IUCN Conservation Outlook Assessment 2017 **(archived)**
Finalised on 09 November 2017

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# Socotra Archipelago

## SITE INFORMATION

Country:
Yemen
Inscribed in: 2008
Criteria:
(x)

Site description:
Socotra Archipelago, in the northwest Indian Ocean near the Gulf of Aden, is 250 km long and comprises four islands and two rocky islets which appear as a prolongation of the Horn of Africa. The site is of universal importance because of its biodiversity with rich and distinct flora and fauna: 37% of Socotra's 825 plant species, 90% of its reptile species and 95% of its land snail species do not occur anywhere else in the world. The site also supports globally significant populations of land and sea birds (192 bird species, 44 of which breed on the islands while 85 are regular migrants), including a number of threatened species. The marine life of Socotra is also very diverse, with 253 species of reef-building corals, 730 species of coastal fish and 300 species of crab, lobster and shrimp. © UNESCO

# SUMMARY

## 2017 Conservation Outlook

**Significant concern**

Socotra’s values are exceptional on a global scale and have been comparatively well preserved until very recently. Therefore, much is at stake currently, as the island is undergoing rapid development that brings about unprecedented pressures and threats, and critical conditions associated with political turmoil could negatively affect the archipelago. Current and potential threats to Socotra’s values are increasing rapidly. Infrastructure development, tourism and unsustainable natural resource management (following the deterioration of traditional management) are already affecting the island. The management regime of Socotra needs to be strengthened (in terms of legislative basis, cross-sector mainstreaming, capacity, science-based decision making and use of traditional knowledge), in order to ensure sustainable development, and control pressures and threats.

## Current state and trend of VALUES

**High Concern**
**Trend: Deteriorating**

Most of the existing key values have enjoyed a stable and satisfactory conservation status until the late 20th Century (mainly due to Socotra’s isolation). However, there is no systematic biodiversity monitoring system to enable an accurate scientific assessment of changes since the 2008 baseline (Abulhawa et al, 2013). The conservation status of reptiles and invertebrates is poorly understood, but no immediate cause for concern is apparent. However, the status of some values, particularly ecosystems and endemic flora, has begun to deteriorate, with further deterioration predicted, following rapid ongoing socio-economic changes, justifying therefore the assessment of the current state of World Heritage values to be of High Concern.

## Overall THREATS

**High Threat**

Current and potential threats to Socotra’s values are increasing rapidly. Infrastructure development and unsustainable natural resource management (following the increasing abandonment of traditional management) are already affecting the islands. Additional future threats include further habitat destruction, invasive species, climate change, and uncertainty of the political climate.

## Overall PROTECTION and MANAGEMENT

**Some Concern**

A management framework for Socotra’s values is under development, taking into consideration institutional arrangements to facilitate the process of the implementation of management and conservation measures effectively. It should be improved to deal with the rapidly increasing pressures and threats to the archipelago’s values, including projected further increases in tourism, infrastructure development, and unsustainable natural resource use. Priority areas include the creation of an archipelago-wide authority, visitor management and the participation of local people in management, including schemes to promote sustainable natural resource use where possible.

# FULL ASSESSMENT

## Description of values

### Values

### World Heritage values

▶ **Complex assemblage of unique ecosystems**
**Criterion:(x)**

Eight unique main types of vegetation/ecosystems with rich endemic biota. Part of the CI global biodiversity hotspot “Horn of Africa” (CI, 2013) and of the WWF Global 200 priority eco-region “Socotra Island Desert” (WWF, 2013). This isolated and until recently almost untouched island lying between three biogeographic regions, African, Oriental and Palaearctic, is a living museum which has preserved intact three unique endemic ecosystems and their species with a traditional culture living in balance with them (UNEP-WCMC, 2011).

▶ **Endemic flora and vegetation**
**Criterion:(x)**

308 endemic plant species (37%), 15 endemic genera. Global Centre of Plant Diversity (WWF & IUCN, 1994).

▶ **Endemic reptiles with their habitats**
**Criterion:(x)**

Rich overall herpetofauna, with 34 endemic reptile species (90%) (SoOUV, 2008).

### ► Endemic and endangered birds with their habitats

**Criterion:(x)**

6 endemic and additional globally threatened bird species and 11 endemic subspecies (BirdLife International, 2013a). Endemic Bird Area (BirdLife International, 2013a) and 19 Important Bird Areas (BirdLife International, 2013b).

### ► Endemic invertebrates with their habitats

**Criterion:(x)**

High endemism in land snails with 96 species (95%), isopods (73%) and arachnids (ca. 60%) (SoOUV, 2008).

### ► Coastal/marine biodiversity and habitats

**Criterion:(x)**

High marine diversity and some regional endemism. 253 species of coral, 730 species of fish, 2 nesting species of sea turtle, 300 species of crab, lobster, shrimp, and many whale and dolphin species in vicinity (SoOUV, 2008).

## Other important biodiversity values

### ► Rich culture and history of sustainable use of the land and sea

Rich cultural traditions and lifestyles, including the ancient unwritten language of "Sacatri", and a wealth of poetry and folklore, passed down through generations. Semi-nomadic pastoralists have a strong ethic of environmental stewardship, carefully managing rangeland and fodder trees to avoid overuse; and tribal regulations regarding sustainable harvesting from the wild are well respected (Cheung & DeVantier, 2006).
To a lesser extent, the same cultural practices apply to the use of sea resources including community managed coastal reserves and tribal fishing regulations.
Among several others addressing the islands' sustainability, a specialized community-based organization (CBO) was established in 2013 to protect and

promote the Socotri culture, language, and indigenous knowledge, and the Socotri governorate intends to adopt regulations to protect tangible and intangible heritage (State Party Report, 2016).

## Assessment information

### Threats

#### Current Threats

**High Threat**

Having been relatively well-protected by its isolation until the beginning of the 21st Century, Socotra is now undergoing rapid development, which is resulting in high threats from increased natural resource use and infrastructure (particularly road) construction, as well as growing threats related to agriculture/horticulture.

#### ► Logging/ Wood Harvesting

**High Threat**
**Inside site, widespread(15-50%)**
**Outside site**

Increased prosperity has led to the building of houses to replace caves and the consequent overcutting of trees suitable for construction, resulting in less suitable species being lopped for fodder (UNEP-WCMC, 2011). Socotra has become increasingly isolated due to political conflict in the mainland. As a result, fuel supplies have decreased, leading to an increase in wood collection (UNESCO SOC 2016). The State Party states, however, that only fallen wood is collected, and cutting down or damaging trees is not carried out (UNESCO SOC 2015).

#### ► Storms/Flooding

**High Threat**
**Inside site, scattered(5-15%)**

Localized stands of Boswelia and Dracaena suffered a significant impact from

the cyclones that hit in November 2015, but no serious declines island-wide are apparent (UNESCO SOC 2016).

### ► War, Civil Unrest/ Military Exercises

**Very High Threat**
**Inside site, throughout(>50%)**
**Outside site**

The Property is increasingly vulnerable due to the security situation in Yemen resulting from political instability, even though the archipelago has maintained civil peace to an extent. There is a likelihood of recurring fuel shortages, sociopolitical conflicts, and loss of control over land and sea tenure. Vulnerability is likely also exacerbated by the effects of the November 2015 cyclones (UNESCO SOC 2016).

### ► Other

**Low Threat**
**Inside site, scattered(5-15%)**

Use of insecticide Temephos in anti-malaria campaigns since 2000. Localised effects on invertebrate fauna observed (Van Damme & Banfield, 2011). No effects beyond affected areas observed to date.

### ► Crops

**Low Threat**
**Inside site, scattered(5-15%)**

Increasing number of home-garden projects for food (locally concentrated). Increased water demand, biocide pollution, exotic plant import, habitat loss to garden creation and fragmentation (Van Damme & Banfield, 2011).

### ► Fishing / Harvesting Aquatic Resources

**High Threat**
**Inside site, scattered(5-15%)**
**Outside site**

Localized illegal hunting of sea turtles, collection of sea cucumbers, lobsters and shark fins have been recently reported. Some collection of endemic plants and reptiles for international trade (Van Damme & Banfield, 2011). The problem is exacerbated by an increase in security problems in the Indian

Ocean and limited law enforcement capacities of Socotra authorities to respond (Abulhawa et al, 2013).

### ► Roads/ Railroads

**Very High Threat**
**Inside site, throughout(>50%)**
**Outside site**

> 900 km of roads constructed since 2001 (Van Damme & Banfield, 2011). Decree to sustainably manage road construction 2008 and political crisis since 2011 has temporarily reduced this pressure. Road construction may resume in the future (Abulhawa & Abdulhalim, 2013). Indirect effects include habitat and hydrological fragmentation, potentially wildlife mortality, waste and invasive species dispersal, disturbance, and enhanced access for natural resource use (Van Damme & Banfield, 2011). The controversial Qarya-Hegher and Hai Al Salam-Nojed roads have not been completed, and parts that had been previously constructed were almost completely eroded by the November 2015 cyclones (State Party Report, 2016). No maintenance program is in place for the large road network, which increases post construction impacts causing soil erosion, habitats destruction and fragmentation, downstream pollution and contributes to the perceived need for construction of new roads (Abulhawa el al 2013).

### ► Livestock Farming / Grazing

**Very High Threat**
**Inside site, throughout(>50%)**
**Outside site**

Grazing and fodder use appear unsustainable, with excessive grazing levels evident, but no studies to assess level of impact. There is insufficient cooperation with traditional pastoralists to develop a sustainable grazing regime (Abulhawa et al 2013). Overgrazing is a significant pressure, causing soil erosion and habitat degradation (UNESCO SOC 2016). A paper prepared by ten experts for the SCDP (Scholte et al., 2008) argues that the landscape and
unique vegetation of Socotra have evolved with goats for millennia, and have traditionally been managed sustainably. However, land division, less movement of livestock, abandonment of controls on breeding, and walled pastures in the mountains have begun to create overgrazing and

overbrowsing. The authors argue that it is not grazing pressure but reduced grazing management which is degrading the environment. The livestock grazing activity is deeply anchored in local history and traditional practices, however, the dramatic socioeconomic transformation of the island by cash based and market based approaches have resulted in major alteration of the traditional lifestyle related to grazing. It s argued that it is no longer a subsistence based activity, rather has evolved as a prime commercial one.

### ► Storms/Flooding

**Very High Threat**
**Inside site, widespread(15-50%)**
**Outside site**

Due to the cyclones that hit in November 2015, there was infrastructure damage, including increased soil erosion around roads (UNESCO SOC 2016). The storms also resulted in limited access to the Property, and habitat destruction to trees, terrestrial biodiversity, and the marine environment (State Party Report, 2016).

## Potential Threats

**High Threat**

In addition to a further aggravation of current threats, continued and extended development in the future are likely to lead to habitat destruction for construction of tourism infrastructure particularly in areas of high scenic and biodiversity value, a dramatically increased risk of invasive alien species, and increased waste production. The potential threat from climate change to the property’s values is still difficult to predict. The continuation of the political instability and weak governance systems are likely to accelerate and magnify the impacts of potential threats.

### ► Tourism/ Recreation Areas

**Very High Threat**
**Inside site, widespread(15-50%)**
**Outside site**

Tourist numbers increased more than 30-fold since 2000 but absolute numbers are still low (ca. 5,000 in 2009) (Van Damme & Banfield, 2011). Lack of tourism development planning, concentration of tourists at high

natural value sites, increase in road/infrastructure development, water and timber demand, accelerated breakdown of traditional land management, increased risk of invasive species (Abulhawa & Abdulhalim, 2013) are all potential risks associated with increasing tourism. Due to political instability, tourism numbers have dropped from 4,000 visitors in 2010 to less than 200 in 2015 (State Party Report, 2016). Accelerating trend, strong international investor interest, and likely secondary threats related to infrastructure development in the absence of a strong regulatory framework, warrant classification has high potential threat in spite of current low overall tourism numbers.

### ► Solid Waste

**High Threat**
**Inside site, localised(<5%)**
**Outside site**

25% increase in macro-waste production estimated until 2015 (Van Damme & Banfield, 2011). The solid waste problem is concentrated in the general use zone including the development nodes and corridor between Hadibu (the capital) and Qalansyia, the second largest town. This includes the airport, the sea port and the transportation corridor linking them.

### ► Droughts

**Data Deficient**
**Inside site, throughout(>50%)**
**Outside site**

Increasingly dry conditions expected, but exact predictions still impossible (Attore et al., 2007). Coastal areas sensitive to sea level rise.

### ► Invasive Non-Native/ Alien Species

**Very High Threat**
**Inside site, scattered(5-15%)**
**Outside site**

87 exotic (mostly non-invasive) plant species found (80% since 2000), still mostly restricted to home gardens and requiring active cultivation. Several invasive species also introduced (Van Damme & Banfield, 2011). All mammal and freshwater fish species alien (but not threatening current values), two introduced reptiles’ reportedly displacing endemic species (Van Damme &

Banfield, 2011). Invasive Indian House Crow eradicated in 2009 (Suleiman et al., 2010). There are no effective controls in place at the airport or ports to control import of species, and EPA has limited capacity to enforce such controls (SOC Report, 2013). Also potential threat from Qat cultivation in the future. Considering the example of other island ecosystems, this is considered a very high potential threat, however, it should be noted that there is a campaign organized by locals to eliminate Qat from the islands (Abulhawa et al, 2013).

### ► Marine/ Freshwater Aquaculture

**High Threat**
**Inside site, widespread(15-50%)**
**Outside site**

Overfishing by large boats and international fishing fleets is a continuous threat, and is exacerbated by an increase in security problems in the Indian Ocean and limited law enforcement capacities of Socotra authorities to respond (Abulhawa et al, 2013). Pressure has decreased from local communities due to fuel shortage and reduction of ability to export (UNESCO SOC 2016).

### ► Shipping Lanes

**Low Threat**
**Inside site, localised(<5%)**
**Outside site**

Two cargo ships are grounded west of Houlaf Harbor, with potential to lead to damage to the marine environment (UNESCO SOC 2016). One of the wrecks has been removed, and the fuel of the other has also been removed (IUCN Consultation, 2017).

### ► Other Biological Resource Use

**High Threat**
**Inside site, extent of threat not known**
**Outside site**

Export of native species could occur unchecked, as there are no effective controls in place at the airport or ports, and the Environmental Protection Agency (EPA) has limited capacity to enforce such controls (SOC Report, 2013). Several other nonofficial ports spread on the southern coasts as well.

This also includes the export of dead coral from the north-west coastal areas for commercial use in the Gulf Countries.

### ► Logging/ Wood Harvesting

**Low Threat**
**Outside site**

There is a large production workshop near the airport for export of charcoal. This represents a serious precedent, which could lead to impact Socotra's endemic tree species, associated fauna, and environmental pollution (IUCN, 2014). 265,000 kg of charcoal was produced here in 2014. According to the latest information, charcoal production is no longer active (IUCN Consultation, 2017), however, the potential impact of charcoal production on Socotra's endemic flora remains a valid concern. The workshop was established by a foreign investor, and there is concern that this type of foreign investment induces change to the sustainable wood collection techniques traditionally practiced on the island (UNESCO SOC, 2015).

## Protection and management

## Assessing Protection and Management

### ► Relationships with local people

**Serious Concern**

Insufficient mainstreaming of sustainable development among all stakeholders (e.g. local people and traditional users, line ministries, tourism industry) is a key obstacle to effective conservation management (Abulhawa and Abdulhalim, 2013). A special outreach campaign was to be launched by the local governorate in 2016. There is a current joint project with UNDP to build capacities for local CBOs. The local government is adopting a policy to include CBO representatives in decision making. There were also training programs from 2013-2016 implemented by EPA, local government, UNDP, and GIZ (State Party Report, 2016). There are several civil society organizations which are dedicated to promote sustainable development, protect Socotra’s natural and cultural
heritage, and strengthen the political and social representation of the local

people on the national and international levels (Abulhawa et al, 2013).

Intense involvement of national and international scientists in demarcation and management planning. Local stakeholders, who have been stewards and managers of the area for centuries, are not sufficiently involved and do not benefit sufficiently, e.g. from tourism development. There is a need for empowering local communities and local institutions and entities to enable them to manage the site and implement conservation projects.

### ► Legal framework

**Serious Concern**

The land is government property, but outside of Hadibo and Qalansyya its resources are owned by tribal groups that manage them according to long proved customs (UNEP-WCMC, 2011). A basic legal framework is in place, but the need for strengthening the legal framework and enforcement capacity was noted in Committee Decision 32 COM 8B.5. A Conservation and Zoning Plan (CZP, 2000) and Cabinet Decrees No. 45-49 of 2008 set the legal framework for the protection, management, and sustainable development of the Archipelago. However, the responsibility for CZP implementation (both EPA and Ministry of Public Works and Roads) remains unclear. The legal status of Socotra Administration itself (no archipelago wide conservation authority) is a major obstacle to conservation enforcement (Abulhawa & Abdulhalim, 2013; Van Damme & Banfield, 2011). Creation of such authority is planned, but overall a decrease of conservation staff by 50% is observed since the termination of the UNDP Socotra Conservation and Development Program in 2008, which further reduced enforcement capacity (Abulhawa & Abdulhalim, 2013).

### ► Enforcement

**Serious Concern**

The fact that there is no archipelago-wide conservation authority results in a major obstacle to conservation enforcement (Abulhawa et al 2013). A new law enforcement program for maritime protection is being developed. A legislative framework is being designed which would increase the effectiveness of law enforcement capacities related to environmental

violations and crimes (State Party Report, 2016).

### ► Integration into regional and national planning systems

**Mostly Effective**

Socotra was established as an independent governorate in 2014. Thus, the Governor has full authority over the decision making processes and budget managment. Despite the ongoing political conflict, Socotra has maintained civil peace. The new legitimate government of Yemen recognizes the special status of the archipelago and its position on the World Heritage List, and the importance of adhering to obligations of the World Heritage Convention (State Party Report, 2016). Environmental considerations are embedded in the activities and planning of all NGOs and Community-Based Organizations on the island (IUCN Consultation, 2017).

### ► Management system

**Mostly Effective**

5 component Protected Areas of the site implement management plans as of April 2011. 1 further plan has been prepared but is not yet being implemented, while 2 more plans are in preparation. Buffer zone management is not sufficiently aligned with core zone management. Capacity of EPA representation at Socotra to manage the site was limited, but the emerging government of Yemen recognizes the importance of activation of the EPA. The CZP was approved in 2000, with revision originally planned for 2011. The revision of the CZP, in cooperation with UNEP, is now ongoing (which will cover the period 2016-2020), with a specialized planning unit established to oversee the interim and long-term implementation. A committee has been established to integrate planning for development and conservation. All measures will include specific components for the outer islands, particularly Abdul Kuri and Samha (State Party Report, 2016).

### ► Management effectiveness

**Serious Concern**

No systematic management effectiveness assessments of component PAs of property have been published, but reportedly there is still insufficient capacity for effective management as well as a significant reduction of management staff on-site between 2008 and 2012 (Abulhawa & Abdulhalim,

2013).

### ► Implementation of Committee decisions and recommendations

**Some Concern**

In response to Committee Decision 37 COM 7B.9, a new law enforcement program for maritime protection is being developed (State Party Report, 2016).
In response to Committee Decision 39 COM 7B.6, a Deputy Governor for Environment and Development has been appointed, initiatives have been taken to strengthen the Environmental Protection Agency’s role in the management of the property, and there is ongoing consideration of a policy to cancel all previous decisions to expand main access roads within the property (SOC, 2016).

Despite these positive developments, overall the response to Committee decisions and recommendations is slow, and is not keeping up with the emergence of new threats.

### ► Boundaries

**Mostly Effective**

The boundaries and buffer zones as defined in the Conservation Zoning Plan (CZP) are adequate but not always respected. Revision of the CZP was originally planned for 2011 but is still ongoing. There are indications of land use pressures in the buffer zones, particularly adjacent to core areas, and a growing issue of land grabbing. This represents a potentially harmful trend leading to land conversion into residential, tourism, military, and other land uses at the expense of more sustainable local development and expansion. Furthermore, a lack of demarcation or signage of the buffer zones makes it difficult for land users to recognize the limits of the World Heritage site (Abulhawa et al, 2013).

### ► Sustainable finance

**Serious Concern**

Financing is still largely donor dependent, with several donors (UNDP, GIZ, Italian Development Cooperation, FFEM/France, GEF) committed to continue financial support for the coming years, to varying degrees. Increased funding

to meet the long-term needs for maintaining the World Heritage site is being sought through the UN-led Socotra Conservation & Development Programme and the GEF, and an internationally supported endowment fund is being sought. Starting in 2009, entry fees for non-resident visitors and fines for violations of environmental laws were to be levied (UNEP-WCMC, 2011). Sustainable long-term financing from State budget or other long-term sources are not secured, although since the establishment of Socotra as an independent governorate in 2014, fiscal allocation in the national budget for the archipelago has tripled (State Party Report, 2016). No sustainable financing strategy/business plan is in place. The Socotra Conservation Fund was established in 2002, making a small contribution to conservation funding.

### ► Staff training and development

**Some Concern**

Staff of EPA have received considerable capacity building support, but practical applicability and implementation reportedly is not always effective. Reduction of staff after discontinuation of UNDP SCDP is also a challenge. The EPA's capacity to manage the property successfully will depend on educating, training and winning the support of local people. Training has been carried out for guides, territorial, marine and archaeological, diver guides, drivers, including training in foreign languages (UNEP-WCMC, 2011).

### ► Sustainable use

**Serious Concern**

Grazing and fodder use throughout the property appears unsustainable and a threat to native flora although no systematic studies are available, as provisions to deal with the overgrazing challenge in the 2008 decree on the property are not being implemented (Abulhawa & Abdulhalim, 2013). The same is true for marine resources use including inside marine core areas. Some small scale positive examples of sustainable resource use exist, particularly bee-keeping (Abulhawa & Abdulhalim, 2013). Regarding road construction, a policy is in the process of being adopted by the Yemeni government to cancel all previous decisions to expand the main access roads within the property. This was to be in force by mid-2016. The roads master plan was to be revised by the Yemeni government, to be completed by the end of 2017. The local government plans to implement an emergency

rehabilitation plan for roads to prevent further erosion and waste disposal, and allow for rehabilitation of trees and soil. Although current EIA legislation is suspended in Yemen, the local government plans to adopt an interim EIA mechanism (State Party Report, 2016).

### ► Education and interpretation programs

**Serious Concern**

Education and interpretation activities and materials were previously virtually absent, with the World Heritage status of property not being appropriately communicated. A special outreach campaign was to be launched in 2016, and an interpretation system at the airport was to be completed by the end of 2016 (State Party Report, 2016).

### ► Tourism and visitation management

**Some Concern**

Limited local visitor management at places of particular interest has lead to damage. Lack of overall tourism and visitor management is a major future challenge if the rapid increase in tourism, which currently is completely unregulated, continues after normalization of the political situation. However, tourism is currently almost non-existent, and not foreseen to pick-up in the near future (State Party Report, 2016).

### ► Monitoring

**Some Concern**

There is some ad-hoc monitoring of the conservation status of the site but currently no systematic planned monitoring of the state of values, pressures, threats and management effectiveness (Abulhawa and Abdulhalim, 2013). Several trainings were conducted which included information on monitoring. Monitoring programs are underway for mangroves (implemented since late 2015) and the Socotra cisticola (Cisticola haesitatus) (State Party Report, 2016).

### ► Research

**Some Concern**

The islands are living laboratories of evolution, and the flora has been well

researched since the late 1800s. In the 1990s, a major multidisciplinary expedition was led, and a series of detailed studies began and continued through 2005. A multidisciplinary zoological and botanical expedition began in 1999 to systematically inventory the whole fauna of the archipelago, and included investigations into the terrestrial vegetation and people, bird populations and fish and underwater habitats, marine turtle nesting, fishing and meteorology, and fauna of the extensive cave systems. Except for reptiles, the terrestrial fauna
and ecology have been less well studied than the flora, and it is clear that many smaller species remain to be discovered. Monitoring, mapping and description is done of bird populations, meteorological conditions, marine biodiversity, undersea and tidal/subtidal habitats, fishing, turtles and vegetation by plots, transects and key species (UNEP-WCMC, 2011). Knowledge on conservation status of values is satisfactory for most plants and for birds, but lacking for most reptiles and invertebrates, and some plants. There is a need for more management-orientated knowledge generation and use. Nowadays there is limited application and erosion of traditional knowledge about environmental management among the local population. A comprehensive assessment was planned to study the impacts of the cyclones of November 2015 (State Party Report, 2016).

## Overall assessment of protection and management

**Some Concern**

A management framework for Socotra’s values is under development, taking into consideration institutional arrangements to facilitate the process of the implementation of management and conservation measures effectively. It should be improved to deal with the rapidly increasing pressures and threats to the archipelago’s values, including projected further increases in tourism, infrastructure development, and unsustainable natural resource use. Priority areas include the creation of an archipelago-wide authority, visitor management and the participation of local people in management, including schemes to promote sustainable natural resource use where possible.

### ► Assessment of the effectiveness of protection and management in

**addressing threats outside the site**

**Serious Concern**

There is an urgent need for improved management of external pressures from resource use (including of marine resources outside the property), tourism development and road/infrastructure development, and particularly port/airport controls for invasive alien species (IAS) (Van Damme & Banfield, 2011). The increasing demand on land acquisition by foreign investors remains a major potential threat particularly in coastal areas of high scenic value (e.g. north east coast) (Abulhawa et al, 2014).

▶ **Best practice examples**

Empowering local communities to acquire a leading role in the management of their natural heritage within an effective collaborative management approach to biodiversity conservation and sustainable management of natural resources:
After the termination of the SCDP program and decline of EPA capacity, at least five local associations were created with support from EPA and SCDP to oversee the management of the pilot Protected Areas established in mid 2000s. The local associations decided unilaterally to maintain the management programs for their respective areas regardless of the level of follow up and
support provided by EPA, and subsequently maintained commendable levels of protection and maintenance (Abulhawa et al, 2013). The current changes in local governance system are better recognizing the role of local communities in decision making and effective management of the islands (State Party Report, 2016)

## State and trend of values

### Assessing the current state and trend of values

#### World Heritage values

### ► Complex assemblage of unique ecosystems

**High Concern**
**Trend:Deteriorating**

Relatively pristine in comparison to other islands, but increasingly affected by degradation of vegetation, soil erosion through overgrazing, fragmentation, and coastal areas acquisitions including marine resources use (Abulhawa & Abdulhalim, 2013) (Abulhawa et al, 2014).

### ► Endemic flora and vegetation

**High Concern**
**Trend:Deteriorating**

Possibly four species have been lost over the 20th century, and some key species are declining (e.g. Draceana cinnabari). 157 plant species are listed as critically endangered, endangered or vulnerable (UNEP-WCMC, 2011). Localized stands of Boswelia and Dracaena suffered a significant impact from the cyclones that hit in November 2015, but no serious declines island-wide are apparent (UNESCO SOC 2016). Intensive grazing and impacts of roads represent ongoing threats to terrestrial habitats and flora (Abulhawa et al, 2014).

### ► Endemic reptiles with their habitats

**Low Concern**
**Trend:Stable**

No endemic reptile species are reported lost since the 20th century. However, conservation status of most reptile species is not assessed by IUCN, and only poorly known (Rösler & Wranik, 2004).

### ► Endemic and endangered birds with their habitats

**Low Concern**
**Trend:Stable**

No endemic bird species are reported to have been lost since the 20th century. 2 endemic species are classified as vulnerable, 1 as near-threatened, and 3 as least concern on the IUCN Red List of threatened species (IUCN, 2013).

### ► Endemic invertebrates with their habitats

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

No endemic mollusk species are known to be lost since the 20th century. Conservation status of invertebrates in general is not assessed (except dragonflies, freshwater crabs) and poorly understood (e.g. Riservato et al., 2013).

### ► Coastal/marine biodiversity and habitats

**High Concern**
**Trend:Deteriorating**

Marine communities reportedly are still comparably healthy. Increasingly, they are affected by unsustainable use in some areas (Van Damme and Banfield, 2011). Increasing pressures in land acquisition in coastal areas present a serious threat to associated marine ecosystems and adjacent terrestrial ones (Abulhawa and Abdul Halim, 2013).

## Summary of the Values

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

**High Concern**

**Trend: Deteriorating**

Most of the existing key values have enjoyed a stable and satisfactory conservation status until the late 20th Century (mainly due to Socotra’s isolation). However, there is no systematic biodiversity monitoring system to enable an accurate scientific assessment of changes since the 2008 baseline (Abulhawa et al, 2013). The conservation status of reptiles and invertebrates is poorly understood, but no immediate cause for concern is apparent. However, the status of some values, particularly ecosystems and endemic flora, has begun to deteriorate, with further deterioration predicted, following rapid ongoing socio-economic changes, justifying therefore the assessment of the current state of World Heritage values to be of High Concern.

### ► Assessment of the current state and trend of other important

### biodiversity values

**High Concern**

**Trend: Deteriorating**

The biodiversity related cultural values, traditional knowledge and practices are increasingly deteriorating due to socioeconomic transformations, political instability, external pressures, and lack of conservation efforts. These values, knowledge and practice are critical for the long term sustainability of the islands natural heritage.

## Additional information

### Benefits

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### Understanding Benefits

#### ► Livestock grazing areas

Strong traditional livestock economy based on goats, as well as cattle and sheep to a lesser extent (Morris, 2002), with a strong contribution to local livelihoods.

The socioeconomic transformations as well as infrastructure development (e.g. road construction) are increasing local users access to remote resources and changing their patterns of use in terms of distribution and duration.

#### ► Collection of genetic material

The rich endemic biota of the property offer the opportunity to exploit genetic materials of potential economic use.

Research efforts on documentation and collection of genetic resources have been drastically declining due to weak governance and lack of financial and human resources. The conditions are foreseen to improve under the new UNEP implemented project (State Party Report, 2016).

### ► Fishing areas and conservation of fish stocks

The coastal waters around Socotra contribute greatly to the diet and livelihood of the local population and have the potential to support a considerable sustainable fishing industry, if managed wisely (Cheung & DeVantier, 2006). The current trend in marine resources is moving rapidly into less sustainable practices due to lack of proper management, monitoring and law enforcement.

Coastal habitats destruction due to land acquisition and infrastructure development and over-exploitation of marine resources due to economic transformations, lack of good governance, and weak management and law enforcement represent major threats to the marine ecosystems services associated with the provision of food (Abulhawa and Abdul Halim, 2014).

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

The site has contributed to traditional knowledge, the scientific understanding of island biogeography, conservation biology, climate change and other subject areas, and continues to support relevant scientific research and publications (UNEP-WCMC, 2011). The site provides an outdoor learning environment for local communities, researchers, and visitors to the islands. It offers a mosaic platform for exchange of knowledge and experiences among inhabitants, users and interest groups.

The continuation of the factors negatively affecting this benefit will lead to successive erosion of knowledge and learning derived form the site thus negatively impacting traditional practices related to the sustainable utilization of the land and sea and their resources.

### ► Wilderness and iconic features, Cultural identity and sense of belonging

Although the limited accessibility and unfavorable framework conditions have precluded strong tourism development in the past, the iconic wilderness values and unique biota of the island have great potential benefits, including for tourism.

The inter-linkages between cultural values, traditional knowledge and practices and the conservation of natural heritage are weakened by the accelerating trends of socioeconomic transformations in the islands and continuing political instability in Yemen.

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

Presently, tourism to Socotra is basically non-existent, but is foreseen to increase in the future. The potential economic benefits of sustainable tourism are not clearly understood among stakeholders, despite the fact that there is a potential for a significant number of jobs as a result (Abulhawa et al, 2014). Ecotourism-associated activities such as handicrafts and bee-keeping could provide alternatives to excessive grazing and over-fishing (State Party Report, 2016). To date, the site provides the main source of income to the majority of its inhabitants through the utilization of land and sea resources (e.g. livestock rearing and fishing). These are by far the main sources of income on the islands.

Habitat destruction and over-exploitation represent the main threats to the site's capacity to provide income to most of its inhabitants. The potential of tourism and other alternative activities remain of marginal economic impact. Political instability is the underlining factor leading to the decrease in tourism. Pollution is mainly outside the property, however concentrated in access points and main tourism related facilities (e.g. around airport and the capital of Hadibu)

### ► Traditional agriculture

Cultivation of date palms has been carried out for hundreds of years, and are an integral part of many Socotrans' livelihoods and culture. Dates are an important part of the diet, and are preserved to be eaten throughout the year. Almost the entire date palm is used as food for people or cattle, for building, weaving, or as fuel (Cheung & DeLevantier, 2006)

The site has limited capacity for horticulture development due to scarcity of water resources, harsh climatic conditions and lack of traditional knowledge and practices associated with it.

## Summary of benefits

Apart from its tremendous global conservation value, the Socotra archipelago also supports significant traditional natural resource based economies such as livestock rearing and fishing which represents the main sources of local communities income. It is argued that the site will always have these economic activities as the main driver of local economy. Nonetheless, it has a potential for further knowledge generation and wilderness based, responsible tourism. Overall, The current sociopolitical and economic trends are negatively impacting the site's capacity to provide sustainable economic growth for its people.

## Projects

### Compilation of active conservation projects

| № | Organization/ individuals | Project duration | Brief description of Active Projects |
|---|---|---|---|
| 1 | Friends of Socotra society | | Various small research and conservation projects, past and ongoing |
| 2 | GIZ, UNDP, IFAD, UNEP, FRC | | Since 2012, several projects and initiatives (including the GIZ program mentioned earlier) were signed between the Yemeni government and international partners, with a total budget of around 20 million US dollars. Three of these projects address the restructuring and empowerment of the EPA (State Party Report, 2016). |
| 3 | Green Climate Fund | | The Yemeni government is negotiating access to funds from the Green Climate Fund through UNEP (State Party Report, 2016). |
| 4 | UNEP | From: 2015 To: 2018 | Socotra Archipelago Project. Program for conservation and sustainable development jointly implemented by UNEP and Ministry of Water and Environment (State Party Report, 2016). |

## Compilation of potential site needs

| № | Site need title | Brief description of potential site needs | Support needed for following years |
|---|---|---|---|
| 1 | Capacity building and empowerment for local communities | Empowerment and capacity building for local communities and civil society organizations to co-manage natural resources and protected areas. Program should be strongly attached to sustainable financing mechanisms (Abulhawa et al, 2013). | |
| 2 | Tourism development strategy | Sustainable tourism development strategy should be developed in collaboration with local and international private sectors (Abulhawa et al, 2013). | |
| 3 | . | Biodiversity monitoring system, with a particular focus on an early warning system for alien invasive species | |
| 4 | Sustainable financing | Sustainable financing strategy is required to ensure the necessary human and financial resources for the long-term management of the property (UNEP-WCMC, 2011). | |
| 5 | . | World Heritage communication and interpretation programme | |
| 6 | . | Road impact remediation programme | |
| 7 | . | Organizational development of relevant nature conservation institutions, including archipelago-wide authority | |
| 8 | . | Action Plan development, resourcing and implementation to implement 2008 decrees on biodiversity conservation at Socotra | |
| 9 | Archipelago-wide management authority | An Archipelago-wide management authority should be established, legally mandated and well-resourced to oversee the conservation of the property and its sustainable development. The current political reforms taking place in Yemen represent a rare opportunity to strengthen the legal and institutional status of Socotra in accordance with its World Heritage status (Abulhawa et al, 2013). | |

| № | Site need title | Brief description of potential site needs | Support needed for following years |
|---|---|---|---|
| 10 | Inclusion of outer islands in management programs | A clear strategy should be devised to include the outer islands in all management programs, including solutions to year round access, communication and reporting (Abulhawa et al, 2013). | |
| 11 | Road master plan revision | A clear decision should be taken on the cancellation of the remaining components of controversial roads. The MOPWH road master plan should be revised to be fully in line with the World Heritage zoning plan. A Strategic Environmental Assessment of the road network should be undertaken to find the least environmentally damaging options for transportation on the island (Abulhawa et al, 2013). | |
| 12 | Effective EIA process | An effective EIA process should be developed and adopted for all new infrastructure development (Abulhawa et al, 2013). | |
| 13 | Strengthen marine enforcement capacity | Adopt a clear strategy on strengthening the marine enforcement capacity (Abulhawa et al, 2013). | |
| 14 | Devise clear land grabbing strategy | A comprehensive study on the potential impact of land grabbing and land conflicts should be undertaken. A clear strategy should be devised to ensure their minimal impact (Abulhawa et al, 2013). | |
| 15 | Documentation and protection of cultural heritage | Efforts should be expanded to document and protect the cultural heritage of Socotra as a holder of great traditional and indigenous knowledge and practices related to the conservation and sustainable utilization of the property’s resources (Abulhawa et al, 2013). | |
| 16 | Salvage of grounded ships | The possibilities of and risks involved in salvaging the two grounded ships should be assessed, and appropriate measures taken to restore any damages caused (UNESCO SOC, 2016). | |
| 17 | Revival of traditional land management practices | Revival of traditional land management practices including seasonal transhumance should be promoted in an effort to reduce threats from soil erosion and habitat degradation as a result of overgrazing (UNESCO SOC, 2016). | |

| № | Site need title | Brief description of potential site needs | Support needed for following years |
|---|---|---|---|
| 18 | Direct line of communication | In light of political instability, a direct and continuous line of communication needs to be established with the management team to help voice their needs at the regional and international levels (Abulhawa et al, 2014). | |
| 19 | Crisis management measures and post-crisis plan | A set of specific crisis management measures are needed, including advocating the supply of liquefied gas in order to avoid the catastrophic impacts of wood collection on the site's trees. A post-crisis plan should be discussed, addressing the priority capacity-building needs for site access control and monitoring (Abulhawa et al, 2014). | |
| 20 | Management links developed | Appropriate linkages need to be developed between the management of the property, its buffer zones and the Socotra Biosphere Reserve (UNEP-WCMC, 2011). | |

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