

# Namib Sand Sea

## 2020 Conservation Outlook Assessment

### SITE INFORMATION

**Country:** Namibia

**Inscribed in:** 2013

**Criteria:** (vii) (viii) (ix) (x)



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.

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### SUMMARY

#### 2020 Conservation Outlook

Finalised on 01 Dec 2020

**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 and therefore resilient to threats. There are virtually no roads or facilities of any kind within the property. 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 are secure. Limited deposits of alluvial diamonds along the coastal plains have been exploited in the past, however site has now been withdrawn from any mineral prospecting. Today the area is protected within the management framework of 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. NSS is not managed in isolation but in the context of the integrated management system of conservation areas and wildlife resources under the Ministry of Environment, Forestry and Tourism. Visitor facilities and information have been improved, however there are management challenges on monitoring tourism and ecological activities, and controlling episodic occurrences of alien species after large flood events in the seasonal rivers. The relocation of the Head Office of Namib Naukluft Park to Sesriem, along with a number of key staff will no doubt improve several aspects of management through increased on-site management presence. The revision of the NNP management plan, due to be completed in 2020, is also

welcome progress towards addressing some of the issues highlighted in this assessment, including the development of a Tourism Development Plan and Namib Sand Sea WH site management plan (to be incorporated in the NNP management plan as annexures), participatory management arrangement with indigenous people, addressing natural resource exploitation and biodiversity conservation.

## FULL ASSESSMENT

### Description of values

#### Values

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##### World Heritage values

► **World's only coastal desert with extensive dune fields influenced by fog** **Criterion:(viii)**

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, endorheic 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 (World Heritage Committee, 2013; IUCN, 2013).

► **Massive dunes made of sand transported from afar** **Criteria:(vii)(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 (World Heritage Committee, 2013).

► **Diversity of dune formations and natural beauty** **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 (World Heritage Committee, 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 (State Party of Namibia, 2013; IUCN, 2013).

► **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 (World Heritage Committee, 2013; IUCN, 2013).

► **Rare and endemic species** **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 (State Party of Namibia, 2013; IUCN, 2013).

## Assessment information

### Threats

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#### 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 high pressure from tourism where 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 and pet animals brought by inhabitants. The implementation of a Tourism Development Plan, participatory management arrangements with indigenous people and resident communities, and removal of alien species will help to ameliorate the threats. NAMPARKS V has purchased a pit latrine, which will be installed at Dune 45 as a trial by Zais staff members to improve on sanitation issues.

#### ► Invasive Non-Native/ Alien Species

Low Threat

*(Invasive alien species)*

Inside site, localised(<5%)  
Outside site

There are some invasive plants and animals, including 11 species of plants, 1 fish, 2 birds, 2 mammals and 12 invertebrate species noted by the State Party in the nomination dossier. Most of the invasive species are either plants carried into the property by ephemeral rivers or feral populations (Ministry of Environment and Tourism, 2013a), but only in very small parts of the buffer area (<5%), and in worst cases transient within the site. The Ministry of Environment, Forestry and Tourism (MEFT) has developed a programme that monitors and opportunistically eradicates undesirable and feral population of alien species (Ministry of Environment and Tourism, 2013a). MEFT, Namib Naukluft Park (NNP) staff members use steel capture cage to eradicate feral cats at Sesriem in the buffer zone. Further plans include active eradications and native plant nurseries (IUCN Consultation, 2020).

#### ► Tourism/ Recreation Areas

Low Threat

*(Disturbance from tourism)*

Inside site, widespread(15-50%)  
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. For example, there has been a recent notable increase in low-flying aircraft, often below authorised flight levels, which are widespread and affects large parts of the park usually inaccessible to visitors (vulture breeding colony; Ramsar site and seabird breeding colonies; particular scenic areas) (IUCN Consultation, 2020). Proposals to develop a tethered balloon at one of the most scenic and highly visited tourist spots at Sossusvlei, and the development of a new lodge within the buffer area at Sesriem, neither of which included consultation with the management of the property or were based on prior desk evaluation of impacts on scenic or environmental OUVs, have been granted ministerial permission (IUCN Consultation, 2020). The Namib Naukluft Park (NNP) integrated management plan is underway, under the NamParks Programme (Phase V) through KfW funding (German Development Bank), which will be implemented in January 2021. Tourism Development Plan and Namib Sand Sea management plan will be incorporated into the NNP management plan as annexures. The Tourism Development Plan will address carrying capacities and affordable access for Namibians, better interpretation and education facilities at Sesriem, improve provision of relevant information materials to increase visitor appreciation, improve waste disposal procedures, better regulation of aerial flying heights and introducing no fly zones and improve training and registration of guides.

The new NNP headquarters to be built at Sesriem, including the stationing of a number of wardens and rangers will strengthen law-enforcement efforts (IUCN Consultation, 2020). Tourist control measures will

be enforced on a high level, and during peak seasons other NNP staff members from Zais and Ganab stations will be called in for reinforcement. The current risks posed are manageable e.g. dune climbing which is naturally rehabilitated by wind. There are only four dunes allowed by MEFT for tourist utilization, Dune 45, Big Daddy, Big Mamma and Sossusvlei, Dune 40 will be added in future to relief stress from Dune 45. New visitor information sign boards has been erected at Sesriem entrance gate. MEFT experiences financial constraints but the property is well managed with available limited funds and staff member capacity has been improved (MEFT,2020).

There are discussions under way to limit the number of visitors to Sossusvlei through the introduction of a daily quota. Stricter measures will also be introduced such as: preventing permits of non-complying 4x4 tour operators to be renewed; active 4x4 tour operators who are not adherent to their permit conditions to be banned from operating within the site and the entire Namib Naukluft National Park. An online booking system for sightseeing will also be introduced to improve visitor access and to aid monitoring.

► **Hunting and trapping, Fishing / Harvesting Aquatic Resources**

*(Hunting, fishing and resource harvesting and use by local communities)*

**Low Threat**

Inside site, localised(<5%)

Outside site

The Topnaar community living in scattered villages along the Kuiseb River (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 (about 222 cattle, 939 goats, 154 donkeys, 71 sheep; Ministry of Agriculture, Water and Forestry, 2018) 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 outside the boundaries of the site for animals that are shot by Ministry staff for distribution among community members. Illegal hunting by community members and other residents along the northern fringe, as well as their visitors, occur sporadically and hunting of game predominantly Oryx and Zebra within Namib Naukluft Park, supplying game meat to coastal towns of Walvisbay and Swakopmund has been observed following the outbreak of the COVID-19 pandemic (IUCN Consultation, 2020). MEFT and police officials patrol and occasionally when they have adequate proof for prosecution through the legal system (IUCN Consultation, 2020). In order to promote conservation and sustainable natural resource management and socio-economic development the Ministry of Environment and Tourism developed a National Policy on Protected Areas' Neighbours and Resident Communities (Ministry of Environment and Tourism, 2013a,b; Namibia, 2015). The policy provides guidelines on the involvement of neighbours and resident communities in protected area management and benefits thereof, while at the same time recognizing the need to promote biodiversity conservation. The property predominantly consists of sand dunes and only the coastline is viable for fishing, however fishing within the property is prohibited. The other waterbody found within the property is Sandwich Harbour Ramsar Site, where no fishing is taking place. No aquatic resources are harvested at the property. There remains heaps of mussel shells along the coastline, which clearly indicate that the coastline was utilized by ancient Beach Dwellers (MEFT, 2020). The number of households per settlement varies greatly: each settlement may have between five to 25 residents in up to 15 households (Mortimer, D.J. et al, 2016). The literature review revealed that the Topnaar population living in the Kuiseb valley has fluctuated over the years, which is in part due to the high degree of mobility between Walvis Bay and the settlements along the river (Mortimer, D.J. et al, 2016, Werner, 2003). Also, some people might be registered at a settlement in order to receive drought relief or to keep livestock there while they are residing most of the time in Walvis Bay (Dieckmann, U. et al, 2013). The latest communication from the Office of the Prime Minister indicates that the current estimated number of Topnaar households living along the Lower Kuiseb River is 135, with up to five members per household (IUCN Consultation, 2020).

**Potential Threats**

**Low Threat**

Increased upstream use of water resulting in a reduction in the seasonal flow that will affect riparian woodlands along watercourses is always a potential threat in the arid climate in which the site is located. The threat of mining has been significantly reduced as a result of legally withdrawing the property from

prospecting so that no more licenses can be issued. The greatest potential threat is from poorly considered and poorly managed tourism development, noted in the current threats but also discussed under potential threats on the basis of potentially unsustainable growth of the tourism market. There is a high demand for new tourism ventures within the buffer area and property itself such as accommodation; infrastructure such as tethered balloons at frequently visited places; an increase in low-altitude scenic flights; additional tourism concessions to communities with no historical cultural links to the property; concessions to exploit very sensitive wildlife refuges and terrains; and poorly supervised and managed activities at over-tourism sites such as Deadvlei, Sossusvlei, Sandwich Harbour, and other places. A tourism management and development plan should be a high priority.

► **Mining/ Quarrying**

*(Mining and mineral exploitation)*

**Low Threat**

Inside site, extent of threat not known  
Outside site

Although there remain no active mining operations within the site, 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. Notwithstanding that the Langer Heinrich and Husab uranium mines to the north of property are operational, the mines are located far away from the property to an extent that their activities will have no impact on the property (Namibia, 2016; Mining Review Africa, 2009; Jamasmie, 2015). Despite discoveries of uranium on gravel plains north of the property, as well as quarries of dimension stone and salt mining licences on the periphery of the buffer zone, the prospects for significant new finds of any high value minerals such as diamonds or uranium within the site are considered limited. In recognition of this, as well as the incompatibility of mining and World Heritage Sites the State Party made an undertaking of cancelling existing Exclusive Prospective Licenses (EPLs) 4323 and 4324, whose renewal by custodian Ministries (Ministry of Mines and Energy and Ministry of Environment and Tourism) was a procedural oversight, and no other EPLs are currently active (Namibia, 2016).

► **Dams/ Water Management or Use**

*(Water extraction)*

**Low Threat**

Outside 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 will be used. Presence of trees such as *Faidherbia Albida* and *Acacia Erioloba* in high numbers in Kuiseb River valley may alter the ecology of the Ramsar-designated wetlands at Sandwich Harbour (IUCN Consultation, 2020), as well as other attributes of the site. These potential threats are reported to be under consideration in the Integrated Park Management Plan. Developments that are likely to impact the property must be subject to rigorous Environmental Impact Assessment (EIA) and mitigation procedures specifically evaluating potential and likely effects on the attributes of the property, which the current legislation and regulations regarding environmental management and evaluation of EIAs do not address. An increase in lodges around the property may also drain the subterranean aquifers. However currently they are confined to areas well outside the buffer area. The only aquifer in the buffer area from which water are notably extracted for tourism are in the upper Tsauchab around the Sesriem area, but none of the water from that aquifer supports ecological systems in the site. None of the ephemeral rivers have dams that affects the flood-dependent riparian woodland systems. Overall, water extraction is not posing an imminent threat to the attributes of the property as the property predominantly rely on moisture from fog inflow from the Atlantic ocean.

**Overall assessment of 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 prohibited by the State Party. There remains a threat of ecological change along the

few seasonal rivers and at sandwich harbour 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. The implementation of a Tourism Development Plan and the National Policy on Protected Areas' Neighbours and Resident Communities will assist to reduce threats.

## Protection and management

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### Assessing Protection and Management

#### ► Management system

Mostly Effective

The property is state-owned land and lies within the Namib-Naukluft Park. It is managed by the Ministry of Environment, Forestry 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. The Management Plan of the Namib Sand Sea, which was finalised in 2014 addresses issues such as conservation, research, monitoring, tourism, enforcement, education, traditional practices and cultural heritage within the context and aspirations for national and regional development (Management Plan for NSS World Heritage Site 2014). The property has a zonation map which illustrates the operational management zones. The management plan is in the process of being reviewed and updated, with several meetings already having taken place, for finalisation during 2021.

#### ► Effectiveness of management system

Mostly Effective

Although the Namib Sand Sea is not being managed as a distinct unit, it benefits from the flexibility of having access to a large potential resource base. Conservation areas and wildlife resources in Namibia are managed through integrated mechanisms that allows optimal use of manpower and financial aspects (Management Plan NSS World Heritage Site 2014). The financial and human resources available for management have previously been insufficient to undertake the range of tasks required for effective management. Whilst most of the area is inaccessible and requires no management intervention, a need for additional resources to improve the effectiveness of tourism regulation, community outreach, visitor interpretation, ecological monitoring and alien plant control was identified in the nomination evaluation report for the site (IUCN, 2013). The now outdated Namib Naukluft Park management plan 2013–2018 is effective and still in use at the time of this assessment. However, an evaluation of this management plan was undertaken in February 2020, and the Integrated Namib Naukluft Park management plan is under development, in which a Tourism Development plan and Namib Sand Sea WH site specific management plan will be incorporated in the NNP management plan as annexures (IUCN Consultation, 2020).

#### ► 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 km<sup>2</sup>) 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).

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

Management of the property is well integrated with regional and national planning systems. The NSS 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.

► **Relationships with local people** **Some 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 WH property. The Topnaar community wants to gain formal recognition of ancestral rights to land and resources for the protection of community culture and unrestricted access to Topnaar cultural sites as well as rights in order to benefit from tourism. The national policy on protected areas and neighbours/residents allows for consultation, benefit sharing, right to practice cultural customs etc. within the framework of national laws and regulations. Dorob Namib Naukluft and Topnaar. Stakeholder relationships and appropriate participatory management is taking shape with technical assistance (MEFT, 2020), albeit reportedly at a slow pace (IUCN Consultation, 2020). The MEFT, in its Strategic Plan, has embraced the exploration of co-management approaches to landscapes and biodiversity conservation across different land tenure systems with different land owners or custodians. The envisaged outcomes include the establishment of co-management committees with neighbours to promote (a) conservation and sustainable natural resource management and (b) socio-economic development. Co-management approaches across contiguous landscapes will promote more effective landscape and biodiversity conservation across a diversity of land uses. In 2019, the Community Park Management Collaborative Committee (DNNTC) was formed to include Indigenous Topnaar Communities in decisions making regarding Namib Naukluft Park, including Namib Sand Sea World Heritage Site and Dorob National Park, including 3 Topnaar Traditional Authority representatives; 2 Topnaar Concession Trustees; a representative of the Topnaar Women's desk; one member of the Farming community and one ordinary community member (MEFT, 2020). Various agreements have been reached between the MEFT and the traditional authority. These include access to tourism opportunities through the allocation of concessions, an annual wildlife utilization quota, and accepting the need for the Topnaar community to continue their traditional subsistence and lifestyle practices within the context of national development (Management Plan NSS World Heritage Site 2014).

► **Legal framework** **Some Concern**

The property is wholly state-owned, managed by the Ministry of Environment, Forestry and Tourism (MEFT), and is subject to specific regulations regarding use. Vast areas of the Namib Sand Sea have been legally protected and restricted for a long time, some of which has been protected since 1907 (Management Plan NSS World Heritage Site 2014). The management system is designed to conform to the relevant rules and regulations, e.g. the Public Service Act, the State Finance Act, the National Planning Act, the Labour Act, and other relevant laws that governs how public officials manage state assets. The procedural components of the management system furthermore comply with legal instruments and policies designed specifically for environmental conservation, inter alia the Nature Conservation Ordinance, the Environmental Management Act, the Tourism Act, the Concessions policy, and the Lands policy. The management approach to the Namib Sand Sea conforms to the policies and procedures of the Government of the Republic of Namibia as advised by the Office of the Prime Minister. It consists of an integrated system of strategic (long-term), operational (medium-term), and activity (annual) planning.

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 property 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). Whilst none of the existing legislation have specific mandate that provides the level of protection required to guarantee the future integrity of the property, particularly in respect of mining, tourism and community rights, a Tourism Development Plan was commissioned and a National Policy on Protected Areas' Neighbours and Resident Communities and the recent formation of the Community Park Management Collaborative Committee (DNNTC) has addressed threats from tourism, indigenous peoples' concerns and biodiversity conservation. Although some 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, the State Party has cancelled the two EPLs that are currently running and has guaranteed that no similar activities will occur inside the boundaries of the site in future (IUCN Consultation, 2020). That being the case there is still need to promulgate laws or policies that regulate mining, water abstraction and sustainable resource use in protected areas including the World Heritage property leading to (a) the permanent cessation of all mineral prospecting and mining, (b) sustainable water extraction and (c) the recognition of indigenous community rights and their accommodation within the management of the property. There is no law in Namibia that prohibits prospecting and mining within World Heritage properties, so the legal protection needs to be strengthening by incorporating this into the legal framework.

► **Law enforcement**

**Mostly Effective**

Unlawful activities such as illegal use of wildlife and other natural resources as well as visitor transgression of regulations intended to minimize impacts on the ecosystem are rare (Management Plan NSS World Heritage Site 2014). The Ministry of Environment, Forestry and Tourism collaborates with Ministry of Fisheries and Marine Resources, Namibian Police and Ministry of Justice to combat crime. Conservation officials carry out law enforcement patrols and surveillance in order to maintain compliance with regulations and laws in regards to such issues like speed limits, off- road driving, flying heights, camping restrictions and management of waste. The construction of the Namib Naukluft Park headquarters at Sesriem will strengthen law enforcement activities on behalf of the management authority. Tourist control measures will be enforced on a high level, and during peak seasons other NNP staff members from Zais and Ganab stations will be called in for reinforcement. Namibian Police stationed at Sesriem plays a vital role in enforcing the law. There is visible decrease in off-road driving (MEFT 2020). Unlawful activities such as illegal use of wildlife and other natural resources as well as visitor transgressions of regulations intended to minimize impacts on the ecosystems, are currently rare (IUCN Consultation, 2020). Information on crime records was not provided hence the effectiveness of law enforcement cannot be assessed.

► **Implementation of Committee decisions and recommendations**

**Mostly Effective**

Pursuant to requests from the World Heritage Centre (IUCN, 2013) the State Party finalized and submitted the Management Plan NSS World Heritage Site, addressed issues relating to termination of mining, participatory management arrangements with indigenous people, visitor interpretation facilities, monitoring programmes, tourism concessions and alien species (State Party of Namibia, 2015). The zonation map was submitted and clarification of Husab uranium mining and Mining Cadastre Portal were provided. However strengthening management capacity and support to Gobabeb- Namib Research Institute have not yet been addressed.

► **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 (Deichmann et al., 2013). The traditional harvesting of !Nara fruit has been transformed into an open access system where everyone is in competition for the fruit due to commercialization, which causes distrust between members of this community and their traditional authority (Deichmann et al.,

2013). Although participatory management arrangements with the indigenous people have been put in place the impact of commercialization of !Nara fruit need to be monitored

► **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 capacity, training, and development**

**Some Concern**

Although information on the staff profile is not available visitor guides and tour operators are poorly trained and often ignorant in specific aspects relating to Namib Desert (Management Plan NSS World Heritage Site 2014). Gobabeb – Namib Research Institute has initiated such training and developed a dedicated Namib Sand Sea training guide. Added responsibilities relating to monitoring and ecological management in line with the implementation of the Management Plan, a Tourism Development Plan and implementation of the Protected Area, Indigenous and Resident Communities Policy may require further staff training and development as well as the new Integrated Management Plan which is currently under development for the site. Gobabeb has initiated induction courses on the NSS environment and ecological process for staff as planned (Management Plan NSS World Heritage Site 2014).

The Ministry of Environment, Forestry and Tourism do train their staff members on park management but tourism sector section is not wholly covered. Park staff are not involved in guiding activities but do implement the park management plan and enforce Nature Conservation Ordinance, 4 of 1975. In 2016, a law enforcement Training School was built at Waterberg Plateau Park, Namibia to cater for training needs for MEFT staff members as well as other ministries and private organizations that have interest in wildlife protection, particularly keystone species e.g. Rhinos. The school is also available for other training needs for MEFT staff members.

► **Education and interpretation programs**

**Mostly Effective**

Since inscription in 2013 notable improvements on information and interpretation of NSS have been achieved (State Party of Namibia, 2015). Visitor interpretation facilities were established at Sesriem and Sossusvlei, information on Namib Sand Sea is available at Sesriem at the Namib Wildlife Resorts, a plaque about the NSS World Heritage Site has been placed to the entry to the site, banners about the site are on the walls of the Headquarters of the Ministry of Environment, Forestry and Tourism and are also made available at tourism and public events (Report on the state of conservation NSS World Heritage Site 2015). Gobabeb has further developed a range of outdoor information signs to be distributed appropriately. Visitor guides and tour operators are poorly trained and often ignorant in specific aspects relating to Namib Desert (Management Plan NSS World Heritage Site 2014), however Gobabeb has initiated improved training of tour guides from the local Topnaar community and some hospitality centres. Further training of guides and tour operators at local and national levels is required. Gobabeb has also developed specific outreach programmes like indigenous people, schools and university students to increase knowledge and appreciation of the property. There are reports that the new Tourism Development Plan, which will be captured within the revised Management Plan for the property, will include the development of better interpretation and education facilities.

► **Tourism and visitation management**

**Some Concern**

Until the global COVID-19 pandemic in 2020, tourism to the property was reported to be increasing 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 site. By 2019 those numbers have more than doubled without a concomitant increase in staff and management resources (IUCN Consultation, 2020). The Directorate of Wildlife and National 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 and appropriate equipment and financial allocations, especially transport to cover such a vast area adequately. There are reportedly plans for the introduction of new measures to address potential threats from increasing tourism through the introduction of daily visitor quotas to Sossusvlei, and having stricter measures for tour operators (IUCN Consultation, 2020).

Visitor interpretation facilities were established at Sesriem and Sossusvlei, information on NSS is available at Sesriem at the Namib Wildlife Resorts, a plaque about the NSS World Heritage Site has been placed to the entry of the site, banners about the site are on the walls of the Headquarters of the Ministry of Environment, Forestry and Tourism and are also made available at tourism and public events (State Party of Namibia, 2015). Outdoor information boards have been developed by Gobabeb for appropriate deployment at frequently visited locations (IUCN Consultation, 2020). A Tourism Development Plan for Namib-Naukluft Park was commissioned to enhance the identification, allocation, management and monitoring of tourism concessions (State Party of Namibia, 2015), but did not adequately explore options for optimising use but rather recommended diversification which would have further challenged adequate management. Despite the improvement in visitor facilities and management of tourism concessions there is need to monitor the impacts from tourism and introducing appropriate mitigation measures. Additional resources are needed to enhance management and enforce existing controls. The property is heavily understaffed so there is a need to address this issue in the face of increasing tourism.

► **Monitoring**

**Some Concern**

Some monitoring of biophysical and ecological parameters (e.g. rainfall, temperature, humidity, fog, vegetation, invertebrate, mammal and bird populations) are undertaken by Gobabeb, and have been 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 (NSS World Heritage nomination dossier, 2012). So far, the only programme of key ecological and management effectiveness has been the introduction of the Incident Book Monitoring System (Report on the state of conservation NSS World Heritage Site, 2015). Short- and long-datasheets are archived at Gobabeb which is situated within the area and with its reputation on research and monitoring is ideal host for collating, curating, analysing and disseminating data and information from monitoring (Management Plan NSS World Heritage Site, 2014). A research collaboration agreement between MEFT and Gobabeb, awaiting signature, will provide a framework under which joint monitoring/management initiatives can be developed (IUCN Consultation, 2020).

► **Research**

**Highly Effective**

Gobabeb – Namib Research Institute 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. A full bibliography of all scientific papers and theses emanating from Gobabeb is made available annually. Gobabeb is also spearheading the training of visitor guides and tour operators as well as the translation of research results into accessible information for the lay person. It is fundamental that research results inform management planning and guide the formulation of subsequent research (Management Plan NSS World Heritage Site 2014). Annual budgets should also make provision for research and support Gobabeb, particularly for the organising, capturing and cross referencing of research data and results.

## 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. 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. The construction of the head office to Sesriem along with the relocation of a number of staff will significantly aid these management processes on site.

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

Mostly Effective

Natural resources exploitation, invasive species, tourism, mining and water abstraction pose external threats to the property. 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. The Ministry of Environment, Forestry and Tourism should consistently engage relevant ministries over the issues of mining and water extraction

### ► Best practice examples

Gobabeb - Namib Research Institute is a positive example of a public-private partnership arrangement to incubate and promote bespoke research and training, where the infrastructure and some support is provided through public channels, while academic excellence in research and training is ensured by civic engagement and independent project management and implementation. In 2019 Dorob Namib Naukluft and Topnaar Community Park Management Collaborative Committee (DNNTC) was formed to include Indigenous Topnaar Communities in decision-making regarding Namib Naukluft Park, including Namib Sand Sea World Heritage Site and Dorob National Park.

## 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 geological and geomorphological (erosion, transportation, deposition, sand particles) and climatic (ocean currents, winds, fog) setting and processes have been stable over several millennia (State Party of Namibia, 2013). Such a compact and resilient system can withstand human influence (IUCN Consultation, 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 has been in existence for more the 5 million years (State Party of Namibia, 2013). The long period of existence, large scale of the system and in accessibility of most of the area make human influence insignificant. Natural disturbances like climate change remain indeterminable.

► **Diversity of dune formations and natural beauty**

**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; State Party of Namibia, 2013) 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. Most remarkably plants and animals have developed highly distinctive morphological, physiological and behavioural adaptations to condense and harvest fog as a primary source of water in this hyper-arid environment (IUCN, 2013). 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**

**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 (State Party of Namibia, 2013). 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

### Benefits

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#### Understanding Benefits

► **Legal subsistence hunting of wild game**

The indigenous Topnaar community, who live in the northern fringes of the property along the Kuiseb River, has used the land and resources of the NSS for centuries (IUCN 2013). Occasional legal hunting of wild game occurs by MEFT staff and is shared amongst local communities.

Factors negatively affecting provision of this benefit :

- Overexploitation : Impact level - Low

#### ► **Collection of wild plants and mushrooms**

The indigenous Topnaar community, now living in scattered settlements along the Kuiseb River, has used the land and resources of the NSS for centuries. Their livelihoods depend on exploitation of the area's natural resources which includes harvesting of wild fruits, notably wild !nara melon.

Factors negatively affecting provision of this benefit :

- Overexploitation : Impact level - Low, Trend - Increasing

#### ► **Livestock grazing areas**

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). Their livelihoods depend on exploitation of the area's natural resources and including subsistence farming (rearing animals and gardening). They keep livestock along the Kuiseb River which is estimated to be around 222 cattle, 939 goats, 154 donkey and 71 sheep (Ministry of Agriculture, Water and Forestry, 2018).

Factors negatively affecting provision of this benefit :

- Overexploitation : Impact level - Low, Trend - Increasing
- Habitat change : Impact level - Low, Trend - Increasing

#### ► **Access to drinking water**

The indigenous Topnaar community, who live in scattered settlements along the Kuiseb River, has used the land and resources of the NSS for centuries (IUCN 2013). Traditionally water for livestock and the Topnaar community was derived from dug out wells from the Kuiseb River. More recently supplies had been replaced by boreholes and taps on the pipeline which are provided by the government on a fee (Management Plan NSS World Heritage Site 2014)

Factors negatively affecting provision of this benefit :

- Overexploitation : Impact level - Low

#### ► **Wilderness and iconic features**

The sheer size of the property with its forbidding conditions and popular destinations like Sossusvlei coupled with good planning, zonation, management and collaboration between conservation and tourism sectors has a potential for a high quality eco-friendly experience that includes inter alia wilderness value (Management Plan NSS World Heritage Site 2014).

Factors negatively affecting provision of this benefit :

- Habitat change : Impact level - Moderate, Trend - Increasing

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

Visitors to NSS enjoy the outcome of marvellous geological and ecological processes that are at play. The diversity of dune formation (16 distinctive dune types) in NSS creates a spectacular dunescape with a unique interplay of shape, colour, movement and habitat (SoOUV, IUCN 2013). In addition to the geological and geomorphological processes the property has unique ecological processes resulting in physiological, morphological and behavioural adaptations of flora and fauna.

Although statistical information is lacking tourism at NSS particularly at Sesriem and Sossusvlei has shown a tremendous exponential growth (NSS World Heritage nomination dossier 2012). In support of the influx of tourists a network of approximately 60 tourism lodges on private land outside the property were developed (IUCN 2013).



Factors negatively affecting provision of this benefit :

- Pollution : Impact level - Moderate, Trend - Increasing
- Overexploitation : Impact level - High, Trend - Increasing
- Invasive species : Impact level - Low, Trend - Continuing
- Habitat change : Impact level - Moderate, Trend - Increasing

► **Importance for research,  
Contribution to education**

Gobabeb- Namib Research Institute is globally recognized for its excellence in research on desert environment as it has established a unique record of fundamental research results spanning over 50 years (IUCN 2013). The research outputs from Gobabeb assist in understanding the climatic, geological and ecological processes at NSS, Namib Desert in general and its conservation at all levels (NSS World Heritage nomination dossier 2012, IUCN 2013, Management Plan NSS 2014). Through Gobabeb, NSS offers opportunities for students from various tertiary institutions to do diploma and undergraduate research projects that contribute to the understanding of desert environment and its conservation for the benefit of future MEFT staff.

Factors negatively affecting provision of this benefit :

- Overexploitation : Impact level - Low

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

Although statistical information is lacking, tourism in the NSS, particularly at Sesriem and Sossusvlei has shown a tremendous exponential growth (Namibia, 2012). The increase in tourist arrivals at NSS translates into increase in tourism receipts.

For the purpose of management, conservation, monitoring ecological and tourism activities, and outreach programmes, 28 staff were assigned to NSS. In tandem with the increase in tourists, tourism infrastructure including 60 lodges on private land was developed (Namibia, 2012). Although information on the number of jobs created through tourism activities is not available, tourism creates jobs at local, regional and national levels.

Factors negatively affecting provision of this benefit :

- Overexploitation : Impact level - Low, Trend - Decreasing
- Habitat change : Impact level - Low, Trend - Increasing

## **Summary of benefits**

The indigenous Topnaar community residing in scattered settlements along the Kuiseb River in fringes of the northern boundary of the property derives the following benefits from the NSS: pastures for their animals, water for the livestock and people, hunting and harvesting of wild fruits, notably wild !nara melon. The NSS, which has diverse dune formations (16 distinctive dune types) that create a spectacular dunescape with a unique interplay of shape, colour, movement and habitat is a popular tourist destination. Although statistical information is lacking, tourism in the NSS particularly at Sesriem and Sossusvlei has shown a tremendous exponential growth. In sync with increase in tourist arrivals a robust tourism infrastructure including approximately 60 lodges on private land was developed. 28 staff are deployed at NSS to carry out management, conservation, monitoring of ecological and tourism activities, revenue collection and outreach programmes at NSS. Similarly the booming tourism industry creates jobs at local, regional and national level, even though the number of the created employment posts is not available. The Gobabeb- Namib Research Institute, with over 50 years of research and training experience, continue to provide invaluable information on the geological and ecological processes of the NSS and the Namib Desert in general and conservation of the desert environment. The NSS through Gobabeb offers space and facilities to schools and tertiary institutions for training as well as creating employment opportunities.

## **Projects**

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## Compilation of active conservation projects

<b>Nº</b>	<b>Organization</b>	<b>Brief description of Active Projects</b>	<b>Web site</b>
1	Gobabeb Research and Training Centre	Numerous initiatives concerned with fundamental research on desert species, ecological monitoring, weather and climate change, etc.	
2	Ministry of Environment & Tourism, Directorate of Parks and Wildlife	Re-introduction of extirpated large mammal species, e.g. giraffe, blue wildebeest, etc.	
3	Ministry of Environment & Tourism, Directorate of Parks and Wildlife	Tracking migrations and movements of large herbivores and carnivores, e.g. satellite tracking of cheetah and the near-endemic Hartmann's zebra; camera traps at waterpoints, seasonal strip counts, etc.	
4	Ministry of Environment & Tourism, Directorate of Scientific Services	Annual counting and ringing at vulture breeding sites	
5	Ministry of Environment & Tourism, Directorate of Scientific Services	Semiannual monitoring of migratory birds at Sandwich Harbour and nearby Walvis Bay Lagoon (Ramsar site)	
6	Gobabeb Research and Training Centre	Monitoring of livestock resource utilisation, movement and environmental impacts	
7	Gobabeb Research and Training Centre	Programme to raise tourism operator awareness of sensitive areas and processes to reduce footprint in NSS	
8	Gobabeb Research and Training Centre, MET Directorate of Parks and Wildlife,	Multidisciplinary analysis of grazing impact around artificial waterpoints (piosphere)	
9	Gobabeb- Namib Research Institute	Namib Sand Sea awareness programmes, information products and outreach	
10	Gobabeb- Namib Research Institute	Bespoke and multidisciplinary training for tour guides, NSS management staff and emergent Namibian researchers on aspects related to the management and protection of the attributes of the NSS	

## REFERENCES

### No References

- 1 Dieckmann, U., Odendaal, W., Tarr, J. & Schreij, A. (2013). Indigenous Peoples and Climate Change in Africa: Report on case studies of Namibia's Topnaar and Hai||om communities. Land, Environment and Development Project Legal Assistance Centre. [online] Legal Assistance Centre. Available at: <https://www.eldis.org/document/A65157> [Accessed 24 November 2020].
- 2 IUCN Consultation. (2013). IUCN Confidential Consultation- Namib Sand Sea, Namibia.
- 3 IUCN Consultation. (2020). IUCN Confidential Consultation- Namib Sand Sea, Namibia.
- 4 IUCN. (2013). World Heritage Nomination – IUCN Technical Evaluation, Namib Sand Sea (Namibia). In: IUCN World Heritage Evaluations 2013, IUCN Evaluations of nominations of natural and mixed properties to the World Heritage List. WHC/13/37.COM. [online] Gland, Switzerland: IUCN. Available at: [https://whc.unesco.org/?cid=31&l=en&id\\_site=1430&am...](https://whc.unesco.org/?cid=31&l=en&id_site=1430&am...) [Accessed 24 November 2020].
- 5 Jamasmie, C. (2015). Chinese firm close to start mining uranium in Namibia. [online] 21 February, mining.com. Available at: <https://www.mining.com/chinese-firm-close-to-start-mining-u...> [Accessed 24 November 2020].
- 6 MEFT (Ministry for Environment, Forestry & Tourism). (2020). Ministry of Environment, Forestry and Tourism (MEFT), Namib Naukluft Park Integrated Management Plan. Under development and unpublished.
- 7 Mining Review Africa. (2009). Positioned in a World class Namibian uranium resource. [online] 6 May, Mining Review Africa. Available at: [https://www.miningreview.com/top-stories/positioned-in-a-wo....](https://www.miningreview.com/top-stories/positioned-in-a-wo...) [Accessed 24 November 2020].
- 8 Ministry of Agriculture, Water and Forestry. (2016). Utuseb ADC Farming Area Drought Monitoring Report 25 April 2016.
- 9 Ministry of Environment and Tourism (2013a) Management Plan for Namib Sand Sea World Heritage site 2013-2018. Republic of Namibia. Ministry of Environment and Tourism, Directorate of Regional Services and Parks Management. .
- 10 Ministry of Environment and Tourism. (2013b). National Policy on Protected Areas' Neighbours and Resident Communities. [online] Available at: <http://the-eis.com/elibrary/sites/default/files/downloads/l...> [Accessed 24 November 2020].
- 11 Ministry of Environment and Tourism. (2013c). Tourism development plan: Namib Naukluft Park 2013/2014 - 2017/2018. Republic of Namibia. Ministry of Environment and Tourism, Directorate of Regional Service and Parks Management.
- 12 Ministry of Environment and Tourism. (2013d). Management Plan: Namib Naukluft Park, September 2013. Republic of Namibia, Ministry of Environment and Tourism, Directorate of Regional Services and Park Management.
- 13 Mortimer, D. J., Trivino, G. C., Gagnon, J. A., & Iwanicki, S. W. (2016). Creating Tourism Employment Opportunities for the Topnaar in the Namib Sand Sea. [online] Available at: <https://digitalcommons.wpi.edu/iqp-all/895> [Accessed 24 November 2020].
- 14 State Party of Namibia (2015). Report of the State Party to the World Heritage Committee on the state of conservation of the Namib Sand Sea (Namibia).
- 15 State Party of Namibia. (2013). Nomination of Namib Sand Sea as a World Heritage Site. Windhoek, Namibia: Namibia National Committee for World Heritage, Namibia National Commission for UNESCO, Ministry of Education.

**No**   **References**

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- 16   World Heritage Committee. (2013). Decision 37 COM 8B.8, Namib Sand Sea. In: Report of decisions of the 37th session of the World Heritage Committee (Phnom Penh, 2013). [online] Paris, France: UNESCO World Heritage Centre. Available at: <https://whc.unesco.org/en/decisions/5124> [Accessed 24 November 2020].