WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

GORGONA AND MALPELO ISLANDS, COASTAL & OCEANIC NATIONAL MARINE PARKS

OF COLOMBIA'S EASTERN TROPICAL PACIFIC (COLOMBIA) – ID N° 1216

1. DOCUMENTATION

i) **Date nomination received by IUCN:** April 2005

ii) **Additional information requested and provided by the State Party:** IUCN requested supplementary information on 7 December 2005, after the field mission, and on 31 January 2006 after the first meeting of the IUCN WH Panel. State Party responses were received on 10 January, 2006 and 13 March, 2006 respectively.

iii) **IUCN/WCMC Data Sheet:** 10 references

iv) **Additional Literature Consulted: Proceedings of the World Heritage Marine Biodiversity Workshop, Hanoi, Vietnam,** World Heritage papers 4; **A Global Representative System of Marine Protected Areas. Vol. III,** GBRMPA, WB, IUCN, 1995;. **Biota y Ecosistemas de Gorgona**, Aguirre, J. and O. Rangel (eds), Fondo para la Protección del Medio Ambiente –FEN- Colombia; **Estudio Petrográfico y Geoquímica de las Rocas Volcánicas y Plutónicas de la Isla Gorgona,** Arndt, N. and Revillon, S. 1998, informe, Universidad de Rennes, Francia; **Malpelo Islas Oceánicas de Colombia**, Brando, A., Pral. H.V., and Cantera J.R., 1992, Banco de Occidente; **Geología de la Isla Malpelo**, Informe Final de la Investigación Presentado a la Unidad Administrativa Especial del Sistema de Parques Nacionales Naturales, 2004; **Monitoreo de Aves Acuáticas (Marinas y Playeras) y su Articulación como Herramienta en la Planificación, Manejo y Conservación de Tres Áreas Protegidas del Pacífico Sur de Colombia,** Calidris, 2004; **Plan de Manejo Preliminar de los Recursos Icticos del Parque Nacional Natural Gorgona y Su Área de Influencia**, Castillo B. et al, 2004; **Gorgona Marina, Contribución al Conocimiento de una Isla Única,** INVEMAR, serie Publicaciones Especiales No. 7, Santa Marta, 2001; **Plan de Manejo, Sanctuario de Fauna y Flora Malpelo, 2005-2009**, Unidad Administrativa del Sistema de Parques Nacionales Naturales, Fundación Malpelo; **Plan de Manejo, Parque Nacional Natural Gorgona, 2005-2009,** Parques Nacionales Naturales de Colombia, Dirección Territorial Suroccidente, Cali.

v) **Consultations:** 4 external reviewers; Directors and Staff of the General Directorate of National Natural Parks and the National Academy of Sciences; Naval Officers in Bogota and Buenaventura; staff of INVEMAR, Fundación Malpelo and Conservation International/Colombia; Municipal authorities and community organisations of Guapi.

vi) **Field Visit:** Carl Gustaf Lundin. 15-26 November, 2005.

vii) **Date of approval of this report:** April 2006

2. SUMMARY OF NATURAL VALUES

The nominated serial property, Gorgona and Malpelo Islands (GMI), comprises two main areas and covers a total area of 919,187 ha as detailed below:

Gorgona Natural National Park (GNNP) is located approximately 35 km off the coast of Cauca (Department). Gorgona has a total land area of 1333.29 ha and a marine area of 60,353.71 ha including the continental shelf slope down to more than 1000 m.

Malpelo Fauna and Flora Sanctuary (MFFS) is located 506 km from the closest Colombian sea port, Buenaventura, Valle del Cauca (Department) and comprises a land area of 350 ha, and a marine area of 857,150 ha to a depth of 3,400 m.

There is no marine buffer zone connecting these two areas.

Though separated by approximately 440 km, the two marine protected areas included in this serial nomination share the same marine currents (California Current, North Equatorial Countercurrent, Equatorial Undercurrent, Equatorial Countercurrent, South Equatorial Countercurrent, Humboldt Current, Colombian Current and the Panamanian Cyclonic Countercurrent). However, due to the proximity of Gorgona to the continent, the ecological processes and oceanographic regime occurring around this island are much more influenced by the continent. On the other hand, Malpelo represents the farthest Colombian island from the continent in the Pacific Ocean and it is highly important for the dispersion and recruitment of benthonic

Table 1. Extent of the nominated serial property

Nominated property	Land (ha)	Sea (ha)	Total (ha)
Gorgona NNP	1333.29	60,353.71	61,687
Malpelo FFS	350	857,150	857,500
	1683.29	917,503.71	919,187

larvae and for maintenance and re-population of fish stocks in the surrounding oceanic waters, as reported for other islands around the world.

GNNP and MFFS are linked in an ecological marine corridor along the waters of the Eastern Tropical Pacific (ETP) which includes other islands such as Revillagigedo, Cocos, Galapagos, Coiba and Clipperton. This corridor is essential for the survival of emblematic species, such as the humpback whale, the whale shark, the devil ray, and 2 sea turtles.

At least 208 fish species, 43 birds species, 11 hard coral species, 44 crustacean species, 18 echinoderms species, 42 mollusk species and 11 marine mammals species are present at both GNNP and MFFS. Taxonomic studies are currently incomplete, especially with respect to invertebrates, and therefore the number of species could be even greater.

Biogeographically the marine habitats of Gorgona and Malpelo are complementary. Malpelo exhibits typical oceanic habitats (to a depth of 3400 m), while Gorgona includes coastal habitats, such as superficial soft bottoms (less than 80 m in depth) which are influenced by coastal runoff. Coastal species such as catfish and the Pacific anchovy, as well as oceanic species such as tuna fish, and sailfish are frequently observed in the serial property. However, the landscapes of both islands and the ecological processes occurring on them are very different. Malpelo Island is almost free of vegetation and subject to an oceanic regime that conditioned the existence of extreme ecological conditions, while Gorgona Island is much more influenced by the continent and contains tropical rainforest and abundant fresh water.

These marine protected areas preserve important habitat for endangered marine and terrestrial species under several categories of threats. According to the IUCN Red List of Threatened Species (IUCN, 2000) this includes 4 spp. in the critical risk category (Hawaiian petrel, giant grouper, and the hawksbill and leatherback turtles), 8 spp. in the endangered category, and 17 spp. in the vulnerable category.

Gorgona Natural National Park (GNNP)

The geology of GNNP includes a large variety of mafic and ultramafic volcanic rocks (basalts, tuff, breccias, pyroclastic rocks, komatiites, gabbros and peridotites). This allows a detailed and complete study in a single locality of the whole original material which developed during the formation of the Caribbean-Colombian Volcanic Province (Arndt and Révillon, 1998). The island is noted in particular for the occurrence of the most recent (Mesozoic) komatiites known in the world. Komatiites are an unusual type of lava with low silica content, and a high magnesian concentration (MgO). Almost all komatiites are known from Archaean rocks of up to 3 billion years old, whereas the Gorgona komatiites are much younger at c.90 million years. The Gorgona komatiites are currently an important element within a number of the studies of the interior structure and cooling history of the Earth.

GNNP protects important ecosystems of the tropics: coral reefs and very humid tropical rain forest. Gorgona's coral reefs are some of the most developed and diverse in the Eastern Tropical Pacific (ETP) (Zapata, 2001a). With an approximate extension of 30 hectares, coralline life cover extends over 75% of the reef and supports 19 species of scleractinian corals and a complex arrangement of other invertebrates and reef fishes. Additionally the forest in Gorgona, with a canopy of over 30m high, is well conserved, with patches of primary forest in some areas and second growth forest, with over 20 years of re-growth, in others. This is the result of the development of a penal colony on the island, which was in operation between 1958 and 1985. During this period much forest was cut and exotic species introduced. This forest represents critical habitat for twelve endemic species or subspecies such as the blue lizard, the bananaquit and the red-legged honeycreeper.

The confluence in GNNP of continental marine environments on the leeward side of the island, with depths of less than 85m, and of oceanic environments on the seaward side, with depths down to 1000m, adds to the variety of marine habitats (submarine rocky outcrops, coral reefs, sand bottoms and several depth profiles) and terrestrial environments (very humid tropical rain forest, cliffs, beaches and emergent rocks). This provides the conditions for the existence of high biological diversity in an insular marine area of relatively small size (381 fish species, 154 bird species, over 500 species of mollusks), making GNNP an area of scientific interest.

GNNP provides important habitat for 29 species in several threatened categories. It is estimated that around 10% to 30% of the estimated population of 2600 individuals of the ETP´s humpback whales, considered vulnerable by IUCN, visit the park during their annual migration from June to December, 36% of which are calves (Flórez-Gonzalez and Capella, 1995; Soler et al, *in review*). The giant grouper, listed as critically endangered by IUCN and listed in Appendix I in CITES, inhabits the waters of Gorgona. GNNP is also a breeding area for green turtle and a feeding area for black turtle (Amorocho *et al*, 2001). Both species are considered endangered by IUCN and also listed in Appendices I and II of CITES. The numbers of some species within the property, particularly of marine mollusks and other

lower taxonomic groups are likely to increase, once deeper water investigations are conducted.

Malpelo Fauna and Flora Sanctuary (MFFS)

Malpelo, a seamount considered as the maximum elevation of the Malpelo Ridge, is widely recognized as one of the top diving sites in the world (Shark Diver, June 1998; Plongeurs International, June 2003; Sub, 2003; Plongee Magazine, August 2004; Ca m'interesse, February 2004; Buceadores, June 2004; Skin Diver, 2004). It provides important critical habitat for a number of internationally threatened marine species, and is a major source of nutrients and an important area of aggregation of marine biodiversity.

The influence of several marine currents and the varied bathymetry of the Malpelo Range are the key factors which give rise to this complex and rich ecosystem. The surrounding waters of this oceanic island support massive populations of pelagic bony fishes, sharks, marine mammals and sea turtles (Brando *et al*, 1992). One of the most outstanding features of Malpelo is that it is one of the few places in the world to record confirmed sightings of the short-nosed ragged–toothed shark, a deepwater shark. Additionally very large aggregations of pelagic species, including outstanding schools of over 200 individuals of hammerhead sharks, over 1000 individuals of silky sharks, whale sharks and tuna have been recorded around the island (*Malpelo Foundation's observation*). There are also barracuda, endangered eagle and manta rays, and great numbers of striped bonito, snappers and travelly. Also to be found are the vulnerable Pacific seahorse and two endemic species of sea stars. Many more marine species probably remain to be described, especially among the invertebrates.

Terrestrially, Malpelo's ecosystems provides habitat to five endemic species of plants. The rocky outcroppings support the largest colony of masked boobies in the world with over 40,000 individuals (Pitman and Jehl, 1998; Calidris, 2004). Furthermore, this island supports important populations of endangered bird species such as the swallow-tailed gull, masked booby, and Hawaiian petrel.

3. COMPARISON WITH OTHER AREAS

Of the 160 natural properties currently included on the World Heritage List (2005), only 18 have been nominated predominately for outstanding marine attributes. Additionally the Pacific Ocean, which accounts for 40% of the Earth's surface, is represented by eight natural World Heritage properties: East Rennell, Hawaii Volcanoes, Henderson Island, Galapagos, Coiba Island, Cocos Island, Lord Howe Island and the Great Barrier Reef.

This serial property has been nominated under all four natural criteria.

In relation to **criterion (i)** the geological significance of GMI is mainly claimed based on Gorgona's geological features. However, whilst the komatiites of Gorgona are unusual because of their young age, komatiites are better known and much more extensive in Archaean exposures in Australia, South Africa, Canada and the Baltic Shield. The type locality for these rocks is the Komati River in South Africa, after which they are named. The Caribbean-Colombian Volcanic Province is one of numerous Large Igneous Provinces recognized on the Earth, and Gorgona is a key locality for its study. Overall the komatiites of Gorgona are far too specific and specialised a feature to be accepted as being of outstanding universal value. On the other hand, whilst Malpelo is a seamount considered as the maximum elevation of the Malpelo Ridge, there are other World Heritage properties also associated to seamounts, such as Brazilian Atlantic Islands, that present a more complex geological and geomorphological setting. In addition the Galapagos Islands, also in the Eastern Pacific, show active volcanism.

The case on **criterion (ii)** is made primarily on the claim that MFFS and GNNP are important components of the marine corridor connecting the islands and seamounts of the Eastern Tropical Pacific (ETP). Whilst the marine ecosystems of GNNP are important in the context of this corridor the ecological processes that it supports are not different or unique in relation to other World Heritage properties located in the Eastern Tropical Pacific. In fact, Coiba National Park is by far more important due to the protection it offers from the effects of the El Niño/Southern Oscillation (ENSO) phenomenon, thus playing a critical role in maintaining a more stable marine environment than the other pacific islands, and providing larval and post-larval "seeds" of many marine species.

However, Malpelo Island is particularly noteworthy as an oasis in an "oceanic desert" for a large number of pelagic boney fishes, such as tuna, and many species of sharks, as well as for marine mammals and turtles. This oasis effect is enhanced by the effective no-fishing zone established around the island, which is the largest no-take reserve in the Eastern Tropical Pacific[1]; by the absence of fisheries in or around the area; and by the non-existence of invasive species. In addition, fishing close to the limits of the MFFS will remain limited because of the lack of biogeographic features that aggregate fish to the surrounding oceanic waters. Thus, the ecological processes associated to MFFS, supported by its effective protection, provides a true "reservoir" for sharks, giant grouper and billfish which can be expected to continue to thrive in the area free from the fishing pressures. This ecological role is essential to maintain and replenish the population of these species in the ETP if populations in other existing marine protected areas eventually collapse due to over fishing.

In relation to **criterion (iii)** the terrestrial environments of GNNP and MFFS do not compare highly when compared to the exceptional beauty of other World Heritage properties, such as the Galapagos Islands. It is important to note that Cocos Island exhibits impressive coastal cliffs, partially covered by tropical forests producing a much more impressive landscape than that exhibited by GNNP and MFFS, and yet Cocos was not inscribed under criterion (iii) as it didn't rank highly when compared to other properties. On the other hand, the submarine environment of the MFFS, characterized by steep walls, caves, and large aggregations of large

predators and pelagic species, is indeed a phenomenon of outstanding natural beauty and aesthetic importance. It is one of the few areas in the world where large predators and pelagic species can be observed in large numbers in an undisturbed environment where they maintain behavioral patterns relatively free from human influence. The superlative nature of this area is well recognized by the major diving magazines of the world, which rank it as a top dive destination. On the contrary, the submarine environment of GNNP does not rank highly when compared to those existing in Galapagos Islands, Coiba and Cocos; all of them characterized by a variety of submarine forms with abundant marine life in very clear waters, as opposed to GNNP where turbidity associated to sediments coming from the continent substantially limits its aesthetic value. Most of the large fishes have also been removed from the GNNP marine environment. In addition the forests of Gorgona are largely secondary growth and not particularly significant in terms of their beauty.

In relation to **criterion (iv)** it is important to compare the nominated property with other World Heritage properties in the same region. Table 2 provides a comparison between three existing properties and the nominated serial property. These islands are all suitable for comparison as they form part of the Eastern Tropical Pacific (ETP).

Based on existing studies on marine biodiversity reflected in table 2, it can be concluded that the Colombian nominated serial property ranks higher than Cocos Island in terms of fish and mammal species. However the nominated serial property ranks lower than Galapagos Islands and Coiba National Park. Gorgona is the richest in terms of birds, which is expected due to its proximity to the continent that allows the presence of a variety of both terrestrial and marine bird species. Malpelo, with its extended marine protected area, including seamounts, is likely to add a number of new marine species, including endemic species.

The oceanic World Heritage properties included in table 2 all include the same charismatic species but in numbers that vary considerably. For example, Malpelo has the largest masked booby colony, but Galapagos has larger colonies of red footed boobies and blue footed boobies. The high degree of rainfall and proximity to the continent makes Gorgona, as well as Coiba particularly rich in terrestrial species. The mid-oceanic location and associated upwelling of Cocos, Galapagos and Malpelo provide conditions that attract large oceanic species of fish.

However, the ecological isolation of Malpelo is only comparable to that of the Galapagos Islands and, contrary to Galapagos, Malpelo does not suffer from any reported alien invasive species. The relatively low number of visitors makes it unlikely that introductions will be made, either on land or in the ocean. This is not the case for Cocos and Galapagos, where alien invasives are prevalent and remain a difficult management issue to addresses. The situation of Malpelo makes it the 'easiest' reserve for fisheries control since there is no domestic fishing industry targeting the reserve, unlike both Galapagos and Cocos that have significant domestic industries and quite conflictive relationships with the protected area administrations. Gorgona, due to its low level of development, also suffers less risk in terms of a new introduction of invasive species than the other areas.

The uniqueness of the oceanic islands (Cocos, Malpelo and Galapagos) is greater due to their isolation from sedentary species. The coastal islands, such as Coiba and Gorgona, however, receive considerable influence

Table 2. Basic information of key protected areas of the ETP.

WH Properties in ETP	Area (km2)	Type of Island	Key Biodiversity Data	Other Key Features
Cocos Island National Park (Costa Rica)	2,000	Oceanic	+300 fishes, 95 birds, +10 marine mammals	- Covered mainly by primary humid tropical forest. - Protects large pelagic species.
Coiba National Park (Panama)	270,125	Continental	735 fishes, 147 birds, 19 marine mammals	- Patches of primary humid tropical forest. - Protects hotspot of marine biodiversity, including several endemic species.
Galapagos Islands (Ecuador)	133,000	Oceanic	444 fishes, 150 birds, 24 marine mammals	- Melting pot of several marine currents conditioned high marine biodiversity. - Active volcanism. - High level of endemism.
Gorgona Natural National Park (Colombia)	616.8	Continental	381 fishes, 154 birds, 15 marine mammals	- Maintains few patches of tropical rainforests. - Important coral reef areas.
Malpelo Fauna and Flora Sanctuary (Colombia)	8,575	Oceanic	394 fishes, 49 birds, 17 marine mammals	- Very large aggregations of pelagic species. - Support the largest colony of masked boobies in the world

from adjacent continental areas. Thus, the terrestrial habitat of these islands is a subset of the more biologically diverse continental areas, showing similarities in relation to the existing terrestrial ecosystems and the species they contain.

4. INTEGRITY

4.1 Legal status

The nominated serial property is owned entirely by the Colombian government. Legal protection of the Malpelo FFS began in 1995 when the island was declared a protected area by Ministerial Resolution. In 1996, the protected area was extended to include a marine component 6 nautical miles around the island, and in 2003 the marine area was extended once again to its current size. The same year, the International Maritime Organisation declared the Malpelo FFS a Particularly Sensitive Sea Area, making it off-limits to commercial shipping. The Gorgona National Natural Park was created by Ministerial Decree in 1985. A marine buffer zone was established in 1995 by Ministerial Decree to include the breeding habitat of the humpback whale.

4.2 Boundaries

The Gorgona NNP has been in place for 20 years and includes a significant part of the marine area surrounding the island; however its current size is considered by a number of experts as not sufficient to conserve its marine biodiversity. The Malpelo FFS has recently been expanded to include a significantly larger marine area (14 times than the original extension when established), thus providing better protection to marine biodiversity. There are currently no plans for further extensions to the two areas.

4.3 Management

Management of the areas is carried out by the Colombian Park Service. A single administrative unit has been created for the management of Malpelo and Gorgona under the coordination of a single Park Director. The Management Plans of the two component sites were developed using the same methodology, though it should be noted that they are largely descriptive and provide little guidance for day-to-day management. The proposed management programmes aim at establishing integrated management for the two component sites. Furthermore, these areas are key for the National Fisheries Management Plan of the Colombian Pacific region, since they are important recruitment areas for larvae for the adjacent waters, and integral components of the Eastern Pacific Seascape Project being led by Conservation International with funding from the United Nations and Walton Family Foundations.

There is a concession programme under way in Gorgona that will give a private operator the right to run the facilities on the island. Local fishermen sometimes seek shelter on Gorgona, but are not allowed to fish in the marine park. On Malpelo there will be no land facilities available for tourism development, as it will all be boat-based using an existing mooring. All trips on land will be of short duration, and with limited impact.

Given their remote locations, sustainable finance for management of these two protected areas is an ongoing concern. However, steps are being taken by the Colombian Park Service, the Colombian National Protected Areas Conservation Trust Fund, and interested NGOs, to develop the mechanisms to assure that sustainable finance is attained within a relatively short period.

Gorgona is currently managed with limited resources and maintenance is insufficient, which, in the humid climate of the island, leads to a sense of decay. The many facilities left behind from the penal colony times are all in different levels of dilapidation. The high humidity makes upkeep central to any management effort, and that is lacking at this time. Since the concessioning of facilities to a private operator has not yet taken effect, it is hard to assess if this will improve overall maintenance. The relatively high number of scientific studies that have been conducted in Gorgona should make it a key site of future scientific studies and in particular restoration efforts. However, given the poor state of the library and the limited effort that has gone into restoration, it is as yet unclear whether the scientific potential can be fulfilled.

Conflicts with the coastal population are currently minimal. However, with high population growth and fisheries being the main economic activity of poor coastal communities, the lack of effort by the current park administration to address these issues is notable. Community leaders seemed relatively unaware of the values of Gorgona, and there was no sense of ownership of, or pride in, the property. The overall effectiveness of the management regimes for the Malpelo FFS and Gorgona NNP have not been evaluated on a systematic basis, but it appears that significant effort will be required to bring that of Gorgona NNP up to the level of World Heritage standards.

The situation in Malpelo is very different. A joint patrol vessel is, manned by the park service and the navy and carries out periodic patrolling. This will reduce, if not eliminate, the main threat of commercial fishing to Malpelo. Currently, this is the only threat to the environmental quality of Malpelo. Strong NGO engagement has led to increased sources of finance which ensure that, even if the government is unable to raise the necessary funds, sufficient funding will remain available to continue the patrols for the foreseeable future. Limited dive tourism will generate some of the revenue needed to cover management costs. The remoteness of Malpelo makes community relations rather simple, particularly since there is virtually no domestic pressure to exploit the fisheries resource. Regular patrols by the Navy and Park Service should be sufficient to discourage most illegal activities. The current level of management should be adequate to manage Malpelo FFS for the benefit of coming generations.

4.4 Threats and Human use

4.4.1 Human Occupation

Gorgona is currently inhabited only by Park Service personnel. This will change later this year with the arrival of the tourism concessions. Malpelo has a population of 6 military personnel that rotates every couple of months. There are no local inhabitants in either Gorgona

or Malpelo. With the arrival of the patrol boat, an additional 10 or so people will be in the Malpelo FSS permanently, but on a rotating basis. Both areas receive visitors; on Gorgona they will be based on land, and in Malpelo at sea.

4.4.2 Fisheries

Fishing in Gorgona is primarily conducted by local fishermen and has led to depletion of many of the top predators and large fishes. The size of the area makes maintaining healthy fish populations difficult and it is unlikely that there will be any significant recovery in the short term. On the contrary, in Malpelo the fish stocks are in good condition with large numbers of top predators and well preserved ecosystems. Illegal fishing from neighboring countries could be a potential problem, but with the semi-permanent presence of a patrol vessel in the areas, the threat is likely to be significantly reduced.

4.4.3 Research

Due to its isolation from civil conflict, Gorgona has been a refuge not just for flora and fauna, but for conservationists as well. Research began some 20 years ago, and today university research programmes are ongoing, complemented by NGOs implementing monitoring and conservation programmes. The island provides an opportunity to study one of the wettest places in the world with annual rainfall of 6900 mm and no dry season. Its proximity to the continental shelf provides relatively easy access to a great variety of habitats, though most are influenced by continental processes.

The two parks are well placed for study of climate induced changes (ENSO) due to their proximity to a variety of ocean currents. Evolution and colonization are being studied to great effect in these parks, especially given the diversity of habitats they contain.

Malpelo with its rich oceanic life permits the study of large predators in a largely pristine environment. With the risk of pollution and predatory fisheries being very small, Malpelo is likely to remain in very good condition. While comparatively little research has conducted around Malpelo, some of the recent studies are of high quality.

However, the level of scientific research in the two reserves is still not globally significant. In comparison with Galapagos, these areas are still poorly understood. In particular, Malpelo has much scientific work still to be done. The status of collections in Gorgona is also a constraint for further work. Neither site has had research conducted below a depth of 200 m.

4.5 Other threats

Climate change induced shifts in water temperature remains a great threat. Events in Galapagos over recent years illustrate how significant such a threat can be with significant loss of live corals and reduction in the abundance of many species. To date there have been no similar impacts on Malpelo and Gorgona. The local oceanographic conditions are probably the main explanation for this lack of devastation.

Nutrient runoff from the Colombian mainland has the potential of significantly impacting Gorgona NNP. At this time there are no clear signs of smothering of the reefs, but visibility can be poor at times, and the runoff effects are likely to be of some significance in the medium term future if adequate measures to control erosion from the continent are not designed and implemented.

5. ADDITIONAL INFORMATION

When IUCN evaluates a serial nomination, such as this one, it asks the following questions:

(a) What is the rational for a serial nomination? The rationale for serial nomination is based on the ecological connections between GNNP and MFFS, the complementarities of terrestrial and marine habitats diversity between these sites and the need to ensure their integrated management to enhance the protection of marine biodiversity. As noted above, there are a limited number of species that are present in both sites and further research may find that the number of shared species could be higher than current estimates. However the sharing of species is quite common in the marine environment and it is not a sufficiently strong element to argue for a serial approach.

(b) Are the separate components of the property functionally linked? As noted previously, though separated by 440 km, there is an ecological and biological connection between MFFS and GNNP. The connection is the product of shared marine currents and oceanographic regimes which also influenced the sharing of a number of marine species. However, as noted above, this is a common feature in the marine environment and the degree of ecological connectivity has yet to be determined by genetic connectivity studies. Such studies are being designed for some groups such as corals and zooxanthels. For sharks, the use of telemetry tracking technology will help in future to determine the connectivity between these sites. While it is expected that both areas are probably important for the dispersion and recruitment of benthic larvae, and for the maintenance and re-population of fish stocks in the surrounding waters, there is no specific scientific evidence that the MFFS and GNNP are actually functionally linked in this way. In the specific case of MFFS, there is probably a stronger case for a serial nomination with Galapagos, Cocos Island and Coiba on which the survival of highly migratory and emblematic species depends, such as the humpback whale, the whale shark, the devil ray, and sea turtles.

(c) Is there an overall management framework for the two components? As noted previously, a single administrative unit has been created for the management of the MFFS and GNNP; the same planning methodologies and management programmes are being used in each area; both protected areas are important components of the regional fisheries management plan; and both

areas are usually included in recreational diving tours. However, these linkages are common among many protected areas that are managed as part of their broader landscape/seascape and do not necessarily constitute an argument for serial nomination.

In conclusion, it is the view of IUCN that the case for a serial nomination has not been demonstrated. There are no studies completed as yet that clearly show a strong functional link between the two nominated areas. From a management perspective the issues to be addressed are quite different and few if any of the same technologies and technical personnel will be engaged on a day to day basis.

6. APPLICATION OF CRITERIA / STATEMENT OF SIGNIFICANCE

The serial property has been nominated under all four natural criteria.

Criterion (i): Earth's History and Geological Features

Only the geological values for Gorgona Island have been described in the nomination document. The geology of Gorgona is of regional importance in relation to the understanding of the Caribbean-Colombian Volcanic Province. However this is one of many such provinces and does not have a special claim to global geological preeminence. The komatiites of Gorgona are distinguished as the youngest known examples of this unusual volcanic rock type, however this is too specific and specialized a feature to be accepted as being of outstanding universal value. IUCN considers that the nominated serial property does not meet this criterion.

Criterion (ii): Ecological Processes

Malpelo and Gorgona are important for the conservation of the marine biodiversity associated to the Eastern Tropical Pacific Seascape. However, only Malpelo FFS is particularly noteworthy as an oasis in an "oceanic desert" for a large number of pelagic boney fishes such as tuna and many species of sharks, as well as for marine mammals and turtles. This oasis effect is enhanced by the protection existing around the island, which is the largest no-fishing zone in the Eastern Tropical Pacific. Thus, the ecological processes associated to Malpelo FFS, supported by its effective protection, provides a true "reservoir" for sharks, giant grouper and billfish, which can be expected to continue to thrive in the area free from the fishing pressures. This ecological role is essential to maintain and replenish the population of these species in the ETP if populations in other existing marine protected areas eventually collapse due to over fishing. IUCN considers that the Malpelo FFS meets this criterion, but that the Gorgona NNP does not.

Criterion (iii): Superlative Natural Phenomena or Beauty and Aesthetic Importance

The marine environment of the Malpelo FFS, characterized by steep walls, caves, and large aggregations of large predators and pelagic species, is indeed a phenomenon of outstanding natural beauty and aesthetic importance. It is one of the few areas in the world where large predators and pelagic species can be observed in large numbers in an undisturbed environment where they maintain behavioral patterns relatively free from human influence. The superlative nature of this area is well recognized by the major diving magazines of the world, which rank it as a top dive destination. On the contrary most of the large fishes of the marine environment of the Gorgona NNP have been removed, and these environments are affected by sedimentation from continental sources, thus limiting its natural beauty for divers and snorkelers. The forests of Gorgona are largely secondary growth and not particularly significant in terms of their beauty. IUCN considers that Malpelo FFS meets this criterion, but that Gorgona NNP does not.

Criterion (iv): Biodiversity and threatened species

The levels of biodiversity and number of threatened species of the Malpelo FFS and Gorgona NNP do not vary significantly from that found in Cocos Island; however they rank lower than the levels of biodiversity existing in Coiba National Park and the Galapagos Islands. Furthermore Galapagos Islands are characterized by the presence of a large number of endemic species. IUCN considers that the nominated serial property does not meet this criterion

7. RECOMMENDATION

IUCN recommends that the Committee **inscribe** the Malpelo Fauna and Flora Sanctuary on the World Heritage List on the basis of natural criteria (ii) and (iii).

On the other hand, IUCN recommends the Committee **not to inscribe** Gorgona Natural National Park on the World Heritage List on the basis of natural criteria.

Furthermore, the Committee may wish to recommend the State Party to:

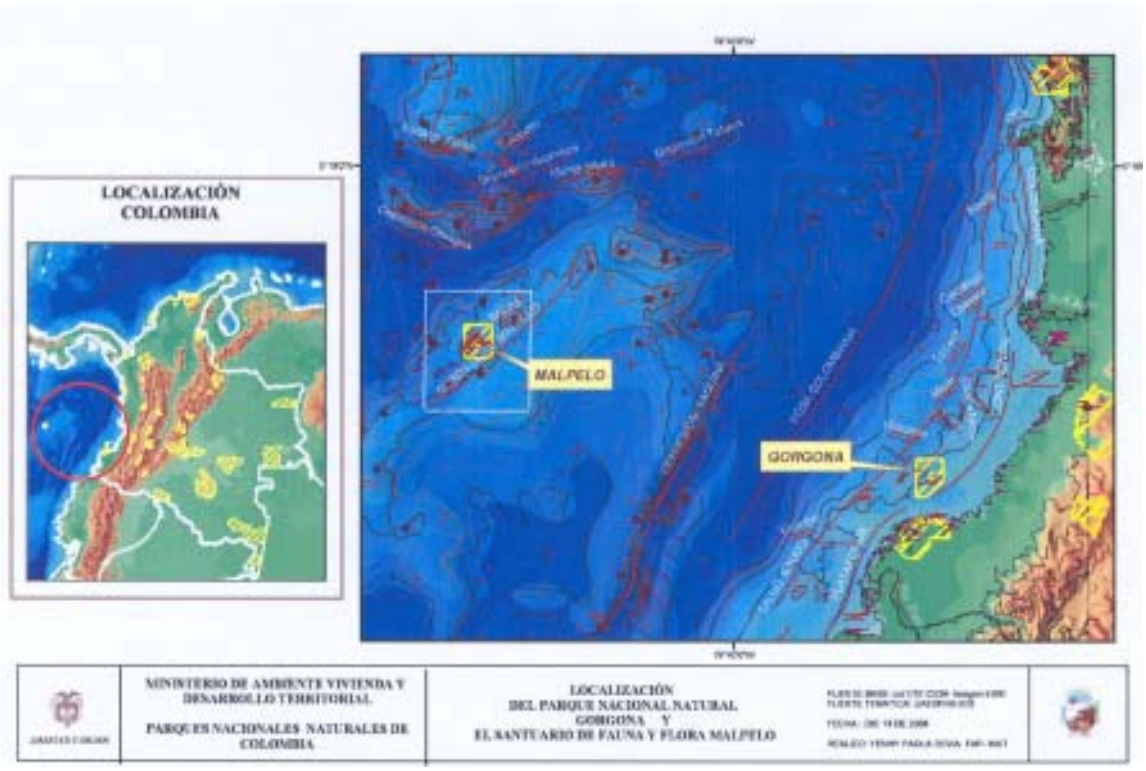
a) improve the management of Malpelo Fauna and Flora Sanctuary, including through the implementation of a programme to ensure that illegal fishing pressure is avoided permanently in the areas in and around the sanctuary;

b) strengthen tourism management and develop the funding base for long term management of both Gorgona Natural National Park and Malpelo Fauna and Flora Sanctuary; and

c) commence research on the deeper waters in both areas, including seamounts within them.

IUCN commends the State Party for its continued efforts in conserving these important protected marine areas, as well as the NGOs, other institutions and private partners that are contributing to their conservation and management.

Map 1: General Location of Nominated Serial Property



Map 2. Boundaries of Malpelo Flora and Fauna Sanctuary (before extension of marine boundaries)

Map 3: Boundaries of Gorgona Natural National Park