

## World Heritage Sites

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## MALPELO FAUNA AND FLORA SANCTUARY COLOMBIA

*Malpelo Island is an isolated oceanic habitat of extremely rich marine life in very good condition which is important to the maintenance and dispersal of the marine life of the Eastern Tropical Pacific. It has some of the best diving in the world but is terrestrially barren and unlikely to be developed.*

### COUNTRY

Colombia

### NAME

Malpelo Fauna and Flora Sanctuary

### NATURAL WORLD HERITAGE SITE

2006: Inscribed on the World Heritage List under Natural Criteria vii and ix.

### STATEMENT OF OUTSTANDING UNIVERSAL VALUE [pending]:

### IUCN MANAGEMENT CATEGORY

IV Habitat / Species Management Area

### BIOGEOGRAPHICAL PROVINCE

Malpelo Island (8.43.13).

### GEOGRAPHICAL LOCATION

Malpelo Island stands isolated in the Pacific Ocean, 506 km west of the Pacific coast of Colombia. It lies at 3°58'00"N by 81°37'00"W between 4°26'00"N / 81°08'00"W to 4°26'00"N / 82°00'00"W by 3°32'00"N / 81°08'00"W to 3°32'00'00"N / 82°00'00"W) (MoE,2005).

### DATES AND HISTORY OF ESTABLISHMENT

1995: Malpelo Island designated a Flora and Fauna Sanctuary by Resolution 1292;

1996: The marine area was extended to 6 nm by Resolution 1423.

2002: The marine boundaries re-defined by Resolution 0761;

2002: Designated a Particularly Sensitive Sea Area by the International Marine Organisation;

2005: Malpelo Island boundaries extended by Resolution 1589 from 65,450 ha to 857,500 ha.

### LAND TENURE

Colombian State. Administered by the Special Administrative Unit of the Natural National Parks System (PNNC) of the Ministry of the Environment.

## **AREA**

857,500 ha comprising a land area of 350 ha plus a marine area of 857,150 ha;

## **ALTITUDE**

> 1,000 m under sea level to 376 m (El Cerro de la Mona).

## **PHYSICAL FEATURES**

Malpelo Island, isolated in the Pacific 506 km west of Colombia, lies within an oceanic system known as the Eastern Tropical Pacific Marine Wilderness (ETP) unified by the movements of major oceanic currents and counter-currents related to the winds; it also lies within the Inter-Tropical Convergence Zone. The ETP area extends from Punto San Lazaro on the Baya California peninsula at 24°45' north to Paita in Peru at 5°0 south. It includes the archipelagos of Revillagigedo and Galapagos and the islands of Clipperton, Cocos, Coiba in Panama and Gorgona in Colombia. The dominant ocean currents of the region are the North Equatorial countercurrent bringing moderately warm sub-tropical waters from the north via the south-flowing Panama current, and the South Equatorial countercurrent bringing cooler low salinity water from the southwest via the north-flowing Colombia current, reinforced by the cool Peru (Humboldt) Coastal current flowing up the coast of South America and the Panamanian Cyclonic countercurrent. The Equatorial undercurrent that flows along the Equator from the west, also produces upwellings of cool water rich in nutrients when they hit the underwater base of islands. This wide range of oceanic influences adds to the diversity of habitats and species to be found around the island.

Malpelo is an isolated basaltic seamount with sheer cliffs rising 4,000m above the ocean floor, which extends 240 by 80 kilometers under water. Its ridge peaks at 376m above sea level, surrounded by a dozen satellite rocks. It was formed between 17 and 20 million years ago and is of volcanic origin, sited in a centre of marine-floor expansion between the Cocos and Nazca tectonic plates and related to the magmatic plume which underlies the Galapagos. This is evidenced by a wide variety of mafic and ultramafic rocks. It is wet but barren, rugged and inhospitable, in relatively cool waters, with steep submarine walls which offer little substrate for coral, but many cliffs, tunnels and caves which are encrusted with algae and invertebrates. Within the marine protected area are an underwater mountain, Bajo Bojarca, and two deeps (PNNC, 2005).

## **CLIMATE**

The island's climate is dictated by the cycles of the surrounding marine currents and the Intertropical Convergence Zone which moves seasonally north and south with the sun, due to the heating of the air over the Equator. Trade winds converging from the northeast and southeast push the warm air up, producing heavy rainfall along the fluctuating North Equatorial Front. Malpelo is subject to the variable winds and various sea currents of the region. In winter from December to May conditions are calm, cold and clear, from June to November they are warm, rainy and the sea is full of plankton. The water temperature is usually between 26°C and 28°C, with a salinity of 33-34 ppt and tides ranging between 5m and 0.6m. There is a sharp thermocline between 9 and 30m, depending on the season.

Variations in sea-level temperatures on the Equator caused by an alternation of high level winds which on falling entrain and heat sea currents, create the warming of seawater known as El Niño. This occurs at 4-7 year intervals for 14-22 months when the cool upwelling waters of the Humboldt Current and the life that depends on them disappear from the tropics. It is followed by the related La Niña period of unusually cool seawater surface temperatures.

## **VEGETATION**

The island is a largely barren oceanic rock, its sparse vegetation depending on guano and limited erosion. Plant species are few and small: ferns, leguminous and grassy shrubs, mosses, lichens and algae which are also widespread underwater; its marine resources are very rich.

## FAUNA

The surrounding oceanic system and currents of the Eastern Tropical Pacific form an ecological corridor for the fish and marine life of the area, and Malpelo is an important source for the colonisation and dispersal of the benthic larvae of corals, fish and molluscs around the region. It has 17 marine mammal, 5 terrestrial and 7 marine reptile species, 61 species of birds, 394 species of fish and 340 species of molluscs. The terrestrial fauna of the island is adapted to the barren conditions and the deposits of guano which are the basis of the island's ecology, both on land and undersea. There are twelve endemic species, five terrestrial and seven marine. On land, there are a land crab *Gecarcinus malpilensis*, lizards *Anolis agassizi* and *Diploglossus millepunctatus*, a beetle *Platynus carabidae*, and a gecko *Phyllodactylus transversalis*, but no mammals. Over 50 bird species include the world's second largest colony (25-30,000) of Nazca boobies *Sula granti* as well as the endangered swallowtailed gull *Creagrus furcatus*, the Galapagos petrel *Pterodroma phaeopygia* (CR), and the peregrine falcon *Falco peregrinus*, white-vented storm petrel *Oceanites gracilis*, ringed storm petrel *Oceanodroma hornbyi*, magnificent and greater frigate birds *Fregata magnificens* and *F. minor*. 30 species are migratory.

Three marine communities exist around the island: vertical, coralline reefs and pelagic, which are the basis for great biological diversity. The undersea walls fall 70m, dominated by barnacles both living and as a dead substrate for numerous other species. The steep coast supports only a 10% coral cover, mainly on submarine ledges, but this provides important shelter for many fish and invertebrate species and is to have recovered well from the El Niño events of 1982-3 and 1997-8. Isolation and 20°C water below a thermocline at 30m prevent further development of coral. The pelagic fauna which comprises most of the species found in this region of the east Pacific, depends on the marine communities, and aggregate in great numbers feeding especially on the rock bottom crustaceans, and for cleaning by the butterfly fish *Johrandallia nigrirostris* and king angelfish *Holacanthus passer*. Furthermore, some pelagic species are said to use the island as point of reference for navigation and as an aggregation point for reproduction.

17 species of marine mammals have been reported around Malpelo. Whales include migratory humpback *Megaptera novaeangliae* and occasional blue *Balaenoptera musculus* (EN), fin *Balaenoptera physalus* (EN), sperm *Physeter macrocephalus* (VU), Bryde's *Balaenoptera edeni*, killer *Orcinus orca*, false killer *Pseudorca crassidens*, pygmy killer *Feresa attenuata*, Cuvier's beaked *Ziphius cavirostris*, beaked *Mesoplodon* sp., shortfin pilot *Globicephala macrorhynchus* and melon-headed *Peponocephala electra* whales. Bottlenose dolphins *Tursiops truncatus* live around Malpelo; other dolphins occasionally seen are Risso's *Grampus griseus*, Fraser's *Lagenodelphis hosei*, striped *Stenella coeruleoalba*, Pacific spotted *Stenella attenuata*, rough-toothed *Steno bredanensis*, shortbeaked common *Delphinus delphis* and spinner *Stenella longirostris* dolphins. The Galapagos fur seal *Arctocephalus galapagoensis* (EN) and Galapagos sea lions *Zalophus californianus wollebaeki* (EN) stray into the surrounding waters. There are also hawksbill turtle *Eretmochelys imbricatus* (CR), green turtle *Chelonia mydas* (EN), olive ridley turtle *Lepidochelys olivacea* (VU), leatherback turtle *Dermochelys coriacea* (CR) and loggerhead turtle *Caretta caretta* (EN).

The island provides food for an abundance of marine mammals and turtles, and schools of large pelagic fish and sharks, which become more obvious when the winter thermocline rises to 15m. 394 fish are recorded of Central American species plus some indo-Pacific, some Galapagan and some endemic species. They include the giant grouper *Epinephilus lanceolatus* (VU), and blacktip shark *Carcharhinus limbatus*; the rare deep water ragged-tooth shark *Odontaspis ferox* (VU), scalloped hammerhead sharks (EN: 300 individuals), nurse shark *Ginglymostoma cirratum* (VU), whale shark *Rhincodon typus* (VU: 1,000), whitetip reef shark *Triaenodon obesus*, Galapagos and oceanic whitetip sharks *Carcharhinus galapagensis* and *C. longimanus* (VU). There are huge aggregations (>1,000) of silky sharks *C. falcoformis* and moray eels (*Muraenidae*). Endemic fish include the Malpelo barnacle-blenny *Acanthemblemaria stephensi* (VU), Malpelo wrasse *Halichoeres malpelo* (VU), pretty goby *Chriolepis lepidotus* (VU), Rubinoff's triplefin *Axoclinus rubinoffi* (VU) and twin-spot triplefin *Lepidonectes bimaculatus* (VU). Populations of billfish, the main objects of sport fishermen, are replenished from the area. These include four species of marlin, blue and black *Makaira nigricans* and

*M. indica*, white and striped *Tetrapturus albidus* and *T. audax*, sailfish *Istiophorus platypterus*, spearfish *Tetrapturus pfluegeri* and broadbill swordfish *Xiphias gladius*. There are also pelican barracuda *Sphyræna idiaestes*, spotted eagle and manta rays *Aetobatus narinari* and *Manta birostris*, with great numbers of striped bonito *Sarda orientalis*, snappers *Lutjanus* sp. and travelly *Caranx* spp. There are the Pacific seahorse *Hippocampus ingens* (VU) and two endemic sea stars *Tamaria stria* and *Narcissia gracilis malpeloensis*. Many more marine species probably remain to be described, especially among the invertebrates.

## **CONSERVATION VALUE**

The island's rich oceanic marine life is in excellent condition and is important to the maintenance and dispersal of the marine life of the Eastern Tropical Pacific. The island also has some geological interest for its evidence of recent crustal cooling. It is unlikely to be developed. The site lies within a Conservation International-designated Conservation Hotspot and is an IMO-designated Particularly Sensitive Sea Area (PSSA).

## **CULTURAL HERITAGE**

Malpelo' means bald. It has no harbors or running water so was probably never used by passing sailors. It was nominally Spanish since the 1494 treaty of Tordesillas.

## **LOCAL HUMAN POPULATION**

Malpelo is uninhabited except for six soldiers, rotated biannually, plus 10 more from the patrol boat. Artisanal fishermen visit illegally from the mainland. Rain is the only source of water.

## **VISITORS AND VISITOR FACILITIES**

Visitors to Malpelo number 500 a year, almost entirely from diving boats which furnish all the accommodation, food and equipment needed. There are excellent dive sites to which only one group of 25 divers at one time is permitted in order to preserve the site. All tourism is boat-based and land trips are short.

## **SCIENTIFIC RESEARCH AND FACILITIES**

The first scientists studied Malpelo in 1895; the first major publication on the wildlife was in 1945, followed by a Smithsonian Tropical Research Institute expedition in 1972, published in 1975. In 1999 and continuing to the present, the Colombia Institute for Marine and Coastal Investigation (INVEMAR), the Colombian Navy, the Calidris Association and Malpelo Foundation with the National Parks conduct research on the island. The island is pristine and in good ecological health, appropriate for the study of colonisation and deepwater ecology, and much is still to be done. Only in 1998 was the latest shark species discovered (*Odontaspis ferox*).

The European Community has granted the Malpelo Foundation US\$117,000 towards ecotourism monitoring and to determine the limit of acceptable change on both islands from 2005 (the INCOFISH project). Monitoring of hammerhead sharks has been carried out by the Malpelo Foundation in Malpelo SFF since 2000. Currently, the Foundation is starting a project financed by the Environmental Action Fund for US\$100,000 for studies on hammerhead sharks diurnal and migratory movements using satellite and acoustic telemetry. In 2005 there was a submarine expedition, the Deep Ocean Quest, to explore the seas down to 1,000m, coordinated by MarViva, (the Costa Rican Marine Conservation Organization) and the Malpelo Foundation (PNNC, 2006).

## **MANAGEMENT**

The island is administered by a Special Administrative Unit of the National Natural Parks System, and is a key component of the National Fisheries Management Plan for Colombia's Pacific Region. The Park Unit and the Malpelo Foundation protect the island, and 10 volunteers work each year in Volunteer Ranger programs for hammerhead sharks, black turtles, seabirds, coral reefs, demersal fishing and climate. In the Eastern Tropical Pacific region, the management cooperates in the adaptive management of the area which is under increasing pressure from illegal fishing, alien species, tourism

and sea traffic. The Sanctuary was declared a Particularly Sensitive Sea Area (PSSA) in 2003. From 2005 a Marine Biological Corridor of Conservational and Sustainable Development between Costa Rica, Panama, Colombia and Ecuador to connect the main sites of the region - Cocos, Coiba, Malpelo, Gorgona, Galapagos - was set up by UNESCO and Conservation International. They are contributing US\$619,000 towards a three-year subcomponent for Malpelo to strengthen the Malpelo Foundation operation, with patrols, research cruises and management of the recently expanded area. Collaborating with them in the Corridor are IUCN, UNEP, UNESCO, the Ramsar Convention, the International Commission for Tropical Tuna, Stanford University and the Charles Darwin Foundation of the Galapagos.

The extended protected area around Malpelo has been declared a no fish-take area (PNNC, 2005). It was agreed between the Malpelo Foundation, Colombian National Parks, the Colombian Navy, MarViva, Invemar and Conservation International, to designate a vessel from the Colombian National Navy for patrolling and enforcement in the Sanctuary for at least 20 days a month to protect its natural resources. The refit for this boat for patrolling purposes is mostly being achieved with SEASCAPE project funds. Operations should start in early 2006. The boat has been renamed, will be operated permanently by the Navy, with a permanent crew of seven Navy officers and sailors, as well as staff members from the National Parks, and the NGOs who also support the operation. Sustainable long-term financing for the patrol boat will channel funds via the Colombian National Protected Areas Conservation Fund. Conservation International is to secure an endowment from the Global Conservation Fund. Initial support will come from a \$15 million GEF/World Bank project. This will be augmented by a more effective ecotourism fee structure, by sales, by fuller use of existing legal financial procedures and by help from national and international NGOs. Long-term law enforcement to guarantee sustainable fishing of the resources around Malpelo will be through a Surveillance Protocol based on cooperation between all the interested parties to enforce existing national laws informed by the FAO Code of Conduct for Responsible Fisheries (PNNC, 2006).

### **MANAGEMENT CONSTRAINTS**

Since designation, areas previously impacted are recovering, but it remains necessary to monitor and control several factors. Chief among these is illegal artisanal and industrial fishing within and around the marine protected zone. Monitoring and prevention of illegal fishing beyond the protected zone is essential but difficult to prosecute. Hand, seine and long-line fishing (with 1,500 to 5,000 hooks per line) are used to overfish all commercial species and they cause much destructive by-catch of sharks. Tourism is carefully controlled and the tourism concession is to assume the costly maintenance of infrastructure, freeing Park staff to better manage the resource (PNNC, 2006).

### **COMPARISON WITH SIMILAR SITES**

Less than 3% of World Heritage Sites are predominantly marine: the whole Pacific Ocean has only nine, and within the Eastern Tropical Pacific region the island is under less threat than the Galapagos or Cocos Island. Among its remarkable characteristics are the geology, coral, variety of marine habitats and fauna. There are relatively few reefs in the eastern Pacific and although the island's coral reefs are small and not very diverse, they are well protected and in good condition, even after the 1983-84 and 1997-98 El Niño bleaching episodes which killed most of the corals of the Galapagos and Cocos reefs. Reefs in the central and west Pacific are even more vulnerable to natural predation and to damage, pollution, overfishing and destructive fishing methods than those in the eastern Pacific.

The island's marine substrate is the basis for a wide diversity of fish and marine invertebrates; and their position in the flux of regional currents make it important for the dispersal of marine organisms. The large numbers of shark and fish species are well protected. In general, species abundance and variety is high, if not as high as that of the Galapagos and Coiba islands. The abundance of the masked boobys is higher in Malpelo which has the world's largest colony. Furthermore, the hammerhead schools are as large as those encountered in Galapagos and Cocos.

## STAFF

Two boats are used to control illegal fishing, one recently re-fitted through SEASCAPE project funds to improve patrolling round the expanded Malpelo marine area. On Malpelo, 6 soldiers at the navy post warn off intruders by radio and a Navy boat patrols every month. Experts from the Malpelo Foundation help to manage the area.

## BUDGET

For 2004, Malpelo funding totalled US\$40,677, US\$30,500 being from the Dutch Pacific Park program, US\$5,083 from the Park Unit, US\$4,027 from donations and US\$1,067 from shop revenues. In addition, average entry fee revenue for 1997-2003 was US\$60,000. This is sent to the government which returns what amounts to 38% of the total budget. Present and proposed research projects budgeted for Malpelo should bring in some US\$884,000 during 2005-2007. These include the SEASCAPE project for US\$619,000 and the INCOFISH projects for US\$117,000, both pending. US\$100,000 has also been approved for hammerhead studies in Malpelo financed by the Environmental Action Fund. \$265,000 has also been pledged by the Navy to support the patrol boat, long-term financing of which is being initiated with a \$15 million GEF/World Bank project (PNNC, 2006).

## LOCAL ADDRESS

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The principal source for the above information was the original nomination for World Heritage status.

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## **DATE**

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