

# Sanganeb Marine National Park and Dungonab Bay - Mukkawar Island Marine National Park

## 2020 Conservation Outlook Assessment

### SITE INFORMATION

**Country:** Sudan  
**Inscribed in:** 2016  
**Criteria:** (vii) (ix) (x)



The property consists of two separate areas: Sanganeb is an isolated, coral reef structure in the central Red Sea and the only atoll, 25 km off the shoreline of Sudan. The second component of the property is made up of Dungonab Bay and Mukkawar Island, situated 125 km north of Port Sudan. It includes a highly diverse system of coral reefs, mangroves, seagrass beds, beaches and islets. The site provides a habitat for populations of seabirds, marine mammals, fish, sharks, turtles and manta rays. Dungonab Bay also has a globally significant population of dugongs. © UNESCO

### SUMMARY

#### 2020 Conservation Outlook

Finalised on 01 Dec 2020

#### GOOD WITH SOME CONCERNS

The property contains impressive natural phenomena, formations and areas of great natural beauty and is a relatively undisturbed area that serves as a standard to assess the health of the central Red Sea's regional ecosystems. Its marine habitats are well preserved and remain largely untouched and unspoiled, largely due to isolation and low visitation, despite this increasing in recent years. However, some degradation of the site's biodiversity values through exploitation by the local community is a potential threat as are increasing impacts from climate change, given it is one of the northernmost tropical coral reef systems on earth. The protection and effective management of the property is guided by a well formulated Integrated Management Plan, however is hampered by a complex legal framework covering State and National legislation and limited resources. Home to the only atoll-like feature in the Red Sea, lagoons, islets, sand flats, seagrass beds, and mangrove habitats and displaying a diversity of reefs, from living reefs to ancient fossil reefs the property remains one of the world's best dive areas but will require improved resources for management in the face of potential threats.

*IUCN World Heritage Outlook: <https://worldheritageoutlook.iucn.org>*

*Sanganeb Marine National Park and Dungonab Bay - Mukkawar Island Marine National Park - 2020 Conservation Outlook Assessment*

## FULL ASSESSMENT

### Description of values

#### Values

---

##### World Heritage values

- **An outstanding example of the northernmost tropical coral reef systems on earth** **Criterion:(ix)**

The property including Sanganeb Marine National Park (SMNP) and Dungonab Marine National Park (DMNP) lies on the western shore of the north-central Red Sea and is located in an ecologically and globally outstanding region (World Heritage Committee, 2016). It is within the world's northernmost tropical sea and is a Global 200 priority biogeographic region (State Party of Sudan, 2013). The habitats of the property are diverse and mostly undisturbed, representing the transition between northern and southern Red Sea biogeographic zones. The property and its surrounding area include a wide variety of different bio-physiographic reef zones with beaches, lagoons, islets, mud and sand flats, seagrass beds and mangrove habitats and a huge diversity of coral reefs, from living to ancient fossil reefs, and one of the largest and best known atoll-like features in the Red Sea (State Party of Sudan, 2013; IUCN, 2014; World Heritage Committee, 2016).

- **Exceptional level of Biodiversity** **Criterion:(x)**

The site hosts an exceptional diversity of species from both the northern and southern Red Sea including endemic and rare species. The site hosts populations of corals (260 species), fish (361 species), seabirds (20 species), marine turtles (5 species) and marine mammals (11 species). The site provides important nursery and spawning grounds for threatened and endangered species and there are healthy populations of sharks, manta rays and dugong. The seasonal aggregation of manta rays in DMNP is one of the few known sites within the western Indian Ocean. The site is also an important feeding ground for what is now perhaps the most northerly population of endangered dugong in the Red Sea (State Party of Sudan, 2013; World Heritage Committee, 2016; IUCN Consultation, 2020). DMNP and SMNP lies in a regional hotspot for reef fish endemism (IUCN, 2014). The property generally supports a higher than average subset of endemics than found elsewhere in the Red Sea, including a rich diversity of coral and a number of coral species that are at the limits of their global range (World Heritage Committee, 2016).

- **Impressive natural phenomena, formations and areas of great natural beauty** **Criterion:(vii)**

The property contains impressive natural phenomena, formations and areas of great natural beauty and is a relatively undisturbed area that serves as a standard to assess the health of the central Red Sea's regional ecosystems (World Heritage Committee, 2016). As a prime example of a deep-water offshore coral reef, Sanganeb provides an outstanding opportunity for comparative studies with similar systems in other regions including the Indian and Pacific Oceans and a place to understand the interactions of biota and the environment (IUCN, 2014). Located within the Red Sea's centre of biodiversity the remarkable clarity of the water makes it one of the best diving sites in the Red Sea and indeed the world.

### Assessment information

#### Threats

---

## Current Threats

Low Threat

It is noteworthy that the property and surrounding buffer zone are largely unaffected by human activity and the key threats to the property remain at a relatively low level. Threats to the property are limited in both number and magnitude as a result of its relative isolation and the fact that both the property and the surrounding buffer zone are currently exposed to minimal, low intensity human activity. As a result of this the key threats to the property remain at a relatively low level. The most concerning current threat posed by tourist liveaboard vessels from outside Sudan which are causing irreparable damage through wild-anchoring directly on the reefs, particularly at the most popular dive sites. Other concerns regarding threats to the property are largely centered on possible future impacts. However, the property presently has almost no on-the-ground management presence, and unless rectified there will be very limited capacity to cope with emerging or escalating threats.

### ► Problematic Native Species

Low Threat

*(Crown of Thorns starfish and other marine species.)*

Inside site, localised(<5%)  
Outside site

Coral predators such as the Crown of Thorns starfish (*Acanthaster planci*) and *Drupella*, a small gastropod snail, occur naturally on many reefs worldwide and they have been recorded within the property in high abundances at some sites (PERSGA 2004; Cousteau 2013). The Crown of Thorns can pose a potentially serious threat if there are outbreaks. Monitoring of impacts from species such as these is required to assess the level of impact and threat, although it is thought that outbreaks have never been as significant as those elsewhere in the region such as in Egypt (State Party of Sudan, 2018).

### ► Temperature extremes

High Threat

*(Increase in coral bleaching from increased severity and frequency of temperature extremes.)*

Inside site, widespread(15-50%)  
Outside site

Coral bleaching is considered to be the single most significant impact on the corals present in recent years (IUCN, 2014). In line with this as the most significant impact to date it is also the most pressing threat on the property. Previous surveys have indicated that reefs in the property were relatively healthy, supporting a diverse fish population, and bleached corals covered relatively small areas (PERSGA 2004; Cousteau 2013). Overall, whilst the onset of recurrent severe bleaching heat stress events is relatively low in comparison to other World Heritage coral reefs (Heron et al., 2018), the threat remains high, given the potential severity of coral bleaching on the values of the site.

### ► Shipping Lanes

Low Threat

*(Damage from ships or shipping accidents.)*

Inside site, extent of threat not known  
Outside site

While there is little to no evidence of impacts from shipping traffic within the property at the moment, the threat remains given the increase in shipping globally and within the vicinity of the site. Increasing levels of shipping traffic increases the potential for accidents and impacts resulting from spills and physical damage caused by collisions.

### ► Fishing / Harvesting Aquatic Resources

Very Low Threat

*(Small-scale commercial and subsistence fishing by local communities.)*

Inside site, scattered(5-15%)  
Outside site

Human activities have until very recently remained at relatively low levels with small-scale commercial fishing and subsistence fishing being the key direct human impact on the property (IUCN, 2014). Small-scale commercial fishing and subsistence fishing is generally permitted inside the site except for no-take zones, which includes SMNP, where all types of fishing are prohibited. Previous surveys have indicated that reefs were relatively healthy and support a diverse fish population (APF 2006, Cousteau Society, 2013). More recent surveys have been conducted to assess the fisheries in the area by staff and students from the Red Sea University, Port Sudan working in partnership with scientists from the Institute of Marine Research, Norway, under a project supported by UNIDO (Olsen et al. pre-print). The grouper fishery is of particular concern, as this fishery targets spawning aggregations known to occur within the site (Elamin 2012). There have been recent intermittent accounts of illegal fishing on SMNP,

particularly for Trochus. The continued use of monofilament nets within the small-scale commercial fisheries poses a particular threat to marine mega-fauna (Adam 2013), especially where these gear are used within known feeding grounds of the endangered dugong and manta rays (Klaus, 2017). Threat from the local communities in Dungonab Bay to the fish resource is spearfishing (powered speargun and Harpoons) (IUCN Consultation, 2020). Other threats are gill net fishing for mullet in the lagoons by fisher from outside the Dungonab community. The fishers fish on foot (do not possess boats) and transfer the catch by lorries to the Port Sudan fish market. There is a norm among the fishers from Dungonab that they could not prevent others from fishing in their area though it affects them. They want it to come from the authorities. Increased shell collection from Dungonab Bay by collectors from Port Sudan for making souvenirs. In most cases, sea turtle (two species in Dungonab) is not returned to the sea when the fisher caught it incidentally. Management on the ground, enforcement, and awareness among fishers are lacking.

► **Fishing / Harvesting Aquatic Resources**

**Low Threat**

*(Illegal, unregulated, unlicensed commercial fishing)*

Inside site, scattered(5-15%)

Outside site

There were historical occurrences of large scale commercial fishing inside the property, involving the use of destructive fishing gear such as trawling. Recently new trawling licences were issued but it remains unclear if these fisheries commenced and the location of their operations. The recently clarified marine boundaries of the reserves which comprise the site (Klaus, 2017) will aid in mitigating this threat.

► **Tourism/ visitors/ recreation**

**High Threat**

*(Wild-anchoring)*

Inside site, localised(<5%)

There is an increasing number of large tourist liveaboard vessels (motor sailing yachts) that have been visiting the site in recent years, most of which originate from Egypt. The liveaboard vessels are causing damage to sensitive coral habitats when they deploy and recover their anchors (Cousteau 2013; IUCN Consultation, 2017). To mitigate for the damage caused by these large boats anchoring within the site, there is an urgent need to prohibit wild-anchoring, to install fixed mooring buoys and to educate the tourism operators in the need to and proper use of these moorings (Klaus, 2017).

► **Marine/ Freshwater Aquaculture**

**Very Low Threat**

*(Mariculture of shrimp and pearl oyster)*

Inside site, localised(<5%)

There is a pearl oyster farm within Dungonab Bay. The farm has ceased operations for nearly a decade. Some of the infrastructure remains. There are various other prawn farms along the mainland coast at the southern end of the site. Many of these sites are no longer operational.

► **Commercial/ Industrial Areas**

**Very Low Threat**

*(Saltworks)*

Inside site, localised(<5%)

There is an evaporative saltworks on the tip of the peninsular within DMNP, which is a pre-existing operation of potential historical interest that has limited impact on the site values. The extracted salt is transported by truck to Port Sudan along the main coastal road.

**Potential Threats**

**Low Threat**

The main potential threats to the site arise from issues such as increased tourism and associated development, coastal development in general, biological impacts, the expected consequences of climate change and increased activity from local residents. Currently the property is largely unaffected by threats, partly due to its isolation and limited visitation, however the operation of foreign tourism ventures causing damage to the reef within the site is a growing cause for concern. Limited management presence and virtually no available data on the baseline values of the property will make it difficult to not only respond but detect any impacts to the site.

► **Tourism/ Recreation Areas**

*(Increase in visitation from tourism)*

**High Threat**

Inside site, localised(<5%)  
Outside site

Despite limited infrastructure to support tourism there is growing interest in the site as a result of overcrowding in other similar locations within the Red Sea (IUCN, 2014). The resulting increases in recreational vessels, including live aboard dive vessels, could potentially impact on the property through pollution from tourism activities, anchor damage from an increase in the number of vessels and direct damage to reef ecosystems from diving related activities including boat damage. There is some concern over increasing interest by investors to start development projects both outside and within the property, and there is a lack of regulations to manage development activities in the area.

► **Fishing / Harvesting Aquatic Resources**

*(Increase in fishing within the property.)*

**Low Threat**

Inside site, scattered(5-15%)

There are currently two local communities residing within the buffer zone of the property and utilizing the area for subsistence fishing. Given the harsh conditions in the area and an expressed interest from the communities to move away from livelihoods dependant on fishing it is unlikely the communities will expand in number significantly. However, increased monitoring of impacts from fishing should be conducted to ensure no adverse impacts on the values of the property and further awareness of the natural values of the site and the boundaries of the Marine Park are needed.

► **Commercial/ Industrial Areas**

*(Spread of coastal development)*

**Low Threat**

Inside site, extent of threat not known  
Outside site

It has been noted that there is growth of coastal development along the Sudanese Red Sea coastline, especially focussed in the 70kms of coastline south of Port Sudan to Suakin, where there are two major ports, oil refineries, a desalination plant, saltworks, power station, a shrimp farm and the new Red Sea Economy Free Trade Zone (IUCN, 2014). Increased development has also begun to spread northwards from Port Sudan. Whilst the property remains in good condition this context reinforces the need to protect landward areas which are integral to the values of the marine areas and to upscale resources and management capacity.

**Overall assessment of threats**

**Low Threat**

The property is at risk from both direct and indirect impacts from activities both inside and outside its boundaries. Direct threats from the local communities are somewhat restricted but without careful management and planning could increase. Lack of facilities and infrastructure mean threats from tourism remain relatively low but are increasing and therefore have the potential to significantly harm the OUV of the site in the future if not carefully managed, and impacts from climate change are only likely to increase. However, the current legal protection and management recognises the range of potential impacts and is attempting to consider these in both the legal protection and on the ground management of the property.

## Protection and management

### Assessing Protection and Management

► **Management system**

**Mostly Effective**

The management system is guided by the 2017-2021 Integrated Management Plan (IMP) (Klaus, 2017) which replaced the previous 2004 Master Plans, prepared by PERSGA, and the management plan that was produced for Dungonab Bay and Mukkawar Island National Park in 2016. The plan is well prepared with a management framework directly related to the OUV of the site. The management authorities of

SMNP and DMNP have established a management committee for the World Heritage property to improve coordination and communication between the agencies at the Federal and State Level given the shared mandate for the management of environmental issues. This committee also includes other key stakeholders in the management of the property (IUCN Consultation, 2020).

► **Effectiveness of management system**

**Some Concern**

Responsibility for management of the property sits with the Wildlife Conservation General Administration (WCGA) under the National Government, however the state level government is also involved. The multi-agency and National and State level involvement in management results in somewhat complex procedures. For example rangers from the National agency aware of infringements are required to report these to the relevant state level authority and then these incidents, if serious enough to warrant further action, are reported to the police. Staffing capacity was significantly increased during the recent PERSGA project and in response to concerns expressed by IUCN during an evaluation mission in 2014 regarding the resources and management capacity applied to the protection of the property and the effectiveness of management actions (State Party of Sudan, 2018). However, despite this, the World Heritage Committee encouraged further resources to be made available for the management of the site (World Heritage Committee, 2018). As such, whilst the management system is well designed through the new 2017-2021 Integrated Management Plan, there is some concern relating to its implementation. In addition, there is still a lack of facilities for park managers (IUCN Consultation, 2020).

► **Boundaries**

**Mostly Effective**

At inscription, the World Heritage Committee provided specific recommendations to the State authorities that included a request to provide additional information about the boundaries of the property and an updated map (Decision WHC/16/40.COM/19), with reference to the information submitted prior to the 40th Session of the World Heritage Committee (WHC/16/40.COM/8B.Add) and the IUCN Evaluation Report (WHC/16/40.COM/INF.8B2). The Arab Regional Centre for World Heritage (ARC-WH) requested assistance, on behalf of the State party, in addressing the WHC Decision (WHC/16/40.COM/19). The boundary file for the property submitted by the Sudanese UNESCO MAB Committee was reviewed and an updated map prepared (Klaus 2018). The World Heritage core sites partially align with the boundaries of the two marine national parks, SMNP and DMNP, which both appear to be quite intact at the moment, both in terms of habitats and species and the boundaries are sufficient to include all the necessary conditions to protect the values for which it has been inscribed. The property covers a wide range of habitats that are ecologically and functionally interconnected and are necessary to maintain viable plant and animal populations, including shallow coastal areas, reef formations and deep-sea areas. In response to the World Heritage Committee's Decision, 2016, the 2018 State Party report stipulates that the process for declaration of Sha'ab Rumi as Sudan's third MPA is now also in progress, given its clear potential to contribute significantly to the integrity and OUV of the existing site, should this area be included in the site in future (State Party of Sudan, 2018). The buffer zone is not legally protected (IUCN Consultation, 2020).

► **Integration into regional and national planning systems**

**Some Concern**

A greater level of coordination and communication with neighbouring countries is definitely needed to ensure the site is included in regional planning and this is also true in regards to national level planning systems. In particular coordination at both the national and state level is needed in order to regulate the level of tourism with many live-aboard vessels now moving into the area during the peak tourism season. In addition threats from mineral exploration and pollution from neighbouring countries will require greater coordination if they are to be assessed and planned for and the role of the site in supporting resilience in other similar locations should be considered within the wider Red Sea environment. At a national level, the Council is representative of a number of different sectors and ensures effective involvement of all stakeholders in the management of the property (State Party of Sudan, 2018).

► **Relationships with local people**

**Mostly Effective**

The MNP boundaries and inscription on the World Heritage List is likely to have had little impact on the activities of local people within the area. Local communities are allowed to fish within the Marine Park as well as the buffer zone with restrictions on fishing activities related to the kind of fishing gear used. The local communities living within DMNP were consulted about the creation of the national park during the PERSGA MPA-SAP project and no-take zones before the area was gazetted in 2004. There also appear to be no significant or ongoing cultural rights issues with the local communities. However the IUCN evaluation mission to the property indicated there was limited evidence of consultation or awareness raising efforts with local communities (IUCN, 2014). In 2016, an IUCN / Arab Regional Centre for World Heritage (ARC-WH) mission to the property found that progress is being made by the local authorities engaging with local communities and involving them in certain aspects of management, and this is consolidated in the Integrated Management Plan (Klaus, 2017), which was informed by a series of training and planning workshops involving local communities to discuss the vision, goals and objectives for inclusion in the plan (State Party of Sudan, 2018). A UK-Aid Darwin Initiative funded project supported a national communication campaign which used social media to raise awareness about the site and organised events and outreach activities around the country and in Port Sudan and in the villages in DMNP (Cousteau 2016; Sudia 2016).

► **Legal framework**

**Mostly Effective**

There is a commitment from the Government of Sudan at both the National and State level towards the protection and conservation of resources within its coastal waters, including the property. Several laws and regulations are in place and Sudan has signed and abides to regional and international protocols and conventions. Both SMNP (1990) and DMNP (2004) have been declared as marine protected areas. SMNP was declared as a marine national park in 1990 by the Secretary General of the Council of Ministers, under the Federal Wildlife and Hunting Law of 1986, by the order “Approval to Declare the Area of Sanganeb in the Red Sea a National Park”, which was signed on 1st April 1990. DMNP was legally declared as a national park in 2004, following the World Bank GEF funded PERSGA Marine Protected Area Strategic Action Programme (MPA-SAP). The national park was legally declared by the President of Sudan as ‘Dungonab Federal Reserve’ under the Federal Wildlife and Hunting Law of 1986, “Order to Designate the Dunqonab Area of the Red Sea a Federal Reserve for the Year 2004”, which was signed on 13th October 2004. As such both SMNP and DMNP are protected under the Federal Government of Sudan and covered by various other pieces of national legislation.

► **Law enforcement**

**Some Concern**

The management of the property spans both national and state level Government with the main responsibility for management assigned to the Wildlife Conservation General Administration (WCGA), under the Ministry of Tourism and Wildlife at the National Level. The State level is also involved in the management through the Ministry of Agriculture, Animal Wealth and Natural Resources, which is responsible for all environmental matters in the Red Sea State. However it is not clear if and to what degree good collaboration occurs between the different levels of government and the relative strength of different pieces of legislation. There is a potential risk that the protection of the property may be compromised given the strongly growing regional push for increased coastal development, commercial fishing, aquaculture and oil exploration. The MPA Division of the WCGA is located in Port Sudan, the capital of the Red Sea State. At the time the Integrated Management Plan (Klaus 2017) was drafted, the MPA Division was staffed by the General Manager for MPAs, four MPA Managers, all of whom have Bachelor degrees in Marine Biology and 35 rangers, many of whom were recruited from the local community, as well as other administrative personnel. The WCGA has an operational base within DMNP, south of Mohammed Qol, one of the villages within the park. On SNMP, WCGA staff stationed on the atoll share the Sea Port Corporation facilities. The WCGA MPA staff are deployed to the MPAs from Port Sudan on a two-week rotation. Generally, each rotation consists of one MPA Manager and 10 rangers in DMNP and one staff member who is stationed on SMNP, who resides there with a staff member from the Sea Port Corporation. However, staffing levels were evaluated as very poor during the IUCN mission and capacity remains low. To address these capacity gaps, various capacity building programmes are being

developed by different institutions, including PERSGA, Cousteau, ARC-WH and IUCN Tabe'a Programme. Although the level of threats remain low, increasing potential threats, such as tourism, are such that the current resources and capacity of management staff may not be suffice for on going effective management of the property.

► **Implementation of Committee decisions and recommendations** **Mostly Effective**

SMNP was first presented for inscription on the World Heritage list in the 1980s with the subsequent recommendation requesting the formal gazetting of the Marine Parks before inscription would be considered. As a result it was resubmitted and inscribed in 2016, with a number of requests imposed on inscription. As such, the State Party submitted a State of Conservation report (State Party of Sudan, 2018), which was considered by the World Heritage Committee in 2018. The actions of the State Party in the development of high quality maps and a draft Integrated Management Plan (IMP), the recruitment of additional staff, and the increase in resources were welcomed alongside the identification of additional areas of potential Outstanding Universal Value (OUV) for inclusion as part of the World Heritage site (World Heritage Committee, 2018). However, the State Party was also requested or encouraged to make increased resources for effective management, and address the growing potential threats related to growing tourism in and around the site. It is unclear to what extent these further requests have been addressed, especially given the economic and political situation in the country the following year. Despite this, the efforts made by the State party relating to requests from the Committee at the time of inscription are mostly effective.

► **Sustainable use** **Some Concern**

Human impact, including that from the communities situated within the buffer zone is relatively low. There is private ownership of land within the buffer zone but this is strictly controlled through the legal framework controlling the area. Sustainable use activities are only allowed in the buffer zone and concentrate on artisanal fishing (IUCN Consultation, 2017).

► **Sustainable finance** **Serious Concern**

There is currently no detail available in regards to the level of financing for the property and in particular future prospects for conservation financing. It is therefore impossible to assess the current situation, trend and prospects for financing in the future or to comment on the adequacy of the current budget. The source of financing for management is from the Federal Ministry of Finance through the support provided to the Wildlife Conservation General Administration (IUCN, 2014). While no detailed information is available, the Evaluation mission noted that very limited budgets are made available to the management agencies and there is a need to investigate and secure sustainable financing for the property. However, during a coordination meeting between different key institutions supporting Sudan, convened by IUCN Tabe'a Programme and ARC-WH, the State Party reported that it has increased the management budget by 500%. Nevertheless, the adequacy of the level of funding available to the property needs to be confirmed further, and indeed the World Heritage Committee has encouraged the State Party to make more resource available for the management of the site (World Heritage Committee, 2018).

► **Staff capacity, training, and development** **Serious Concern**

At the time the Integrated Management Plan was prepared, the MPA Division of the WCGA staffing included: the General Manager for MPAs, four MPA Managers and 35 rangers, as well as other administrative personnel. Given the extent of its area and the potential for infringements, staffing levels are very poor and capacity incredibly low (IUCN Consultation, 2017). While the level and degree of threats remains low, the resources and capacity of management staff is such that it hinders effective management of the property, particularly in the face of increasing tourism and other threats (IUCN Consultation, 2020). While the management authority has established 5 ranger stations for monitoring and patrolling, the small staff numbers lack even basic equipment and transport and there is no information available on staff training or development (IUCN Consultation, 2017).

► **Education and interpretation programs**

**Some Concern**

There appears to be little if any education or awareness activities around the values of the property, either within local communities or with the limited number of visitors to the property. There is an aquarium based in Port Sudan with some information around the marine ecosystem but the majority of visitation is currently based on live aboard vessels and as such opportunities for education and awareness are limited. However, the 2017-2021 IMP was informed by a number of workshop involving local communities. Such stakeholder engagement in the management of the property is likely to foster greater opportunities for better local awareness of the values of the site.

► **Tourism and visitation management**

**Some Concern**

The property presently has almost no on-ground management presence with most management actions linked to tourism and visitation during the busiest season when live aboard dive vessels visit from other parts of the Red Sea. A general increase in tourism to the site and associated pressures has occurred, following World Heritage inscription (IUCN Consultation, 2020). Monitoring of impacts from tourism activities should be conducted to detect any impact on key habitat types and species in anticipation of increased visitation, but currently appears not to occur. Residential and resort/tourism development in terrestrial areas both within the buffer zones and areas adjoining the property should be closely monitored to ensure population size and tourist numbers do not exceed the limits of infrastructure and ecosystems.

► **Monitoring**

**Some Concern**

A coral reef monitoring programme was established for both SMNP and DMNP with support from the African Parks Foundation (APF 2006). Maintaining regular monitoring proved challenging due to access issues and financial constraints. More recently, the staff from the Red Sea University re-started monitoring with support from PERSGA. The Integrated Management Plan for the site (Klaus, 2017) proposed the maintenance and expansion of the monitoring programmes, with the support of the Red Sea University in recognition of the fact that there are capacity constraints in terms of staff numbers within the WCGA. Further research and monitoring will need to be conducted within the property to address gaps in the baseline data. Increased monitoring of the impacts from fishing and tourism should be conducted to ensure no adverse impacts on the values of the property and to increase knowledge about the natural values of the site and the boundaries of the Marine Park are needed (IUCN, 2014). The impacts of increasing tourism in the area, especially and potential damage to the reefs from recreational diving, is also a growing requirement for monitoring (IUCN Consultation, 2020).

► **Research**

**Some Concern**

There is currently limited research being conducted within the property mainly due to difficulties with access and cost constraints. The Red Sea University have established a research base in DMNP from which staff and students can conduct studies using small local fisher boats. However, due to the size of the property and the distances offshore, much of the property is only safely accessible from a larger vessel, such as a liveboard dive boat. Despite these challenges studies of charismatic and endangered species including dugong, manta rays and sharks, have been conducted as well as studies of bird populations, and monitoring the status of the coral reefs and seagrass beds and local fisheries. The results of several of these studies have been published in scientific journals: manta rays (Kessel et al., 2017), green sawfish (Elhassan et al., 2018), fisheries (Olsen pre-print). The IUCN Consultation (2017) recommended that research and monitoring projects being conducted by the Red Sea University and collaborating researchers should be linked to the management of the property and the results used to inform management planning and actions.

**Overall assessment of protection and management**

**Some Concern**

The Integrated Management Plan for the site provides a good framework for the management of the site. However the implementation of the plan may face significant challenges if related capacity and

resource needs are not met, as requested by the World Heritage Committee. So far, human impact, including that from the communities situated within the buffer zone is relatively low. There is private ownership of land within the buffer zone but this is strictly controlled through the legal framework controlling the area. The laws defining and affecting the property provide for a complementary and generally harmonized suite of protection including to some degree instruments for co-management of the areas within the buffer zone of the property. There is, potentially, a need for greater integration of stakeholders in the management in areas surrounding the property. However greater awareness of the values of the site has been addressed to some extent through the process of identifying areas of potential Outstanding Universal Value in the buffer zone of the site and more recent stakeholder engagement in management planning. Laws and regulations exist to control development within the buffer zone of the property and are consistent in their objectives to protect the key values of the site, however the increasing tourism market may bring challenges in this regard in the near future. As such, greater monitoring of any impact from these activities is needed to ensure no adverse impacts on the values of the site.

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

**Some Concern**

There is a commitment from the Government of Sudan at both the National and State level towards the protection and conservation of the resource in the coastal waters. Several laws and regulations are in place and Sudan has signed and abides to regional and international protocols and conventions. Despite these commitments the level of management and policy integration between State and National levels remains low, and it is only through the combined efforts of various stakeholders, representing the public and private sectors, and the very low levels of visitation and surrounding development, that there is currently effective conservation of the property.

## State and trend of values

---

### Assessing the current state and trend of values

#### World Heritage values

► **An outstanding example of the northernmost tropical coral reef systems on earth**

**Good  
Trend:Stable**

The site has remained relatively isolated from human interference and species have adjusted to the unique conditions found within the locality (World Heritage Committee, 2016). The site is in a relatively pristine state with limited impacts or threats and therefore likely to be stable. Previously established monitoring programmes (Mergner and Schumacher 1985, Reinicke et al. 2003, PERSGA 2003c, AFP 2006, Cousteau 2013) have confirmed this trend but access issues have meant these programmes are difficult to maintain. More comprehensive and regular monitoring, as set out in the new integrated management plan (Klaus, 2017), would help keep track of this trend with more certainty.

► **Exceptional level of Biodiversity**

**Good  
Trend:Stable**

The property contains a high level of endemism and represents a complete and relatively intact marine ecosystem, in a significant biogeographic region of the Red Sea (World Heritage Committee, 2016). It is home to a rich reef ecosystem, containing over 300 fish species and includes some of the most expansive regional seagrass beds representing at least 9 of the 10 regional species. It remains home to significant populations of globally important and endangered species including sharks, cetaceans, and marine turtles (Elhassan, 2018; World Heritage Committee, 2016).

► **Impressive natural phenomena, formations and areas of great natural beauty**

**Good**  
**Trend: Stable**

Sanganeb is an isolated, atoll-shaped coral reef structure in the central Red Sea, surrounded by 800 m deep water, the atoll is a largely pristine marine ecosystem and provides some of the most impressive dive sites on earth resulting from the very high diversity of physiographic zones and reefs characterised by an extraordinary structural complexity (World Heritage Committee, 2016). The Dugonab Bay and Mukkawar Island areas of the property include highly diverse systems of coral reefs, mangroves, seagrass beds, beaches, intertidal areas, islands and islets. The clear visibility of the water, coral diversity, marine species and pristine habitats and colourful coral reef communities against a backdrop of the Red Sea Hills, rising over 1500 m, creates a scene of immense natural beauty (World Heritage Committee, 2016).

## Summary of the Values

► **Assessment of the current state and trend of World Heritage values**

**Good**  
**Trend: Stable**

The Sanganeb Marine National Park and Dugonab Bay - Mukkawar Island Marine National Park World heritage site, set within the wider Sudanese Red Sea Coast, continues to exhibit high levels of endemism in marine fish and invertebrate species. A number of ecological and socio-economic characteristics of the area mean that the property is of national, regional and international importance for biodiversity conservation, reef resilience studies, interconnectivity, and for sustainable use of living marine resources. The relative isolation and low number of visitors to the site continues to ensure its conservation and the near pristine status of its world heritage values, which will be sustained through the recent development of the integrated management plan for the site, should it be implemented sufficiently.

## Additional information

### Benefits

---

#### Understanding Benefits

► **Importance for research, Contribution to education, Collection of genetic material**

The site provides an outstanding opportunity for research and education and awareness for the local, national and international communities, about regional biodiversity. It also provides an important site for research as a prime example of a deep water offshore coral reef, providing an outstanding opportunity for comparative studies with similar systems in other regions including the Indian and Pacific Oceans. It also provides a place to understand the interactions of biota with the environment in an almost pristine system.

Factors negatively affecting provision of this benefit :

- Climate change : Impact level - Low, Trend - Increasing
- Invasive species : Impact level - Low, Trend - Increasing

► **Fishing areas and conservation of fish stocks**

Hosting at least 361 fish species with numerous endemic and rare species the property provides important nurseries and spawning grounds for key species.

Factors negatively affecting provision of this benefit :

- Climate change : Impact level - Low, Trend - Increasing
- Overexploitation : Impact level - Low, Trend - Continuing
- Invasive species : Impact level - Low, Trend - Continuing

► **History and tradition,  
Cultural identity and sense of belonging**

The property is home to a number of local communities, many of which have inhabited the area for many generations. These communities were present prior to the designation of the National Park and World Heritage Property and continue to undertake a relatively traditional way of life with many of them reliant on artisanal fisheries supported by the property.

Factors negatively affecting provision of this benefit :

- Climate change : Impact level - Low, Trend - Increasing
- Overexploitation : Impact level - Low, Trend - Continuing

► **Outdoor recreation and tourism,  
Natural beauty and scenery**

The site offers tourism activities which are significant to local, regional and international communities. Tourism is increasing in the area with local and regional tourists contributing to this increase and provides an opportunity for recreation and time in nature.

Factors negatively affecting provision of this benefit :

- Overexploitation : Impact level - Low, Trend - Increasing

► **Tourism-related income,  
Provision of jobs**

Tourism levels remain low for the property but are likely to increase as a result of influences in other parts of the Red Sea. Any increase in visitation will require services to support them which are likely to be provided by local communities both within the property and through tourism related activities in other areas.

Factors negatively affecting provision of this benefit :

- Overexploitation : Impact level - Low, Trend - Increasing

One of the reasons for tourists visiting the property are the current low levels of visitation, particularly in regards to diving. An increase in visitor numbers (over exploitation) may then have a negative impact on this benefit.

► **Coastal protection**

The complex reef systems contained within the property, mirroring the Red Sea Coast of Sudan provide protection from extreme weather conditions and protect the fragile coast line from the impacts of such events.

Factors negatively affecting provision of this benefit :

- Climate change : Impact level - Low, Trend - Increasing

**Summary of benefits**

The benefits from the SMNP/DMNP are largely in the conservation value of the ecosystem, including the relatively pristine reef systems and the unique biodiversity found within the site. The reefs and other associated marine habitats provide a productive environment for a number of species of global conservation concern, as well as in providing food to local communities, and protection of local infrastructure and populations from extreme weather events, the frequency of which may increase under climate change. There are also economic benefits in terms of job creation and tourism.

## Projects

---

### Compilation of active conservation projects

No	Organization	Project duration	Brief description of Active Projects
1	University of the Red Sea		Various projects monitoring endangered species and conducting species surveys.
2	PERSGA		PERSGA implemented a GEF funded Marine Protected Areas Strategic Action Programme (MPA-SAP) that supported various regional studies and surveys in Sudan that resulted in the designation of DMNP in 2004. More recently PERSGA implemented the “Strategic Ecosystem based Management” (SEM) project. The SEM project supported a legal review and the preparation of an updated management plan for Dungonab Bay and Mukkawar Island National Park under the SEM project (Klaus 2016), followed by the preparation on an integrated management plan (Klaus 2017) for the World Heritage site as requested by the WCGA. PERSGA support training, monitoring and many other activities within the Red Sea and Gulf of Aden region.
3	Cousteau Society		UK-Aid funded Darwin Initiative project 21-019 entitled "Strengthening marine protected areas and marine ecotourism benefits in Sudan".
4	UNIDO in partnership with Institute of Marine Research, Norway		"Surveys of renewable marine resources in the Red Sea State" implemented in the period from 2012 to 2013

## REFERENCES

### No References

- 1 Adam, B.E.K.A. (2013). Current Status and Distribution of Dugongs (Dugong dugon) in Sudan. Presentation and Abstract. RIHN 8th International Symposium “Risk Societies, Edge Environments: Ecosystems and Livelihoods in the Balance” October 23 - 25, 2013 Research Institute for Humanity and Nature. [http://www.chikyu.ac.jp/rihn\\_e/events/2013/131023-25abstrac...](http://www.chikyu.ac.jp/rihn_e/events/2013/131023-25abstrac...)
- 2 African Parks Foundation (2006). Survey Report: Sudan Marine Parks Expedition (2006). Dungonab Bay and Mukkawar Island National Park and Sanganab Atoll Marine National Park. African Parks Foundation, Netherlands, 2 vols. (121 p. and 116p.).
- 3 Ali, A.A.M., Mahmoud, Z.N.E. and Elamin,S.E.M. (2015). Nesting, Hatchling Breeding and Feeding of Osprey *Pandion haliaetus* in Um El Sheikh Island, Dongonab Bay, Sudan. *Adv. Environ. Biol.*, 9(5), 226-228, 2015
- 4 Cousteau (2013). Toward a sustainable future for the Red Sea coast of Sudan: Part 1. Coastal and marine habitats Survey. Editors T. Chekchak and R. Klaus. Cousteau Society, Custodians of the Sea, New York 4 East 27th Street PO Box 20321 New York NY 10001.
- 5 Cousteau (2014). Toward a sustainable future for the Red Sea coast of Sudan: Part 2. Socio-economic and Governance Survey. Editors T. Chekchak and M. Macfarlane. Cousteau Society, Custodians of the Sea, New York 4 East 27th Street PO Box 20321 New York NY 10001.
- 6 Cousteau (2016). Strengthening marine protected areas and marine ecotourism benefits in Sudan. Editors T. Chekchak and R. Klaus. Report to the Darwin Initiative.
- 7 Elanaeim, S.M.E. (2012). Stock Assessment and Population Dynamics of *Plectropomus pessuliferus* and *Plectropomus areolatus* in the Sudanese Red Sea Coast. PhD Thesis. University Malaysia.
- 8 Elhassan, I.S. (2018). Occurrence of the green sawfish *Pristis zijsron* in the Sudanese Red Sea with observations on reproduction. *Endangered Species Research*, 36, pp.41-47.
- 9 Heron, S.F., van Hooidek, R., Maynard, J., Anderson, K., Day, J.C., Geiger, E., Hoegh-Guldberg, O., Hughes, T., Marshall, P., Obura, D., and Eakin, C.M. (2018). Impacts of Climate Change on World Heritage Coral Reefs: Update to the First Global Scientific Assessment. UNESCO World Heritage Centre, Paris.
- 10 Hussey, N., Stroh, N., Klaus, R., Chekchak, T., and Kessel, S. (2011). SCUBA diver observations and placard tags to monitor grey reef sharks, *Carcharhinus amblyrhynchos*, at Sha’ab Rumi, The Sudan: assessment and future directions. *Journal of the Marine Biological Association*. 1-10.
- 11 IUCN (2014). Evaluation Report for Sanganab Marine National Park and Dungonab Bay / Mukkawar Island Marine National Park (Sudan - Red Sea). IUCN Gland, Switzerland.
- 12 Kattan A, Coker DJ, Berumen ML. (2017) Reef fish communities in the central Red Sea show evidence of asymmetrical fishing pressure. *Mar Biodiv*. Springer, Berlin, Heidelberg; 2017;6: 1-12. doi:10.1007/s12526-017-0665-8
- 13 Kessel, S.T., Elamin, N.A., Yurkowski, D.J., Chekchak, T., Walter, R.P., Klaus, R., Hill, G. and Hussey, N.E. (2017). Conservation of reef manta rays (*Manta alfredi*) in a UNESCO World Heritage Site: Large-scale island development or sustainable tourism?. *PLoS one*, 12(10), p.e0185419.
- 14 Klaus, R. (2017). Integrated Management Plan for the UNESCO World Heritage Site for Dungonab Bay and Mukkawar Island and Sanganab Atoll Marine National Park, Sudan (2017-2021). Volume I Current Conditions, and Volume II Operations Manual. Prepared under the World Bank GEF funded Strategic Ecosystem Management (SEM) for the Red Sea and Gulf of Aden Project.

**No**   **References**

- 
- 15 Klaus, R. (2018) Updating the Map for the Sanganeb Marine National Park and Dungonab Bay - Mukkawar Island Marine National Park UNESCO World Heritage Site. Report to Arab Regional Centre for World Heritage (ARC-WH) under the auspices of UNESCO 62p.
- 
- 16 Mergner H., and Schumacher, H. (1985). Quantitative Analyse von Korallengemeinschaften des Sanganeb Atolls (mittleres Rotes Meer) I. Die Besiedlungs-Struktur hydrodynamisch unterschiedlich exponierter Außen- und Innenriffe. *Helgolander Wissenschaftliche Meeresuntersuchungen* 26: 238-358.
- 
- 17 Olsen, E., Axelsen, B.E., Moland, E., Utne-Palm, A.C., Elamin, E.M., Mukhtar, M.A., Saleh, A.M., Elamin, S.M., Iragi, M.A. and Gumaa, S.G.F. (pre-print) Distribution and diversity of fish species exposed to artisanal fishery along the Sudanese Red Sea coast. doi: <https://doi.org/10.1101/763961>
- 
- 18 PERSGA (2002). The Red Sea and Gulf of Aden Regional Network of Marine Protected Areas Regional Master Plan. PERSGA Technical Report Series No. 1. Jeddah.
- 
- 19 PERSGA (2003a). Status report of marine turtles in Sudan. PERSGA, Jeddah. The Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA). PERSGA Technical Series.
- 
- 20 PERSGA (2003b). Status of Breeding Seabirds in the Red Sea and Gulf of Aden. The Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA). PERSGA Technical Series No. 8.
- 
- 21 PERSGA (2003c). Survey of the Proposed Marine Protected Area at Dungonab Bay and Mukkawar Island, Sudan, The Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA). PERSGA Technical Series
- 
- 22 PERSGA (2004). Dungonab Bay-Makkawar Island Proposed Marine Protected Area Site-Specific Master Plan with Management Guidelines. PERSGA Jeddah.
- 
- 23 Reinicke, G.B., Kroll, S.D.K., Schumacher, H. (2003). Patterns and changes of reef-coral communities at the Sanganeb-Atoll (Sudan, Central Red Sea): 1980 to 1991. *Facies* 49:271-298
- 
- 24 State Party of Sudan (2013). Nomination of Sanganeb Marine National Park and Dungonab Bay/Mukkawar Island Marine National Park (Sudan - Red Sea).
- 
- 25 State Party of Sudan. (2018). Report of the State Party to the World Heritage Committee on the state of conservation of the Sanganeb Marine National Park and Dungonab Bay - Mukkawar Island Marine National Park (Sudan). [online] Ministry of Tourism, Antiquity and Wildlife, and Sudanese MAB National Committee/ Sudanese National Commission for UNESCO (NATCOM). Available at: <https://whc.unesco.org/en/list/262/documents/> (Accessed 22 October 2019).
- 
- 26 UNESCO. (2018). Report on the State of Conservation of Sanganeb Marine National Park and Dungonab Bay - Mukkawar Island Marine National Park, Sudan. State of Conservation Information System of the World Heritage Centre. [online] Paris, France: UNESCO World Heritage Centre. Available at: <https://whc.unesco.org/en/soc/3683> (Accessed 22 October 2019).
- 
- 27 World Heritage Committee (2016). Decision: 40 COM 8B.6 Sanganeb Marine National Park and Dungonab Bay / Mukkawar Island Marine National Park Provisional Statement of Outstanding Universal Value (Sudan). Istanbul, Turkey. Accessed 1st April 2017.