World Heritage Sites

Protected Areas and World Heritage

BRAZILIAN ATLANTIC ISLANDS:
FERNANDO DE NORONHA ARCHIPELAGO & ATOL DAS ROCAS RESERVES
BRAZIL

The islands are volcanic peaks of a submerged mountain chain, part of the Southern Atlantic submarine ridge and they form a considerable proportion of the island surfaces of the south Atlantic. In the rather barren ocean waters the archipelago is an oasis essential to the reproduction, dispersal and colonisation by marine organisms of the entire tropical south Atlantic. The rich waters are very important for tuna, shark, turtles and marine mammals migrating to the coast of Africa. Baia de Golfinhos has an exceptional population of resident dolphin and at low tide the Rocas Atoll provides a spectacular seascape of lagoons and tidal pools teeming with fish and submarine landscapes recognised worldwide by divers. The islands also host the largest concentration of tropical seabirds in the western Atlantic and contain the only remaining example of the Insular Atlantic forest and the only oceanic mangrove in the South Atlantic.

COUNTRY
Brazil

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

NATURAL WORLD HERITAGE SERIAL SITE
2001: Inscribed on the World Heritage List under Natural Criteria vii, ix and x.

STATEMENT OF OUTSTANDING UNIVERSAL VALUE [pending]
The UNESCO World Heritage Committee issued the following statement at the time of inscription:

Justification for Inscription

Criterion (ix): FNNMP/AdRBR 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 (vii)*:* Baía dos Golfinhos is the only know place in the world with such a high population of resident dolphins and Atoll das Rocas 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 (x): FNNMP/AdRBR 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.

IUCN MANAGEMENT CATEGORY

Fernando de Noronha Archipelago National Park	II National Park
Atol das Rocas National Biological Reserve	Ib Wilderness Area

BIOGEOGRAPHICAL PROVINCE
Fernando de Noronha Island (8.456.13)

GEOGRAPHICAL LOCATION

The 21 islands of the archipelago lie in the Atlantic some 355 km northeast of Cabo de São Roque and Natal city on the mainland. Their co-ordinates are 03°45' to 03°57' S and 32°19' to 32°41'W. The Atol das Rocas lies 145 km to the west at 03°30' to 04°30' S and 32°00' to 34°00' W.

DATES AND HISTORY OF ESTABLISHMENT

1979: Atol das Rocas Marine Protected Area established; later redesignated the first National Biological Marine Reserve;

1986: 70% of the Fernando de Noronha Marine National Park designated by Federal Decree 92.755;

1988: The Fernando de Noronha Marine National Park created by Federal Decree 96.693;

1989: The entire archipelago and surrounding waters declared an Environmental Protection Area of the state of Pernambuco by State Decree 13555 which forms the legal basis for the buffer zone around the Marine National Park.

LAND TENURE

The Republic of Brazil owns both areas, and the proposed buffer zones. Administered by the Institute of the Environment and Renewable Natural Resources (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis - IBAMA).

AREA

Total area: 42,270 ha. Fernando de Noronha Marine Park: 11,270 ha of which 9,579 ha (85%) is marine and 1,691 ha is land. Atol das Rocas Reserve (land area 6.7 ha): 32,000 ha. A buffer zone of 140,713 ha is proposed, following the 2,000m isobath around each site and its islands.

ALTITUDE

From sea level to 321m (Morro do Pico).

PHYSICAL FEATURES

These 21 islands are a small volcanic archipelago formed of the peaks of a submerged mountain chain, part of the South Atlantic submarine ridge which rises 4,000m from the ocean bed. They form 50% of the island surface areas of the south Atlantic. The main island, aligned northeast-southwest, is far the largest at 12 km long by an average of 3 km wide. The site excludes only the settled central section of the north coast. The Atol das Rocas lies 145 km west, and 145 km from the mainland. The islands lie in the west-flowing nutrient-poor Southern Equatorial current and in this relatively barren part of the ocean the archipelago and atoll are oases of marine life.

The Fernando de Noronha volcanos erupted in two episodes along an east-west tectonic fracture zone, the earlier in the Upper Miocene, 12.3 – 9 million years ago and the second in the Upper Pliocene 3.3 - 1.7mya. There are several types of volcanic rock, including tufa deposits on the central plateau which is about 30-45m a.s.l., breccias and a number of alkaline magmatic intrusions: volcanic plugs, dykes and domes. Over a basic pyroclastic structure dating from the first volcanic period, intruded by basalts which form the distinctive sharp peaks such as Morro do Pico and offshore stacks. Later ultrabasic lava flows dominate the narrow 150-200m-high plateaus on the east and west sides of the main island. There are also more recent sedimentary deposits, such as a raised coral plateau to 30m thick, and sand dunes. The coastline is complex, with a number of high cliffs on the south coast, which faces the predominant currents and winds and are largely rocky with considerable wave action. But there are also sixteen sandy beaches, mainly on the relatively calm north coast. Bird guano has left a fertile soil.

The Atol das Rocas is a coralline algal reef of *Lithothamnium* sp. formed on a submarine mountain peak, with a land area of 6.7 ha. It is the only atoll in the South Atlantic. At high tide only two sandy islands some 3 m above sea level and isolated calcareous formations, the *rocas*, stand above water. Farol, the larger of the two islands, is about 1,000m long and 200m wide. During low tide the reef ring of the atoll is exposed as a natural wall some 1.5 m high bordered by sandbanks. Inside the atoll is a spectacular 750 ha lagoon with shallows and pools 1 to 6m deep (Trowbridge, 2001).

CLIMATE

The climate is equatorial, rainy from March to November and dry for the rest of the year; October is the driest month. An approximate monthly average of 860mm of rain falls annually at between 180mm to 2,700mm a month, with the heaviest rainfall between March and July (Trowbridge, 2001). The relative humidity varies little from 81.5 %. The average temperatures vary between 23.5°C and 31.5°C. The hottest months are January to March; the summer sun is intense. The prevailing winds are the east-northeasterly trades.

VEGETATION

The original vegetation of the islands, known as Insular Atlantic Rainforest, has clear affinities with the highly threatened Atlantic Rainforest, but with considerably reduced diversity and some endemism, a result of its isolation. Only 5% of the original forest remains, near the isolated Cape Sapata, having been deliberately cleared in the past. A small area of some 1.5 ha of mangroves occurs, in a monospecific stand of *Laguncularia racemosa* which is the only oceanic mangrove community in the south Atlantic. Over 400 plant species are recorded, including 3 endemics: the *gameleira Ficus noronhae*, the *mulungo Erythina velutina* and the *burra leiteira Apium escleratium*.

The vegetation is now dominated by vine and shrub species with a few trees, principally from the *Nyctaginaceae, Bignoniaceae, Anacardiaceae, Rubiaceae* and *Euphorbiaceae,* and planted secondary forest. Fifteen species are locally endemic. There are a great number of introduced species which include the harmful climbing vines *Ipomea* sp. and *Merremia* sp. Introduced fruit trees include papaya, cashew, banana, tamarind, caja, and guava; other ornamental species include almond, royal poinciana, eucalyptus, and even coconut palms.

Rocas Atoll has a dense herbaceous vegetation which is resistant to salt and strong sunlight. Dominant species include *Portulaca oleracea, Sesuvium portulacastrum, Cyperus ligularis* and *Eragrrostris prolifera*. A few individual coconuts *Cocos mucifera* and casuarinas *Casuarina equisetifolia* were introduced by fishermen.

FAUNA

The archipelago is a highly productive oasis of marine life in a relatively barren ocean and the islands play a key role in the reproduction, dispersal and colonisation by marine organisms of the whole of the tropical south Atlantic. Some of the largest breeding colonies of tropical Atlantic seabirds are found in the islands which are also visited by 55 species of migratory birds. The Atol das Rocas is the most important site for these birds, with aggregations of more than 150,000 which include the largest South Atlantic colonies of sooty tern *Sterna fuscata,* brown noddy *Anous stolidus* and masked booby *Sula dactylatra*. There are also large numbers of black noddy *Anous minutus*, white tern *Gygis alba*, brown booby *Sula leucogaster*, red footed booby *Sula sula*, little shearwater *Puffinus assimilis*, magnificent frigatebird *Fragata magnificans* and red-billed and yellow-billed tropicbirds *Phaethon aethereus* and *Phaeton lepturos.* There are six terrestrial birds of which three are locally endemic: the Noronho vireo *Vireo gracilirostris*, the Noronho elaenia *Elaenia spectabilis ridleyi* (VU)*,* and the eared dove *Zenaida auriculata noronha.*

There are two mammals: the introduced rock cavy *Kerodon rupestri*s and domestic sheep. Reptiles include the mabuya or Noronha skink *Trachylepis atlantica (Mabuya maculata)* and two lizards, the endemic Ridley's blind worm *Amphisbaena ridleyana,* and the teju *Tupinambis teguxim*, introduced to control rats but now a menace to birds. There are also two endemic invertebrates.

The offshore marine environment is of great interest. A population of spinner dolphin *Stenella longirostris* of up to 1,200 individuals lives in the surrounding waters and daily aggregates in great numbers to rest in an enclosed bay. Two species of marine turtles are common nearshore, the green turtle *Chelonia mydas* (EN) which breeds on the islands in the country's second largest rookery, and juvenile hawksbill turtles *Eretmochelys imbricata* (CR) during their migration to the coast of Africa. Many other cetaceans are regular visitors to the islands: pilot *Globicephala melas*, minke *Balaenoptera acutirostrata* and humpback whales *Megaptera novaeangliae,* common *Delphinus delphis*, spotted *Stenella attenuata* and melonheaded dolphins *Peponocephala electra*.

The rich benthic communities are largely composed of thin veneers over the volcanic substrate. Although Brazilian reefs lack the diversity of Caribbean reefs being separated by the massive intervening river mouths, they are of considerable biogeographical interest. Reef-building corals of some 18 species are found, including six endemic to the region, 12 around Fernando de Noronha

and 6 around Atol das Rocas but reef structures are not recorded for the islands. The dominant species of the atoll are *Siderastrea stellata* and *Montastrea cavernosa.* Some 95 fish species have been recorded including the endemic *Thalassoma noronhum* and *Stegastes rocasensis,* and 147 around Atol das Rocas. Pelagic species, 6 sharks including Caribbean reef shark *Carcharhinus perezi*, ragged-tooth shark *Odontaspis ferox*, and whale shark *Rhincodon typus* (VU), 3 rays, one the southern stingray *Dasyatis americana*, billfish, marlin and tuna, are also found due to the close proximity of deep oceanic waters to the islands. The lemon shark *Negaprion brevirostris* breeds around Rocas Atoll.

CONSERVATION VALUE

Although degraded, the site has remnants of unique vegetation in the Insular Atlantic Rainforest, and some endemic species. Rocas is the only atoll in the South Atlantic, and its offshore benthic communities harbour some of the best examples of the unique Brazilian coral reef fauna. The islands are important for a large population of spinner dolphins and for the large colonies of breeding seabirds. The Park lies within a WWF Global 200 Marine Eco-region and a BirdLife-designated Endemic Bird Area.

CULTURAL HERITAGE

The first maps of 1502 marked the island as *Ilha da Quaresma* (Isle of Lent), sighted by a Portuguese expedition a year or two earlier, officially by Amerigo Vespucci. In 1504 the islands were granted to Fernao de Loronha, The uninhabited slands were variously invaded by the English (1534), French (1556-l612), and Dutch West India Company (1628 and 1635-65) who in 1646, built a small fort on the high ground; in 1736, the French East India Company took the island renaming it Isle Dauphine.

However, in 1700, the lordship had reverted to the Portuguese crown and became part of the Capitania of Pernambuco. In 1737, the forts of Nossa Senhora dos Remedios, Nossa Senhora de Conceicao and Santo Antonio were built to defend the approaches to Brazil. The church of N. S. dos Remedios was completed in 1772 to serve a growing population (it was completely restored in 1988). About this time, the island became a penal colony. Most of the forest was cleared in the 19th century to prevent escapes by raft and to eliminate hiding places. The island's use as a defensive outpost and a penitentiary continued until the mid 20th century. São Miguel Palace, formerly the prison administration centre, is now the District administrative headquarters. An historic ruin is the Capela da Quixaba, built to hold troublesome prisoners. The uninhabited atoll was first charted in the 16th century map of Cantino, and the first detailed chart drawn in 1852 by Captain Lieutenant Phillip Lee.

LOCAL HUMAN POPULATION

No-one lives in the Park, but some 3,000 inhabitants live outside the Park in the buffer zone, mainly in Vila dos Remedios. Small-scale agriculture is carried on outside the boundaries but the main business is now tourism.

VISITORS AND VISITOR FACILITIES

Since the 1970s tourism has been important to the island, which is considered to be Brazil's most beautiful, and there are five daily flights from Recife and Natal as well as visiting cruise ships. In 1991 there were 4,435 visitors, in 2000, 47,450. The very deep clear waters make it one of the world's ten finest dive sites. There is a good network of trails with well trained local guides and there are riding, fishing and boat rides. Dolphin viewing is very popular. There is a hotel and some 70 guesthouses, totalling 1,000 beds. An ecotourism management plan has been drawn up and is carefully observed. Visitors are controlled to 420 per day and must pay the state an environmental tax, levied daily to limit their numbers and length of stay (IUCN, 2001). The National Park has an interpretive centre at its headquarters where environmental education talks are given several evenings a week. Only scientific research expeditions are permitted to the Atoll.

SCIENTIFIC RESEARCH AND FACILITIES

Darwin's visit in the *Beagle* in 1832 prompted the visits of later 19th century scientists on publication of his observations in 1839 and the islands' geology has been well studied (Almeida, 2000). Since the 1970s, the Federal government has organised scientific expeditions and research today is regularly conducted, particularly into spinner dolphin (Project ROTATUR) and nesting marine turtle populations (Project TAMAR) which has a base between the Sueste Bay and the Leão Beach on Fernando de Noronha, the main nesting beaches of the green turtle, and have monitored them since 1987. On Rocas regular studies have been conducted since 1990 on migratory and resident

seabirds, as well as on migrating hawksbill turtles, fish, crustaceans, coralline algae and benthic organisms.

MANAGEMENT

The Fernando de Noronha Archipelago National Marine Park, the Atol das Rocas Biological Marine Reserve and the Environmental Protection Area are administered by the Institute of the Environment and Renewable Natural Resources (IBAMA). A Management Plan was prepared by FUNATURA in 1990 for Fernando de Noronha National Marine Park and an Implementation Plan was developed in 1992 by IBAMA for the Atol das Rocas, which guides its management and conservation and regulates boating and diving. The protection has allowed the island's habitat to recover from past misuse and a recently completed Sustainable Development and Ecotourism Management Plan to prevent the pressure of tourism from damaging the economy is carefully observed. Local artisanal fishermen are licensed to work but no commercial fishing is permitted. Migration to the island is controlled at present levels and limited to relatives of the islanders.

MANAGEMENT CONSTRAINTS

Environmental degradation of Fernando de Noronha has a long history. During the time the island was a penitentiary the trees were systematically cut until only 5% of the original forest remained. Introduced species are a particular problem such as the cats and rats which have destroyed bird populations and the widespread goats which have had severe impacts on the native vegetation. The teju lizard *Tupinambis teguxim*, introduced to feed on the rats, prefers the eggs and young of birds and turtles. Introduced *Ipomea* sp. and *Merremia* sp. have spread through the native vegetation, and are proving impossible to eradicate as their seeds can live for many years in the soil without germinating. Illegal spear fishing and blast fishing occur on the reefs. Human construction has clearly influenced wide areas in the buffer zone, including the recent landing strip and a dam built to guarantee a water supply to the growing number of tourist lodges. There are some problems of solid waste disposal and some sewage release into the ocean, although the quantities are relatively low.

STAFF

Fernando do Noronha Park has a staff of 21, consisting of one Unit Manager, eight administrative staff and eleven rangers. They are equipped with 3 cars, 3 motorcycles and one speedboat which is also patrols the atoll. Rocas Atoll Reserve has a Unit Manager and assistant, with additional support from 3-4 visiting researchers and the Brazilian navy and coastguard.

BUDGET

The Federal government supports Fernando do Noronha Park with US$80,000 a year, and Atol das Rocas Reserve with US$30,000 a year. The Ministry of Environment's National Environmental Fund funds specific projects. Coupled with the visitor tax and entry fees, the site's budget is adequate.

LOCAL ADDRESSES

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Website: http://www.noronha.com.br/ [in Portuguese]

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