

Ramsar Information Sheet

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1. Date this sheet was completed:

20.11.1996

2. Country:

Botswana

3. Name of wetland:

The Okavango Delta System

4. Geographical co-ordinates:

The Okavango Delta System lies between Longitudes 21 degrees 45 minutes East and 23 degrees 53 minutes East; and Latitudes 18 degrees 15 minutes South and 20 degrees 45 minutes South.

It includes the Okavango River, commonly referred to as the Pan handle; the entire Okavango Delta; Lake Ngami; and parts of the Kwando and Linyanti River systems that fall west of the western boundary of the Chobe National Park. The entire area is as depicted on the attached map.

5. Altitude:

Generally between 930 metres and 1000 metres above sea level.

6. Area:

Approximately 68 640 km² (6 864 000 hectares)

7. Overview

Three main features characterise the region, the Okavango, the Kwando and Linyanti river system connected to the Okavango Delta through the Selinda spillway and the intervening and surrounding dryland areas. These features are located within the Okavango rift, a geological structure subject to tectonic control and infilled with Kalahari Group sediments, principally sand, up to 300 metres thick. The Delta is the most important of the above named features. It is an inland delta in a semi arid region in which inflow fluctuations result in large fluctuations in flooded area (10,000 - 16,000 km²), which is comprised of permanent swamp, seasonal swamp and intermittently flooded areas. Similar flooding takes place in the Kwando/Linyanti river system. This leads to high seasonal concentrations of birdlife and wildlife, giving the area a very high tourism potential.

8. Wetland type:

Inland Wetlands

3. Inland delta (permanent)
4. Riverine flood plains
6. Seasonal freshwater lake

9. Ramsar Criteria:

10. Map of site included:

See attached map of the Okavango Delta and a map of Botswana showing the relative location of the Delta within the country.

11. Name and address of compiler:

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12. Justification of criteria selected under point 9:

The area described is a unique inland wetland providing a haven for many endangered species of flora and fauna. The multiplicity of habitats between the extremes of perennial swamp and semi-arid scrubland allow a substantial biodiversity among all life forms to compensate for the vagaries of a

mainly dry, low-rainfall, drought-prone and very variable climate. It is this juxtaposition of these contrasting land- and waterscapes, with their attendant biota in a wilderness setting, which provides the appeal for tourism as well as the rationale for their inclusion in the RAMSAR convention.

13. General location:

The described area covers the northeastern part of the Ngamiland sub-District in the Northwest District of Botswana and borders Namibia in the north. Indeed the Okavango River enters Botswana from Angola through Namibia and the Kwando/Linyanti River system borders Namibia. A map of Botswana is also enclosed to show the relative location of the proposed Ramsar site within the country. The village of Maun is the major village of the area and it is considered to be the tourist capital of Botswana while Gaborone, the capital city of Botswana is some 580 kilometres south east of the Delta.

14. Physical features:

The Okavango River rises in Angola, flows through Namibia and enters Botswana where it flows in a broad well-defined channel with a clearly defined floodplain for a distance of about 90 kilometres. This reach is known as the panhandle. It then spreads out to form the delta. The Okavango Delta has developed in a depression in the Kalahari bedrock. The system slopes from an elevation of 1000m above sea level at Molembo at the beginning of the panhandle to 980 m at the apex of the delta and to 930m at Maun, at the base of the delta. There is very little suspended matter in the incoming water, but a considerable bed load. The bed consists of sand with a median grain diameter of 0.2-0.4 mm. The continued deposition of sand has given rise to the present complex of islands, ridges, pools and permanent and seasonal swamps. The total drop in altitude between Molembo and Maun, a distance of 440 km, is only 62 metres, giving a gradient of approximately 1:7,000 only. Thus anastomosing and braiding channels distribute the sediment, while most of the water moves through flood plains. Maximum local relief, between island crest and channel thalwegs is around 6 metres. The permanent swamp covers approximately 6000 km², while the seasonal swamp varies between 4000 and 10,000 km² in size.

15. Hydrological values:

The area is the only inland delta in sub-Saharan Africa and possibly in the world. It is hydrologically unique. The variations in inflow have profound effects in the processes of river flow, water distribution and sediment distribution. All ecological dynamics are directly controlled by these processes, which are critical in understanding water balance processes in (semi) arid environments. The annual inflow ranges between 7,000 and 15,000 million cubic metres. Of this almost 97% is lost to evapotranspiration and seepage leaving only 3% to exit past Maun.

16. Ecological features:

The primary ecological determinant is flooding duration and depth. This maintains open floodplain grassland by preventing woody encroachment. Most vegetation in flooded areas consists of sedges, grasses and aquatic plants. Woody species are restricted to the dryland areas and the islands, with the exception of water fig. Permanent and seasonal floodplains form critical habitat for many species of wildlife and birdlife that are at their southern limits of distribution in the region. The maximum flooding occurs in the winter (dry) months and thus provides important dry season forage and water for wildlife. Conversely, the dryland areas form important grazing areas in the rainy season. Fluctuations in flooded area are very important for productivity, both primary and secondary.

17. Noteworthy flora:

Some 1061 different plant species have been recorded in the Okavango. While the area as a whole has a high plant species/area ratio when compared with other parts of the subcontinent, this situation arises more from the wide spectrum of habitats rather than any greater, inherent within-habitat diversity. The Okavango ecosystem is oligotrophic with a low supply of nutrients and low in productivity. Almost half the number of plant species grow in the wetlands with the other half in the drylands. There are 208 aquatics or semi-aquatics, 675 herbs (including grasses, sedges and forbs) and 195 woody plants (trees, shrubs, etc.). The most important families are the grasses, sedge, legumes and composites with 460 species (some 43% of the total). The woodland and savanna communities are dominated by trees or shrubs of the legume family (mophane, *Acacia*, *Albizia*, *Lonchocarpus*, *Dichrostachys*) or *Combretaceae* (*Combretum*, *Terminalia*) as well as shrubs of *Grewia*, *Maytenus*, *Rhus* and *Ximenia*. One orchid (*Habenaria pasmithii*) is so far the only plant known to be endemic to the Okavango.

region. Several other species of orchids are rare and endangered.(see original for list of tree and shrub species)

18. Noteworthy fauna:

There are some 32 large mammal species in this region ranging from the relatively rare and shy sitatunga (*Tragelaphus spekei*) to the ubiquitous elephant (*Loxodonta africana*). The area boasts the largest populations of sitatunga and red lechwe (*Kobus lechwe*) in the world. The Okavango is regarded as the major surviving stronghold of the sitatunga and is therefore of paramount importance. The area also contains one of the largest remaining populations of wild dog (*Lycyon pictus*) and some 72 small mammal species occur in the area. The majority is represented by three orders, Carnivores (23 spp), Rodents (24 spp) and Bats (12 spp). Some 95 species of reptiles and amphibians occur in the region some of them endemic. The total number of insect species in the Delta is unknown. At least 84 species belonging to the Odonata have been recorded, while some 117 species of belonging to the Lepidoptera have been recorded from the Moremi Game Reserve alone.

Of particular note, however, is the tse-tse fly which is found in the central parts of the area. This fly has had the most influence on the environmental history of the Okavango through preventing the spread of domestic livestock and arable agriculture from the periphery to the interior of the Delta. An equally large but for more serious gap in knowledge exists with regard to very small organisms, the lower forms of life such as algae plankton and bacteria, which are important to an understanding of ecosystem processes and functioning of the Okavango ecosystem.

The Okavango Delta and the Kwando-Linyanti River systems sustain a wide variety of mammalian fauna with perhaps the exception of small mammals in the Okavango largely due to the shortage of certain niches which occurs as a result of seasonal flooding. A broad spectrum of interlocking habitat types within the wetland systems of Northern Botswana contribute to the diversity of mammalian species ranging from those that are almost or completely aquatic to animals that are by and large independent of surface water.

The permanent swamps or areas of perennial water provide habitats for three species of aquatic or semi-aquatic large mammals :

Hippopotamus	<i>Hippopotamus amphibius</i>
Sitatunga	<i>Tragelaphus spekei</i>
Red lechwe	<i>Kobus lechwe</i>

Many other terrestrial herbivores that require regular access to surface water inhabit the seasonally inundated areas whose extent is largely determined in the case of the Okavango by magnitude of the annual flood from the Angolan highlands and local rainfall. The higher dry land masses found within the Okavango Delta and the riverfronts of the Linyanti and Kwando are important refuges particularly when flooding renders the above areas inaccessible.

Large herbivores that utilise these areas include :

Syncerus caffer, *Equus burchelli*, *Loxodonta africana*, *Connochaetes taurinus*, *Damaliscus lunatus*, *Redunca arundinum*, *Tragelaphus scriptus*, *Kobus vardoni*, *Aepyceros melampus*, *Kobus ellipsiprymnus*.

Less water dependent herbivore which utilise surface water to varying degrees include :

Sylvicapra grimmia, *Raphicerus campestris*, *Taurotragus oryx*, *Oryx gazella*, *Giraffa camelopardalis*, *Tragelaphus strepsiceros*, *Hippotragus niger*, *Hippotragus equinus*, *Struthio camelus*, *Phacochoerus aethiopicus*.

Several of the above species including elephant, zebra and wildebeest migrate on a seasonal basis between temporal wetland which are scattered throughout Northern Botswana and the permanent wetland systems. The high concentration of herbivores near permanent water bodies attract numerous predators such as :

Panthera leo, *Crocuta crocuta*, *Lycayon pictus*, *Acinonyx jubatus*, *Panthera pardus*.

Baboon (*Papio ursinus*) are conspicuous residents of the ecotonal areas of these wetland systems. Several protected small mammals also occur within the wetland systems. These include several species of civet and otter.

The Okavango, Kwando and Linyanti wetland systems also support a variety of waterbirds and terrestrial bird species. More than 650 species of birds have been identified in the Okavango delta alone despite the paucity of anatidae which tend to occur in the few areas with soils richer in nutrients. The Pygmy Goose (*Nettapus auritus*) however is one anatid which occurs in significant numbers in the delta. Two globally threatened waterbird species are resident in Botswana. The Wattled Crane, *Burgeranus carunculatus* breeds in the Okavango (several hundred pairs). The Delta also serves as a major breeding site for the Slaty Egret (*Egretta vinaceigula*) and other species of herons and storks.

The permanent swamps and rivers of Northern Botswana provide important habitats for the following species:

Ardea goliath, *Ardea purpurea*, *Butorides rufiventralis*, *Botaurus stellaris*, *Ardeola ralloides*, *Gorsachius leuconotus*, *Phalacrocorax africanus*, *Phalacrocorax neglectus*, *Platalae alba*, *Balearica regulorum*, *Grus carunculata*, *Ephippiorhynchus senegalensis*, *Mycteria ibis*, *Leptoptilos crumeniferus*, *Egretta garzetta*, *Egretta ardesiaca*, *Egretta vianciegula*, *Sacred ibis*, *Ahinger melanogaster*, *Pelecanus onocrotalatus*, *Chlidonias hybridus*, *Rynchops flavirotris*, *Phoenicopter minor*, *Phoenicopter major*, *Dendrocygna viduata*, *Thalassornis leuconatus*, *Nettapus auritus*, *Alopochen aegyptiacus*.

An estimated 68 species of fish occur in the Okavango ecosystem, with the sharp tooth catfish being endemic. The species diversity decreases in a downstream direction. (see original for list)

19. Social and cultural values:

The part of the Delta outside Wildlife Management Areas is populated by several ethnic groups, notably the Bayei, the Tawans, the Hambukushu, the Herero and the Banoka (River Bushmen). These have traditionally based their lifestyles on rivers and wetlands. They are ethnically distinct from other groups in Botswana, having different languages, social structures and relationships. The Bayei are responsible for bringing to the Delta the “mokoro” (dug-out canoe), which has become symbolic of travel in the Delta. The Hambukushu, who are also concentrated in the Delta region, are the original makers of the baskets that have made Botswana famous for the craft. All these people rely on the Delta for much of their livelihood.

Reeds and thatching grass are used for houses, palmfronds for baskets and fish and plant products for food. The latter include not only the fruit of trees but also the several waterbased plants like bulrushes and water lilies. They have considerable traditional knowledge of the flora and fauna in the Delta region, including plants used for medicinal purposes. This ethno-botanical knowledge provides an important resource base for cultural tourism and possible genetic extraction for pharmaceutical and other causes. Most people living in the area depend in the tourist industry for cash income, either directly or through remittances. Because the tourist season fits neatly between the harvest time and the next ploughing season, it has not disrupted subsistence farming. Instead it allows households to remain economically active throughout the year. Many farmers rely on “molapo” of flood recessions farming, which allows them to grow crops in any area where rainfall is insufficient.

20. Land tenure/ownership of:

All of the region described above is Tribal land under the control of the Tawana Land Board. The Board leases a number of concession areas to safari operators for hunting and photographic purposes. Further camp/lodge sites are leased to operators for photographic purposes only. The area is subdivided into administrative units named Controlled Hunting Areas (CHAs). Nine Controlled Hunting Areas are zoned for community management, while a further twelve are zoned for commercial management.

The Moremi Game Reserve is a part of the Delta System and in this area all wildlife is protected. This game reserve is unique in that it was founded by the local tribe. Outside the game reserve and the

Wildlife Management Areas is communal land where subsistence farming and livestock farming are the common forms of land use. Fishing for subsistence also takes place.

21. Current land use/principal human activities:

Current land use has several facets. The Moremi Game Reserve is wholly utilized for non-consumptive (photographic) tourism. The Reserve is zoned into a medium density tourism zone, a low density tourism zone and a wilderness zone, in which there is a progressively decreasing amount of human activity. Traditional resource use e.g. grass and reed cutting takes place on the fringes of the Reserve. The surrounding Wildlife Management Areas are subdivided into areas for commercial and community management and are either zoned for non-consumptive utilization (the areas immediately bordering the Reserve) or as multi-purpose areas in which both non-consumptive utilization and consumptive utilization (trophy hunting, citizen hunting, subsistence hunting, capture, culling and cropping) are allowed. In the community managed areas limited subsistence cropping takes place, while some small stock and donkeys are kept as well. All commercial and most community areas managed under a resource use leases given out by the Tawana Land Board. Most of the region has been declared a stock-free zone under the Diseases of Animals Act of 1977.

Most of the area covered by the Delta has been afflicted by a cattle disease known as cattle lung disease (Contagious Bovine Pleuro Pneumonia) which forced Government to kill all cattle in the area. Re-stocking will only start once the appropriate authorities are satisfied that the disease has been eliminated. While the area had over 300.000 cattle, now it has none.

Being close to water dryland farming is practised in the region mainly at a subsistence level. Fishing is also undertaken. The reeds and papyrus and palms are used for building homes, making mats and basketry the latter being for local consumption as well as for sale to tourists.

22. Factors adversely affecting the site's ecological character, including changes in land use and development projects:

The main threat may come from possible water abstraction from the Okavango and Kwando Rivers and their subsidiaries by the riparian fringe states (Botswana, Namibia, Angola and Zambia). For the Okavango River system however Botswana, Namibia and Angola have formed the Okavango Commission to oversee the management and use of the system on a sustainable basis. There is however the ever present possibility that one or other of the states may decide to extract water for one reason or the other without consulting the others. As of now Namibia is looking into the possibility of extracting water from the Okavango River and they have instituted a study to look into the possible implications of such extraction. Botswana asked that the study also include the Botswana side and the Namibians have since agreed to expand the study.

23. Conservation measures taken:

The Moremi Game Reserve and the Wildlife Management Areas enjoy protection under the Wildlife Conservation and National Parks Act of 1992. The wildlife areas consist of the Moremi Game Reserve (4,865 km²) and the Kwando (12,530 km²) and the Okavango (8,655 km²) Wildlife Management Areas. In the Game Reserve only non-consumptive utilization is allowed. In the Wildlife Management Areas wildlife utilization (both consumptive and non-consumptive) is the primary form of land use. Appropriate land use and management plans have been or are being prepared for the region.

The part of the Delta outside the wildlife areas does not enjoy any particular conservation status. However land use in the area, like elsewhere in the country, is regulated. Land is zoned for a specific use and an institution called the Tribal Land Board allocates land for given uses to specific users, be they individuals, companies or communities. A land use map is drawn up by the appropriate authorities in the district and submitted to central government in this case the Ministry of Local Government Lands and Housing, for approval. Any local threats to the Delta will therefore be monitored through the various authorities responsible for land use and water extraction. The main users, however, for the area outside wildlife areas are the communities.

24. Conservation measures proposed but not yet implemented:

None over and above the already designated Game Reserve and Wildlife Management Areas. The move by Government to designate the entire area as a Ramsar site means that all concerned with

allowing any form of land use in the area will have to take into account the guidelines and limitations implied by the area becoming a Ramsar site.

25. Current scientific and research facilities:

Considerable research efforts have always been directed at the region under discussion, in particular at the Okavango Delta itself. This ranges from the Government annual aerial surveys of wildlife in Botswana to private researchers investigating certain aspects of the ecosystems in the region. Research has been done on elephant, buffalo, zebra, wildebeest, baboon, lion and wild dog, and fisheries. The vegetation-wildlife interaction of the region has also been studied by a number of researchers and the Ministry of Agriculture have routine range studies that cover the entire country. University groups and private researchers have studied the processes shaping the region, its geomorphology and other physical aspects. The Okavango Research Centre of the University of Botswana has taken form and started research in the Delta.

26. Current conservation education:

No specific conservation education facilities presently exist within the region. However, schools from all over the country are assisted by the Department of Wildlife and National Parks to visit the Moremi Game Reserve and the Botswana Wildlife Training Institute also engages in environmental education activities with the region as an example. Other conservation activities take place on an ad hoc basis.

27. Current recreation and tourism:

The Okavango delta is a show piece for Botswana's tourism and is known worldwide as a tourist attraction not to be missed. It and the nearby Chobe National Park are the country's draw cards as far as international tourism is concerned and the tourist route connects them to the Victoria falls in Zimbabwe.

28. Jurisdiction:

Jurisdiction over the area is divided amongst a number of organizations.

- i. The Tawana Land Board has jurisdiction over the allocation and management of land in the area;
- ii. The North West District Council which is the political authority responsible for all developments within the district;
- iii. There is the Ministry of Local Government lands and Housing under who the Land Board and North West District Council fall;
- iv. The National Conservation Strategy Advisory Board and its Secretariat, the National Conservation Strategy (Coordinating) Agency, are charged with coordinating all issues relating to the environment including Environmental Impact Assessment;
- v. The Ministry of Mineral Resources and Water Affairs which is responsible for managing water issues;
- vi. The Ministry of Commerce and Industry which, through its Department of Wildlife and National Parks and Department of Tourism is responsible for managing the Moremi Game Reserve and the Wildlife Management Areas as well as promoting the Okavango as a tourist destination;
- vii. The Ministry of Agriculture which is responsible for range management, forestry and fisheries.

29. Management authority:

The National Conservation Strategy (Coordinating) Agency. Private Bag 0068, Gaborone. Botswana. Telephone: (267) 302050. Telefax (267) 302051.

30. Bibliographical references:

There is much literature about the Delta and its environs, both popular and scientific. Below is a selection of documents that have a direct bearing on the management and conservation of this proposed RAMSAR site.

Field, D.J. 1976

A Handbook of Common Grasses in Botswana.
Ministry of Agriculture, Private Bag 003, Gaborone.
Botswana.

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- Roodt, V. Undated The Shell Field Guide to the Common Trees of the Okavango Delta and Moremi Game Reserve. Printed by Dando and Van Wyk. South Africa.
- Skelton, Paul 1993 A Complete Guide to the Freshwater Fishes of Southern Africa.
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