IUCN Conservation Outlook Assessment 2017 **(archived)**
Finalised on 08 November 2017

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

Okavango Delta

SITE INFORMATION

Country:
Botswana
Inscribed in: 2014
Criteria:
(vii) (ix) (x)

Site description:

This delta in north-west Botswana comprises permanent marshlands and seasonally flooded plains. It is one of the very few major interior delta systems that do not flow into a sea or ocean, with a wetland system that is almost intact. One of the unique characteristics of the site is that the annual flooding from the River Okavango occurs during the dry season, with the result that the native plants and animals have synchronized their biological cycles with these seasonal rains and floods. It is an exceptional example of the interaction between climatic, hydrological and biological processes. The Okavango Delta is home to some of the world’s most endangered species of large mammal, such as the cheetah, white rhinoceros, black rhinoceros, African wild dog and lion. © UNESCO

SUMMARY

2017 Conservation Outlook

Good with some concerns

The nature of the Okavango Delta – a vast inaccessible wetland on the fringes of a sparsely populated desert – gives it a high degree of natural protection. There are very few roads and tourism is built around a high-cost low-volume business model with small lodge facilities accessed by private charter aircraft. Human impacts across the site are low and the area remains in a largely unaltered, pristine condition. The most significant long-term threat arises from the possibility of future use (or impoundment) of the waters of the Okavango River which flow from catchment areas in the Angolan highlands through Namibia before crossing into Botswana and reaching the head of the delta. Any such developments would be subject to the approval of the Permanent Okavango River Basin Water Commission (OKACOM), which should ensure recognition and respect for the site's Outstanding Universal Value. The most significant existing management challenges arise from an observed decline in populations of some large mammals (which has resulted in a nationwide hunting ban), a continued need to control alien plants, and to ensure proper management of local community access rights and benefit sharing.

Current state and trend of VALUES

Good
Trend: Stable

The Outstanding Universal Value of the Okavango Delta is the result of complex geological, biophysical and ecological interactions. The annual cycle of flooding, which maintains the wetland habitats and sustains the delta's biodiversity happens at such a scale as to be largely unaffected by present levels of human activity. The extraordinary natural beauty of the place, with its ever-changing mosaic of open water, islands, channels and swamps is well conserved and in a stable condition. There remains however the on-going risks associated with insufficient accurate data pertaining to large mammal population trends, alien

invasive water flora and any future water containment of extraction in the upstream catchment areas of Angola or Namibia.

Overall THREATS

Low Threat

The Okavango Delta is a remarkably pristine and expansive wetland system, unaltered by development activities or other man-made threats. The most significant current threat probably comes from poaching as there have been significant declines in populations of some large mammals over the past decade or so. As a precautionary measure, commercial hunting activities (which were previously allowed) have now been stopped. The ecological integrity of the delta has been significantly affected over several decades by veterinary fences, which have blocked large mammal migration routes. Several of these have now been removed (or allowed to collapse), so animals can disperse more widely and there is scope for further restoration of natural movement patterns. In the long-term the future of the Okavango will be determined to a large extent by Botswana's regional partners and decisions over possible future developments such as dam construction, water abstraction, mining, and irrigated agricultural developments in the catchment areas of Angola and Namibia.

Overall PROTECTION and MANAGEMENT

Some Concern

Overall the ecological integrity of the property remains good as a result of its large size, inaccessibility and low human population densities in surrounding areas. The legal basis for protection is adequate for Moremi Game Reserve (4,610 km2 or 23% of the core area) but weak elsewhere, with much of the area (15,625 km2) designated as 'Wildlife Management' and 'Controlled Hunting' Areas where human settlement, cultivation and livestock are (potentially) allowed. In practice most of the Wildlife Management Areas are well protected and managed by commercial tourism operators. Management regimes are complex and vary across the site according to the designation of particular 'blocks'. It seems that there remain significant constraints in capacity and resources for the management of the Moremi Game Reserve and across most of the community-managed WMAs.

FULL ASSESSMENT

Description of values

Values

World Heritage values

► **Africa’s most extensive inland delta without an outlet to the sea, lying within a desert environment**
Criterion:(vii)

The Okavango Delta is a huge inland delta, where the waters of the Okavango river disappear into the sands of the Kalahari desert without reaching the sea. It is the juxtaposition of this vibrant wetland with its arid desert surroundings which led to it becoming known as the ‘Jewel of the Kalahari’ (Ross, 2003).

► **Annual cycle of flooding**
Criterion:(vii)

The annual flood-tide, which pulses through the wetland system every year revitalizes ecosystems and serves as a critical life-force during the peak of the area’s dry season (during June/July). As the flood-waters extend into lands around the wetland’s margins the pulse of new growth across the seasonal grasslands draws in herds of large herbivores, driving their migration patterns across a much wider landscape. In an extraordinary way plants and animals have adapted their life-cycles, growth and reproductive behaviour to the arrival of the flood-waters (as well as the arrival of seasonal rains, which allows dispersal to other areas as the waters of the delta recede later in the year) (SoOUV, 2014).

►

An outstanding example of the complexity, inter-dependence and interplay of climatic, geo-morphological, hydrological, and biological processes

Criterion:(ix)

The Okavango Delta World Heritage property is an outstanding example of the complexity, inter-dependence and interplay of climatic, geo-morphological, hydrological, and biological processes. The continuous transformation of geomorphic features such as islands, channels, river banks, flood plains, oxbow lakes and lagoons in turn influences the abiotic and biotic dynamics of the Delta including dryland grasslands and woodland habitats. The site exemplifies a number of ecological processes related to flood inundation, channelization, nutrient cycling and the associated biological processes of breeding, growth, migration, colonization and plant succession. These ecological processes provide a scientific benchmark to compare similar and human-impacted systems elsewhere and give insight into the long-term evolution of such wetland systems (SoOUV, 2014). The delta extends over an area half the size of Belgium, with 6,000km2 of permanent swamps and 7-12,000 km2 of seasonally flooded grassland. Remarkably, it remains in a largely pristine condition, unaffected by any major developments either within the delta itself, or anywhere along the course of its inflowing rivers and their tributaries.

► Rich diversity of species across many taxa, with significant populations of African mega-fauna

Criterion:(x)

The delta supports a high diversity of natural habitats including permanent and seasonal rivers and lagoons, permanent swamps with reeds and papyrus, seasonal and occasionally-flooded grasslands, riparian forest and woodlands, dry woodlands and island communities (GoB, 2012). Each of these habitats has a distinct species composition with strong representation of aquatic organisms across most taxa. A total of 1061species of plants (belonging to 134 families and 530 genera), 89 fish, 64 reptiles, 482 species of birds and 130 species of mammals has been recorded (SoOUV, 2014).

► Habitat for important populations of rare and endangered species

Criterion:(x)

The delta provides a refuge to globally significant numbers of rare and endangered large mammals, including white and black rhinoceros, wild dogs, lions and cheetahs. It is also recognized as an Important Bird Area (BirdLife, 2017), harbouring 24 species of globally threatened birds, including among others, six species of vulture, Southern Ground-Hornbill, Wattled Crane and Slaty Egret. Thirty-three species of water birds occur in the Okavango Delta in numbers that exceed 0.5% of their global or regional population (SoOUV, 2014). The Okavango supports significant populations of wetland-adapted mammals such as the sitatunga, red lechwe and southern reedbuck, Finally Botswana supports the world's largest population of elephants, numbering around 130,000: the Okavango Delta is the core area for this species' survival (SoOUV, 2014).

► **Landscape of exceptional and rare beauty**
Criterion:(vii)

Permanent crystal clear waters and dissolved nutrients transform the otherwise dry Kalahari Desert habitat into a scenic landscape of exceptional and rare beauty, and sustain an ecosystem of remarkable habitat and species diversity, thereby maintaining its ecological resilience and amazing natural phenomena (SoOUV, 2014). The natural beauty of the emerald-green 'Jewel of the Kalahari' in its red-sand desert setting is legendary. Its crystal clear waters meandering through the ever-changing channels of the delta, its islands and waterways teeming with wildlife create an unparalleled range of vistas of exceptional beauty. Furthermore, the size and difficulty of accessing the area (except by light aircraft) ensure that it maintains exceptional wilderness qualities with very little development or management infrastructure.

Assessment information

Threats

Current Threats

Low Threat

Current threats to the site are relatively minor and the delta remains in a remarkably pristine condition. An attempt was made to address concerns regarding the significant population declines of some large mammal species by introducing a ban on all hunting in 2014, but the result of this measure still needs to be quantified. The disruption of natural movement routes of larger species by the veterinary fences has been considered to have a major impact on natural processes. The on-going evaluation of the effectiveness of these fences and the rationalisation where necessary may result in an improved natural movement system and other associated ecological benefits. It is also important to note that in certain areas the veterinary fences may have played a large role in the conservation of the area by restricting the movement of livestock. Elephant populations are still high and there is concern over the destruction of woodlands resulting from over-population in some areas. Minor threats arise from tourism-related disturbances, use of the area's natural resources by local communities, hydrocarbon and wastewater discharge pollution, as well as the spread of an invasive aquatic flora.

► Fire/ Fire Suppression

Low Threat
Inside site
Outside site

Fires are frequently and deliberately started by people throughout the delta to (1) stimulate new growth for livestock grazing (2) improve stands of reeds and thatching grass, (3) attract wildlife to areas of new growth for tourist viewing, (4) clear access routes through the wetlands to fishing sites, and (5) clear agricultural land around the margins of the delta.

► Tourism/ visitors/ recreation

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

Tourism in the delta is necessarily a low-impact low-volume business, since there are no permanent roads into most of the area and everything has to be flown into small-scale tented camps and similar establishments within the

delta. There are currently only 2,129 beds in the core area of the WHS, and sound policies and procedures to regulate tourism are in place. Nevertheless, there are some localized problems related to tourism including the creation of illegal roads (particularly in Moremi Game Reserve), pollution and waste disposal, forest fires and disturbance of plant and animals (especially nesting birds). Most noticeably, noise pollution from low-flying aircraft and boats can be a nuisance, affecting the 'wilderness experience' of visitors. Another concern is the wastewater flow into the system. The Botswana Department of Water Affairs found that only 44% of the wastewater discharge facilities inspected met the requirements of the Botswana standards for discharging into the environment (Kurugundla 2015).

► Hunting (commercial/subsistence)

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

The level of poaching affecting the delta's wildlife is unknown, but a 2012 aerial census of large mammals by the Department of Wildlife and National Parks confirmed that there has been a significant decline in populations of some key large mammal species over the past decade (since a comparable survey was last done). An earlier NGO aerial survey (carried out in 2010) had suggested that populations of 11 animal species had plummeted by an average of 61 per cent (Gifford, 2013), with ostrich, wildebeest, kudu and giraffe particularly badly affected. Whilst the reason for the decline is not fully understood, some attribute it to over-hunting in parts of the property designated as Wildlife Management Areas where commercial hunting was allowed. To curb this decline in game species population numbers, a hunting ban was implemented in 2014. Although quantitative data on the the impacts of the hunting ban on the game populations have not been published, there have been some reports in the media that the State Party has recent wildlife population statistics indicated a generalised increase in the number of animals.

► Other Ecosystem Modifications

Low Threat

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

Botswana's livestock industry has for decades depended on the prevention of disease transmission between wildlife and domestic stock through (1) the use of high multi-strand veterinary cordon fences to stop the movement of large wild mammals into designated livestock grazing areas, and (2) the eradication of tse-tse flies through chemical spraying. Most of the delta is designated a 'livestock free zone', with the southern boundary of the core area defined by the line of a veterinary fence. This stops livestock coming into contact with wildlife, but it also blocks the traditional migration and dispersal of wildlife to the south. Other veterinary fences lie to the east and north of the world heritage site, but these have been abandoned (or removed) so migration routes towards the Makgadikgadi Pans (to the East), Chobe National Park, and other areas have been re-established. There are continuing efforts to rationalize the veterinary cordon fencing through the Department of Veterinary Services continued monitoring of the effectiveness of the fences. The Botswana Government Policy on veterinary fences stipulates that a periodic Environmental Impact Assessment (EIA) be conducted every five years on the veterinary cordon fencing to determine the effectiveness of such fencing. It has been suggested, that although veterinary fences have blocked wildlife migratory routes, the Southern and Northern Buffalo Fences have played a significant role in protecting the core parts of the delta from encroachment by livestock (GoB 2015).

► Livestock Farming / Grazing

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

Local people have rights to use certain natural resources within the delta, including fish, reeds and thatching grass, medicinal plants and poles for house-building, as well as being allowed to keep cattle and other domestic stock in the area (Botswana 2014). The ecological impact of this is limited. The local communities include descendants of the original San hunter-gatherer inhabitants of the area, as well as more recent immigrants from other ethnic groups. As there are only three settlements (with a total population of 530 individuals) in the interior of the delta, resource use tends to be restricted to peripheral areas close to villages outside the core zone of

the world heritage site.

▶ Invasive Non-Native/ Alien Species

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

The floating water fern, Salvinia molesta (native to South America) became established in the Okavango in the 1980s and has become widespread. It chokes water channels and prevents light and oxygen penetration into sub-surface waters, impacting the aquatic ecology. A reasonable degree of success in controlling this invasive weed has been achieved through the propagation of a weevil (Cyrtobagous salviniae) as a bio-control agent, but Salvinia infestation remains a significant problem (GoB, 2012). The Aquatic Vegetation Control Unit (AVCU) continues to apply and monitor the Salvinia biological control agent Cyrtobagous salviniae. According to the Botswana Department of Water Affairs (Botswana, 2015), no significant Salvinia infestations were observed in 2013 but new infestations were observed in 2014 and increased in 2015. However, Salvinia biological control has been thoroughly established in 64 sites within the core zone. Tour guides in the core area have also been trained to monitor and control Salvinia and weevils breeding pools have been set up to provide an on-going supply of the biological control agent (Kurugundla 2015).

Potential Threats

High Threat

The long-term integrity of the delta will depend to a large extent on wise use of water in the catchment areas of Angola and Namibia. There are a wide range of potentially devastating threats that could arise through development schemes such as dam construction, water abstraction, irrigated agricultural development and mining in the areas upstream. The Permanent Okavango River Basin Water Commission (OKACOM) will serve a mediating role in negotiations over any such developments and should serve to achieve appropriate outcomes that can preserve the integrity of the delta. It should also be noted that the there is a general trend in elephant populations numbers that’s show as decline in population numbers due to ivory poaching (Chase et al. 2016). Although Botswana is one of the few countries where the

elephant population has not shown a significant decrease since 2007, poaching remains a potential threat.

► Dams/ Water Management or Use

High Threat
Outside site

The most significant long-term threat to the integrity and ecological function of the delta remains beyond Botswana's borders in the catchment areas of Angola and Namibia, where upstream use of water or construction of dams could prove devastating. Namibia indicated an intention to connect its Eastern National Water Carrier to the Kavango River to 'provide water to Windhoek and the surrounding areas' (Botswana, 2012). Namibia has since informed the other Permanent Okavango River Water Commission (OKACOM) Member States Angola and Botswana, about the on-going feasibility study for water augmentation to central Namibia. This feasibility study is examining options for water augmentation either through inter-basin transfer from the Okavango, or via ground water exploration (Botswana, 2015). It has also emerged from OKACOM that NamPower has halted its Hydro Power Project for the Popa Falls on the Okavango River in Namibia. The IUCN nomination evaluation team was informed of possible Chinese interest in irrigated agriculture in the river basin in southern Angola, and also of plans to expand a network of protected areas in the headwaters (where human populations are reportedly very low due to the prolonged Angolan war) (IUCN, 2013). However, this has neither been confirmed by Angola nor brought to the attention of OKACOM Member States concerned. The only concept document in the possession of OKACOM, is the "Plano de Gestão Integrada dos Recursos Hidricos da bacia do Cubango" (Botswana, 2015).

► Temperature extremes

Low Threat
Inside site, extent of threat not known
Outside site

The potential effects of climate change on the delta have been a research focus of staff at the Okavango Research Institute for several years (Botswana, 2012). It seems likely that there will be some increase in evaporative losses of water in the delta due to increases in regional temperature, but other impacts of climate change are less certain. A drying

of the catchment would result in the replacement of existing seasonally-flooded grassland with more wooded communities, but such outcomes are far from certain (Botswana, 2012).

► Water Pollution

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

The quality of the inflowing waters is just as important to the ecological integrity of the delta as the quantity and flooding cycle. The possibility of diamond mining in the catchment areas of southern Angola with its associated threat of pollution has been identified as a potential future threat (IUCN, 2013). There is the possibility of a major Chinese-backed irrigated agricultural scheme in southern Angola which would not only result in water use, but could also lead to eutrophication and/or pollution with artificial fertilizers, pesticides and other agrochemicals (IUCN, 2013). This has neither been confirmed by Angola nor brought to the attention of Member States concerned (SOC 2016). Base metal mining at sites on the Okavango River system in Namibia may pose a serious threat to sensitive riverine environment along the Okavango River and influence water quality. Sites are being explored for potential mining in the Kavango East area of Namibia (Enviro Dynamics 2014). Concerns were raised in October 2015 by the Botswana Department of Water Affairs regarding oil contamination in the Okavango Delta panhandle area. Analysis showed that hydrocarbon content in the water being above maximum allowable limit of 5 mg/L. Probable sources boats, ferries, house boats and boat harbours (Kurugundla 2015).

► Mining/ Quarrying

High Threat
Outside site

Mining presents a significant potential threat to the Delta as a number of concessions overlap the nominated area and buffer zone. The State Party has given assurances that those overlapping the core area will not be renewed when they expire in 2014 or early 2015 and no new mining licenses will be issued within the core area of the property. There is nevertheless a possibility that mining could be undertaken in the buffer zone, or areas of the catchment in Angola and/or Namibia. No new mining licences have been

issued since 2014 for the core area. Nine out of 41 prospecting licenses remain in the buffer area for which the State Party is engaging the mining companies with a view to not renewing these licenses. The Department of Mines in consultation with the Ministry of Energy and Water Resources is also considering the threats posed to the system by the prospecting licences for areas close to but outside of the buffer zone to the west of the panhandle area (GoB 2015). Mining in Namibia in sensitive river areas of the Okavango River remains a threat.

Protection and management

Assessing Protection and Management

► Relationships with local people

Mostly Effective

A management zoning regime is in place through which the interests of local communities are addressed. Three small settlements, with a total population of 530 individuals, are located within the core area of the property. People residing in these settlements, as well as those living around the periphery of the core area, have user access rights to fish, reeds, thatch, medicinal and building products. There are restrictions on the type of resource use that may be carried out in particular areas (see below), but in general areas designated as Wildlife Management Areas that are leased to Community Trusts are managed on a ‘sustainable use’ basis by the communities concerned and land-use may include livestock keeping and cultivation in addition to harvesting a range of wildlife products. Regulated commercial hunting was part of the management regime until a hunting ban was introduced early in 2014. Communities are provided with technical assistance in support of their Community-Based Natural Resource Management (CBNRM) programmes, and those that were previously benefiting from commercial hunting revenues are now being encouraged to re-align their CBNRM activities towards non-consumptive (tourism) activities. Many of the beneficiaries of these programmes are members of the San/Basarwa communities, the original inhabitants of the area (some of whom were displaced when Moremi Game Reserve was created). The UN Special Rapporteur in the field of cultural rights (Shaheed 2016) on her visit

to Botswana, was pleased to receive the Botswana Government's assurances that there will be no fencing off of the area, nor eviction of local communities, nor disruption of their rights of access to natural resources. The Special Rapporteur noted that consultations with communities were on-going through, for example, a multi-stakeholders community consultative conference held in Maun in March 2015. It is noted that the outcomes of this participatory workshop held in Maun (Satau et al. 2015), included recommendations that the indigenous peoples should approach government to promote an Okavango Delta wide governance system for the Okavango site that would include all the different communities and traditional authorities, relevant government ministries, and the private sector. The aim is to promote a shared vision of conservation, address poverty issues, promote benefit-sharing, and to create an effective platform to promote innovations and to respond to problems.

► Legal framework

Some Concern

The legal framework for protection of the property is weaker than would normally be expected for a conservation area of such outstanding value. Less than 25% of the area is designated as Game Reserve, through which it is protected against all forms of consumptive use. This area (the Moremi Game Reserve, 4,610 km2) lies at the centre of the 'core area' and its status is likely to be upgraded to National Park designation in the foreseeable future (IUCN, 2013). It is surrounded by 18 Wildlife Management Areas (WMAs) and 1 Controlled Hunting Area, which make up three quarters of the world heritage property. WMAs are areas of tribal land held in trust for communities by a government agency, the Tawana Land Board (TLB). The TLB leases the land to commercial tourism operators and/or community trusts, and supervises the activities of lease-holders. The legislation governing WMAs and CHAs allows settlement, cultivation, livestock and other activities that would not normally be expected within a 'protected area', so it is up to the TLB to determine lease terms, including any restrictions that it might impose for the benefit of wildlife. In practice, the TLB exercises its powers in a manner that ensures that 'commercial' WMAs (12 of the 18 WMAs making up the core area of the WHS) are used exclusively for high-end tourism operations where no settlement, cultivation or livestock is permitted, while 'community' WMAs are less restrictive and commonly include areas for

cultivation and livestock (most associated settlements have been excluded from the core zone and are located in the buffer zone, except as noted above). In the long term it may be appropriate to consider National Park status for most (or all) of the WHS ‘core area’.

► Enforcement

Some Concern

In terms of the legal framework being effectively enforced it is noted that concern was raised in the IUCN Technical Evaluation Report (WHN 2014) regarding the anti-poaching activities and wildlife management that are carried out by a very limited number of patrol staff at Moremi Game Reserve and by a number of other government, community and private sector operations. It was found that overall, on-the-ground management of wildlife appeared weak, lacking necessary resources, and being somewhat ad-hoc. There was found to be a general lack of capacity (material resources, vehicles, staff and funding) to fully implement the management plan. The State party State of Conservation report (GoB 2015) again highlights the limited resources (financial and human resources) available for implementing conservation programmes, including enforcement, as outlined in the ODMP. However, the State Party has confirmed its commitment to providing resources for the protection and management of the Okavango Delta and has since April 2014, made purchases and rationalised staff so as to strengthen management and monitoring of the site. It is also noted that the cooperation between DWNP and the Botswana Defence Force in anti-poaching enforcement is considered by many of the Tour Operators in the region to be effective (Anonymous Pers. Comm. 2016).

► Integration into regional and national planning systems

Mostly Effective

Management of the property is well integrated with regional and national planning systems, but has no unified management authority of its own. The nomination dossier (GoB, 2012) identifies no fewer than 37 pieces of legislation, policies, protocols and plans supporting conservation of the property, ranging from Botswana’s Vision 2016 to district and area-based plans such as the Okavango Delta Management Plan (covering the RAMSAR-

designated area).

▶ Management system

Mostly Effective

The management system is complex and involves a large number of local and national agencies. The Ministry of Environment, Wildlife and Tourism (MEWT) provides overall coordination at national level as most of the seven departments within the Ministry are involved in one way or another with site management. The MEWT's Department of Wildlife and National Parks has direct management authority over about 23% of the area (Moremi Game Reserve) while the Department of Environmental Affairs is serving an important role in coordinating the various district and national agencies. The Tawana Land Board and Botswana Tourism Organisation are also key players in management. Whilst the existing system seems to be working remarkably well, consideration should be given to the possibility of establishing a single authority with overall responsibility for the World Heritage site to avoid problems which might otherwise arise from over-lapping mandates and poor coordination in the longer term.
Amongst the various land-use and development plans that cover the World Heritage site the 2006 Okavango Delta Management Plan is most relevant. The focus of this plan is the RAMSAR-designated wetland of international importance, a much bigger area than that covered by the World Heritage site. Inscription of the Okavango Delta on the World Heritage list might be used as an opportunity to develop a revised management plan for the area that incorporates the requirements of world heritage status and addresses the need for a unified management system.

▶ Management effectiveness

Some Concern

The level of financial and human resources available for management varies significantly between different zones across the property. In general, Wildlife Management Areas that are leased to commercial tourism operators appear to benefit from the highest standards of management and protection, while there are significant short-comings in the Game Reserve, Community Trust and Controlled Hunting Areas. Whilst much of the area is inaccessible and requires little management intervention, there is a need for additional

resources to improve the effectiveness of wildlife protection, tourism regulation, community-based resource management, visitor interpretation, ecological monitoring and alien plant control (IUCN, 2013). There is also a need to involve community, NGO and private sector stakeholders in management decision making for the property through a multi-stakeholder Management Advisory Body (IUCN 2013).

► Implementation of Committee decisions and recommendations

Some Concern

The property was inscribed in 2014 and progress has been made on a number of issues addressed by the Committee at the time of inscription including:
1. Continued to implement the Okavango Delta Management Plan in order to maintain the Outstanding Universal Value of the property.
2. Developed protocols for wildlife monitoring in the Okavango Delta through the support of SAREP, including a web-based portal for analyzing the data.
3. Relinquished all the prospecting licenses in the core area and has not renewed most licenses in the buffer zone except 9, of which 2 of these are folios (at application stage).
4. Continued and expanded implementation of livelihoods programmes in the Delta.
5. Progress has been made in consulting the indigenous peoples on cultural heritage related issues.
6. Addressing the governance, stakeholder and coordination issues for the effective management of the property.
7. Continued with control and monitoring of alien invasive species within the property.
In the State of Conservation Report (GoB 2015) the State Party also drew attention to a number of challenges faced including:
1. Little progress has been made in establishing population baseline for key species and this is now earmarked for 2016/17.
2. Limited resources (financial and human resources) for implementing conservation programmes as outlined in the ODMP.
3. Challenge of dealing with outstanding prospecting licenses in buffer zone, which can be renewed up to 7 years, in terms of the existing laws.
4. New developments in the implementation of CBNRM, which take away the privileges local communities used to have under the old arrangement.

5. Coordination for the implementation of the management plan is still a challenge due to lack of capacity and resources.

► Boundaries

Mostly Effective

The boundaries of the core area of the property encompass most of the permanent swamps and seasonally flooded grasslands, and include a substantial additional area of adjacent deciduous woodlands. The boundaries were modified after submission of the nomination dossier, and now cover a core area of 20,236 km2 with a buffer zone of 22,866 km2 (SoOUV, 2014). The main elements, species and processes characteristic of the delta could be sustained within this area. However, it must be recognized that the property's Outstanding Universal Value will only be maintained if the inflowing river and its tributaries in Angola and Namibia are kept in a natural state without abstraction of water, building of dams and/or the development of agricultural irrigation schemes. Furthermore, it should be recognized that much of the mega-fauna migrates to areas beyond the boundaries of the property and is consequently vulnerable to hunting and/or any change of status in the buffer zone and beyond. The modified boundary provides for the inclusion of most of an important elephant migration corridor along the 'Selinda Spillway' to the north of the delta, and provides important connectivity with Chobe National Park along about 60km of common boundary.
Five distinct management regimes apply to zones within the nominated area. Moremi Game Reserve occupies about 23% of the core area and lies approximately in the centre of the property, surrounded by WMAs and CHAs. Thus the protected area design principles of having a totally protected core surrounded by zones designated for multiple uses are applicable in this case.

► Sustainable finance

Some Concern

The nomination dossier (GoB, 2012) notes that most funding comes from government and there is a shortage of resources for the management of the site. The various government departments involved in the site receive the equivalent of approximately US$1 million annually at district level (for all their district-wide activities, only a portion of which involves the Okavango

Delta WHS). The DWNP submits all revenue from Moremi Game Reserve to the national treasury, so there is no direct revenue retention scheme for re-investment in the property (although a trial scheme is now underway in the nearby Chobe National Park). Land royalties have recently been increased to 6% of the gross revenues taken by all tourism operations in the delta, which must amount to a substantial sum (the nomination dossier records US$ 750,000 of royalties at the old 3% rate). Revenue from land royalties is also submitted to the national treasury and will go into a new National Environment Fund (it was previously administered by District Authorities). With such a substantial 'high-end' tourism industry operating in the delta it seems very feasible to design and implement a suitable mechanism to re-invest a portion of revenues in the management and conservation of the property, but this is not yet in place. And there remains an administrative issue as the area of the World Heritage site is not a recognised management unit under a recognised authority that could manage its own budget and resources.

The private concessions in some of the Wildlife Management Areas are economically driven entities which seem to be very successful (IUCN, 2013). The income is partly used to maintain and develop the concession sites according to the approved management plans, while land royalties are paid to government, thereby supporting (indirectly) government's capacity to regulate and manage the property.

► Staff training and development

Some Concern

The Okavango Research Institute plays a significant role in training for monitoring and ecological management. Training has also been carried out for tour guides at various concessions for the implementation of a wildlife monitoring protocol.

► Sustainable use

Mostly Effective

The Delta has been inhabited for centuries by small numbers of indigenous people, living a hunter-gatherer existence with different groups adapting their cultural identity and lifestyle to the exploitation of particular resources (e.g. fishing or hunting). This form of low-level subsistence use has had no

significant impact on the ecological integrity of the area, and today mixed settlements of indigenous peoples and later immigrants to the area are located around the fringes of the delta, mostly outside the boundaries of the property. Six of the 18 Wildlife Management Areas in the core area are under lease to community trusts where community members use the land for cultivation and livestock rearing, and harvesting of wild products such as fish, thatching grass, reeds, medicines and building poles. The community trusts benefit from a good system of community-based natural resource management (CBNRM) Technical Advisory Committees (TACs). At the time of inscription, local communities were directly managing and using natural resources through their Community Based Organizations (CBOs). Since 2014 local communities no longer sign theses leases with the Tawana land Board. The Department of Lands now signs concessions directly with tour operators. A leading motivation behind the change was to provide equitable access to resources for communities through the Tourism Development Fund which supports a fairer distribution of wealth amongst a greater number of CBO’s (GoB 2015). There has also been the recent commitment by the State party that there will be no fencing off of the area, nor eviction of local communities, nor disruption of their rights of access to natural resources (Shaheed 2016).

► Education and interpretation programs

Some Concern

There are various government departments and non-governmental organizations implementing programmes for local communities such as the Community Based Natural Resources Programme (CBNRM), Poverty Eradication Programme, Youth Empowerment Schemes and Youth Development Fund, Funding programmes such as Citizen Entrepreneurship Development Agency (CEDA), Technical Capacity Building programmes for small enterprises through Local Enterprise Authority (LEA) and the revision of the Tourism Policy of 1992 to provide opportunities for citizens to participate in the tourism sector (GoB 2015). It is also noted that although the State Party is committed to continuing to empower different stakeholders in the conservation of the site, coordination remains a challenge.

► Tourism and visitation management

Highly Effective

Tourism is a substantial industry in the Okavango Delta, generating significant revenue and employment. There are 100 camps and lodges within the property, 33 establishments in nearby towns and villages, as well as 86 registered mobile camping safari operators (GoB, 2012). In general tourism operations are high-end, low-volume activities with small tented camp facilities located in exclusive concession areas reached by private charter aircraft. Management of concessions and the tendering and award of leases is carried out by the Department of Tourism (soon becoming a self-financing parastatal, the Botswana Tourism Organisation) and the Tawana Land Board.

► Monitoring

Some Concern

Monitoring of some parameters related to the ecological function and management of the delta is carried out by various government agencies and parastatal organizations. The Department of Water Affairs has maintained an extensive network of hydrological stations throughout the delta since the late 1960s, providing invaluable long-term information on the flooding cycle and changes in water quality. The University of Botswana’s Okavango Research Institute (ORI) has been monitoring various environmental parameters, on a rather ad hoc basis, for the past 16 years and has recently established a monitoring section. The State Party, through the Department of Wildlife and National Parks (DWNP) continues to work with researchers from the Okavango Research Institute (ORI), independent researchers and University of Botswana to conduct research on wildlife in the Okavango Delta. In March 2015, DWNP in partnership with ORI, held a symposium on Wetlands and Wildlife in Botswana which was attended by researchers, scientists, independent research organizations, NGOs, Community Based Organizations and government departments to share their research findings. The research results will contribute to the effective protection and management of the property. Aerial censuses of large mammal populations have been carried out sporadically by the Department of Wildlife and National Parks and non-governmental conservation organizations, while Birdlife Botswana monitors populations of globally threatened bird species. In general, far greater effort is required towards the development of a comprehensive, systematic monitoring programme that provides the data required to inform adaptive management of the delta (GoB, 2012). Despite maintaining these

partnerships, the State Party has not yet managed to establish the population baselines for key species and tracking long term trends. Current monitoring is therefore informed by the population census conducted in 2012. The State Party is however in the process of signing a Memorandum of Understanding with Okavango Research Institute to ensure collaboration in research in the Okavango Delta. Also, and in partnership with the Southern African Regional Environmental Programme (SAREP), DWNP has managed to establish a wildlife monitoring programme. The monitoring programme is aimed at collecting data to address the issue of the decline of wildlife populations in Northern Botswana as shown by the population census conducted in 2011 and 2012 by DWNP and Dr Mike Chase respectively. The programme has established Standardized Monitoring Protocols for the basic monitoring of flora and fauna within the Ngamiland concessions. As part of this monitoring tool, SAREP has also designed an Interactive Web-based Database and Basic Analyzing tool for Concessions (Bourquin and Brooks 2014).

► Research

Mostly Effective

The Okavango Research Institute carries out a range of research activities some of which have a direct bearing on management. Research tends to be project-related and determined by the availability of funding. A research strategy has been developed as part of the Okavango Delta Management Plan (DEA, 2008). A targeted research programme that feeds into an implemented adaptive management system of the site, needs to be developed.

Overall assessment of protection and management

Some Concern

Overall the ecological integrity of the property remains good as a result of its large size, inaccessibility and low human population densities in surrounding areas. The legal basis for protection is adequate for Moremi Game Reserve (4,610 km2 or 23% of the core area) but weak elsewhere, with much of the area (15,625 km2) designated as ‘Wildlife Management’ and ‘Controlled Hunting’ Areas where human settlement, cultivation and livestock are (potentially) allowed. In practice most of the Wildlife Management Areas are

well protected and managed by commercial tourism operators. Management regimes are complex and vary across the site according to the designation of particular ‘blocks’. It seems that there remain significant constraints in capacity and resources for the management of the Moremi Game Reserve and across most of the community-managed WMAs.

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

Some Concern

The main threats arising outside the site are related to (1) upstream water use and (2) poaching of migratory wildlife when animals move out of the area. The Permanent Okavango River Basin Water Commission (OKACOM) provides a regional forum for negotiation over use of the delta’s waters throughout its catchment, and should help minimise the impact of any future upstream developments on the flooding and functioning of the delta. Recent declines in the populations of some key large mammal species suggest that wildlife protection measures are not fully effective and poaching may be taking place under the guise of organized commercial hunting. To address this problem a nationwide ban on hunting was introduced in 2014.

▶ **Best practice examples**

N

State and trend of values

Assessing the current state and trend of values

World Heritage values

▶ **Africa’s most extensive inland delta without an outlet to the sea, lying within a desert environment**

Good
Trend:Stable

The delta’s physical characteristics are determined by the underlying geology and landforms, being the product of a process of faulting which has

blocked the flow of the Okavango River and forced it to spread out over the desert sands of the Kalahari Basin (Mendelsohn,et al, 2010). As long as the flow of the river continues, the delta's existence seems assured.

▶ Annual cycle of flooding

Good
Trend:Stable

The annual cycle of flooding is determined by seasonal rainfall patterns in the Angolan highland catchment areas as well as the physical geography of the Kalahari Basin which slows the flow of water to such an extent that flooding occurs during the dry season. This would be affected by any upstream water abstraction, or the construction of dams in the catchment areas, but there is no immediate prospect of any such development (IUCN, 2013).

▶ An outstanding example of the complexity, inter-dependence and interplay of climatic, geo-morphological, hydrological, and biological processes

Good
Trend:Stable

The ongoing ecological processes of this pristine wetland system are likely to be sustained as long as there are no significant alterations in the annual flood cycle (IUCN, 2013)

▶ Rich diversity of species across many taxa, with significant populations of African mega-fauna

Low Concern
Trend:Deteriorating

Species inventories for most taxa are likely to be far from complete, but the pristine nature of the habitats represented at the property suggests that its biodiversity is likely to be mostly intact. Populations of large animals in the Okavango Delta have fluctuated over the years. Census data provided for 2012 and other data reinforces the reported variability in population trends. Recent elephant research (Chase et.al. 2016) shows elephant numbers in Botswana increased prior to 2007 and decreasing thereafter. Species data is variable, subject to different survey techniques and surveys are somewhat

uncoordinated as they are undertaken by different institutions. This all contributes to an unclear picture of the Okavango Delta's wildlife (WHN 2014). The implementation of standard protocols for wildlife monitoring in the Okavango Delta data will assist in more accurately determining species population trends.

▶ Habitat for important populations of rare and endangered species

Data Deficient
Trend:Data Deficient

Habitat diversity and condition across the property is good, but there is little information on particular species and few data to indicate population trends for any of the area's rare and endangered plants and animals (GoB, 2012). Although the State party has developed protocols for wildlife monitoring in the Okavango Delta through the support of SAREP, which includes a web-based portal for analyzing the data, there is still insufficient data to determine trends in species populations.

▶ Landscape of exceptional and rare beauty

Good
Trend:Stable

Whilst these are necessarily subjective assessments, the natural beauty and wilderness values of the delta are widely recognized through popular literature and film (for example, Ross, 2003; Lanting, 1994), and evident from the large numbers of visitors willing to pay for high-end tourist facilities. These values are being maintained through appropriate development of low-volume tourism that has minimal impact.

Summary of the Values

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

Good
Trend: Stable

The Outstanding Universal Value of the Okavango Delta is the result of complex geological, biophysical and ecological interactions. The annual cycle of flooding, which maintains the wetland habitats and sustains the delta's

biodiversity happens at such a scale as to be largely unaffected by present levels of human activity. The extraordinary natural beauty of the place, with its ever-changing mosaic of open water, islands, channels and swamps is well conserved and in a stable condition. There remains however the on-going risks associated with insufficient accurate data pertaining to large mammal population trends, alien invasive water flora and any future water containment of extraction in the upstream catchment areas of Angola or Namibia.

Additional information

Benefits

Understanding Benefits

▶ **Legal subsistence hunting of wild game, Collection of wild plants and mushrooms, Fishing areas and conservation of fish stocks, Traditional agriculture**

Communities benefit greatly from the Delta, with parts of the property under direct management of community trusts. They have access to livelihood materials such as fish, and plants for food but hunting is limited. The State Party remains committed to improving livelihoods of local communities in the Delta and ensuring that they have access to the use of their natural resources (GoB 2015). A number of programmes continue to be implemented by different stakeholders to ensure that local communities benefit from the Okavango delta. These include the Community Based Natural Resources Programme (CBNRM), Poverty Eradication Programme, Youth Empowerment Schemes & Youth Development Fund, Funding programmes such as Citizen Entrepreneurship Development Agency (CEDA) and the Technical Capacity Building programmes for small enterprises through Local Enterprise Authority (LEA).

Factors negatively affecting these benefits are low but need to be managed sustainably.

► **Access to drinking water**

The Okavango Delta system provides vital ecosystem services, and is an important source of fresh water in an otherwise arid region (WHN 2014).

At the moment factors negatively affecting water are low, but the biggest threat to the overall integrity of the delta is disruption of the natural flow of water from the catchmnet areas.

► **History and tradition, Wilderness and iconic features, Sacred natural sites or landscapes, Sacred or symbolic plants or animals, Cultural identity and sense of belonging**

The Okavango Delta hold a number of important historic, cultural and spiritual sites. In order to recognize these sites, the San/Basarwa communities (the original inhabitants of the area) have been requested to document names and positions of all sites of cultural value so that these can be included the action plan for the World Heritage Site. The Special Rapporteu (Shaheed 2016) received the Botswana Government’s assurances that there will be no fencing off of the area, no eviction of local communities and no disruption of their rights of access to natural resources. Consultations with communities are on-going through, for example, a multi-stakeholders community consultative conference held in Maun in March 2015 (Satau et.al. 2015).

Low negative affects on cultural and spiritual values.

► **Collection of medicinal resources for local use, Outdoor recreation and tourism, Natural beauty and scenery**

A significant proportion of the local community derives employment through a thriving eco-tourism industry and its associated services. This is based on the natural beauty and scenery of the Okavango Delta. Medicinal plants are collected by the local inhabitants.

Low negative impacts on health and recreation.

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

There are a number of research projects carried out in the Delta every year. The Okavango Research Institute contributes to scientific knowledge of the area and plays a coordination role. The State Party continues to engage indigenous peoples and local communities, their traditional leaders and other stakeholders such as the University of Botswana (ORI), government departments, and non-governmental organizations to implement a holistic research programme.

The factors negatively affecting knowledge at the site are low.

► **Carbon sequestration, Soil stabilisation, Flood prevention, Water provision (importance for water quantity and quality), Pollination**

Rural community livelihoods are largely dependent on the ecosystems services provided by the river's system (Chevallier and Bybee 2014) and the Okavango Delta system provides a number of these, including; Provision of water for livestock or domestic use; production of wild foods and medicines; production of grazing for livestock; production of fuel, craftwork materials, construction materials; medicine, products for materials science, genes for resistance to plant pathogens and crop pests; climate regulation; carbon sinks; flood attenuation through the reduction of the amplitude and velocity of flood waters by wetlands, reducing downstream damage; groundwater recharge; retention of soil and fertility within an ecosystem; waste treatment through breaking down of waste, detoxifying pollution, dilution and transport of pollutants and the regulation of pests and pathogens (Turpie et.al. 2010).

factors negatively affecting environmental services are low.

► **Collection of timber, e.g. fuelwood, Sustainable extraction of materials (e.g. coral, shells, resin, rubber, grass, rattan, etc)**

The Delta supports the livelihoods of approximately 130,000 local people, most of who depend on its resources for building materials, food and medicines (WHN 2014).

The level of impact of the factors negatively affecting materials is low.

► Tourism-related income, Provision of jobs

Communities benefit greatly from the Delta at present, with parts of the property under direct management of community trusts, and other areas providing tourism-related direct employment. A significant proportion of the local community derives employment through a thriving eco-tourism industry and its associated services (WHN 2014). The revision of the Tourism Policy of 1992 provides opportunities for citizens to participate in the tourism sector. The Poverty Eradication Programme supports small enterprises in different sectors such as agriculture, tourism and catering (GoB 2015).

The level of impact of factors negatively affecting the contribution to local economy is low.

Summary of benefits

The key benefits generated by the Okavango Delta World Heritage site depend entirely on the maintained health of a complex ecological system that underpins the ecosystem services it provides. These include food and water, building materials, medicines and health and recreation. The site also provides a very important source of cultural and spiritual value for local communities and visitors. Because of the natural beauty and diversity of the area, the site is a major contributor to local economic development. The site also affords an opportunity to develop knowledge through research and education which allows for the on-going adaptive management of the site and the education of future generations.

Projects

Compilation of active conservation projects

№	Organization/ individuals	Project duration	Brief description of Active Projects
1	TOCaDI (Trust for Okavango Cultural and Development Initiatives)		Support for community development

№	Organization/ individuals	Project duration	Brief description of Active Projects
2	SAREP (Southern Africa Regional Programme for the Environment		Management and strategic panning support
3	Okavango Research Institute		Research and Monitoring
4	Birdlife Botswana		Monitoring bird life
5	Kalahari Conservation Society		No data

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