Malpelo Fauna and Flora Sanctuary

2020 Conservation Outlook Assessment

SITE INFORMATION

Country: Colombia
Inscribed in: 2006
Criteria: (vii) (ix)

Located some 506 km off the coast of Colombia, the site includes Malpelo island (350 ha) and the surrounding marine environment (857,150 ha). This vast marine park, the largest no-fishing zone in the Eastern Tropical Pacific, provides a critical habitat for internationally threatened marine species, and is a major source of nutrients resulting in large aggregations of marine biodiversity. It is in particular a ‘reservoir’ for sharks, giant grouper and billfish and is one of the few places in the world where sightings of the short-nosed ragged-toothed shark, a deepwater shark, have been confirmed. Widely recognized as one of the top diving sites in the world, due to the presence of steep walls and caves of outstanding natural beauty, these deep waters support important populations of large predators and pelagic species (e.g. aggregations of over 200 hammerhead sharks and over 1,000 silky sharks, whale sharks and tuna have been recorded) in an undisturbed environment where they maintain natural behavioural patterns. © UNESCO

SUMMARY

2020 Conservation Outlook

Finalised on 02 Dec 2020

GOOD WITH SOME CONCERNS

The conservation outlook for Malpelo Fauna and Flora Sanctuary is positive compared to the situation of many marine protected areas in the World. This is because of the size and remoteness of the site, the existence of a large no-take area and the encouraging conservation efforts by governmental and non-governmental actors, including foundations, research institutions and tourism operators. While many management aspects demonstrate highly effective performance, law enforcement with regards to illegal fishing remains the biggest challenge. Illegal fishing can be considered the largest current threat to the site, with both illegal artisanal and, more importantly, illegal industrial fishing occurring within and around the marine protected zone, including by foreign vessels. Intensified efforts and technology are needed to curb and eventually completely prevent illegal fishing. Improved international cooperation is needed to ensure the management of marine traffic, pollution and fisheries in the Tropical Eastern Pacific. Malpelo and the various other World Heritage sites in the Eastern Tropical Pacific can play a key role in large scale seascape management under the umbrella of CMAR.
FULL ASSESSMENT

Description of values

Values

World Heritage values

▶ Undisturbed marine wilderness

The pristine underwater environment of Malpelo Fauna and Flora Sanctuary featuring dramatic cliffs, rock formations, caves and tunnels, as well as abundant and diverse marine life is of striking natural beauty (World Heritage Committee, 2015). A sight of extraordinary natural beauty, major aggregations of the full range of large top predators and pelagic species constitute an increasingly rare phenomenon in the world’s overfished oceans. It is one of the few areas in the world where natural population densities and behavioral patterns of these species can be observed in an undisturbed “marine wilderness” (IUCN, 2006, World Heritage Committee, 2006). To-date, no signs of impacts from invasive species have been identified.

▶ Globally significant marine protected area with unaltered and non-threatened ecosystems

One of the largest no-fishing zones in the Eastern Tropical Pacific, the Malpelo Fauna and Flora Sanctuary is a globally significant marine protected area with unaltered and non-threatened ecosystems, free of invasive species impacts, that is essential to maintain and replenish the population of sharks, groupers, snappers and billfish in the Eastern Tropical Pacific (World Heritage Committee, 2006). The confluence of several marine currents turns the property into an unusual geographical spot with a complex and diverse array of habitats and species. The three major marine communities surrounding Malpelo Island can be distinguished as belonging to the vertical habitats, the coral reefs and the pelagic. Large top predators continue to fulfil their ecological roles and behaviour patterns continue undisturbed, providing unique opportunities for research. The evolutionary processes associated with the extreme isolation, the convergence of several ocean currents and related nutrient regimes and the geological formations are of great ecological importance and scientific interest (World Heritage Committee, 2015).

The small island and its rocky satellites are believed to serve as an aggregation point of critical importance for the reproduction of numerous marine species. Impressive populations of marine species include Giant Grouper, Billfish and various shark species, including major aggregations of Hammerhead Shark, Silky Shark, Whale Shark and Tuna. Seventeen marine mammals’ species were documented, besides numerous reptiles (some endemic). Close to 400 fish species have been recorded, including several endemics. The small terrestrial areas are home to several endemic animal species, including three endemic lizards (Phyllodactylus transversalis, Anolis agassizi and Diploglossus millepunctatus), snails (Malpelina labiate and Ichnocion conica) and one species of crab (Johnsgarthia malpilensis), and also support large nesting seabird colonies. Most shark populations have even been increasing (Fundación Malpelo, 2016), evidencing the importance of this site in global conservation efforts for these threatened species. There is a high diversity of fish assemblages and piscivorous species show both high biomass and high endemism values (Quimbayo et al. 2017). Malpelo is home to the largest seabird nesting colony in Colombia, the largest Nazca Booby nesting colony in the world, and is the only site where this and other seabirds nest in Colombia (López-Victoria & Estela, 2006; López-Victoria & Rozo, 2006, 2007).

Other important biodiversity values

▶ Part of the Eastern Tropical Pacific Marine Corridor

Malpelo FFS is an integral part of the Eastern Tropical Pacific Marine Corridor, a marine conservation site
Malpelo Fauna and Flora Sanctuary - 2020 Conservation Outlook Assessment

Assessment information

Threats

Current Threats

Illegal artisanal and, more importantly, illegal industrial fishing within and around the marine protected zone is a continuing problem. Vessels from various nations illegally enter and fish within the site, attracted by the abundance of pelagic fishes and sharks, causing great damage to the ecosystem. More efficient monitoring and law enforcement is required in the no-take areas. Illegal fishing in the wider region is even more challenging and likely to impact on the longer term integrity of the site.

Other Activities

(Disturbance of terrestrial fauna and flora)

The small naval station on the island impacts local fauna and flora, even though care is taken to reduce disturbance of native biodiversity and risk of introduction of alien species to a minimum (Herron et al, 2007; Parques Nacionales Naturales de Colombia, 2015).

Fishing / Harvesting Aquatic Resources

(Illegal fishing)

Illegal artisanal and, more importantly, illegal industrial fishing within and around the marine protected zone is a continuing problem. Colombian fishers within the zone are no longer a major issue, but vessels from various nations illegally enter and fish within the Sanctuary, attracted by the abundance of pelagic fishes and sharks, causing great damage to the ecosystem. A single boat can extract thousands of sharks in a few hours (IUCN Consultation, 2020b). Illegal fishing targets sharks, given the high price of fins in the Asian market; detached fins, which is an illegal practice in Colombia, have been found in fishing vessels (IUCN Consultation, 2020b; Fundación Malpelo, 2016). In 2016, from 19 vessels that practiced illegal fishing, only 3 were effectively legally processed, due to legal gaps (Fundación Malpelo, 2016). In 2017, 2018 and 2019, a total of three, five and 32 illegal fishing boats were recorded in the area, respectively (IUCN Consultation, 2020b). It is important to note that this high number in 2019 corresponds mainly to a single encounter with 28 small fast boats that usually work together and tend to have a mother ship situated further away. Illegal fishing in the wider region is even more challenging and likely to impact on the longer-term integrity of the property. More efficient monitoring and law enforcement is required in the no-taking areas. Enforcement needs to be improved by increasing the number of vessels patrolling the surrounding waters and/or by introducing new technologies. As a response to the threat, permanent presence of personnel either of Parques Nacionales Naturales or of the Colombian Navy has been established. However, insufficient resources and equipment, as well as logistical constraints, have made it difficult to ensure effective enforcement throughout this large area (IUCN Consultation, 2020b). A promising scheme is the current presence of a vessel with Parques Nacionales Naturales personnel managed by Biodiversity Conservation Colombia, under a signed agreement. This sailing catamaran named 'Silky' has been operating since 2018, increasing the number of days present in the island; this is an effective deterrent to illegal fishing (Fundacion Malpelo 2019b). A recent fishing law (Ley 1851 de 2017) has toughened legal consequences of illegal fishing and is expected to further deter this practice. Some of the illegal boats have been processed, but legal action needs to be better coordinated after apprehension of boats and gear. There is currently a national committee of relevant authorities (Mesa Nacional de lucha en contra de la Pesca Ilegal) discussing ways to reduce illegal fishing in Colombia including in marine protected areas (Fundacion Malpelo, 2019b). Colombia also actively participates in binational meeting with the governments of Ecuador and the government of Costa Rica to coordinate and mitigate illegal, unregulated and undeclared fishing.
Temperature extremes (Climate change and extreme ocean temperatures)

Climate change has been recognized as one of priority issues in the current Management plan of Malpelo FFS, with its impacts assessed as moderate on terrestrial and pelagic areas and high on bentic communities (Parques Nacionales Naturales, 2015).

Effects of climate change are multiple. Abnormally high water temperatures affect corals, cause changes in ecosystem productivity, result in harmful algal blooms and cause physiological stress in some species (Parques Nacionales Naturales, 2015).

Potential Threats

Accidental introduction of exotic species and increasing tourism pose relatively low-level potential threats to date, however, strong measures need to be taken to prevent future invasions. In the longer term, the pressure on marine resources is expected to increase in line with global trends and as a function of resource depletion elsewhere. Illegal fishing requires monitoring and law enforcement while management of legal fisheries in the wider marine region likewise needs to respond to the increasing demand. Studies on plastic marine pollution besides the comparatively well-understood situation in the North Pacific are insufficient at the moment. Increasing dive tourism currently does not pose a serious threat, but needs management actions to minimize impacts. The introduction of foreign species to the terrestrial system of Malpelo must be prevented with strict controls to the entrance of people and provisions. In order to minimize the risks, controls must be made in the embarkment site in the continent, when disembarking in the island and during the permanence in Malpelo.

Solid Waste (Plastic marine pollution)

Major risks include increasing marine traffic, which is addressed by the PSSA (Particularly Sensitive Sea Area) designation by the International Maritime Organization in 2002. Under this designation, boats greater than 500 tons have to pass at least six miles away from the island. The confirmation of garbage patches in various parts of the Pacific is an even more complex and truly global challenge. Recent research has recorded marine plastic pollution both north and south of the Eastern Tropical Pacific suggesting that even remote locations far from pollution sources can be at risk (Eriksen et al., 2013). Furthermore, the presence of abandoned or lost fishing gear such as nets and longlines is an increasing problem in our oceans and Malpelo FFS is not exempt. Sharks, fish, birds and turtles have been observed trapped in these ‘ghost nets’ in the area (IUCN Consultation, 2020b).

Tourism/ visitors/ recreation (Increasing diving tourism and scientific visits)

Recreational and scientific boating and scuba diving can negatively affect the Sanctuary. While a relatively small number of less than 500 divers visit the site per year, active management is required (Parques Nacionales de Colombia, 2015). Liveabords are visited in regular bases by rangers to give talks of Best Diving Practices as well as general information to the area.

Invasive Non-Native/ Alien Species (Accidental introduction of alien invasive species)

Few marine non-native species were detected in the last few years (i.e. Carijoa spp). There is no information about the source of these introductions but octocoral populations in the Eastern Tropical Pacific have been declining due to massive mortalities, microbial diseases and the invasion by Carijoa riisei. While no impacts were detected within Malpelo Sanctuary, this is considered a high threat due to the high level of endemism in the protected area. Therefore, stronger measures must be taken to prevent future invasions. Scientists, tourists and Navy personnel should follow strict protocols to minimise the risks, as described in its Management Plan for 2015-2020 (Parques Nacionales Naturales...
The terrestrial fauna and flora could be affected by the accidental introduction of some species with invasive potential, so the necessary precautions should be taken. At least one introduced spider species has been identified, although it does not imply a risk for the Malpelo biota, since it has very specific requirements of vegetation that it does not find in the island (Posada et al., unpublished data).

**Fishing / Harvesting Aquatic Resources**

(Imadequate fisheries management in the wider region)

In the medium term, the management of fisheries in the wider seascape must be considered in the management of Malpelo FFS. The designation of the multiple-use area Distrito Nacional de Manejo Integrado Yurupari - Malpelo in 2017 can help support the sustainable use of fisheries in the region (Ministerio de Medio Ambiente y Desarrollo Sostenible, 2017). A revised (2020-2025) management plan is currently under development (IUCN Consultation, 2020a).

As several species are migratory, strong horizontal and vertical coordination is needed to address this threat. Colombia's active participation in the regional collaboration CMAR (including also Ecuador, Panama and Costa Rica, and which now includes fisheries agencies in addition to protected area agencies) is a good way to increase much needed regional collaboration (CMAR, 2020). Bilateral agreements between the governments of Colombia, Ecuador and Costa Rica have been signed to address issues relating to illegal and unregulated fishing (Ministerio de Ambiente, 2020). Colombia needs to ensure an active participation in other international treaties related to fisheries, high seas management and migratory and endangered species. The management of fisheries if not addressed timely might soon become a high threat.

**Overall assessment of threats**

Illegal fishing is the largest current threat to the site, with both illegal artisanal and, more importantly, illegal industrial fishing occurring within and around the marine protected zone, including by foreign vessels. More efficient monitoring and law enforcement is required in the no-take areas. Legal and illegal fishing in the wider region is even more challenging and likely to impact on the longer term integrity of the property. In the longer term, the pressure on marine resources is expected to increase in line with global trends and as a function of resource depletion elsewhere. Alien invasive species and disturbance from visiting tourists, scientists and Navy personnel likewise pose threats but appear comparatively straightforward to manage. However, strong measures need to be taken to prevent any potential new introductions of invasive species.

**Protection and management**

**Assessing Protection and Management**

**Management system**

The island and surrounding waters are administered by Colombia's Protected Areas Agency - Parques Nacionales Naturales de Colombia (PNN). There are multiple agreements that allow PNN to work collaboratively with the Colombian Navy, different NGO (notably Fundación Malpelo, Conservation International and Biodiversity Conservation Colombia), and other organisations. The involvement of multiple organisations has helped to cover an important portion of the costly implementation of the management plan. For example, an Endowment Fund of 5M USD allocates 40% of funding for management activities, but this is not enough. Fundación Malpelo operates the endowment resources. The cost of surveillance to control illegal fishing is particularly high, and some agreements were signed specifically to cover this activity. These include an agreement signed in 2014 between PNN, Fundación Malpelo and Conservation International, and a more recent one in 2017 between PNN and Biodiversity Conservation Colombia to operate a sailing catamaran with personnel from both institutions. Biodiversity Conservation Colombia provides the boat and the crew, while Parques Nacionales provides
for part of the fuel, other operational coast as well as personnel on board (Parques Nacionales Naturales, 2015; Fundación Malpelo, 2019a; 2019b). The Colombian Navy, with a permanent post on Malpelo Island, cooperates in the patrolling of the island and the surrounding waters. While cooperation with non-governmental organizations and intergovernmental cooperation between different agencies is very positive, many challenges remain, particularly in the field of law enforcement. The most recent Management Plan was completed in 2015 for the years 2015-2020, but still lacks funding for its full implementation. Currently this Management Plan is being updated for the 2020-2025 period (IUCN consultation, 2020a).

► Effectiveness of management system  Mostly Effective

Parques Nacionales Naturales de Colombia evaluates on a periodical basis the management effectiveness of all national protected areas. The most recent assessment was made on medium-term effectiveness, with a score of 61.1% (PNUD, 2014). Since the assessment was made, recommendations have been followed on strengthening the National Agency personnel, updating monitoring protocols and a better coordination between Fundación Malpelo and park officers. In the latest Management Evaluation Effectivity from 2020; the Protected Area scored 76% for the short term efficiency and 65% in the medium term efficiency (IUCN Consultation, 2020a). Details of recent actions for management effectiveness, including aspects of governance, are described in the Management Plan 2015-2020 (Parques Nacionales Naturales de Colombia, 2015). Despite multiple issues, particularly regarding control of illegal fishing, Malpelo has been recognized as one of the most effective marine protected areas in the world (Edgar et al., 2014), and has been recognized as a Hope Spot since 2016 (Mission Blue, 2020) and a Blue Park since 2017 (Marine Conservation Institute, 2020).

► Boundaries  Highly Effective

Terrestrial areas are covered in their entirety, and marine boundaries cover a broad range of the diverse habitats with an area of 9585 km2 (Parques Nacionales, 2015). In 2017, a large adjacent multiple-use area was created to complement the conservation objectives of Malpelo Flora and Fauna Sanctuary. The Distrito Nacional de Manejo Integrado Yaruparí-Malpelo, with an extension of almost 27000 km2, was established in September 2017 by the Ministerio de Medio Ambiente and the Autoridad Nacional de Acuicultura y Pesca under resolution 1908 as a strategic area for the development of sustainable and responsible fishing practices (Ministerio de Ambiente y Desarrollo Sostenible, 2017).

► Integration into regional and national planning systems  Mostly Effective

This large marine protected area is a key component of Colombia’s National Protected Area System (Parques Nacionales Naturales de Colombia, 2015) and an integral part of the Eastern Tropical Pacific Marine Corridor (CMAR, 2020), and it is also a focal site for the ETPS Eastern Tropical Pacific Seascape identified in 2004 by CI with other protected areas of Colombia, Costa Rica, Panama and Ecuador (Conservation International, 2020). Bi-lateral agreements have been achieved between Colombia and Costa Rica, and Colombia and Ecuador, regarding patrolling and law enforcement in their respective waters to reduce illegal fishing (Parques Nacionales Naturales de Colombia, 2015; Ministerio de Ambiente, 2020).

► Relationships with local people  Mostly Effective

Due to the remoteness of the area, there are no local communities within or in the vicinity of the World Heritage site. Cooperation with the Navy station personnel located within the site is effective. Increasing relationship with fishermen based at Buenaventura and Tumaco Ports in Colombia would be highly advisable, as fishermen are concerned about the declaration of the protected area and its recent expansion, and a better understanding of the goals of this protected area could change their perception (IUCN Consultation, 2020a).

► Legal framework  Some Concern

An analysis, sponsored by Conservation International and produced by WildAid (2010), identified a number of challenges in the broader Eastern Pacific Seascape, including unclear or incomplete enforcement policy frameworks; inadequate strategies, staffing and technologies to detect and intercept
offenders; inadequate preparation for effective legal cases. This constraints result in difficulties in both administrative and judicial processes and unclear and overlapping responsibilities between different institutions (IUCN Consultation, 2020). The Illegal Fishing Law (Ley 1851 de 2017) has helped improve the legal framework at a national level, including some of the inefficiencies that were identified a few years ago for Malpelo FFS. Additionally, Colombia has two other tools to denounce illegal activities in EEZ: The National Identification Vessel tool (www.uvicolombia.org) and the Guia para el control y la vigilancia de los recursos pesqueros de Colombia (www.guiarecursospesqueros.org).

Law enforcement

The Navy, Fundación Malpelo and Conservation International have been supporting the Parques Nacionales Naturales de Colombia in enforcement activities and through a collaboration agreement between these organizations, a surveillance vessel had been on patrol in the area, however the vessel is not operating at the time thus the agreement needs to be updated. A promising scheme is the current presence of a vessel with Parques Nacionales Naturales de Colombia personnel managed by Biodiversity Conservation Colombia, under a signed agreement from 2017. This sailing catamaran named ‘Silky’ has been operating since 2018 increasing the number of days present in the island; this should be an effective deterrent to illegal fishing. However, compared to the large size of the site, the law enforcement capacity remains limited and the site remains under pressure from industrial and semi-industrial illegal fishing (Parques Nacionales Naturales de Colombia, 2015). Legal proceedings of cases of illegal fishing and legal sanctions were also assessed as having the poorest performance among all management actions (IUCN Consultation, 2020b). The enormous distance that separates Malpelo from the continent and, above all, from the authorities that can carry out legal processes against the illegal fishermen, has been a great impediment. The logistics required to catch offenders and bring them before the authorities involve several days of navigation, and times are very restrictive in this aspect of Colombian law, which provides that a person can only be detained for up to 36 hours before being brought before a judge (IUCN Consultation, 2020c).

Implementation of Committee decisions and recommendations

The inscription decision in 2006 recommended improving management, highlighting illegal fishing, as well as strengthening tourism management, developing long term funding and embarking on research in the poorly known deeper areas, including seamounts. Collaborative work with other agencies and NGO has helped increase surveillance of the area. Regardless of progress, more funding and control operations are still needed. Main stakeholders (National Parks, relevant NGO) have had incidence in the development of a coordinated strategy across sectors and government levels to deal with illegal and underreported fishing, including the passing of the illegal fishing law (Ley 1851 de 2017). Further work is underway to ensure a more effective processing of infractors (Mesa Nacional de Pesca Ilegal). Bi-national agreements have been signed with the governments of Ecuador and Costa Rica for a better management of illegal, non-regulated and underreported fishing activities (Ministerio de Ambiente, 2020). Regarding tourism management, the carrying capacity has been revised and the number of boats limited to ensure diving limits are not exceeded. Funding continues through a combination of government and non-government funds, including those contributed or raised by key partners. The endowment fund is one of the most important milestones. Considering the costs of regular patrols in a large area like Malpelo, it is not surprising that despite progress in funding efforts, this activity and the required equipment is frequently not enough to prevent illegal fishing. Finally, regarding research, Fundacion Malpelo has managed to organize multiple research expeditions with the participation of different Universities and research institutions and organizations (Parques Nacionales Naturales de Colombia, 2005; 2015; Fundacion Malpelo, 2016; 2019a; 2019b). Exploration of some deep sea ecosystems has been conducted.

Sustainable use

Recreational and scientific diving in the Sanctuary is strictly regulated, limiting the number of boats, the number of divers and prohibiting anchoring in sensitive areas. The terrestrial system of Malpelo is visited very occasionally by visitors, under strict control measures and for reduced spaces of time. In the
island it is prohibited to spend the night as a tourist, and only Navy personnel and Park rangers spend several days on the island (Parques Nacionales Naturales de Colombia, 2015).

**Sustainable finance**

A privately administered 5 million USD endowment (Conservation International/Global Conservation Fund + Fondo Acción) with public-private governance provides annual funding since 2009 for main activities of the management plan through an NGO operator that also leverages significant additional funding. Currently the operator is Fundación Malpelo. The full potential of tourism revenues remains to be realized. NPP provides an annual budget for the area and seven permanent staff (Parques Nacionales Naturales de Colombia, 2015). Other funding is covered by multiple projects, and is raised by different organizations (see projects).

**Staff capacity, training, and development**

Navy personnel stationed on the island on a rotational basis are trained to follow protocols to minimize the risks of introducing alien invasive species. The Navy also supports the management of the area, as does Fundación Malpelo through a cooperative agreement. Furthermore, Parques Nacionales Naturales de Colombia have signed an agreement in 2017 with Biodiversity Conservation Colombia to support the presence of personnel in the area aboard the sailing catamaran ‘Silky’. This scheme has increased substantially the presence in the area discouraging illegal fishing. However, even with this external support, staff numbers are insufficient, particularly to ensure law enforcement (Parques Nacionales Naturales de Colombia, 2015).

**Education and interpretation programs**

Oral and video presentations are conducted in Bogota, Cali, and Buenaventura at secondary schools, universities, international meetings, and on-board boats visiting Malpelo to raise awareness of the conservation values of the Sanctuary and best practice protocols to protect those values (Fundación Malpelo, 2019a).

**Tourism and visitation management**

Approximately 500 divers visit the Sanctuary annually. The diving boats furnish accommodation, food, and equipment for divers, and only 25 divers are allowed at one time in dive sites. Concessionaires assume part of the cost of maintenance of anchor buoys. A handbook has been developed that regulates activities that can be undertaken in the Sanctuary. The Fundación Malpelo conducts some of the tours to the Sanctuary, and the proceeds help pay for management of the site. The Foundation also attends major diving fairs in Europe and the U.S. to promote conservation and travel to the Sanctuary (Fundación Malpelo, 2019a).

**Monitoring**

Diving boats visiting the Sanctuary monitor ecosystem status including data on sea temperatures, marine mammals, turtles, birds, and the presence of fishing boats in the area. The Fundación Malpelo has monitored populations of Hammerhead Sharks since 2000 (Fundación Malpelo, 2019a). Monitoring is also carried out through annual expeditions by the Fundación Malpelo, the Universidad del Valle, the Caldris Association and BIOMMAR group, partially funded by the Malpelo Endowment Fund. Monitoring of the Nazca boobies has also been conducted at Malpelo which is the only place in Colombia where this bird nests (Lopez-Victoria et al. 2009; Fundación Malpelo and Parques Nacionales Naturales, 2016). In cooperation with the Universidad del Valle, monitoring of some key endemic fish species has been conducted since 2013 (Parques Nacionales Naturales, 2015; Fundacion Malpelo, 2019a). However, monitoring could be further strengthened, including by embracing new technological opportunities, in order to have more systematic data to better inform decision making. Other groups of terrestrial organisms, besides the nesting sea birds, were monitored for several years, until the National Parks cabin burned down, which greatly limited the logistics for researchers who needed to stay on the island for a few days in order to monitor the endemic terrestrial species (IUCN Consultation, 2020c).
Research

Research has been conducted in the Sanctuary since 1999 by the Colombian Institute for Marine and Coastal Investigation (INVEMAR), the Colombian Navy, Calidris Association, Malpelo Foundation, the Universidad del Valle, Universidad Javeriana, other Universities and PNN. The Malpelo FFS is remote and in very good conditions, which make it an excellent research location for several group of organisms. In this respect, the amount of scientific literature has grown prominently during the last decades, yet there is still a lot to be done. Only in 1998 was the latest shark species discovered (Odontaspis ferox). Current research includes monitoring of invasive octocoral species, connectivity patterns of two pelagic fish species, effects of climate change in the growth dynamics of an octocoral, and several studies on genetic connectivity and fisheries that make part of the Sharks’ National Action Plan. In 2018 National Geographic visited the area to do deep sea studies. The use of ROVs and Dropcams yielded new insight on the deep water fauna surrounding Malpelo Island (Fundacion Malpelo, 2019a). Migramar is a regional research network established to improve understanding of distribution and migration patterns of key species like sharks and turtles (www.migramar.org).

Overall assessment of protection and management

Management activities have advanced significantly since inscription and the protected area has increased its financial, technical, human and operational resources. However, further consolidation of funding and management is needed, including on a regional basis (mostly coordinated by CMAR), and in particular, increased efforts in monitoring and law enforcement are needed. Formal coordination between the Navy, PNN and Biodiversity Conservation Colombia is supporting enforcement activities. However, due to the large size of the site, law enforcement capacity remains low due to lack of personnel and equipment and therefore the site remains under pressure from illegal fishing. A Management Plan was completed in 2015 for the years 2015-2020, but it still needs funding for its complete implementation. The 2020-2025 Management Plan is currently under development and should be ready by the end of 2020 (IUCN Consultation, 2020b).

Assessment of the effectiveness of protection and management in addressing threats outside the site

Coordination between agencies has increased, but management efforts outside the large marine protected area, e.g. fisheries, are not effectively coordinated with the management of the site. However, it is important to note that binational agreements with the governments of Ecuador and Costa Rica have been achieved to address this issues.

Best practice examples

The conservation history of Malpelo FFS, including the successful World Heritage nomination, is based on an exemplary cooperation between governmental and non-governmental actors. An active approach to showcase the area and its values has resulted in significant international support (financial and in kind).

State and trend of values

Assessing the current state and trend of values

World Heritage values
IUCN World Heritage Outlook: https://worldheritageoutlook.iucn.org/
Malpelo Fauna and Flora Sanctuary - 2020 Conservation Outlook Assessment

- **Undisturbed marine wilderness**
  
  The pristine natural beauty of the site remains largely preserved.

- **Globally significant marine protected area with unaltered and non-threatened ecosystems**
  
  Ecological processes remain largely intact in the site as evidenced by the population densities of a broad range of apex predators and pelagic species. The location of the site and its related role as an aggregation point enable dispersal and replenishment of benthic larvae of corals, fish and mollusks and other marine life in the broader Eastern Tropical Pacific. Some of the species of elasmobranchii have shown certain fluctuations in their numbers, most likely influenced by the El Niño and La Niña phenomena. However, most of these populations show overall stable trends, with the exception of the scalloped hammerhead shark (Sphyrna lewini, EN), whose population has declined by almost 70% in the last ten years (Fundación Malpelo, 2019a). An assessment by García (2013) evaluated the ecological integrity of the site based on three main indicators - birds (Sula granti), corals and fish - and concluded that the overall ecological integrity was good.

**Summary of the Values**

- **Assessment of the current state and trend of World Heritage values**
  
  The current state and trend of World Heritage values continue to be very good despite the occurrence of illegal fishing. Ecological processes remain largely intact in the site as evidenced by the population densities of a broad range of apex predators and pelagic species. Populations of most key species remain stable. One alarming exception is the scalloped hammerhead whose population has decreased by almost 70% in the last ten years.

- **Assessment of the current state and trend of other important biodiversity values**
  
  The above mentioned illegal fishing is a broader challenge transcending national boundaries, including within the regional CMAR efforts.

**Additional information**

**Benefits**

**Understanding Benefits**

- **Importance for research**
  
  The Sanctuary is in very good condition regarding contamination and other modifications and impacts. Jointly with the population densities and behaviour patterns considered natural Malpelo is a reference area for many aspects of marine ecology and biology.

- **Fishing areas and conservation of fish stocks**
  
  The Malpelo FFS serves as a major reproduction, breeding and nursery area for many forms of marine life and contributes to the productivity of the fisheries of the Eastern Tropical Pacific. Conservation of a number of fish species of high commercial relevance depends on Malpelo’s no-take zones.

  Factors negatively affecting provision of this benefit:
  - Overexploitation: Impact level - High, Trend - Increasing
Tourism-related income, Provision of jobs

Dive tourism is the main economic activity. Divers are mostly attracted by mega-fauna, but it is still small scale (500 divers/year). The diving operation is currently based only from Colombian ports with two liveaboard, but before there were boats from Panama and Costa Rica operating in the area. This has given the Colombians national boat operators an exclusive niche in the diving activity in Malpelo which is world renowned. There are more divers from other countries than nationals. This activity provides jobs and benefits especially to the communities of the Pacific coast as well as extra funding to Parques Nacionales Naturales de Colombia through the fees that divers have to pay.

Natural beauty and scenery

Beyond possible economic benefits for the industry of the tourism, Malpelo has been considered by several specialized publications as one of the 10 best places to dive in the world. The possibility of diving in a place where the marine populations are in an almost original state is invaluable and of a scenic beauty difficult to find in other places.

Summary of benefits

The Malpelo FFS is of major importance for conservation and research, and serves as an aggregation, reproduction, breeding and nursery site for numerous marine species that are of great importance for the Eastern Tropical Pacific fisheries and to preserve the global biodiversity. The large predators and pelagic species are the basis for the high-end diving tourism, which brings economic and social benefits. It is a pristine key-site that contributes to ecosystem connectivity across the Eastern Tropical Pacific Marine Corridor and a place of priceless scenic beauty.

Projects

Compilation of active conservation projects

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<td>Colombian Navy</td>
<td>Patrol boat and personnel for law enforcement.</td>
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<tr>
<td>2</td>
<td>Conservation International, Fundación Malpelo, Asociación Calidris and Universities</td>
<td>Support for participation in activities related to the Eastern Tropical Pacific Seascape (ETPS) to coordinate conservation policies, research, and management, and facilitate information exchange.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Environmental Action Fund of Colombia</td>
<td>Annual contribution of more than US$230,000 per year (proceeds from the Malpelo Endowment Fund) to support management. Endowment manager.</td>
<td><a href="http://www.fundacionmalpelo.org">www.fundacionmalpelo.org</a></td>
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<td>4</td>
<td>Fundación Malpelo</td>
<td>Hammerhead shark research (funding from the Malpelo Endowment Fund); development of management effectiveness and conservation (funded by Conservation International ETPS).</td>
<td><a href="http://www.fundacionmalpelo.org">www.fundacionmalpelo.org</a></td>
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<td>5</td>
<td>Conservation International</td>
<td>Strengthening fisheries management in the Eastern Pacific Tropical Seascape: reducing IUU fishing in four MPAs (Cocos, Malpelo, Galapagos and Coiba) by strengthening the fisheries enforcement chain (detection, interdiction and prosecution) and improving policy frameworks (policy and institutional capacity strengthening, information systems building, communication and outreach)</td>
<td><a href="https://www.conservation.org/places/Eastern-Tropical-Pacific-Seascape">https://www.conservation.org/places/Eastern-Tropical-Pacific-Seascape</a></td>
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<td>6</td>
<td>MigraMar</td>
<td>Founded in 2006, MigraMar is a network of scientists working on research and conservation of migratory marine species in the region of the Eastern Pacific. Its goal is to implement effective plans for management and conservation that are in keeping with the nature of these creatures.</td>
<td><a href="http://www.migramar.org">www.migramar.org</a></td>
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<td>№</td>
<td>Organization</td>
<td>Brief description of Active Projects</td>
<td>Website</td>
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<td>7</td>
<td>Biodiversity Conservation Colombia</td>
<td>Biodiversity Conservation Colombia is an NGO funded by the Biodiversity Conservation Trust. The main objective of this NGO is to help in the presence of Colombian National Natural Park personnel in the Malpelo FFS. This is achieved by the support of a vessel (sailing catamaran) called 'Silky' run by Biodiversity Conservation Colombia crew.</td>
<td><a href="http://www.biodiversityconservationcolombia.org">www.biodiversityconservationcolombia.org</a></td>
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