IUCN Conservation Outlook Assessment 2014 **(archived)**
Finalised on 26 August 2014

Please note: this is an archived Conservation Outlook Assessment for Namib Sand Sea. To access the most up-to-date Conservation Outlook Assessment for this site, please visit https://www.worldheritageoutlook.iucn.org.

Namib Sand Sea

SITE INFORMATION

Country:
Namibia
Inscribed in: 2013
Criteria:
(vii) (viii) (ix) (x)

Site description:

Namib Sand Sea is the only coastal desert in the world that includes extensive dune fields influenced by fog. Covering an area of over three million hectares and a buffer zone of 899,500 hectares, the site is composed of two dune systems, an ancient semi-consolidated one overlain by a younger active one. The desert dunes are formed by the transportation of materials thousands of kilometres from the hinterland, that are carried by river, ocean current and wind. It features gravel plains, coastal flats, rocky hills, inselbergs within the sand sea, a coastal lagoon and ephemeral rivers, resulting in a landscape of exceptional beauty. Fog is the primary source of water in the site, accounting for a unique environment in which endemic invertebrates, reptiles and mammals adapt to an ever-changing variety of microhabitats and ecological niches.
© UNESCO

SUMMARY

2014 Conservation Outlook

Good

The nature of the Namib Sand Sea property – a vast inaccessible area of fog-bathed desert dunes – makes it sufficiently inhospitable to deter most forms of exploration or exploitation. There are virtually no roads or facilities of any kind within the property. Although there were some early pioneer efforts to exploit limited deposits of alluvial diamonds along the coastal plains in the early part of the 20th century, this proved uneconomic and any remaining mineral prospecting licenses were cancelled at the time of inscription in 2013. Today the area is protected within the Namib Naukluft Park, with some limited use of desert plants and animals around the fringes of the property by indigenous communities and a growing tourism industry. The most significant management challenges are regulating visitor activities in the few accessible parts of the property, controlling alien plants (especially along the seasonal rivers) and managing local community access rights. Water resources require careful management if the few seasonal rivers that penetrate the area are going to be maintained, but the key values of the site seem secure.

Current state and trend of VALUES

Good
Trend: Stable

The Outstanding Universal Value of the Namib Sand Sea is the result of complex geological, biophysical and ecological interactions that have resulted in the evolution of unique plant and animal species that are especially adapted to life in a fog-bathed dry desert. The prevailing biophysical conditions occur at such a scale as to be largely unaffected by human activity, and the extraordinary natural beauty of the place, with its ever-changing dune formations, is maintained by the perpetual strong winds. Thus the geological, ecological, biodiversity and aesthetic values of the site are well conserved and in a stable

condition.

Overall THREATS

Low Threat

The Namib Sand Sea is one of Africa’s least threatened sites, unaffected by human settlement or livestock on account of a lack of fresh water and the nature of its vast area of ever-changing fog-bathed sand dunes. The core of the area is inaccessible and rarely visited by people, but there are tourism activities and a limited amount of community-use of resources around its fringes. These activities threaten the integrity of comparatively small, but crucial areas of the site. Diamond mining was undertaken on a small scale by pioneer operators in the first half of the 20th century but mining has now been terminated and a political commitment made to outlaw further exploration. There remains a threat of ecological change along the few seasonal rivers from upstream dams, subterranean water extraction, and the fluvial transport of the seeds of invasive alien plants, but none of these threats are likely to alter the fundamental values of the site.

Overall PROTECTION and MANAGEMENT

Mostly Effective

The majority of this vast uninhabited desert survives in a largely undisturbed state due to the extreme prevailing conditions and difficulty of access. The few areas that are readily accessible are located close to the edge of the site where visitor accommodation (and most critically, water) can be provided. So, despite very low levels of management intervention the unique ecological values of the site remain largely intact and pristine. Management of tourism, especially around Sossusvlei and the Sesriem area (where three quarters of the park’s visitors are concentrated) presents some challenges, and there is a need to enhance management capacity and visitor management in this area particularly.

FULL ASSESSMENT

Description of values

Values

World Heritage values

- **World’s only coastal desert with extensive dune fields influenced by fog**
  Criterion:(vii)

  The Namib Sand Sea (NSS) is primarily composed of two dune systems, an ancient (semi-consolidated) one overlain by a younger active one. The dune fields make up 84% of the area, with the remainder composed of a variety of other geomorphic features including gravel plains and gramadullas (8%), coastal pans/flats (4%), rocky hills at the fringes (3%), inselbergs within the sand sea (1%), a coastal lagoon, endorheaic pans, ephemeral rivers and rocky shores. The outstanding attributes of the sand seas are derived from interactions between the land, the ocean and the atmosphere. Strong winds from various directions, linked to rain and fog, have an overriding influence on the area and define its key attributes (SoOUV, 2013; IUCN, 2013).

- **Massive dunes made of sand transported from afar**
  Criterion:(viii)

  The NSS is derived from material transported from afar. Sand is carried to the NSS from the interior of southern Africa by river, ocean current and wind. This three-part ‘conveyor system’ begins with erosion of material in the headwaters of the Orange River which is carried into the South Atlantic, where it is picked up and driven northwards by strong ocean currents. Deposited as beach sand it is then mobilised and transported inland by wind where it creates the diversified aeolian desert landforms and features of the

NSS (SoOUV, 2013).

► Diversity of dune formations
Criterion:(vii)

Sixteen distinctive dune types are recognized across the three main zones of the sand sea, with transverse dunes in the coastal strip, linear dunes in the centre and star dune systems in the east. This diversity of dune formations creates a spectacular dunescape with a unique interplay of shape, colour, movement and habitat (SoOUV, 2013; IUCN, 2013). The clarity and visibility of the dunescape is enhanced by the clear sky which is devoid of dust, moisture and air pollutants (IUCN 2013, pers. orb)

► Plant and animal adaptations to desert conditions
Criterion:(ix)

Plant and animal communities are continuously adapting to life in the hyper arid environment. Fog serves as the primary source of water and this is harvested in extraordinary ways while the ever-mobile wind-blown dunes provide an unusual substrate in which well-oxygenated subsurface sand offers respite and escape for ‘swimming’ and ‘diving’ invertebrates, reptiles and mammals. The outstanding combination and characteristics of the physical environment – loose sand, variable winds and fog gradients across the property – creates an ever-changing variety of micro-habitats and ecological niches that is globally unique on such a scale (SoOUV, 2013; IUCN, 2013).

► Rare and endemic species, particularly invertebrates
Criterion:(x)

Although the sand sea habitat exhibits relatively low levels of overall species richness, certain taxa of the sand sea fauna and flora show high levels of endemism. Eight species of plant (53% of the sand sea total), 37 arachnids (84%), 108 insects (52%), 8 reptiles (44%), a bird (11%) and two mammals (17%) are known only from Namib sand sea habitats (IUCN, 2013).

Assessment information

Threats

Current Threats

Low Threat

The remote and inhospitable nature of the desert dunes ensures that there is little disturbance to the vast majority of the interior of the property. The highly scenic and accessible area around Sossusvlei is subject to heavy pressure from tourism and impacts such as vehicle tracks, litter and sanitation, aircraft noise and over-crowding are already affecting the site. Some alien species are present, and eradication is difficult because of re-infestation with seeds transported into the property along seasonal water-courses.

▶ Tourism/ visitors/ recreation

High Threat
Inside site
Outside site

Although the nature of the terrain across most of the property limits access by visitors there are some potentially damaging impacts of tourism. These are already being experienced in some areas and include off-road driving, noise pollution from low-flying sight-seeing aircraft, litter and sanitation problems, unauthorised camping, overcrowding and disturbance of critical wildlife habitat (e.g. notably a vulture breeding colony) (IUCN, 2013). The demands of tourism are growing rapidly and present levels of management input (financial and staffing) are barely adequate to address these demands. There is a need for a more strategic approach to tourism planning to disperse visitor use (e.g. away from the Sossusvlei area), improve basic infrastructure at heavily-used sites and enhance the visitor experience with better interpretation and education facilities. Impacts from tourism need to be vigilantly monitored, and a plan to mitigate impacts and improve visitor experiences urgently needs to be developed and implemented. Additional

resources are needed to enhance management and enforce existing controls.

► Fishing / Harvesting Aquatic Resources, Subsistence hunting

Low Threat
Inside site
Outside site

The Topnaar community, now living in scattered villages along the Kuiseb River valley (which marks the northern boundary of the property), claim ancestral rights to land and resources within the property. They maintain a limited number of livestock (mainly cattle and goats) which are grazed within the northern fringes of the property, and harvest other renewable natural resources for subsistence use (notably the wild !Nara melon fruits). They are given a limited hunting quota for animals that are shot by Ministry staff for distribution of meat between community members. Topnaar community resource use rights are not formally recognised and although present levels of off-take and management practices may be within sustainable limits there is a need to reach a formal agreement on traditional use of resources (IUCN, 2013).

► Invasive Non-Native/ Alien Species

Low Threat
Inside site
Outside site

There are some invasive plants and animals, including the 11 species of plants, one fish, two birds, two mammals and 12 invertebrate species noted by in the nomination dossier (NNCWH, 2012). Most of the invasive plants are carried into the property by ephemeral rivers and are difficult to eliminate due to regular re-infestation during each flooding cycle.

Potential Threats

Low Threat

The greatest potential threat is a reduction in the seasonal flow of watercourses through increased upstream use of water, and ecological changes to the Sandwich Harbour area resulting from subterranean water extraction from the Kuiseb River valley. The threat of mining has been significantly reduced as a result of appropriate political decisions taken to

eliminate all remaining prospecting licenses.

► Mining/ Quarrying

Low Threat
Outside site

Although there are no active mining operations within the property, diamond mining has been undertaken in the coastal zone of the NSS periodically since the early 1900s and some abandoned infrastructure remains to this day. Substantial discoveries of uranium have been made in recent years on gravel plains north of the property but the prospects for significant new finds of diamonds, uranium or other minerals within the property are considered limited. In recognition of this, the State Party’s cabinet passed a landmark decision in February 2012 (after submission of the nomination dossier) to cease all prospecting within the area and terminate all current Exclusive Prospecting Licenses (EPLs). This decision signifies a commendable level of commitment by the State Party to preserve the integrity of the property (IUCN, 2013).

► Dams/ Water Management or Use

High Threat
Inside site

In a country as dry as Namibia water resources have special significance and there is a real possibility that any surface water and subterranean aquifers associated with the property will be used, with unknown ecological consequences. In particular the ephemeral rivers which arise in the western escarpment and drain into the property (or along its borders) are threatened by the possibility of upstream impoundments. Furthermore, extraction of subterranean water supplies from the Kuiseb River valley (which is already happening on a significant scale to supply the nearby town of Walvis Bay) may alter the ecology of the Ramsar-designated wetlands at Sandwich Harbour (as well as other attributes of the property). These potential threats need to be explicitly recognised and developments that are likely to impact the property must be subject to rigorous Environmental Impact Assessment (EIA) and mitigation procedures (IUCN, 2013).

Protection and management

Assessing Protection and Management

► Relationships with local people

Serious Concern

Although there are no people living inside the property, the Topnaar community is settled along its northern boundary, within the Namib-Naukluft Park and buffer zone of the NSS. The current legislation does not recognise the rights of local communities residing in the park, although the Topnaar community wants to gain formal recognition of ancestral rights to land and resources. Issues of particular concern include preferential access to the benefits of tourism, recognition and protection of community culture and unrestricted access to Topnaar cultural sites. The need to address these matters is recognised in the draft NSS Site Management Plan, but there had been little progress in addressing them by the time of the property's inscription on the World Heritage list in 2013 (IUCN, 2013)

► Legal framework and enforcement

Some Concern

Whilst the Nature Conservation Ordinance provides for the conservation of nature and establishment of game parks and nature reserves, a number of other bodies of legislation are relevant to management of the NSS including the Environment Management Act (2007), Minerals (Prospecting and Mining) Act (1992), Namibian Tourism Board Act (2000), National Heritage Act (2004), and Water Resources Management Bill (2004). However, none of the existing legislation provides the level of protection required to guarantee the future integrity of the NSS, particularly in respect of mining, tourism and community rights. At the very least, additional regulations would be required to supplement the existing legal framework. It is of some concern that activities that would be incompatible with world heritage status are currently being undertaken in other parts of the Namib-Naukluft Park, including uranium mining and large-scale water extraction. At the time of inscription (2013) there were a number of Exclusive Prospecting Licenses allowing for

mineral prospecting within the property, and measures were still required to ensure (a) the permanent cessation of all mineral prospecting and mining and (b) the recognition of indigenous community rights and their accommodation within the management of the property.

► Integration into regional and national planning systems

Highly Effective

Management of the property is well integrated with regional and national planning systems. The nomination dossier (2012) lists 24 national, regional and local plans supporting conservation of the property, ranging from Namibia's Vision 2030 to specific regional, municipality and village plans.

► Management system

Mostly Effective

The property is state-owned land and lies within the Namib–Naukluft Park (which is itself an integral part of the planned Namib-Skeleton Coast National Park). It is managed by the Ministry of Environment and Tourism, based on the Nature Conservation Ordinance (1975). Protection of the area dates back over a century. The legal establishment of the Namib-Naukluft Park, encompassing the NSS, has involved seven different stages starting in 1907 and culminating in 1986. The first stage involved the establishment of a game reserve on the northern edge of the NSS, and this was progressively expanded with the addition of further areas until the present configuration of the Namib-Naukluft Park was achieved in 1986.
There are two draft management plans, one for the 'Namib-Naukluft Area of the Namib-Skeleton Coast National Park' (i.e. the Namib-Naukluft Park) and another for the NSS (Nomination dossier, 2012). The draft plan for the Park was developed in January 2009 and its provisions relate to the period 2009-13. The plans address the issues of conservation, research, monitoring, enforcement, education, traditional practices and cultural heritage resources. The draft park management plan includes a provisional zoning plan, with different areas of the NSS (and wider park) identified as strict nature reserve, wilderness, day-visitor use, tourism 4x4 and lodge concessions, and monuments (old diamond-mining areas).

► Management effectiveness

Some Concern

The financial and human resources available for management are insufficient to undertake the range of tasks required for effective management. Whilst most of the area is inaccessible and requires no management intervention, there is a need for additional resources to improve the effectiveness of tourism regulation, community outreach, visitor interpretation, ecological monitoring and alien plant control (IUCN, 2013).

► Implementation of Committee decisions and recommendations

Data Deficient

As the property was inscribed as recently as 2013 there has not yet been any follow-up to the committee's decisions and recommendations at the time of inscription.

► Boundaries

Highly Effective

The boundaries of the nominated property fall within the Namib-Naukluft Park, encompassing about 60% of the Park. They have been carefully designed to embrace as much as possible of the pristine sand sea habitats within the park, whilst excluding areas of the park that might be subject to future mining, abstraction of water or high-impact tourism activities (such as recreational quad-bike use etc). The boundaries of the property follow natural features where possible, using the coast-line to define the western boundary, and the Kuiseb River as its northern boundary (excluding a section near its mouth where water abstraction is likely). Meanwhile, the eastern and southern boundaries are simply 'lines in the sand', designed to allow an area of sufficient size outside the property (but still within the park) to be allocated for uses that may not be compatible with world heritage status. The property is surrounded by a buffer zone of variable width along its northern, eastern and southern boundaries. This buffer zone (8 995 km2) lies entirely within the Namib-Naukluft Park, and its eastern and southern boundaries extend to the boundary of the park. Furthermore, the eastern boundary of the park borders on large-scale private land-holdings that are increasingly given over to tourism, game-ranching and other land-uses that

enhance the ecological viability of the wider landscape. These private properties serve effectively as a useful ‘outer buffer zone’ (although this is not formally recognised or supported by legislation) (IUCN, 2013).

► Sustainable finance

Some Concern

There is no specific budget or dedicated staffing for the NSS, but the Namib-Naukluft Park receives an annual operational budget allocation equivalent to about US$ 850,000 and has a permanent staff of 28. Additional government funds may be allocated for capital expenditure within the park according to specific needs. Although this level of funding is barely adequate for a park of this size, it remains relatively stable and has been increased progressively over the past five years (IUCN, 2013).

► Staff training and development

Data Deficient

There is no specific information on staff training and development, but the Gobabeb Training and Research Centre (situated at the edge of the property) plays an indispensable role in training for monitoring and ecological management.

► Sustainable use

Mostly Effective

The indigenous Topnaar community, now living in scattered settlements along the Kuiseb River, has used the land and resources of the NSS for centuries (IUCN, 2013). They are a nomadic people who have traditionally moved to new areas within their forbidding landscape as dictated by changing conditions and resource availability. Today, many of their traditions are being lost, and most of their settlements are occupied by the old and young, as most adults of working age opt for paid employment in nearby centres.

► Education and interpretation programs

Some Concern

Whilst there has been some outreach activity with local communities, no

visitor interpretation facilities have been provided. This was identified as a priority by the IUCN evaluation team (2013), to foster an appreciation of the unique values of the site.

► Tourism and interpretation

Some Concern

Tourism is developing much faster than the capacity to manage it. In 2011 there were more than 135,000 visitors (focused primarily on the Sesriem/Sossusvlei area), supported by a network of approximately 60 tourism lodges on private land outside the property. The Directorate of Regional Services and Parks Management has only 28 staff whose responsibilities include conservation, monitoring and law enforcement (e.g. adherence to speed limits, control of off-road driving, flying heights, camping restrictions, waste management, etc) and revenue collection. In addition to heavy daily visitor traffic to the SossusVlei and Sandwich Harbour areas, there are 7 active 4x4 concessions which allow convoys of vehicles to make multi-day traverses of the NSS with overnight camping at stipulated sites. These convoys are rarely accompanied by law-enforcement officials due to lack of staffing. Impacts from tourism need to be vigilantly monitored, and a plan to mitigate impacts and improve visitor experiences urgently needs to be developed and implemented. Additional resources are needed to enhance management and enforce existing controls.

► Monitoring

Some Concern

Some monitoring of biophysical and ecological parameters (e.g. rainfall, temperature, humidity, fog, vegetation, invertebrate, mammal and bird populations) has been undertaken at the Gobabeb Training and Research Centre since 1962. However processing of data to inform management planning and decision making has been sporadic and uncoordinated (NNCWH, 2012). The nomination dossier identifies 23 key indicators for measuring the state of conservation of the property, classified into management, human use, geographical and ecological indicator categories (NNCWH, 2012).

► Research

Highly Effective

The Gobabeb Training and Research Centre has established a unique record of fundamental research results spanning more than 50 years and providing extraordinary insights into the adaptations of plants and animals to life in the fog-desert and associated ecological processes. This portfolio of research results is unique at a global scale and the facilities at the Gobabeb Centre should ensure that this body of knowledge and information can be further developed and enhanced.

Overall assessment of protection and management

Mostly Effective

The majority of this vast uninhabited desert survives in a largely undisturbed state due to the extreme prevailing conditions and difficulty of access. The few areas that are readily accessible are located close to the edge of the site where visitor accommodation (and most critically, water) can be provided. So, despite very low levels of management intervention the unique ecological values of the site remain largely intact and pristine. Management of tourism, especially around Sossusvlei and the Sesriem area (where three quarters of the park’s visitors are concentrated) presents some challenges, and there is a need to enhance management capacity and visitor management in this area particularly.

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

Mostly Effective

There is limited management capacity to address threats arising outside the site, although some community outreach is undertaken to regulate use of key resources around the fringes of the property, particularly by the Topnaar communities living along the Kuiseb River. Alien plants are carried into the property by seasonal rivers and there is little capacity to control them either at source (outside the property) or within it. Self-regulation by established tourism operators visiting the site is largely effective, but there is nevertheless significant disturbance to some ‘visitor hotspots’ resulting from

unregulated tourism activities.

State and trend of values

Assessing the current state and trend of values

World Heritage values

▶ **World's only coastal desert with extensive dune fields influenced by fog**

Good
Trend:Stable

The biophysical conditions and phenomena which have created this unique desert environment – erosion, cold ocean currents and wind – are a stable characteristic of this region that are unlikely to be influenced in a major way by human activities (Pers. obs., 2013).

▶ **Massive dunes made of sand transported from afar**

Good
Trend:Stable

The three-phase transport system which brings material from the interior of southern Africa by river, ocean current and wind is an ongoing phenomenon which operates at such a scale that it is unlikely to be affected by human activity (Pers. obs., 2013).

▶ **Diversity of dune formations**

Low Concern
Trend:Stable

The diversity of the dune formations is primarily the result of the interactions of the biophysical conditions, wind and terrain across the property and whilst the dunes are in a continual state of flux, the complexity of the dune systems (16 dune types are recognized, NNCWH, 2012) is likely to persist. There is a possibility that damming of the inflowing seasonal rivers outside the property could prevent the periodic flood events that maintain the dune characteristics of areas such as Sossusvlei, which would affect a small but

crucial area of the property.

▶ Plant and animal adaptations to desert conditions

Good
Trend:Stable

Plant and invertebrate species of the site exhibit unique adaptations to life in this fog desert. Their size, population size and geographical range over vast areas of the desert ensure their resilience to possible local environmental perturbations or disturbance.

▶ Rare and endemic species, particularly invertebrates

Good
Trend:Stable

The rare and endemic species of the Namib Sand Sea are mostly small invertebrate and plant species with large viable populations spread over a wide area of desert. Although they could be vulnerable to the effects of climate change, there is no evidence of any immediate threat to these unique species.

Summary of the Values

▶ Assessment of the current state and trend of World Heritage values

Good

Trend: Stable

The Outstanding Universal Value of the Namib Sand Sea is the result of complex geological, biophysical and ecological interactions that have resulted in the evolution of unique plant and animal species that are especially adapted to life in a fog-bathed dry desert. The prevailing biophysical conditions occur at such a scale as to be largely unaffected by human activity, and the extraordinary natural beauty of the place, with its ever-changing dune formations, is maintained by the perpetual strong winds. Thus the geological, ecological, biodiversity and aesthetic values of the site are well conserved and in a stable condition.

Additional information

Key conservation issues

▶ Establishment of a monitoring programme

Local

There is a need for a long-term programme to monitor key ecological and management effectiveness indicators and the State of Conservation of the property.

▶ Strengthening management capacity and programmes

Local

Staffing levels, equipment and resources for management need to be increased to enable more effective regulation and management of the site, particularly in relation to community outreach, tourism management and alien plant control.

▶ Water resource assessment and management

Local

An assessment of the subterranean and surface water resources in and around the catchment of the property needs to be carried out and a plan for their management which protects the attributes of the site, especially the estuarine system at Sandwich Harbour and the seasonal inflows of the Kuiseb, Tsondab, Tsauchab and Koichab rivers into the property and its buffer zone needs to be prepared.

▶ Recognition of community rights

Local

There is a need to formally acknowledge the rights of the Topnaar local communities to access and use certain renewable natural resources within the property and its buffer zone, and establish the necessary implementation arrangements

▶ Tourism management and visitor interpretation

Local

Enhanced arrangements for the identification, allocation, management and monitoring of tourism concessions and improved visitor interpretation facilities to foster an appreciation of the unique values of the property are needed.

Projects

Compilation of active conservation projects

№	Organization/ individuals	Project duration	Brief description of Active Projects
1	Gobabeb Research and Training Centre		Numerous initiatives concerned with fundamental research on desert species, ecological monitoring etc

REFERENCES

№	References
1	Decision 37COM 8B.8.
2	IUCN (2013). World Heritage Nomination – IUCN Technical Evaluation. Namib Sand Sea (Namibia)
3	Namibia National Committee for World Heritage (NNCWH) (2012). Namib Sand Sea World Heritage Nomination
4	Seely, M and J. Pallett (2012). Namib. Secrets of a Desert Uncovered. Windhoek: Venture Publications