IUCN Conservation Outlook Assessment 2014 **(archived)**
Finalised on 23 September 2014

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

2014 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 are nevertheless some indications of unexplained recent declines in the populations of some large mammals and risks associated with any

possible future construction of dams or water abstraction 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'. There are significant constraints in capacity and resources for management of 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).

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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, 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. There is however some doubt over the level of poaching and its possible impact on some species of large mammal where significant population declines have been recorded in recent years. In addition, the natural dispersal of mammals has been disrupted (for several decades) by veterinary fences, designed to stop disease transmission between wildlife and domestic stock. Some of these fences are now being removed, allowing the restoration of natural migration routes. Elephant populations have recorded significant increases 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 and the spread of an invasive floating fern which disrupts aquatic habitats.

► Commercial hunting

Data Deficient
Inside site
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 (until recently) allowed.

► Livestock Farming / Grazing

Low Threat

Inside site
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 (GoB, 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.

► Other Ecosystem Modifications

Low Threat
Inside site
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) in recent years so migration routes towards the Makgadikgadi Pans (to the East), Chobe National Park, and other areas have been re-established.

► Tourism/ visitors/ recreation

Very Low Threat
Inside site

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.

► Invasive Non-Native/ Alien Species

Low Threat
Inside site
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)

► 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.

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.

► Dams/ Water Management or Use

High Threat
Outside site

The most significant long-term threat to the integrity and ecological function of the delta lies 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 has already indicated an intention to connect its Eastern National Water Carrier to the Kavango River to 'provide water to Windhoek and the surrounding areas' (GoB, 2012), and there will doubtless be many other demands on the waters of the Okavango as regional development gains momentum. 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)

► Temperature changes

Low Threat
Inside site
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 (GoB, 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 (GoB, 2012).

► Water Pollution

Low Threat
Inside site
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).

► 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

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).

► Legal framework and enforcement

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’.

► 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.

▶ Implementation of Committee decisions and recommendations

Data Deficient

As the property was inscribed as recently as 2014 there has not yet been any follow-up to the committee's decisions and recommendations made at the time of inscription

▶ 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

Data Deficient

There is no specific information on staff training and development, but the Okavango Research Institute (situated at the edge of the property) plays a significant role in training for monitoring and ecological management.

► 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). These TACs participate in the district-level Ngamiland CBNRM Forum, and benefit from the existence of a National CBNRM Forum and Policy. The community-based TACs advise communities on concessions, help resolve disputes, help with management plans and provide other services (IUCN, 2013).
A significant portion of the revenue accruing to community trusts was until recently derived from commercial hunting and the loss of this revenue due to the recent hunting ban will have a negative impact in the short term, at least until a successful transition to non-consumptive (tourism-based) use has been effected.

► Education and interpretation programs

Some Concern

Whilst there has been some outreach activity with local communities by the Department of Wildlife and National Parks, and through the support of community-based organizations, more needs to be done.

► Tourism and interpretation

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 ORI is currently in discussions with the Department of Environmental Affairs over the establishment of a formal agreement and provision of resources for a more systematic monitoring programme (GoB, 2012). 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).

► 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)

► 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).

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’. There are significant constraints in capacity and resources for management of 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.

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 some large mammals (e.g. wildebeest, giraffe) have declined over the past decade or so (Gifford, 2013, GoB, 2014), and there is an ongoing problem with Salvinia molesta, an invasive floating plant that is choking some of the delta’s waterways (GoB, 2012)

▶ **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)

▶ **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 are nevertheless some indications of unexplained recent declines in the populations of some large mammals and risks associated with any possible future construction of dams or water abstraction in the upstream catchment areas of Angola or Namibia.

Additional information

Key conservation issues

▶ **Mineral prospecting licenses**
National

It needs to be ensured no extractive industry activity is permitted in the property, and the few remaining mineral prospecting concessions are permanently extinguished, which are scheduled to expire in 2014, without awarding any timeframe extensions and not issue any new concessions within the property

▶ **Recognition of community rights**
Local

The rights of the San and other local communities to access and use certain

renewable natural resources and cultural sites within the property and its buffer zone need to be formally acknowledged.

► Monitoring of state of conservation and management effectiveness indicators.

Local

A systematic long-term programme is required to monitor key ecological and management effectiveness indicators and the state of conservation of the property ensure an initial focus on understanding the observed decline in some large mammal populations and the effectiveness of management interventions (e.g. hunting ban, anti-poaching measures) to reverse it.

► Legislation and governance

National

The legislation to ensure long-term protection of the property’s Outstanding Universal Value, especially in relation to areas currently designated as Wildlife Management Areas and Controlled Hunting Areas (where existing legislation allows settlement, cultivation and livestock keeping) needs to be strengthened.; A simplified management structures for the World Heritage site as a clear entity could also be beneficial.

► Management capacity and programmes

Local

Increased staffing levels, equipment and resources for management are required to enhance anti-poaching activities, community outreach, tourism management and alien plant control throughout the property, with particular emphasis on addressing management needs for Moremi Game Reserve and areas managed by Community Trusts.

► Veterinary fences and landscape connectivity

Local

Veterinary cordon fencing needs to be further rationalized.

► Invasive alien species

Local

Efforts to control and eliminate invasive alien species within the property need

to be further strengthened.

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
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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