

AFRICA

NAMIB SAND SEA

NAMIBIA



WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

NAMIB SAND SEA (NAMIBIA) – ID No. 1430

IUCN RECOMMENDATION TO WORLD HERITAGE COMMITTEE: To inscribe the property under natural criteria.

Key paragraphs of Operational Guidelines:

77 Property meets natural criteria.

78 Property meets conditions of integrity and protection and management requirements.

1. DOCUMENTATION

a) Date nomination received by IUCN: 25 March 2012

b) Additional information: IUCN requested supplementary information following the first meeting of the IUCN World Heritage Panel in December 2012, and a reply was received from the State Party prior to 28th February 2013.

c) Additional literature consulted: Extensive literature reviewed in nomination and in desk reviews. Example references include: Bluck, B.J., Ward, J.D., Cartwright, J. & Swart, R. 2007. **The Orange River, southern Africa: an extreme example of a wave-dominated sediment dispersal system in the South Atlantic Ocean.** *Journal of the Geological Society*, London 164: 341-351; Dingwall, P., Weighell, T., Badman, T. 2005. **Geological World Heritage: A Global Framework.** A contribution to the Global Theme Study of World Heritage Natural Sites. Protected Area Programme, IUCN. 51pp.; Eckardt F.D. and Spiro B., (1999). **The origin of sulphur in gypsum and dissolved sulphate in the Central Namib Desert, Namibia.** *Sedimentary Geology* 123, 255-273.; Goudie, A.S. and Eckardt, F. (1999). **The evolution of the morphological framework of the Central Namib Desert, Namibia, since the Early Cretaceous.** *Geografiska Annaler* 81A, 443-458.; Goudie, A. and Seely, M. (2011). **World Heritage Desert Landscapes: Potential Priorities for the Recognition of Desert Landscapes and Geomorphological Sites on the World Heritage List.** Gland, Switzerland: IUCN. 44pp.; Livingstone, I., Bristow, C., Bryant, R.G., Bullard, J., White, K., Wiggs, G.F.S., Baas, A.C.W., Bateman, M.D. and Thomas, D.S.G. (2010). **The Namib Sand Sea digital database of aeolian dunes and key forcing variables.** *Aeolian Research*, 2, 93-104.; Walden J., White K. and Drake N.A., (1996). **Controls on dune colour in the Namib Sand Sea: preliminary results.** *Journal of African Earth Sciences* 22, 349-353.; Ward J.D., (1988). **Eolian, fluvial and pan (playa) facies of the Tertiary Tsondab Sandstone Formation in the Central Namib Desert, Namibia.** *Sedimentary Geology* 55, 143-162.; Ward J.D., Seely M.K. and Lancaster N., (1983). **On the antiquity of the Namib.** *South African Journal of Science* 79, 175-183.

d) Consultations: 24 external reviews. The field mission met with a range of representatives of the

State Party and partners, including representatives of the technical services of the State Party, the focal point for World Heritage, local government, non-governmental organisations, private sector tourism operators and the Chief of the indigenous Topnaar community.

e) Field Visit: Peter Howard and Darlington Munyikwa, 16-26 September 2012

f) Date of approval: April 2013

2. SUMMARY OF NATURAL VALUES

The nominated property, the Namib Sand Sea (NSS) lies at the heart of the Namib, a coastal fog desert on Africa's South Atlantic coast in Namibia. NSS encompasses an area of 3,077,700 hectares with a further 899,500 hectares (outside the nominated area) designated as a buffer zone. Both the nominated property and buffer zone lie within the Namib-Naukluft Park (4,976,800 ha).

The property 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.

Unlike most of the world's dune fields (which are derived from local bedrock in situ), 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 (wind derived) desert landforms and features of the NSS.

The virtual absence of moisture, dust and atmospheric pollutants in the hyper-arid climate results in exceptional visibility and remarkable clarity of the landscape features by day and the dazzling southern hemisphere sky at night. The aesthetic qualities of the dunescapes are enhanced by colour variations across the erg, which range from red to deep orange to light yellow.

The sand sea flora and fauna have developed unique adaptations to sustain life in the hyper-arid, ever-changing conditions of the dune fields. Most remarkably, plants and animals have developed highly distinctive morphological, physiological and behavioural adaptations to condense and harvest fog as the primary source of water in this hyper-arid environment. In the dunes, well-oxygenated subsurface sand offers swift escape for suitably-adapted “swimming” and “diving” invertebrates, reptiles and mammals. 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.

3. COMPARISONS WITH OTHER AREAS

The property has been nominated under all four natural criteria (vii), (viii), (ix) and (x), and IUCN's evaluation has benefitted from a particularly strong response from external reviewers. In the nomination dossier the State Party draws comparisons with six other coastal fog deserts bordering on cold oceanic currents in North and South America, Australia, the Arabian Peninsula, and Africa. It also draws on relevant sources to compare the nominated area with existing desert World Heritage sites nominated under each of the criteria. It recognises that the existing World Heritage list has relatively few desert properties, and there are few deserts anywhere in the world which have been as intensively studied as the Namib Sand Sea. The resulting paucity of data from other areas limits the scope for rigorous comparative analysis in respect of some of the values and phenomena represented in the nominated property.

On the basis of a broad global comparison of coastal fog deserts, the NSS is exceptional as being the only one which contains extensive areas of sand dunes influenced by fog. The closest equivalent desert elsewhere in terms of situation and climate is the Atacama Desert on the Pacific Coast of South America, but it does not exhibit the same aeolian land form features and is comparatively devoid of life.

In terms of criterion (vii) concerning natural phenomena and beauty, the comparative analysis shows that the NSS is the product of a three-part ‘conveyor system’ which transports sand from the interior of southern Africa to the coast, where it is carried northward by strong oceanic currents and picked up by wind to create the extensive aeolian dune systems of the nominated property. There are no

comparable examples of this type of large-scale ‘conveyor system’, which can be regarded as a superlative natural phenomenon.

In respect of the other component of criterion (vii) – exceptional natural beauty and aesthetic importance – the nomination dossier is richly illustrated with photographs that convey a sense of the spectacular desert scenery and natural beauty of the large dunes and (most especially) the rich array of habitat interfaces where dunes, seasonal rivers and coastal elements interact. Although aesthetic values are clearly subjective, the wealth of photographic books, films and other art-works that have been produced on the area, together with the number of visitors travelling to see it, indicates a widespread appreciation of its natural beauty. The nominated property is exceptional in relation to:

- the diversity and scale of the dune formations;
- the pattern of colouration across the erg; and
- the contrast of textures, colour and form amongst different landscape elements in areas where different habitats meet, such as those associated with the intrusion of seasonal rivers (e.g. at Sossus Vlei) or coastal features (e.g. Sandwich Harbour).

The geological processes that continue to shape the NSS landscape [criterion (viii)] have created a unique desert environment composed of two super-imposed dune systems. Both have been built up from material eroded from the interior of southern Africa and transported for up to 3,000 km by river, ocean currents and wind. The comparative analysis shows that this three-part ‘conveyor system’ is a geological process with no comparable examples elsewhere. Although the nominated area does not encompass the whole of this conveyor system, it covers a major part of the area of deposition where the aeolian elements of the ongoing geological processes are at play.

In terms of the scale and complexity of ongoing geological processes the State Party's comparative analysis notes that no other dune landscape has a comparable diversity in such a relatively small area. It provides a checklist of 25 geomorphic features of which 23 are featured in the NSS, far more than any other of the 14 inscribed World Heritage sites worldwide, with which it is compared. In an African context, the NSS (an area of 30,777km²) is only about half the size of the two largest existing World Heritage properties in the Sahara (Air and Tenere, Niger – 77,000 km²; and Tassili n'Ajjer, Algeria – 72,000 km²); is similar in size to another Saharan site (Tadrart Acacus, Libya); and substantially larger than other desert properties including Banc d'Arguin (12,000 km²), Lake Turkana (1,614 km²) and the Lakes of Ounianga (628 km²).

In terms of ecological processes [criterion (ix)], two underlying features of the NSS contribute to its Outstanding Universal Value – the rarity of coastal fog deserts at a global scale, and the property's ecological isolation in an area remote from other African deserts. Although there are 109 properties listed worldwide under criterion (ix) (25 of them in Africa) there is no

other comparable coastal fog desert. The extraordinary morphological, physiological and behavioural adaptations of the complex biota of the NSS to life in unconsolidated sand and reliance on fog as a water source are as unique as the physical environment in which they have evolved. Furthermore the ecological isolation of the area for millions of years has resulted in levels of endemism and evolutionary processes amongst certain taxa comparable to those of oceanic islands where evolutionary processes are more widely recognised, such as the Galapagos, Seychelles and Socotra, or isolated ancient lakes such as Lakes Malawi and Baikal.

The comparative analysis of biodiversity values [criterion (x)] shows low levels of overall species richness particularly in respect of the sand sea habitat that constitutes the core element of the nomination. Although such comparisons are severely constrained by lack of information (particularly for invertebrate groups), the NSS ranks 14th (out of the 16 properties for which comparable data are available) for plant species richness, 5th out of 16 for vertebrate richness, 3rd out of 4 for invertebrate richness, 7th out of 8 for number of endemic plants and 5th out of 13 for number of endemic vertebrates. This suggests that the nominated property is broadly similar by these measures to other desert World Heritage properties. Comparisons are made with 15 other desert and semi-desert World Heritage properties listed under criterion (x) in terms of what is known of their species richness and levels of endemism. There is however, a high degree of endemism in certain taxa of the sand sea fauna and flora with 8 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%) known only from the sand sea habitats. The property is of outstanding importance for the in-situ conservation of an unusual array of endemic species uniquely adapted to life in a hyper-arid desert environment in which fog serves as the primary source of water.

4. INTEGRITY, PROTECTION AND MANAGEMENT

4.1. Protection

The nominated 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. Much of the area that is now included in the Park was previously designated as diamond areas and closed to public access. Some abandoned settlements and mining equipment on the coastal plains bear testimony to this era, but the impact of past mining activities on the property's Outstanding Universal Value is considered negligible.

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). 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, however these will not be pursued within the nominated area. The protection status of the property needs to be assured through rigorous application of national laws within Namibia.

IUCN considers the protection status of the nominated property meets the requirements set out in the Operational Guidelines.

4.2 Boundaries

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). 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 nominated 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). The State Party provided, on request, a detailed explanation of the rationale for the boundaries of the buffer zone.

IUCN considers that the boundaries of the property meet the requirements set out in the Operational Guidelines.

4.3 Management

NSS falls within the Namib-Naukluft Park and is managed by the Ministry of Environment and Tourism through the Directorate of Regional Services and

Parks Management. 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. This level of funding is barely adequate for a park of this size, but has been relatively stable and has been increased progressively over the past five years.

Two draft Management Plans are included in the nomination dossier, one for the 'Namib-Naukluft Area of the Namib-Skeleton Coast National Park' (i.e. the Namib-Naukluft Park) and another for the NSS. The latter aims to facilitate the smooth and proper management of the NSS through close cooperation between the Ministry of Environment and Tourism and other related government organisations, decentralized local and regional governments, traditional societies, local communities, bodies engaged in tourism, research and Non Governmental Organisations. The plan addresses 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). IUCN recognizes that considerable efforts have already been invested in developing these draft plans, and considers that there is an urgent need to integrate the two plans, clearly identifying the priority actions that can be realistically undertaken within existing budgetary and staffing constraints so that they can become operational. In supplementary information, the State Party confirmed that the zoning scheme is under the final stage of consultation, and that it is envisaged that an operational management zoning map for the Namib Sand Sea and its buffer zone should be in place by June 2013.

The property benefits from an exceptional research and management facility in the form of the Desert Research Station in Gobabeb, which has also played a notable role in the coordination of the present nomination. Continued and increased support for this facility as a key contributor to the quality of management of the property appears essential.

IUCN considers the management of the nominated property meets the requirements set out in the Operational Guidelines.

4.4 Community

The indigenous Topnaar community, now living in scattered settlements along the Kuiseb River, has used the land and resources of the NSS for centuries. They are a nomadic people who have traditionally moved to new areas within their forbidding landscape as dictated by changing conditions and resource availability. Their livelihoods depend on exploitation of

the area's natural resources and include subsistence farming (rearing animals and gardening), hunting, and harvesting of wild fruits, notably wild !nara melons. Today, many of their traditions are being lost, and most of their settlements are occupied by the very old and very young, as most adults of working age opt for paid employment in nearby centres. Consultations between the IUCN mission team and the Topnaar community Chief indicate broad support for the nomination of the NSS property, but continuing concern over access to cultural sites within the property, and the lack of formal recognition for land and resource-use rights. The need to address these matters is recognised in the draft NSS Site Management Plan, and IUCN sought additional information on both consultation, consent and management measures in the supplementary information requested from the State Party.

The current legislation does not recognise the rights of local communities residing in nature reserves and game parks. The IUCN evaluation team met with the Topnaar community Chief Kooitjie, and was told of community support for the nomination, and concerns 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 Topnaar 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 have 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 inside the property and although present *de facto* 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.

4.5 Threats

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/Sossus Vlei 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 Sossus Vlei 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.

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).

There is a clear need for a more strategic approach to tourism planning to disperse visitor use (e.g. away from the Sossus Vlei area), improve basic infrastructure at heavily-used sites and enhance the visitor experience with better interpretation and education facilities.

Although there are no active mining operations within the nominated 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 nominated area and terminate all current Exclusive Prospecting Licenses (EPLs). IUCN sought additional details and confirmation on this matter in supplementary information, and the State Party confirmed that all EPLs will expire by mid-January 2014, after which they will be extinguished. This decision signifies a commendable level of commitment by the State Party to preserve the integrity of the property.

There is significant infrastructure within the buffer zone to the north of the property associated with the provision of education and health services, large-scale water extraction (to supply the nearby town of Walvis Bay), granite quarrying and emerald mining. The impact of these activities within the buffer zone is not fully documented and requires ongoing attention, but resource use within the property itself is limited by the harsh and inhospitable nature of the desert environment and the difficulties of access.

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 plants are carried into the property by ephemeral rivers and are difficult to eliminate due to regular re-infestation during each flooding cycle.

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 at 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 nominated 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.

In summary, IUCN considers that present threats to the property are being adequately addressed and the nominated property meets the conditions of integrity as outlined in the Operational Guidelines.

5. ADDITIONAL COMMENTS

5.1 Upstream process

IUCN notes that the nomination has received support from both the upstream process supported by the World Heritage Committee, and the programme of support for nominations in Africa coordinated by the African World Heritage Fund, in partnership with UNESCO and the Advisory Bodies to the Convention (which included a course hosted at Gobabeb). IUCN has been pleased to be associated with this process, and notes that its success in this case can be attributed to the strong technical engagement of the State Party in the nomination, and in dialogue with UNESCO and IUCN on questions and issues related to the nomination.

5.2 Future nominations in the Namib Desert

IUCN notes the potential for further nominations within the Namib Desert and raised this issue with the State Party in its request for supplementary information. In particular IUCN noted that there would be a logical argument to consider further nominations as extensions (including serial extensions) of the present property. The State Party has provided a detailed statement on this matter in its supplementary information, and notes, inter alia, that the attributes and values in the nomination dossier are specific to the NSS, although some of them are also individually, but not collectively, applicable elsewhere. The NSS is thus nominated as a distinct site, and not to represent the greater Namib Desert.

6. APPLICATION OF CRITERIA

The Namib Sand Sea has been nominated under criteria (vii), (viii), (ix) and (x).

Criterion (vii): Superlative natural phenomena and/or natural beauty and aesthetic importance

The nominated property is the world's only coastal desert that includes extensive dune fields influenced by fog. This alone makes it exceptional at a global scale, but it also represents a superlative natural phenomenon on account of the three-part 'conveyor system' which has produced the massive dune field from material transported over thousands of kilometres from the interior of the African continent by river erosion, ocean currents and wind. Most dune fields elsewhere in the world are derived from bedrock eroded in situ. The age, extent and height of the dunes are outstanding and the property also exhibits a range of features that give it exceptional aesthetic qualities. The diversity of dune formations, their ever-changing form and the range of colour and texture create landscapes of outstanding natural beauty.

IUCN considers that the nominated property meets this criterion.

Criterion (viii): Earth's history and geological features.

The property represents an exceptional example of ongoing geological processes involving the formation of the world's only extensive dune system in a coastal fog desert through transport of material over thousands of kilometres by river, ocean current and wind. Although the nominated area encompasses only the aeolian elements of this ongoing geological process the other elements of the 'conveyor system' are assured. The diversity of the ever-changing dune formations, sculpted by pronounced daily and seasonal changes in dominant wind directions is also exceptional at a global scale within such a relatively small area.

IUCN considers that the nominated property meets this criterion.

Criterion (ix): Ecosystems / communities and ecological / biological processes

The property is an exceptional example of ongoing ecological process in a coastal fog desert where plant and animal communities are continuously adapting to life in a 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.

IUCN considers that the nominated property meets this criterion.

Criterion (x): Biodiversity and threatened species

The property is of outstanding importance for the in-situ conservation of an unusual array of endemic species uniquely adapted to life in a hyper-arid desert

environment in which fog serves as the primary source of water. These are mostly invertebrate animals and display a range of very rare behavioural and physiological adaptations to the desert environment where they live that contributes significantly to the property's Outstanding Universal Value.

IUCN considers that the nominated property meets this criterion.

7. RECOMMENDATIONS

IUCN recommends that the World Heritage Committee adopt the following draft decision:

The World Heritage Committee,

1. Having examined Documents WHC-13/37.COM/8B and WHC-13/37.COM/INF.8B2;
2. Inscribes the **Namib Sand Sea, Namibia**, on the World Heritage list under natural criteria (vii), (viii), (ix) and (x);
3. Adopts the following Statement of Outstanding Universal Value:

Brief Synthesis

The Namib Sand Sea (NSS) lies along the arid African coast of the South Atlantic lying wholly within Namibia's Namib-Naukluft Park. It covers an area of 3,077,700 hectares, with an additional 899,500 hectares designated as a buffer zone.

NSS is a unique coastal fog desert encompassing a diverse array of large, shifting dunes. It is an outstanding example of the scenic, geomorphological, ecological and evolutionary consequences of wind-driven processes interacting with geology and biology. The sand sea includes most known types of dunes together with associated landforms such as inselbergs, pediplains, and playas, formed through aeolian depositional processes. It is a place of outstanding natural beauty where atmospheric conditions provide exceptional visibility of landscape features by day and the dazzling southern hemisphere sky at night.

Life in the fog-bathed coastal dunes of the Namib Sand Sea is characterised by very rare behavioural, morphological and physiological adaptations that have evolved throughout its specialist communities. The large number of endemic plants and animals are globally-important examples of evolution and the resilience of life in extreme environments.

Criteria

Criterion (vii)

The nominated property is the world's only coastal desert that includes extensive dune fields influenced by fog. This alone makes it exceptional at a global scale, but it also represents a superlative natural phenomenon on account of the three-part 'conveyor system' which has produced the massive dune field from material transported over thousands of kilometres from the interior of the African continent by river

erosion, ocean currents and wind. Most dune fields elsewhere in the world are derived from bedrock eroded in situ. The age, extent and height of the dunes are outstanding and the property also exhibits a range of features that give it exceptional aesthetic qualities. The diversity of dune formations, their ever-changing form and the range of colour and texture create landscapes of outstanding natural beauty.

Criterion (viii)

The property represents an exceptional example of ongoing geological processes involving the formation of the world's only extensive dune system in a coastal fog desert through transport of material over thousands of kilometres by river, ocean current and wind. Although the nominated area encompasses only the Aeolian elements of this ongoing geological process the other elements of the 'conveyor system' are assured. The diversity of the ever-changing dune formations, sculpted by pronounced daily and seasonal changes in dominant wind directions is also exceptional at a global scale within such a relatively small area.

Criterion (ix)

The property is an exceptional example of ongoing ecological process in a coastal fog desert where plant and animal communities are continuously adapting to life in a 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.

Criterion (x)

The property is of outstanding importance for the in-situ conservation of an unusual and exceptional array of endemic species uniquely adapted to life in a hyper-arid desert environment in which fog serves as the primary source of water. These are mostly invertebrate animals and display a range of very rare behavioural and physiological adaptations to the desert environment where they live that contributes significantly to the property's Outstanding Universal Value.

Integrity

The boundaries of the property encompass all the elements of the Namib Sand Sea that exemplify its Outstanding Universal Values. These elements are well conserved and included at a scale appropriate to maintaining ongoing dynamic processes. The large size of the area (30,777 km²) ensures that all the active and underlying (fossilized) dune formations and features, causative processes and ancillary habitats are included. The extensive dune-scapes are unspoiled and continuously refreshed and maintained by wholly natural processes. Because of its vast size, difficulty of access and current management within the protected

Namib-Naukluft Park (49,768 km²), the Namib Sand Sea is well conserved and in an excellent, undamaged state. Permanent visitor and management infrastructure is non-existent within the boundaries of the property and visitation is restricted to small, temporary point locations that have no measurable effect on the area.

Protection and management requirements

The Namib Sand Sea has been under conservation management for more than 50 years with well-established management and resource allocation systems, based on regularly revised and updated management plans and long-term budgetary planning. Prior to establishment of conservation management, the area was protected for its potential as a diamond-mining area, but this was never realised. Key management issues today include managing the increasing demand for visitor access to pristine areas and precluding mineral exploration rights that would impact on the values and attributes of the area. There is potential for serial extension of the Namib Sand Sea beyond the Namib-Naukluft Park and beyond national borders to include other significant dune systems within other protected areas of the larger Namib Desert.

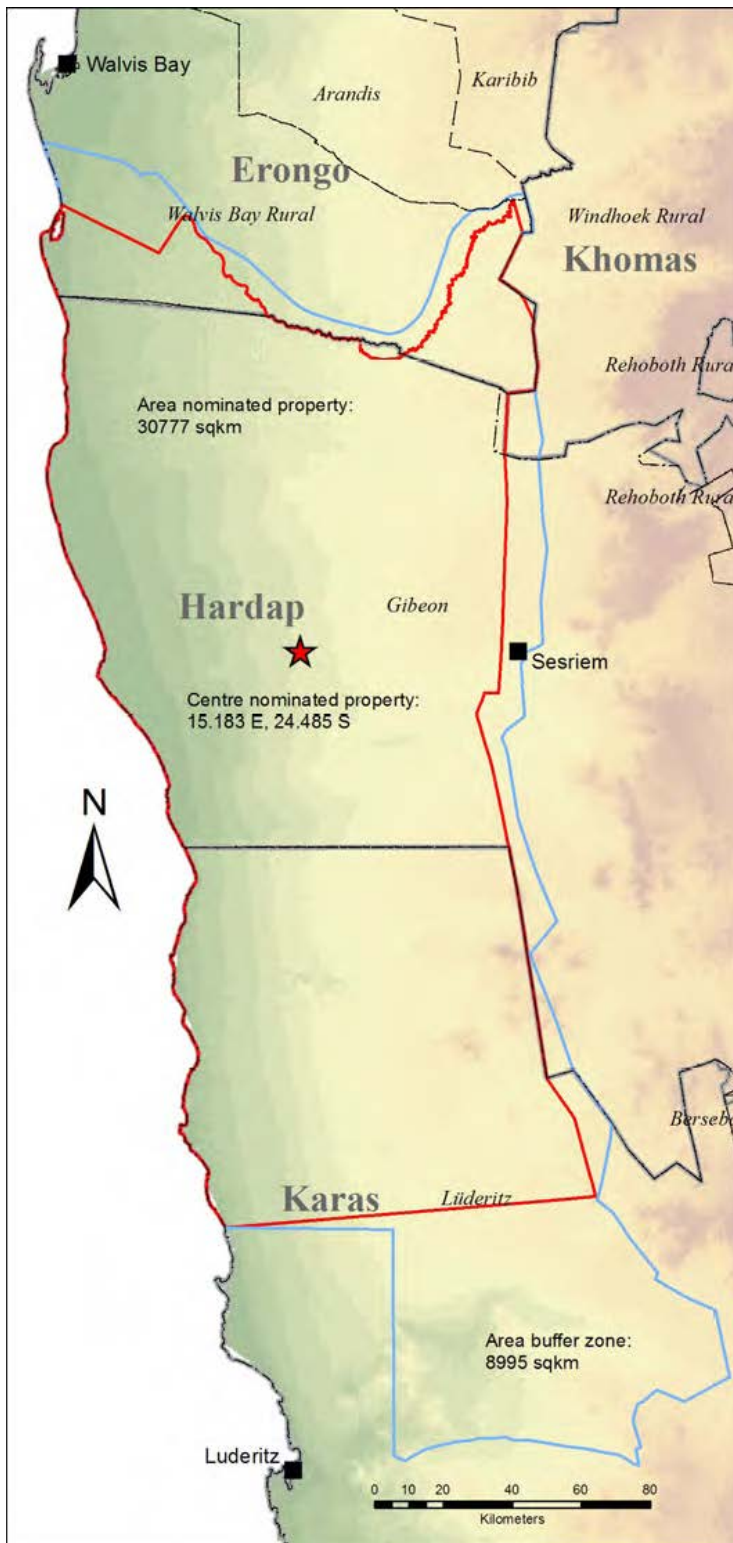
4. Commends the State Party for its landmark decision to terminate all existing mineral exploration licenses within the property, thus eliminating the threat of any future mining operations that would affect its integrity;
5. Requests the State Party to provide a finalized management plan and map showing the intended zonation of the property and the institutional arrangements for its implementation and monitoring to the World Heritage Centre by 31st December 2013;
6. Considers that inscription of the property on the World Heritage List provides an opportunity to further enhance a number of protection and management arrangements for the property and therefore requests the State Party to:
 - a) confirm as soon as possible, through a letter to the World Heritage Centre, the termination of all remaining mineral prospecting licenses within the property at the earliest opportunity, noting that none of these old licences will be activated, and all will be extinguished by the end of January 2014;
 - b) strengthen further participatory management arrangements with the indigenous peoples with rights related to the property, including to maintain traditional access and sustainable use of natural resources within the property and its buffer zone;
 - c) improve visitor interpretation facilities to foster an appreciation of the unique values of the property;
 - d) establish and implement a long-term programme to monitor key ecological and management effectiveness indicators and the State of Conservation of the property;
 - e) strengthen management capacity in terms of financial and human resources, including the highly effective support provided to the property by the Gobabeb Training and Research Centre;

- f) enhance arrangements for the identification, allocation, management and monitoring of tourism concessions; and
- g) further strengthen efforts to control and eliminate invasive alien species within the property;

7. Further requests the State Party to provide a report to the World Heritage Centre by 1st February 2015 on progress in implementing the above recommendations for possible consideration by the World Heritage Committee at its 39th session in 2015;

8. Encourages the State Party, and neighbouring States Parties, to consider options to nominate further outstanding areas of the Namib Desert, including the potential for nominations to form serial extensions of the present property.

Map1 : Nominated property and buffer zone



The nominated "Namib Sand Sea" within Africa and Namibia



- Nominated property
- Buffer zone
- Karas** Regional boundary and name
- Gibeon* Constituency boundary and name

Digital elevation model: Atlas of Namibia (2002);
 Satellite Imagery: ESRI Data & Maps (2004)
 Map prepared by Geological Survey of Namibia
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