastal defences.

**Authenticity**

The challenge for conservation of the cultural landscape is to keep a balance between the principle of minimum intervention and active conservation work necessary to minimise decay, whilst keeping records of all the work that is done. With few exceptions this has meant re-using fallen materials, with little introduction of new materials. Where new materials have necessarily been required these have largely, and as far as possible, been like-for-like replacements. A representative sample of the 1400 cleits is monitored and actively maintained.

**Protection and management requirements**

The primary legislation that protects the archipelago and surrounding seas and their key attributes are: The Conservation (Natural Habitats. & C.) Regulations 1994, as amended; The Wildlife and Countryside Act 1981; The Land Reform Act 2003; Nature Conservation (Scotland) Act 2004; The Ancient Monuments and Archaeological Areas Act 1979; The Planning etc. (Scotland) Act 2006; and The Environmental Liability (Scotland) Regulations 2009. The Scottish Historic Environment Policy (SHEP) sets out the primary policy guidance on the protection and management of the historic environment in Scotland.

The archipelago and surrounding seas are protected by a number of national and international designations, both statutory and non-statutory. For the natural values, the property is designated as a Special Area of Conservation, Special Protection Area, National Nature Reserve, Site of Special Scientific Interest, National Scenic Area, Marine Consultation Area and Geological Conservation Review Site. For the cultural values, selected areas of Hirta are designated as Scheduled Monuments. These designations are backed up by UK, Scottish and local policies, plans and legislation.

The National Trust for Scotland (NTS), a charity, owns and manages the archipelago of St Kilda. Management is guided by a Management Plan which is approved and its implementation overseen by the major stakeholders.

Currently, the MOD has the only full time presence on the islands, although NTS and other conservation bodies/researchers are there for a significant part of the year. The current management regime is vulnerable to the withdrawal of the MOD and to resource constraints within the NTS.

Management of the cultural heritage will proceed on the basis of the minimum intervention required to sustain the attributes of the property’s Outstanding Universal Value, underpinned by the recent intensive and systematic archaeological survey of the whole archipelago, carried out by the Royal Commission on the Ancient and Historical Monuments of Scotland. Conservation of the marine environment, at present, lacks the strong protection of the terrestrial heritage, and ensuring its greater protection in the future will be critical. Management of the natural heritage is and will continue to be one of non-intervention, allowing natural processes to take their course, except where a feature of greater heritage significance is under threat.

Many of the challenges facing St Kilda and/or the NTS in its management of the archipelago -e.g. the threat of invasive species, unsustainable tourism or fishing practices, coastal erosion, etc. -are tackled through working closely with relevant stakeholders, undertaking systematic research and monitoring, providing adequate resources and implementation of the approved and endorsed Management Plan for the property.

**Sundarbans National Park**

Site: Sundarbans National Park

Country: India

Region: Indian Ocean

Year of Inscription: 1987

Size: 1 330,01 km²

Retrospective Statement of Outstanding Universal Value (2012)

Source: 36COM 8E: <http://whc.unesco.org/archive/2012/whc12-36com-8Ee.pdf>

**Brief synthesis**

The Sundarbans contain the world's largest mangrove forests and one of the most biologically productive of all natural ecosystems. Located at the mouth of the Ganges and Brahmaputra Rivers between India and Bangladesh, its forest and waterways support a wide range of fauna including a number of species threatened with extinction. The mangrove habitat supports the single largest population of tigers in the world which have adapted to an almost amphibious life, being capable of swimming for long distances and feeding on fish, crab and water monitor lizards. They are also renowned for being “man-eaters”, most probably due to their relatively high frequency of encounters with local people.

The islands are also of great economic importance as a storm barrier, shore stabiliser, nutrient and sediment trap, a source of timber and natural resources, and support a wide variety of aquatic, benthic and terrestrial organisms. They are an excellent example of the ecological processes of monsoon rain flooding, delta formation, tidal influence and plant colonisation. Covering 133,010 ha, the area is estimated to comprise about 55% forest land and 45% wetlands in the form of tidal rivers, creeks, canals and vast estuarine mouths of the river. About 66% of the entire mangrove forest area is estimated to occur in Bangladesh, with the remaining 34% in India.

**Criterion (ix)**: The Sundarbans is the largest area of mangrove forest in the world and the only one that is inhabited by the tiger. The land area in the Sundarbans is constantly being changed, moulded and shaped by the action of the tides, with erosion processes more prominent along estuaries and deposition processes along the banks of inner estuarine waterways influenced by the accelerated discharge of silt from sea water. Its role as a wetland nursery for marine organisms and as a climatic buffer against cyclones is a unique natural process.

**Criterion (x)**: The mangrove ecosystem of the Sundarbans is considered to be unique because of its immensely rich mangrove flora and mangrove-associated fauna. Some 78 species of mangroves have been recorded in the area making it the richest mangrove forest in the world. It is also unique as the mangroves are not only dominant as fringing mangroves along the creeks and backwaters, but also grow along the sides of rivers in muddy as well as in flat, sandy areas.

The Sundarbans support a wealth of animal species including the single largest population of tiger and a number of other threatened aquatic mammals such as the Irrawaddy and Ganges River dolphins. The site also contains an exceptional number of threatened reptiles including the king cobra and significant populations of the endemic river terrapin which was once believed to be extinct. The property provides nesting grounds for marine turtles including the olive riley, green and hawksbill. Two of the four species of highly primitive horseshoe crab (*Tachypleus gigas* and *Carcinoscorpius rotundicauda*) are found here. The Sajnakhali area, listed as an Important Bird Area, contains a wealth of waterfowl and is of high importance for migratory birds.

**Integrity**

The property is situated within a larger UNESCO Biosphere Reserve that was designated in November, 2001. It is well protected and largely undisturbed as it is surrounded by three wildlife sanctuaries which act as a buffer zone, as recommended in the original 1987 evaluation report. However, the salinity of the Indian Sundarbans, largely due to the eastward shift of the mouth of the Ganges, is being influenced by upstream diversion of up to 40% of the dry season flow of the Ganges, the repercussions of which are not clearly understood. Oil spills are a potential threat which cause immense damage, especially to aquatic fauna and seabirds and probably also to the forest itself into which oil could be carried by high tides. An average of 45 people were killed annually by tigers from 1975-1982. This has caused certain conflicts with local people who use the adjacent Tiger Reserve for collection of honey and firewood and for fishing.

**Protection and management requirements**

The legal protection provided to the property is adequate. The Indian Forest Act, 1927 with its amendments, Forest Conservation Act 1980, Wildlife Protection Act, 1972 and Environment Protection Act 1986 are being effectively implemented, with rules and regulation regarding environmental pollution strictly enforced. The existing laws are sufficiently strict in respect to the protection and conservation of the property.

The property is currently in a good state of conservation with regular maintenance undertaken according to a set maintenance schedule. There is an approved Management Plan of the property. With the existing infrastructure, the Forest Department is making its best efforts, although there is a need to maintain and enhance the level of financial and human resources to effectively manage the property. This includes an ecosystem approach that integrates the management of the existing protected areas with other key activities occurring in the property, including fisheries and tourism. There is a need to develop alternate livelihood options for the local population to eliminate the dependence of people on the Sundarbans ecosystem for sustenance. Maintenance of participatory approaches in planning and management of the property is needed to reinforce the support and commitment from local communities and NGOs to the conservation and management of the property. Research and monitoring activities also require adequate resources.

**Surtsey**

Site: Surtsey

Country: Iceland

Region: Atlantic Ocean

Year of Inscription: 2008

Size: 33,70 km²

Buffer zone: 31,90 km²

 **Statement of Outstanding Universal Value (2008)**

**Source: 32 COM 8B.1:** <http://whc.unesco.org/en/decisions/1469>

**Values**

Surtsey is a new island formed by volcanic eruptions in 1963-67. It has been legally protected from its birth and provides the world with a pristine natural laboratory. Free from human interference, Surtsey has produced long-term information on the colonisation process of new land by plant and animal life.

**Criterion (ix)**: Ongoing biological and ecological processes: Surtsey was born as a new volcanic island in 1963-67 and since that time has played a major role in studies of succession and colonisation. It has been the site of one of the few long term studies worldwide on primary succession, providing a unique scientific record of the process of colonisation of land by plants, animals and marine organisms. Not only is it geographically isolated, but it has been legally protected from its birth, providing the world with a pristine natural laboratory, free from human interference. Above all, because of its continuing protection, Surtsey will continue to provide invaluable data on biological colonisation long into the future.

**Integrity**

The property includes the whole island and an adequate surrounding marine area, and thus all the areas that are essential for the long term conservation of the ecological processes on Surtsey. There is also a relatively small but functional marine buffer zone that is not part of the inscribed property. It is noted that part of the evolution of Surtsey is the process of coastal erosion which has already halved the area of the island and over time is predicted to remove another two thirds leaving only the most resistant core.

**Requirements for Protection and Management**

Surtsey is a highly controlled, isolated environment and so threats are very limited. The purpose of strictly prohibiting visits to Surtsey is to ensure that colonisation by plants and animals, biotic succession and the shaping of geological formations will be as natural as possible and that human disruption will be minimised. It is prohibited to go ashore or dive by the island, to disturb the natural features, introduce organisms, minerals and soils or leave waste on the island. Nearby construction is also strictly controlled. The most significant management issue will be to retain the level of control and protection from human influence that has characterised the protective history of Surtsey. It is noted that, as an island ecosystem, there is the potential for human disturbance and pollution from a very wide area. Contingency planning, for example for oil spills, is required for the property and its wider surroundings. Given the lack of access a creative and positive approach to presenting the property will be required to ensure that visitors are able to appreciate, but not disturb, its values.

**The Sundarbans**

Site: The Sundarbans

Country: Bangladesh

Region: Indian Ocean

Year of Inscription: 1997

Size: 1 395 km²

Retrospective Statement of Outstanding Universal Value (2013)

Source: 37COM 8E: <http://whc.unesco.org/archive/2013/whc13-37com-8E-en.pdf>

**Brief synthesis**

The Sundarbans Reserve Forest (SRF), located in the south-west of Bangladesh between the river Baleswar in the East and the Harinbanga in the West, adjoining to the Bay of Bengal, is the largest contiguous mangrove forest in the world. Lying between latitude 21° 27′ 30″ & 22° 30′ 00″ North and longitude 89° 02′ 00″ and 90° 00′ 00″ East and with a total area of 10000 km2, 60% of the property lies in Bangladesh and the rest in India. The land area, including exposed sandbars, occupies 4,14,259 ha (70%) with water bodies covering 1,87,413 ha (30%).

The three wildlife sanctuaries in the south cover an area of 1,39,7000 ha and are considered core breeding areas for a number of endangered species. Situated in a uniqe bioclimatic zone within a typical geographical situation in the coastal region of the Bay of Bengal, it is a landmark of ancient heritage of mythological and historical events. Bestowed with magnificent scenic beauty and natural resources, it is internationally recognized for its high biodiversity of mangrove flora and fauna both on land and water. The immense tidal mangrove forests of Bangladeshs’ Sundarbans Forest Reserve, is in reality a mosaic of islands of different shapes and sizes, perennially washed by brackish water shrilling in and around the endless and mind-boggling labyrinths of water channels. The site supports exceptional biodiversity in its terrestrial, aquatic and marine habitats; ranging from micro to macro flora and fauna. The Sundarbans is of unversal importance for globally endangered species including the Royal Bengal Tiger, Ganges and Irawadi dolphins, estuarine crocodiles

and the critically endangered endemic river terrapin (*Batagur baska*). It is the only mangrove habitat in the world for *Panthera tigris tigris* species.

**Criterion (ix)**: The Sundarbans provides a significant example of on-going ecological processes as it represents the process of delta formation and the subsequent colonization of the newly formed deltaic islands and associated mangrove communities. These processes include monsoon rains, flooding, delta formation, tidal influence and plant colonization. As part of the world’s largest delta, formed from sediments deposited by three great rivers; the Ganges, Brahmaputra and Meghna, and covering the Bengal Basin, the land has been moulded by tidal action, resulting in a distinctive physiology.

**Criterion (x)**: One of the largest remaining areas of mangroves in the world, the Sundarbans supports an exceptional level of biodiversity in both the terrestrial and marine environments, including significant populations of globally endangered cat species, such as the Royal Bengal Tiger. Population censuses of Royal Bengal Tigers estimate a population of between 400-450 individuals, a higher density than any other population of tigers in the world.

The property is the only remaining habitat in the lower Bengal Basin for a wide variety of faunal species. Its exceptional biodiveristy is expressed in a wide range of flora; 334 plant species belonging to 245 genera and 75 families, 165 algae and 13 orchid species. It is also rich in fauna with 693 species of wildlife which includes; 49 mammals, 59 reptiles, 8 amphibians, 210 white fishes, 24 shrimps, 14 crabs and 43 mollusks species. The varied and colourful bird-life found along the waterways of the property is one of its greatest attractions, including 315 species of waterfowl, raptors and forest birds including nine species of kingfisher and the magnificent whitebellied sea eagle.

**Integrity**

The Sundarbans is the biggest delta, back water and tidal phenomenon of the region and thus provides diverse habitats for several hundreds of aquatic, terrestrial and amphibian species. The property is of sufficient size to adequately represent its considerably high floral and faunal diversity with all key values included within the boundaries. The site includes the entire landscape of mangrove habitats with an adequate surrounding area of aquatic (both marine and freshwater) and terrestrial habitats, and thus all the areas essential for the long term conservation of the Sundarbans and it’s rich and distinct biodiversity.

The World Heritage Site is comprised of three wildlife sanctuaries which form the core breeding area of a number of species of endangered wildlife. Areas of unique natural beauty, ethno botanical interest, special marine faunal interest, rivers, creeks, islands, swamps, estuaries, mud flats, and tidal flats are also included in the property. The boundaries of the property protect all major mangrove vegetation types, areas of high floral and faunal values and important bird areas. The integrity of the property is further enhanced by terrestrial and aquatic buffer zones that surround, but are not part of the inscribed property.

Natural calamities such as cyclones, have always posed threats on the values of the property and along with saline water intrusion and siltation, remain potential threats to the attributes. Cyclones and tidal waves cause some damage to the forest along the sea-land interface and have previoulsy caused occassional considerable mortality among some species of fauna such as the spotted deer. Over exploitation of both timber resources and fauna, illegal hnting and trapping, and agricultural encroachment also pose serious threats to the values of the property and its overall integrity.

**Protection and management requirements**

The property is composed of three wildlife sanctuaries and has a history of effective national legal protection for its land, forest and aquatic environment since the early 19th century. All three wildlife sanctuaries were established in 1977 under the Bangladesh Wildlife (Preservation) (Amendment) Act, 1974, having first been gazetted as forest reserves in 1878. Along with the Forest Act, 1927, the Bangladesh Wildlife (Preservation) (Amendment) Act 1974, control activities such as entry, movement, fishing, hunting and extraction of forest produces. A number of field stations established within Sundarbans West assist in providing facilities for management staff. There are no recognised local rights within the reserved forest with entry and collection of forest products subject to permits issued by the Forest Department.

The property is currently well managed and regularly monitored by established management norms, regular staff and individual administrative units. The key objective of management is to manage the property to retain the biodiversity, aesthetic values and integrity. A delicate balance is needed to maintain and facilitate the ecological process of the property on a sustainable basis. Another key management priority is the maintenance of ongoing ecological and hydrological process which could otherwise be threatened by ongoing developmental activities outside the property. Subject to a series of successively more comprehensive management plans since its declaration as reserved forest, a focus point of many of these plans is the management of tigers, together with other widlife, as an integral part of forest management that ensures the sustainable harvesting of forest products

while maintaining the coastal zone in a way that meets the needs of the local human population. The working plans for the Sundarbans demonstrate a progressive increase in the understanding of the management requirements and the complexity of prescriptions made to meet them. Considerable research has been conducted on the Sundarbans wildlife and ecosystem. International input and assistance from WWF and the National Zoological Park, Smithsonian Institution as well as other organisations has assisted with the development of working plans for the property, focusing on conservation and management of wildlife.

The Sundarbans provides sustainable livelihoods for millions of people in the vicinity of the site and acts as a shelter belt to protect the people from storms, cyclones, tidal surges, sea water seepage and intrusion. The area provides livelihood in certain seasons for large numbers of people living in small villages surrounding the property, working variously as wood-cutters, fisherman, honey gatherers, leaves and grass. Tourism numbers remain relatively low due to the difficulty access, arranging transport and a lack of facilitie including suitable accommodation. Mass tourism and its impacts are unlikely to effect the values of the property. While the legal protection afforded the property prohibit a number of activities within the boundaries illegal hunting, timber extraction and agricultural encroachment pose potential threats to the values of the property. Storms, cyclones and tidal surges up to 7.5 m high, while features of the areas, also pose a potential threat with possible increased frequency as a result of climate change.

**Tubbataha Reefs Natural Park**

Site: Tubbataha Reefs Natural Park

Country: Philippines

Region: Sulu Sea

Year of Inscription: 1993, extended in 2009

Size: 1 300,28 km²

Statement of Outstanding Universal Value (2009)

Source : 33 COM 8B.3: <http://whc.unesco.org/en/decisions/1945>

**Brief Synthesis**

Tubbataha Reefs Natural Park lies in a unique position in the centre of the Sulu Sea, and includes the Tubbataha and Jessie Beazley Reefs. It protects an area of almost 100,000 hectares of high quality marine habitats containing three atolls and a large area of deep sea. The property is home to a great diversity of marine life. Whales, dolphins, sharks, turtles and Napoleon wrasse are amongst the key species found here. The reef ecosystems support over 350 species of coral and almost 500 species of fish. The reserve also protects one of the few remaining colonies of breeding seabirds in the region.

**Criterion (vii)**: Tubbataha Reefs Natural Park contains excellent examples of pristine reefs with a high diversity of marine life. The property includes extensive reef flats and perpendicular walls reaching over 100m depth, as well as large areas of deep sea. The remote and undisturbed character of the property and the continued presence of large marine fauna such as tiger sharks, cetaceans and turtles, and big schools of pelagic fishes such as barracuda and trevallies add to the aesthetic qualities of the property.

**Criterion (ix)**: Tubbataha Reefs Natural Park lies in a unique position in the middle of the Sulu Sea and is one of the Philippines’ oldest ecosystems. It plays a key role in the process of reproduction, dispersal and colonization by marine organisms in the whole Sulu Sea system, and helps support fisheries outside its boundaries. The property is a natural laboratory for the study of ecological and biological processes, displaying the ongoing process of coral reef formation, and supporting a large number of marine species dependant on reef ecosystems. The presence of top predator species, such as tiger and hammerhead sharks, are indicators of the ecological balance of the property. The property also offers a demonstration site to study the responses of a natural reef system in relation to the impacts of climate change.

**Criterion (x)**: Tubbataha Reefs Natural Park provides an important habitat for internationally threatened and endangered marine species. The property is located within the Coral Triangle, a global focus for coral biological diversity. The reefs of the property support 374 species of corals, almost 90% of all coral species in the Philippines. The reefs and seas of the property also support eleven species of cetaceans, eleven species of sharks, and an estimated 479 species of fish, including the iconic and threatened Napoleon wrasse. The property supports the highest population densities known in the world for white tip reef sharks. Pelagic species such as jacks, tuna, barracuda, manta rays, whale sharks and different species of sharks also are common here and the property is a very important nesting, resting and juvenile development area for two species of endangered marine turtles: green turtles and hawksbill turtles. There are seven breeding species of seabirds and Bird Islet and South Islet are breeding grounds to seven resident and endangered breeding species of seabirds. The critically endangered Christmas Island Frigatebird is a regular visitor to the property.

**Integrity**

The property comprises two atolls (North and South Atoll) and an emergent coral cay, Jessie Beazley Reef. It includes open sea with an average depth of 750 m and still displays a well preserved marine ecosystem with top predators, and a large number and diversity of coral reef and pelagic species. The property also hosts an important population of resident, nesting and feeding seabirds. The area is free of human habitation and activities and is of a sufficient size to maintain associated biological and ecological processes. The property is of an adequate size to ensure the complete representation of the key features and processes of the reef systems within it, although the maintenance of these values also requires measures to be taken outside the boundaries of the property in relation to some migratory species and the buffering of the property from threats to the marine environment that could occur in the wider area. A key aspect of the integrity of the property is the low level of fishing pressure, due to the no-take policies which are in place throughout its area.

**Management and protection requirements**

Tubbataha Reefs Natural Park is legally protected through national protected areas legislation and a range of other environmental legislation which enable action to be taken against a wide range of threats. The implementation of the legislation is assisted by clear delegation to the management authority for the property. This is a remote property and its management is therefore a significant logistical challenge, requiring a well-equipped team with operational boats, well trained and well equipped staff and a sufficient operating budget for fuel, maintenance and accommodation to ensure a strong and responsive presence on the water. Tourism visitation requires careful planning and management to ensure the values of the property are maintained, and to respect the capacity of the property, as well as visitor safety and to ensure income is returned to both site management and local communities. There are threats to the property from shipping, marine litter, fishing, marine pollution and oil exploration. Thus effective buffer zone arrangements are needed, and internationally supported legislation to protect the property from shipping threats, and greater enforcement of marine litter regulation on the High Seas by the appropriate international organisations would be a significant benefit to the property.

**Ujung Kulon National Park**

Site: Ujung Kulon National Park

Country: Indonesia

Region: Indian Ocean

Year of Inscription: 1991

Size: 785,25 km²

Retrospective Statement of Outstanding Universal Value (2013)

Source: 37COM 8E: <http://whc.unesco.org/archive/2013/whc13-37com-8E-en.pdf>

**Brief synthesis**

Ujung Kulon National Park, located in Banten Province on the extreme south-west tip of the highly populated island of Java, has the best and most extensive lowland forest remaining on the island. The property, including the Ujung Kulon peninsula and several offshore islands retains its natural beauty and possesses a very diverse flora and fauna, demonstrating on-going evolution of geological processes since the Krakatau eruption in 1883.

The Krakatau volcano as part of the formation of the property, is the most well known and studied of all modern volcanic eruptions, due primarily to the devastating effects (36,000 people killed) registered throughout the northern hemisphere. The property is globally significant as the last and most important natural habitat of the critically endangered, endemic, single-horned Javan Rhinoceros (*Rhinoceros sondaicus*) along with several other species of endangered plants and animals. Ujung Kulon is believed to sustain the last viable natural population of this species, estimated at approximately 60 individuals. It is not known how this compares to historical densities, but is a critically low figure from the point of view of species survival and viable genetic diversity.Other notable mammals in the property include carnivores, such as leopard, wild dog (dhole), leopard cat, fishing cat, Javan mongoose and several species of civets. It is also home to three endemic primate species; the Javan gibbon, Javan leaf monkey and silvered leaf monkey. Over 270 species of birds have been recorded and terrestrial reptiles and amphibians include two species of python, two crocodile species and numerous frogs and toads.

**Criterion (vii)**: Krakatau is one of natural world’s best-known examples of recent island volcanism and the property with its forests, coastline and islands is a natural lanscape of high scenic attaction. The physical feature of Krakatau Island combined with the surrounding sea, natural vegetation, succesion of vegetation and volcanic activities combine to form a landscape of exceptional beauty. In addition, the combination of natural vegetation of the lowlands, tropical rainforests, grass lands, beach forests, mangrove forests and coral reefs within the property, are of exceptional magnificence. The property includes the Ujung Kulon peninsula and several offshore islands that demonstate on-going evolutionary processes, especially following the dramatic Krakatau eruption in 1883.

**Criterion (x)**: Containing the most extensive remaining stand of lowland rainforest on Java, a habitat that has virtually disappeared elsewhere on the island and is under severe pressure elsewhere in Indonesia and Southeast Asia, the peninsula of Ujung Kulon provides invaluable habitat critical for the survival of a number of threatened plant and animal species, most notably the endangered Javan Rhino (*Rhinoceros sondaicus*). The Javan rhino is not known to occur in the wild anywhere else on earth and Ujung Kulon is believed to sustain the

last viable natural population, estimated at approximately 60 individuals. Efforts to protect the Javan rhino’s remaining habitat and individuals have become a symbol for protection of rainforest of worldwide significance, adding to the international importance of the management and preservation of the Ujung Kulon ecosystem.The property also provides a valuable refuge for 29 other species of mammals; nine of which are on the IUCN red list with three species considered endangered and including leopard (*Panthera pardus*), the endemic Javan gibbon (*Mylobates moloch*) and Javan leaf monkey (*Presbytis comata*). Avifauna recorded within the property includes 270 species while two species of crocodile, the endangered false gharial (*Tomistoma schlegelii*) and the vulnerable estuarine crocodile (*Crocodylus porosus*) are included in the reptile and amphibian species recorded for the property. In addition to the rich fauna 57 species of rare plants have also been recorded.

**Integrity**

The oldest and largest of the protected areas on the island of Java the boundary of the property encloses a very large area that is sufficient to protect its outstanding scenic, natural values as well as the important biodiversity values that warranted inscription on the World Heritage List. The huge volcanic mass of Krakatau dominates the property and is completely contained within its boundaries. The property contains all the necessary habitat for the in-situ conservation of its unique biological diversity, including those habitats required to support the threatened species and other biota of outstanding universal value. While it is no longer possible to increase the size of the property, its location, in particular on the peninsula, provides managers with an ideal geographic unit for management. A number of the component areas of the property are surrounded by buffer zones with activities in the zone given increasing attention in regards to regulation from the relevant provincial authority, with advice from the management agency. Poaching of the Javan Rhino has always been the main management issue and careful monitoring is required to ensure there is no illegal poaching of this critically endagered species as well as the other unique biodiversity contained and protected within the property.

**Protection and management requirements**

The property is managed by the central goverment through the technical implementation unit of the Directorate General of Forest Protection and Nature Conservation, of the Ministry of Forestry. The peninsula, along with Pulau Panaitan were established as a nature reserve in 1921 and subsequently redesignated as a game reserve and extended in 1958 to include several offshore islands and marine areas. The mainland component of the property was established as a nature reserve in 1967 and the Ujung Kulon reserve complex was declared a ‘proposed’ national park in 1980 with the Krakatau Nature Reserve included into the site in 1983. The long history of conservation action in the property, dating back to 1921, has helped to protect the values contained within the boundaries despite the lack of a solid legal basis during the early establishment of the reserves. The long term management plan of Ujung Kulon National Park (2001-2020) is the basis for maintaining its natural beauty and preserving the critical habitats. Implementation of the management plan has helped to control the problems of illegal encroachment, logging, and commercial fishing within the boundaries of the property. The buffer zone on the land boundary effectively strengthens protection of the property and in addition, the involvement of various stakeholders from the local, national and international community has enhanced the protection of its values and integrity.

Generally well preserved, encroachment pressures are primarily confined to the eastern boundary on the mainland. Management prioritises long-term survival of the Javan Rhinoceros along with the other endangered species recorded within the property. The Strategy and Action Plan for the Conservation of Rhinos in Indonesia (2007-2017) developed with broad, open, and transparent participatory processes has greatly assisted the future survival of this critically endangered animal. The strategy addresses threats from inbreeding, global warming, and human pressure and includes the development of a new sanctuary within the property and a site outside the property as additional habitat for rhino populations.

Poaching of the Javan rhino has historically been the main management issue within the property. Strengthening of protection through management actions has allowed the population to grow with the highest priority of conservation efforts being the in situ preservation of the population, allowing numbers to increase. Increasing pressure from agricultural encroachment, illegal logging and firewood collection in the terrestrial areas and illegal commercial fishing within the marine components of the park continue to pose a threat to the values of the property. Along with impacts from tourism these issues all require monitoring and enforcement of regulations to ensure long-term conservation of the property.

**The Wadden Sea**

Site: The Wadden Sea

Country: Denmark, Germany and the Netherlands

Region: North Sea

Year of Inscription: 2009, extended in 2014

Size: 11 434,03 km²

Statement of Outstanding Universal Value (2014)

Source: 38 COM 8B.13: <http://whc.unesco.org/archive/2014/whc14-38com-8B-en.pdf>

**Brief synthesis**

The Wadden Sea is the largest unbroken system of intertidal sand and mud flats in the world, with natural processes undisturbed throughout most of the area. The 1,143,403 ha World Heritage property encompasses a multitude of transitional zones between land, the sea and freshwater environment, and is rich in species specially adapted to the demanding environmental conditions. It is considered one of the most important areas for migratory birds in the world, and is connected to a network of other key sites for migratory birds. Its importance is not only in the context of the East Atlantic Flyway but also in the critical role it plays in the conservation of AfricanEurasian migratory waterbirds. In the Wadden Sea up to 6.1 million birds can be present at the same time, and an average of 10-12 million pass through it each year.

**Criterion (viii)**: The Wadden Sea is a depositional coastline of unparalleled scale and diversity. It is distinctive in being almost entirely a tidal flat and barrier system with only minor river influences, and an outstanding example of the large-scale development of an intricate and complex temperate-climate sandy barrier coast under conditions of rising sea-level. Highly dynamic natural processes are uninterrupted across the vast majority of the property, creating a variety of different barrier islands, channels, flats, gullies, saltmarshes and other coastal and sedimentary features.

**Criterion (ix)**: The Wadden Sea includes some of the last remaining natural large-scale intertidal ecosystems where natural processes continue to function largely undisturbed. Its geological and geomorphologic features are closely entwined with biophysical processes and provide an invaluable record of the ongoing dynamic adaptation of coastal environments to global change. There are a multitude of transitional zones between land, sea and freshwater that are the basis for the species richness of the property. The productivity of biomass in the Wadden Sea is one of the highest in the world, most significantly demonstrated in the numbers of fish, shellfish and birds supported by the property. The property is a key site for migratory birds and its ecosystems sustain wildlife populations well beyond its borders.

**Criterion (x)**: Coastal wetlands are not always the richest sites in relation to faunal diversity; however this is not the case for the Wadden Sea. The salt marshes host around 2,300 species of flora and fauna, and the marine and brackish areas a further 2,700 species, and 30 species of breeding birds. The clearest indicator of the importance of the property is the support it provides to migratory birds as a staging, moulting and wintering area. Up to 6.1 million birds can be present at the same time, and an average of 10-12 million each year pass through the property. The availability of food and a low level of disturbance are essential factors that contribute to the key role of the property in supporting the survival of migratory species. The property is the essential stopover that enables the functioning of the East Atlantic and African-Eurasian migratory flyways. Biodiversity on a worldwide scale is reliant on the Wadden Sea.

**Integrity**

The boundaries of the extended property include all of the habitat types, features and processes that exemplify a natural and dynamic Wadden Sea, extending from the Netherlands to Germany to Denmark. This area includes all of the Wadden Sea ecosystems, and is of sufficient size to maintain critical ecological processes and to protect key features and values. The property is subject to a comprehensive protection, management and monitoring regime which is supported by adequate human and financial resources. Human use and influences are well regulated with clear and agreed targets. Activities that are incompatible with its conservation have either been banned, or are heavily regulated and monitored to ensure they do not impact adversely on the property. As the property is surrounded by a significant population and contains human uses, the continued priority for the protection and conservation of the Wadden Sea is an important feature of the planning and regulation of use, including within land/water-use plans, the provision and regulation of coastal defences, maritime traffic and drainage. Key threats requiring ongoing attention include fisheries activities, developing and maintaining harbours, industrial facilities surrounding the property including oil and gas rigs and wind farms, maritime traffic, residential and tourism development and impacts from climate change.

**Protection and management requirements**

Maintaining the hydrological and ecological processes of the contiguous tidal flat system of the Wadden Sea is an overarching requirement for the protection and integrity of this property. Therefore conservation of marine, coastal and freshwater ecosystems through the effective management of protected areas, including marine no-take zones, is essential. The effective management of the property also needs to ensure an ecosystem approach that integrates the management of the existing protected areas with other key activities occurring in the property, including fisheries, shipping and tourism. The Trilateral Wadden Sea Cooperation provides the overall framework and structure for integrated conservation and management of the property as a whole and coordination between all three States Parties. Comprehensive protection measures are in place within each State. Specific expectations for the long-term conservation and management of this property include maintaining and enhancing the level of financial and human resources required for the effective management of the property. Research, monitoring and assessment of the protected areas that make up the property also require adequate resources to be provided. Maintenance of consultation and participatory approaches in planning and management of the property is needed to reinforce the support and commitment from local communities and NGOs to the conservation and management of the property. The State Parties should also maintain their commitment of not allowing oil and gas exploration and exploitation within the boundaries of the property. Any development projects, such as planned wind farms in the North Sea, should be subject of rigorous Environmental Impacts Assessments to avoid any impacts to the values and integrity of the property.

**West Norwegian Fjords – Geirangerfjord and Nærøyfjord**

Site: West Norwegian Fjords – Geirangerfjord and Nærøyfjord

Country: Norway

Region: Atlantic Ocean

Year of Inscription: 2005

Size: 1 227,12 km²

Retrospective Statement of Outstanding Universal Value (2014)

Source: 38COM 8E: <http://whc.unesco.org/archive/2014/whc14-38com-8E-en.pdf>

**Brief synthesis**

The starkly dramatic landscapes of Geirangerfjord and Nærøyfjord are exceptional in scale and grandeur in a country of spectacular fjords. Situated in south-western Norway, these fjords are among the world’s longest and deepest, and vary in breadth from just 250 m to 2.5 km wide. Fjord, a word of Norwegian origin, refers to a long, deep inlet of the sea between high cliffs formed by submergence of a glaciated valley. These two West Norwegian fjords are considered to be classic and complementary examples of this phenomenon, a sort of type locality for fjords that still display active geological processes.

Numerous waterfalls and free-flowing rivers, deciduous and coniferous woodlands and forests, glacial lakes, glaciers, rugged mountains and a range of other natural attributes combine towards making Geirangerfjord and Nærøyfjord among the most scenically outstanding landscapes in the world. A serial property covering an area of 122,712 ha, of which 10,746 ha is sea, these two fjords are separated from each other by a distance of 120 km. They form part of the West Norwegian fjord landscape, which stretches 500 km from Stavanger in the south to Åndalsnes in the north-east. Several inhabited villages and valleys are found along the fjords and inside the boundaries, and the landscape is supplemented (although not dominated) by remnants of its human historical past, which adds further interest and value to the property.

**Criterion (vii)**: The Geirangerfjord and Nærøyfjord areas are considered to be among the most scenically outstanding fjord areas on the planet. Their outstanding natural beauty is derived from their narrow and steep-sided crystalline rock walls that rise up to 1400 m direct from the Norwegian Sea and extend 500 m below sea level. Along the sheer walls of the fjords are numerous waterfalls while free-flowing rivers run through deciduous and coniferous forest to glacial lakes, glaciers and rugged mountains. There is a great range of supporting natural phenomena, both terrestrial and marine such as submarine moraines and marine mammals. Remnants of old and now mostly abandoned transhumant farms add a cultural aspect to the dramatic natural landscape that complements and adds human interest to the area.

**Criterion (viii)**: The West Norwegian Fjords are classic, superbly developed fjords, considered as the type locality for fjord landscapes in the world. They are comparable in scale and quality to other existing fjords on the World Heritage List and are distinguished by the climate and geological setting. The property displays a full range of the inner segments of two of the world’s longest and deepest fjords, and provides well-developed examples of young, active glaciation during the Pleistocene ice age. The ice- and wave-polished surfaces of the steep fjord sides provide superbly exposed and continuous three-dimensional sections through the bedrock. The record of the postglacial isostatic rebound of the crust and its geomorphic expression in the fjord landscape are significant, and represent key areas for the scientific study of slope instability and the resulting geohazards.

**Integrity**

The two fjord areas include all features that typically characterise a fjord landscape and its geological evolution. These include deep rock basins reaching depths far below sea level, prominent rock thresholds, high and steep cliffs, slide scars and avalanche deposits, moraines, till deposits, hanging valleys, so-called fish-hook or agnor valleys (formed by river capture), glaciers, rivers, waterfalls and surrounding mountain and catchment areas. Each fjord has a different morphology and geology and displays a different range of geomorphological features. Taken together, the Nærøyfjord and Geirangerfjord areas provide most of the features in their natural relationship that could be expected of a fjord landscape and its geological evolution. The boundaries of the serial property are appropriately defined to protect the geological features and the areas required to maintain the scenic qualities of the property. Legislation, staffing, budget and institutional structures in place are adequate to ensure its integrity. Of the 200 fjords along the west coast of Norway, Nærøyfjord and Geirangerfjord are the least affected by human activity such as hydroelectric dams and infrastructure. Peridotite is currently quarried outside, but close to the Geirangerfjord component of the property and plans exists for another quarry nearby. These impacts are localized, and restoration will take place when extraction ceases. Underground extraction of anorthosite takes place in the Nærøyfjord area, and this may expand in the future. Though not directly adjacent to the fjord itself, the plant has a visual impact from the road in the Nærøydalen valley.

**Protection and management requirements**

The majority of the property is protected as an IUCN Category V “Protected Landscape” and several small areas within this are Category I “Strict Nature Reserve”. The legislative regulations embodied in the Norwegian Nature Diversity Act provide long-term protection for the full range of natural values. While private lands make up 85% of the property, inhabited parts are carefully controlled under the Planning and Building Act and mechanisms such as County, Municipal and Local Development Plans.

An effective management system includes advisory committees and a management council that meets regularly to facilitate the necessary management cooperation and co-ordination. A “Declaration of Intent” signed by all the relevant national agencies and the Borough Councils, County Councils and County Governors outlines the cooperative measures and “guarantees that the values in the area will endure.”

A comprehensive management plan addresses management objectives and includes guidelines for activities to preserve the Outstanding Universal Value in a long-term perspective. The existing monitoring system needs to be further developed.

Tourism pressures are intense in both fjords, but impacts are limited as most visitors access the property on cruise ships during a short visitor season. Adequate tourism management plans are an important tool for the long-term conservation of the property’s Outstanding Universal Value.

Mining and underground quarrying is a concern, and any expansion of these activities will not be permitted without an environmental impact assessment. This would ensure that any potential impact, including the export of the mined material and the need for related infrastructure, would not affect the property’s Outstanding Universal Value.

Geohazards are a concern for inhabited areas and existing infrastructure within the property. If more measures to protect people’s lives are to be implemented, detailed environmental impact assessments will need to be performed to ensure solutions and measures that will be compatible with the property’s Outstanding Universal Value. Risk-preparedness plans integrated in the overall management plan are essential for this property.

**Whale Sanctuary of El Vizcaino**

Site: Whale Sanctuary of El Vizcaino

Country: Mexico

Region: Pacific Ocean

Year of Inscription: 1993

Size: 3 696,31 km²

Retrospective Statement of Outstanding Universal Value (2013)

Source: 37COM 8E: <http://whc.unesco.org/archive/2013/whc13-37com-8E-en.pdf>

**Brief synthesis**

The Whale Sanctuary of El Vizcaino is a serial property on the Pacific Coast of the central part of Mexico's Baja California Peninsula. It comprises two coastal lagoons, Laguna Ojo de Liebre and Laguna San Ignacio, and their surroundings, a complex mosaic of wetlands, marshes, halophytes, dunes and desert habitats, as well as mangroves in the transition areas. The total extension of the two components of the property is of 370,950 hectares, embedded in the much larger El Vizcaino Biosphere Reserve, Mexico's largest protected area, which in turn is contiguous with another large conservation area to the North. The lagoons are recognized as the World's most important place for the reproduction of the once endangered Eastern subpopulation of the North Pacific Grey Whale. The protection of these winter breeding grounds has been paramount in the remarkable recovery of this species after near-extinction as a result of commercial whaling, including in these very lagoons. Most of the subpopulation migrates between the lagoons and the summer feeding grounds in the Chukchi, Beaufort and Northwestern Bering Seas.

The lagoons are home to numerous other marine mammals, such as Bottlenose Dolphin, California Sea Lion and Harbor Seal. Four marine turtle species occur in the shallow waters which are also important habitat and nursery for a large number of fish, crustaceans, and others forms of life. Countless breeding and migratory bird species, including for example a major resident osprey population and more than half of Mexico´s wintering population of Brant Goose depend on the lagoons and adjacent habitats. This exceptional sanctuary conserves both marine and terrestrial ecosystems and their delicate interface. The surrounding desert, biogeographically part of the Sonoran Desert, boasts a highly diverse flora and fauna.

Despite the protection status the property is susceptible to the potential impacts of economic activities taking place in the immediate vicinity of the lagoons, in particular benthic and pelagic fisheries, large-scale salt extraction and tourism.

**Criterion (x)**: The Whale Sanctuary of El Vizcaino contains the most important breeding grounds of the Eastern subpopulation of the North Pacific Grey Whale. Its protection is intricately linked with saving the species from extinction and recovery after near-collapse due to excessive commercial whaling. Many environmental factors, such as depth, temperature, nutrients, and salinity coincide in Ojo de Liebre and San Ignacio lagoons to make them ideal mating, breeding and calving grounds. The lagoons also provide valuable habitat for numerous other marine mammals, such as Bottlenose Dolphin, California Sea Lion and Harbor Seal. Four species of marine turtles have been recorded in the lagoons and adjacent coasts, the most important being the green and the loggerhead sea turtles. The shallow, well-protected lagoons with their mangrove stands are also highly productive nurseries for a diverse fish fauna and boast a rich invertebrate fauna, and an impressive natural landscape and seascape. The surrounding wetlands attract an extraordinary diversity and abundance of resident and migratory bird species with several hundreds of thousands of wintering birds. The drier terrestrial areas belong to the Sonoran Desert, well-known for its remarkably diverse flora and fauna and a high degree of endemism.

**Integrity**

The boundaries of the property cover the coastal lagoons of Ojo de Liebre and San Ignacio in their entirety. Thereby they encompass a major area of sensitive Grey Whale habitat, a key conservation value of the property. The property is embedded in El Vizcaino Biosphere Reserve, Mexico's largest protected area and is also an integral part of an even larger contiguous conservation complex. The vast terrestrial protected areas serve as a terrestrial buffer for the lagoons, including as regards the maintenance of sea-land interactions. The biosphere reserve including and surrounding the property also comprises a marine strip of five kilometers from the coast as a buffer zone, de facto also serving as a marine buffer zone for the property.

It is important to note that the breeding Grey Whale population, an extraordinary conservation feature of global importance, only spends a relatively small part of its life cycle within the property. In this sense, the property is a telling example of both the benefits and the shortcomings of in-situ conservation. The future of the Eastern subpopulation of the North Pacific Grey Whale will no doubt depend on both the successful conservation of the

property and broader international efforts beyond specific sites.

Human impacts are relatively limited. At the same time, it is remarkable that even in a remote desert human activities have been putting increasing pressure on the natural environment. While the almost fatal whaling has come to a complete halt in the property, ongoing reasons for concern include but are not limited to excessive fisheries, extensive evaporation salt production and uncontrolled tourism development.

**Protection and Management requirements**

The first applicable conservation effort is the Convention for the Protection of Migratory Birds and Game Mammals, a bilateral agreement between Mexico and the United States of America ratified in 1937. Another framework is Mexico's adherence to the International Whaling Commission in 1949, which has been protecting Grey Whales from commercial whaling since its establishment. More recent federal legislation on threatened and endangered native species lists the Grey Whale as "subject to special protection."

A Federal Decree in 1971 established a marine refuge zone for whales in Laguna Ojo de Liebre, followed by another decree one year later establishing several refuges around the lagoons. Yet another decree established a refuge for cetaceans in Laguna San Ignacio in 1979. In 1988, the federal government declared El Vizcaino a biosphere reserve, encompassing today's property. El Vizcaino was recognized internationally under the UNESCO Man and the Biosphere Programme in 1993.

The Laguna Ojo de Liebre is located next to the port town of Guerrero Negro, a centre for whale-watching but also the site of industrial-scale salt extraction. Vessels transport the salt out of the lagoon to an offshore deep water dock. This vessel traffic, along with other vessel traffic along the coast and increasing numbers of tourist boats, entails risks of disturbance, contamination an even collision with marine mammals. Unlike in Laguna San Ignacio, mining exploration and exploitation are not explicitly prohibited in Ojo de Liebre, bearing a potential risk of future salt extraction at the expense of critical Grey Whale habitat. Overfishing and illegal fishing occurs in and around both lagoons and is also a broader concern along the Pacific Coast. Besides complex impacts on the marine ecosystems in the lagoons, Grey Whales, other marine mammals and marine turtles can fatally suffer from entanglement in fishing gear. Tourism and related coastal development have a number of undesired impacts when not managed properly, for example inadequate waste management but also direct disturbance through irresponsible and excessive whale-watching. There is also uncontrolled offroad driving and poaching in the surrounding desert. The impressive natural landscape and seascape requires careful planning and management to maintain the integrity of this property. The challenges are documented in sophisticated management programmes. The Whale Sanctuary of El Vizcaino has the potential to serve as an example of integrated management of natural resources. Beyond the conservation of an outstanding place there is room for sustainable use of natural salt, harvesting of marine resources and whale-watching. This, however, requires a permanent balancing of interests including those from local communities whose livelihoods depend on the natural resources protected in this property. It also requires skilled and motivated staff, adequate financial resources, and full support from local communities to conservation and management activities.