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REPUBLIC OF BOTSWANA

Ministry of Environment,
Wildlife and Tourism
Private Bag BO 199
GABORONE

Date: 25th November 2015

The Director - Dr. Mechtild Rossler
World Heritage Centre
7, Place de Fontenoy
7352, Paris
FRANCE

Dear Dr. Rossler,

As requested by the World Heritage Committee at its 38th Session in Doha in Decision 38 COM 8B.5, the State Party of the Republic of Botswana submit the enclosed State of Conservation Report for the Okavango Delta to be examined by the World Heritage Committee during its 40th Session in 2016.

We believe that this report will give the World Heritage Committee an accurate picture of the progress made in addressing the issues and recommendations made following inscription of the site during the 38th session of the committee.

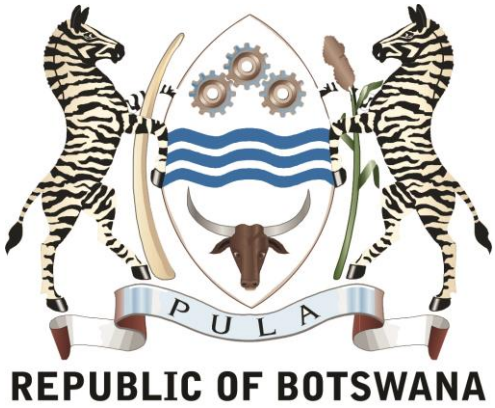
Since inscription, the State Party has made the following progress; (i) continued to implement the Okavango Delta Management Plan in order to maintain the outstanding universal value of the Delta, (ii) developed protocols for Wildlife monitoring in the Okavango Delta, (iii) relinquished all the prospecting licenses in the core area, (iv) progress made in consulting the indigenous peoples on cultural heritage related issues, (vi) progress made in expanded implementation of livelihoods programmes in the Delta, (vi) progress made in addressing the governance, stakeholder and coordination issues for the effective management of the property and (viii) the continued control and monitoring of alien invasive species within the property.

The State Party of the Republic of Botswana is committed to the effective protection and management of the Okavango Delta and is looking forward to continue working with the World Heritage Centre and World Heritage Committee in achieving this.

Yours sincerely,

Hon. Tshekedi Khama
MINISTER OF ENVIRONMENT, WILDLIFE & TOURISM

STATE OF CONSERVATION REPORT
OKAVANGO DELTA NATURAL WORLD HERITAGE SITE, BOTSWANA
(N1432)



BY THE GOVERNMENT OF THE REPUBLIC OF BOTSWANA
DEPARTMENT OF NATIONAL MUSEUM & MONUMENTS
MINISTRY OF ENVIRONMENT, WILDLIFE & TOURISM

Report Developed by State Party of Botswana with the support of USAID, Southern African Regional Environmental Program (SAREP)

NOVEMBER 2015

Contents

Executive Summary

Okavango Delta, located in north-west of Botswana was inscribed on the World Heritage list in June 2014 under natural criteria; (vii), (ix) & (x). The Okavango Delta Management Plan guides the management of the site. Since 2014, a series of meetings were held with different stakeholders among them; Department of Environmental Affairs (DEA), Department of National Museum & Monuments (DNMM), Tawana Land board and Okavango Research Institute (ORI), Okavango Delta Wetlands Management Committee and Southern African Regional Environmental Programme (SAREP) to assess the progress made in implementing the ODMP as per the 2012 Implementation plan and ODRS SEA Report of 2013, as well as prepare for submitting the first report on the State of Conservation (SOC) of the property. This included assessing progress in implementing the recommendations of the World Heritage Committee at the time of inscription (*Decision WHC 38 C0M 8B.5*).

Since inscription, the State Party has made the following progress:

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.

Challenges include:

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.

The State Party would like to thank USAID, Southern African Regional Environmental Programme (SAREP) for supporting preparation of this State of Conservation (SOC) report, of which without their support it would have been difficult to have stakeholders meetings.

1.0 IDENTIFICATION OF THE PROPERTY

1. **NAME OF PROPERTY:** Okavango Delta N1432
2. **YEAR OF INSCRIPTION:** June 2014
3. **INSCRIPTION CRITERIA:** (vii), (ix) and (x)

2.0 PREVIOUS COMMITTEE DECISIONS

Decision WHC 38 C0M 8B.5

3.0 INTERNATIONAL ASSISTANCE

N/A

4.0 UNESCO EXTRA BUDGET

N/A

5.0 PREVIOUS MONITORING MECHANISM

N/A

7.0 FACTORS AFFECTING PROPERTY IDENTIFIED IN PREVIOUS REPORTS

(WHC 38 COM 8B.5)

1. Need to establish population baselines for key species and to track long term trends;
2. Need to rationalize veterinary cordon fencing,
3. Existence of extractive industry activity in the property and the need to permanently extinguish all the few remaining mineral prospecting concessions, as well as not issue any new concessions within the property,
4. Monitoring and managing mining in areas outside of the property so as to avoid any adverse impacts to the property,
5. Traditional resource use for livelihoods, user access rights, cultural rights and access to opportunities for local communities in keeping with the property's Outstanding Universal Value,
6. Address a range of other protection and management issues including
    a. Governance and coordination framework for the site
    b. Stakeholder empowerment
    c. Management planning
    d. Management capacity
    e. Control of alien invasive species.

8.0 CURRENT CONSERVATION ISSUES

7.1 Coordinated and systematic wildlife monitoring programme

Continue efforts to develop, in partnership with Universities, NGOs and wildlife experts, a coordinated and systematic wildlife monitoring programme to establish population baselines for key species and to track long term trends.

The State Party, through the Department of Wildlife & 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. DWNP is also in the process of finalizing the research strategy to guide conduct of research on wildlife in Botswana including the Okavango Delta.

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. Towards addressing this issue, the State Party is in the process of signing a Memorandum of Understanding with Okavango Research Institute that will ensure collaboration in the research in the Okavango Delta which will help establishment of a population baseline for key species and establishing long term trends and a wildlife monitoring programme. The signing of the MoU will inform the year in which the databases will be integrated.

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. The monitoring data is collected by guides under the responsibility of concessionaires, for the long term trend assessment of flora and fauna and observation of wildlife population demographics in Ngamiland. These guidelines have been designed to merge seamlessly with the existing and operational Management Oriented System (MOMS) which is implemented by DWNP and is used by communities in their concessions and protected areas in Botswana. The Monitoring Tool provides sufficient data to guide management decisions, build capacity of field staff, stimulate discussion amongst local resource users and encourages local participation. In addition to the standardized protocol and MOMS, a more scientifically rigid approach to the monitoring of flora and fauna in the concessions in the form of a bi-annual series of transects in March and October, is specifically undertaken in each concession and aimed at observing population demographic patterns of both herbivores and carnivores.

As part of this monitoring tool, SAREP has also designed an Interactive Web-based Database and Basic Analyzing tool for Concessions. The web-based tool allows concessionaires to upload the data they collect in a standardized manner, which is then generated into graphic visuals such maps and graphs. The objective for the website is to provide on-going feedback, that captures the data, visualizes it and collates the data from all the concessions to give a picture, or status report on the state of flora and fauna within the WMAs of northern Botswana as an on-going process. In the past, data was collected by different concessionaires, but was never analyzed and used as a decision making platform on the monitoring process.

As part of implementing this tool, SAREP will conduct 17 field based training activities, one in each concession in the delta, plus 2 in Maun for Safari companies staff and 1 for DWNP staff. A total of about 200 guides will be trained, plus 10 office staff from Safari Companies and 10 staff members from DWNP. During the final year of SAREP activities, they will train DWNP staff to become website administrators while working with all stakeholders to ensure that the website for data collection is running smoothly and effectively. In each company there is a focal person who is responsible for ensuring that the monitoring data is collected and entered. DWNP will liaise with that person to ensure that this occurs. It is expected that DWNP will include in their annual budget the maintenance of the website. However, DWNP has funding and skilled staff challenges. This is critical to the seamless transfer of the programme from SAREP to DWNP.

7.2 Rationalize veterinary cordon fencing

Continue efforts to rationalize veterinary cordon fencing, removing it when its effectiveness for disease control has become questionable or where more holistic approaches to animal sanitation and disease control are possible,

The Ngamiland area, where the Okavango Delta is located, has for a long time been affected by livestock diseases some of which are spread by wildlife such as Buffaloes. In addressing the problem, government erected veterinary cordon fences to control diseases. However, conservationists and researchers have argued that the cordon fences affect wildlife movements and have also questioned the effectiveness of the fences in disease control. However, through a National Policy, Government has, through the Department of Veterinary Services continued to monitor the effectiveness of the fences. DWNP continues to provide advice on this matter.

The Botswana Government Policy on Veterinary fences is that a periodic Environmental Impact Assessment (EIA) should be conducted every five years on all the fences and where possible, some of the fences should be removed if their usefulness has been outlived. For example, an Environmental Impact Assessment (EIA) study by Scott Wilson (2000) on CBPP Fences recommended the removal of the Setata and Nxai Pan Buffalo Fences. The removal of the Setata Fence was done and completed in 2003, and the Nxai Pan Buffalo Fence was removed in 2004. The removal of these fences was of significant to wildlife conservation. The Kalahari Conservation Society (2005) Report indicated that “the removal of the 210 kilometer Setata Fence and the 66 kilometer portion of the Nxai Pan Buffalo Fence resulted in an immediate end to negative impacts on wildlife populations in the affected areas”. Though veterinary fences block wildlife migratory routes and kill wildlife in some instances, some of the veterinary fences such as the Southern Buffalo Fence and indeed the Northern Buffalo fence have played a significant role in protecting the core parts of the delta from encroachment of the livestock industry.

The State Party will commission an EIA that will assess the effectiveness of the fences and its impacts on wildlife species in the Okavango delta for the financial year 2016/2017. Currently, DVS is experiencing challenges in terms of lack of funding to maintain the fences, deal with vandalism of the fences by some local communities and Elephants. The State Party is committed to sourcing funding for maintenance of the fences and educating the public on the importance of the fences in disease control.

7.3 Extractive industry activity

Ensure no extractive industry activity is permitted in the property, and permanently extinguish all the few remaining mineral prospecting concessions, which are scheduled to expire in 2014, without awarding any timeframe extensions and not issue any new concessions within the property.

At the time of inscription, it was realized that there were prospecting licenses issued in both the core area and the buffer zone. The State Party, in its submission of supplementary information committed that it will not allow mining in the core area and that it will expunge all prospecting licenses in the core and buffer once they expire and will not issue any new licenses in the core and buffer zone.

Since 2014, the State Party has not issued any new licenses and neither is there any mining in the core area. The State Party will continue to monitor any illegal prospecting that might take place in the core area. The State Party has made considerable progress in relinquishing and not renewing the licenses in the buffer zone once they expire. Out of 41 prospecting licenses, only 9 licenses are remaining. DOM is in the process of resolving the 9 outstanding prospecting licenses in the buffer zone. It is important to note that there are challenges in this process given that the duration of the prospecting licenses is 7 years and negotiable with the respective companies who may have invested heavily in the process over the years. However, the State Party has not been issuing new licenses in the buffer zone at all. Below is a table that summarizes this progress;

Status of Prospecting licenses at the time of inscription

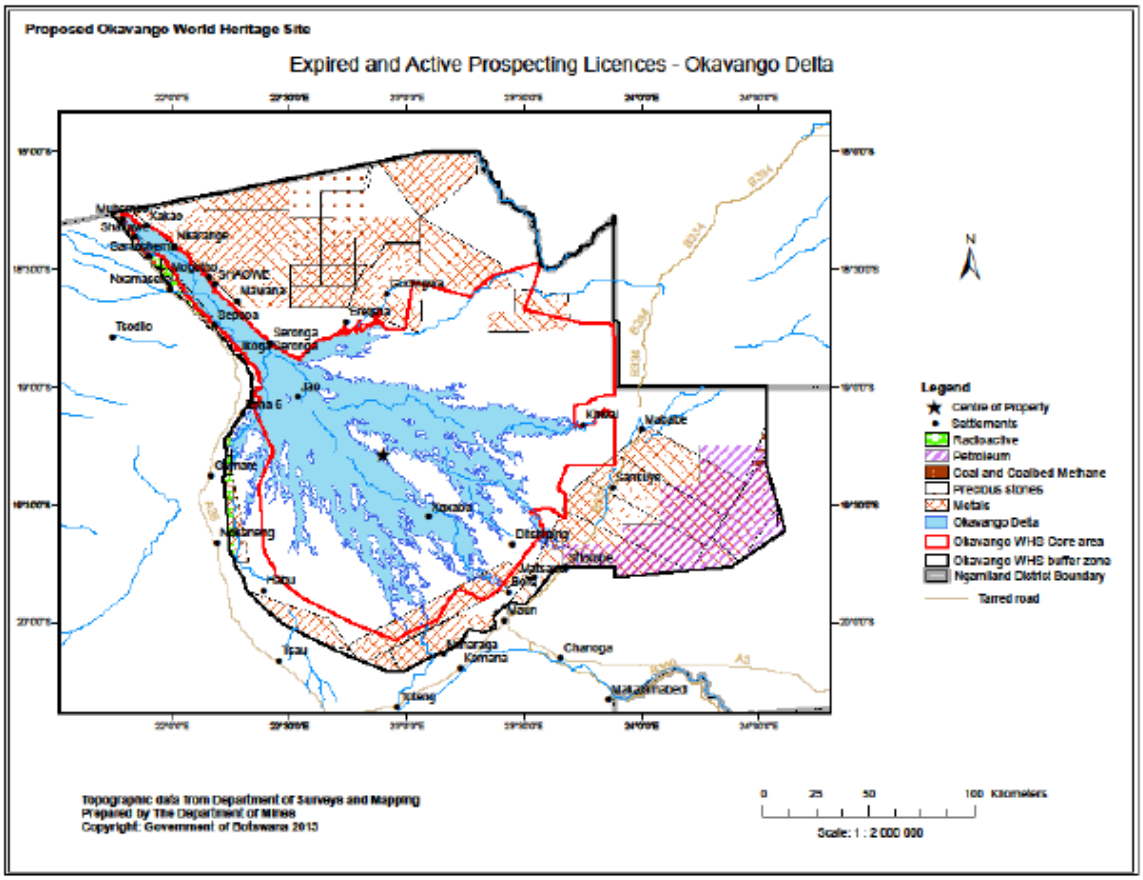
NO	PROSPECTING LICENSES	EXPIRY DATE	STATUS AT TIME OF INSCRIPTION	MINERAL	LOCATION	COMPANY	CURRENT STATUS
1.	PL703/2009	30th Sept 2012	Expired	Coal& CBM	Buffer	Greatways	Expired
2.	PL154/2012	30th Sept 2016	Active	Petroleum	Buffer	Baobab Resources	**Active**
3.	PL 641/2009	30th Sept	Expired	Precious	Buffer	Gcwihaba	Expired, Not

		2012		Stones		Resources	renewed
4.	PL 642/2009	30th Sept 2012	Expired	Precious Stones	Buffer	Gcwihaba Resources	Expired, Not renewed
5.	PL046/2011	31st Dec 2013	Expired	Radioactive	Buffer	Gcwihaba Resources	Expired, Not renewed
6.	PL 047/2011	31st Dec 2013	Expired	Radioactive	Buffer	Gcwihaba Resources	Expired, Not renewed
7.	PL 050/2010	30th June 2013	Expired	Radioactive	Buffer	Gcwihaba Resources	Expired, Not renewed
8.	PL 046/2009	31st Dec 2011	Expired	Radioactive	Buffer	Namenco Energy	Expired, Not renewed
9.	PL 047/2009	31st Dec 2011	Expired	Radioactive	Buffer	Namenco Energy	Expired, Not renewed
10.	PL 048/2009	31st Dec 2011	Expired	Radioactive	Buffer	Namenco Energy	Expired, Not renewed
11.	PL 100/2012	31st March 2015	Active	Metals	Buffer	Zhing gan	Expired, Not renewed
12.	PL 099/2012	31st March 2015	Active	Metals	Buffer	Zhing gan	Expired, Not renewed
13.	PL 109/2012	31st March 2015	Active	Metals	Buffer	Midgel	Expired, Not renewed
14.	PL 571/2009	30th Sept 2014	Active	Base & Precious Metals	Buffer	New Hana	Expired, Not renewed
15.	PL 570/2009	30th Sept 2014	Active	Base & Precious Metals	Buffer & Core	New Hana	Expired, Not renewed
16.	PL 569/2009	30th Sept 2014	Active	Base & Precious Metals	Buffer & Core	New Hana	Expired, Not renewed
17.	PL 568/2009	30th Sept 2014	Active	Base & Precious Metals	Buffer & Core	New Hana	Expired, Not renewed
18.	PL567/2009	30th Sept 2014	Active	Base & Precious Metals	Buffer	New Hana	Expired, Not renewed
19.	PL 566/2009	30th Sept 2014	Active	Base & Precious Metals	Buffer	New Hana	Expired, Not renewed
20.	PL185/2013	30th Sept 2016	Active	Base & Precious Metals	Buffer	Hana Ghanzi	**Active**
21.	PL 098/2012	11th March	Active	Base & Precious	Core	Zhong Gan	Expired, Not renewed

		2015		Metals			
22.	PL 264/2012	30th Sept 2015	Active	Base & Precious Materials	Buffer	Zhong Gan	Expired, Not renewed
23.	PL040/2012	31st Dec 2014	Active	Base & Precious Metals	Buffer	Triprop	Expired, Not renewed
24.	PL059/2010	31st March 2013	Expired	Base & Precious Metals	Buffer	Manica	Expired, Not renewed
25.	PL 062/2011	31st Dec 2013	Expired	Base & Precious Metals	Buffer	Pinette	Expired, Not renewed
26.	PL 392/2008	31st Dec 2013	Expired	Base & Precious Metals	Buffer	Pinette	Expired, Not renewed
27.	PL 392/2008	31st Dec 2013	Expired	Base & Precious Metals	Buffer	Gcwihaba Resources	Expired, Not renewed
28	PL 390/2008	31st Dec 2013	Expired	Base & Precious Metals	Core & Buffer	Gcwihaba Resources	Expired, Not renewed
29.	PL 388/2008	31st Dec 2013	Expired	Base & Precious Metals	Core & Buffer	Gcwihaba Resources	Expired, Not renewed
30	PL 387/2008	31st Dec 2013	Expired	Base & Precious Metals	Buffer	Gcwihaba Resources	Expired, Not renewed
31	PL 386/2008	31st Dec 2013	Expired	Base & Precious Metals	Core & Buffer	Gcwihaba Resources	Expired, Not renewed
32	PL 393/2008	31st Dec 2013	Expired	Base & Precious Metals	Core & Buffer	Gcwihaba Resources	**Expired, Under negotiations**
33	PL 394/2008	31st Dec 2013	Expired	Base & Precious Metals	Buffer	Gcwihaba Resources	Expired, Not renewed
34	PL 395/2008	31st Dec 2013	Expired	Base & Precious Metals	Buffer	Gcwihaba Resources	**Expired, Under negotiations**
35	PL 095/2012	30th June 2012	Expired	Base & Precious Metals	Buffer	Gcwihaba Resources	**Expired, Under negotiations**
36	PL 097/2012	31st March 2015	Active	Base & Precious Metals	Buffer	Gcwihaba Resources	**Expired, Under negotiations**
37	PL 096/2012	31st March	Active	Base & Precious	Buffer	Gcwihaba Resources	**Expired, Under**

		2015		Metals			**negotiations**
38	PL 115/2010	31st March 2013	Expired	Base & Precious Metals	Core & Buffer	Gcwihaba Resources	Expired, Not renewed
39	PL 590/2009	30th June 2012	Expired	Base & Precious Metals	Core & Buffer	Gcwihaba Resources	Expired, Not renewed
40	PL 592/2009	30th June 2012	Expired	Base & Precious Metals	Core & Buffer	Gcwihaba Resources	Expired, Not renewed
41	PL 588/2009	31st Dec 2012	Expired	Base & Precious Metals	Buffer	Gcwihaba Resources	**Expired Under negotiations**

Table1: Status of Prospecting Licenses in the buffer zone as of November 2015; Source; Department of Mines



Map1: Status of Prospecting Licenses as of November 2015; Source; Department of Mines

Current status of prospecting licenses; outstanding 9 Prospecting Licenses

The table below shows the current prospecting licenses in the buffer zone of the property. Six of the licenses have expired and are from one company, Gcwihaba resources. One of the prospecting licenses is expiring in September 2016, while Folio 16c and 16d are applications which the department will make a decision not to approve. As indicated earlier, prospecting licenses can be extended up to 7 years. Therefore their review is a complex task that has to consider companies who have heavily invested in the prospecting process. As such, the State Party is still engaging the companies with a view of not renewing these licenses.

Progress in this regard will be submitted as supplementary evidence either before or as part of SOC.

NO	PROSPECTING LICENSES	EXPIRY DATE	MINERAL	LOCATION	COMPANY
1.	PL 154/2012	30th September 2016	Petroleum	Buffer	Baobab Resources
2.	PL 097/2012	31st December 2013	Base & Precious Metals	Buffer	Gcwihaba Resources
3.	PL 586/2008	31st December 2012	Base & Precious Metals	Buffer	Gcwihaba Resources
4.	PL 096/2012	31st March 2015	Base & Precious Metals	Buffer	Gcwihaba Resources
5.	PL 095/2012	30th June 2012	Base & Precious Metals	Buffer	Gcwihaba Resources
6.	PL 393/2008	31st December 2013	Base & Precious Metals	Buffer	Gcwihaba Resources
7.	PL 395/2008	31st December 2013	Base & Precious Metals	Buffer	Gcwihaba Resources
8,	Folio 16c				
9.	Folio 16d				

Table2: Status of outstanding Prospecting Licenses in the buffer zone as of November 2015; Source; Department of Mines

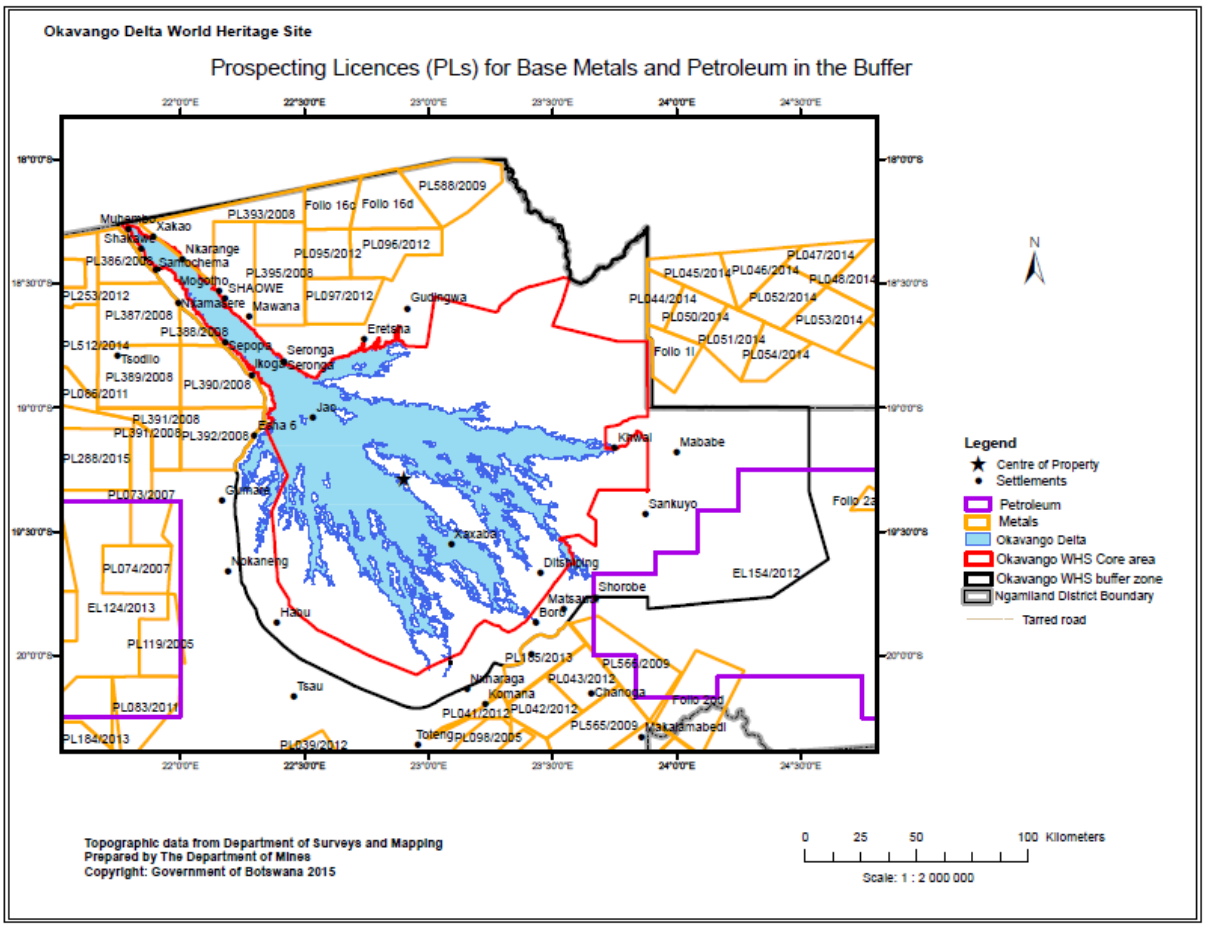
7.4 Monitor and manage mining in areas outside of the property

Carefully monitor and manage mining in areas outside of the property so as to avoid any adverse impacts to the property,

At the time of inscription it was noted that there were prospecting licenses in areas outside the property and that these may develop into mines in the near future. The State Party committed that it will continue monitoring mining outside the property through development of EIAs and monitoring by the relevant departments, Department of Environmental Affairs (DEA) and Department of Mines (DOM) and Department of Waste Management & Pollution Control (DWMPC).

The current status of extractive industries in the Delta shows that there are prospecting licenses and mining operations outside the buffer zone for metals and petroleum, including the 9 remaining licenses in the buffer zone which the department is still engaging with the companies with a view not to renew. It is also important to note the prospecting licenses for metal in the buffer zone, (the Panhandle area in the east) are too close to the core area, while those in the west of the Panhandle (outside the buffer zone) are also considered very close to the buffer zone and the core area which is only 2 kilometers from the buffer. The State Party notes the threat this might have on the integrity of the site in the long term. As part of mitigation, the State Party, through the Department of Mines, and in consultation with the Ministry of Energy & Water Resources are currently discussing this issue. The basis of this discussion is the recommendations of the SEA Report of the Okavango Delta Ramsar site (ODRS) which recommended "a 15km no mining buffer zone from the core area". It is important to note that at the time of inscription, the prospecting licenses outside the buffer zone were not included in the submission but the State Party is trying to be proactive in managing mining areas outside the property to avoid adverse impacts to the property.

Progress in this regard will be submitted as supplementary evidence either before or as part of next SOC report in order to give all the involved parties, including the extractive industry itself an opportunity to agree on a reasonable distance from both the core area and buffer zone.



Map 2: Status of Prospecting Licenses for metals outside the core area and buffer zone as of November 2015; Source; Department of Mines

7.5 Traditional resource use for livelihoods, user access and cultural rights

Expand and strengthen programmes which accommodate traditional resource use for livelihoods, user access rights, cultural rights and access to opportunities to participate in the tourism sector, in keeping with the property's Outstanding Universal Value, and

7.5.1 Traditional resource use for livelihoods and user access rights

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 given their long connection with the Delta. At the time of inscription, a number of programmes already existed and these continue to be implemented by different stakeholders to ensure that local communities benefit from the Okavango delta. The State Party, through various Government Departments and Non-Governmental Organizations (NGO) have come up with diverse programmes that will ensure that local communities have access to livelihoods opportunities but in tandem with maintaining the outstanding universal value (OUV) of the property. 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), 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. It is important to note that the Poverty Eradication Programme supports small enterprises in different sectors such as agriculture, tourism, catering, ICT to name a few.

Funding and technical expertise for these programmes is provided through government departments and, parastatals and Non-governmental organizations. It is also important to note that these are ongoing initiatives and the State Party is committed to reviewing them and expanding and strengthening them to ensure that they are sustainable and continue to benefit local communities but at the same time they do not adversely affect the OUV. Attached is a table which details nature and impact of on-going livelihood projects local communities and citizens in the Okavango Delta.

Implementing livelihoods programmes faces multiple challenges such as lack of resources, transport and human resources, and lack of commitment by local communities and citizens in sustaining the projects. These also include misuse of funds by those funded especially the youth and the collapse of Community Based Organizations (CBOs). Also one major concern raised by local communities is the new developments in the implementation of the CBNRM programme.

At the time of inscription, local communities were directly managing and using natural resources through their CBOs through Head Leases for Controlled Hunting Areas (CHAs) or concessions granted to them in the Okavango Delta, which would empower them to utilize and manage natural resources. As such, they were engaged in non-consumptive tourism and some of them had entered into partnership with Private Tourism Operators or have been running the business venture themselves. The new development of 2014, in which local communities will no longer sign Head leases with the Land Authority, Tawana Land Board, has changed this arrangement. As of now, the Department of Lands, representing Government will sign such concessions directly with the Tour Operators. This, according to local communities, has resulted in them being disempowered as they no longer have direct control and management of the natural resources. The process of introducing new leases has delayed and has led to most CBOs not operating for almost a year while local communities believe that they have lost a lot of benefits they used to get through CBNRM.

The new development of 2014, in which local communities will no longer sign Head leases with the Land Authority, Tawana Land Board, has changed this arrangement. As of now, the Department of Lands, representing Government will sign such concessions directly with the Tour Operators in consultation with the MEWT. A leading motivation behind the change in structure of the leases was that some fortunate CBOs operated in areas of rich natural resource whilst other CBOs in the country do not have the same asset.

Accordingly the change in lease structure facilitates the Tourism Development Fund which supports a fairer distribution of wealth amongst a greater number of CBOs. This can be evidenced through the work done by the Botswana Tourism Organisation (BTO) in assisting CBOs to establish non-consumptive tourism related businesses in areas where previously the CBOs had very little opportunity. This process is on-going and will continue to be supported by the Tourism Development Fund and wealthier CBOs. The State Party, through the Ministry of Environment, Wildlife & Tourism continues to engage with local communities and the traditional leaders to create awareness on non-consumptive tourism which is particularly starting to show results through the seven pilots projects facilitated by the BTO across the country. BTO also negotiates better royalties and management fees on behalf of the communities to ensure better benefits and above all more employment opportunities.

7.5.2 Cultural heritage in the Okavango Delta

While the Okavango Delta was inscribed on the World Heritage list as a natural site, and had the support of all the stakeholders, including indigenous and local communities, the State Party acknowledges the request from indigenous people and local communities to consider cultural heritage aspects of the property. Also, during the evaluation mission by IUCN, indigenous and local communities raised this issue. The indigenous people further submitted a request to the

State Party through the World Heritage Centre, requesting that the State Party addresses this issue by either nominating the site as a mixed site (including cultural components) or incorporating the cultural heritage in the management plan of the property. At this stage, the State Party was requested to respond to the issue and supplementary information was lodged with the World Heritage Committee. The State Party continues to have discussions with indigenous peoples on how to address the issue. Indigenous peoples also had a workshop in Maun in March 2015 to discuss the implications of the World Heritage status on their cultural heritage, traditional and access user rights to their traditional landscapes.

In mitigation, 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 that can inform the mutual decision that can inform whether the cultural components would meet the requirements of World Heritage, and more importantly generating information for assisting in the management of the property. The State Party, in agreement with all stakeholders resolved that a holistic research in the diversity of the cultural heritage of the indigenous peoples and local communities of the Okavango delta should be conducted to inform the way forward in 2016/17. Preliminary or desktop processes will be conducted in collaboration with local communities. It is important to note that the indigenous peoples are already prepared to engage in the project. The research output will inform as to what heritage needs protection, what access rights should be respected, and how its promotion can benefit the indigenous people and local communities. The State Party will further engage indigenous communities to ensure that there is common ground and ownership of the project by all stakeholders. The main challenge is that this is a new project that will require a lot of resources such as funding and human resources. The State Party is committed to sourcing funding together with stakeholders and is also committing its existing resources to make the project a reality in a phased approach.

Attached is a detailed action plan for implementing this research project.

7.6 Address a range of other protection and management issues

Continue efforts to address a range of other protection and management issues including governance, stakeholder empowerment, management planning, management capacity and control of alien invasive species;

7.6.1 Governance and Coordination

While progress has been made in maintaining the state of conservation of the property, the State Party acknowledges that the governance and coordination framework of the site is an area

requiring urgent attention in implementing the ODMP, and any subsequent conservation plans. As part of this process, the State Party, through the support of SAREP undertook a study tour to Namibia to learn about their governance structure with the aim of improving the effectiveness of the Okavango Delta Wetlands Management Committee (OWMC).

In order to take this issue to a point of resolution by the relevant stakeholders, the OWMC Secretariat is working with the Kalahari Conservation Society (KCS) to review the governance and coordination framework of the site including considering the recommendations of the study tour to Namibia. Thereafter, a recommendation will be made on the most effective and sustainable governance and coordination framework for approval by all concerned parties. A record of this meeting of the 3rd December 2015 including the decision thereof, subject to approval by relevant stakeholders will be submitted as supplementary evidence before the 1st of February 2016) or as part of the next SOC report.

Attached is an action plan by KCS and MEWT on addressing this issue.

7.6.2 Stakeholder Empowerment

The State Party continues to empower the different stakeholders in the conservation of the site, but coordination remains a challenge but will be addressed through the governance and coordination process outlined above.

7.6.3 Management Planning

At the time of inscription, the State Party submitted the Okavango Delta Management Plan (ODMP) of 2008. The ODMP was developed as part of the Ramsar requirements following inscription of the Okavango Delta as a Ramsar site in1997. It is a framework management plan that guides the use and management of the Okavango delta and as such specific plans for different sectors have been developed. The implementation of the plan is coordinated by the Department of Environmental Affairs (DEA) through the Okavango Wetlands Management Committee (OWMC). The ODMP was reviewed in 2011 and a report produced in 2012 to evaluate its effectiveness in terms of implementation and what has been achieved which now forms the basis of the implementation of conservation plans at the site. The evaluation of the ODMP revealed that a lot has not been done in terms of implementation and that the institutional structures are not effective in monitoring implementation of the plan, a matter to be resolved through the Governance and Coordination framework.

The State Party remains committed to implementing the ODMP developed in 2008 and reviewed in 2012 but also recognizes the existence of other action plans being implemented by other

stakeholders in a concerted effort to improve the conservation of the site. Given that the ODMP will expire in 2017, stakeholders have agreed that the review of the ODMP, including the integration of the parallel action plans by other stakeholders will start in 2017 to produce an integrated ODMP for the property. The Integrated plan will also include the management of the cultural heritage components as requested by the indigenous people and local communities.

7.6.4 Control of Invasive Species

At the time of inscription, alien invasive species were identified as one of the threats to the property especially *salvinia molesta*. The State Party indicated preventive and biological measures put in place to control alien invasive species in the Okavango delta. The State Party remains committed to addressing the issue as an on-going process. The Aquatic Vegetation Control Unit (AVCU) is specifically mandated to deal with the issue in the Department of Water Affairs in Maun. The Department of Water Affairs have increased staff capacity with an additional four new members for the Hydrology and Aquatic sections in an effort to improve implementation of the measures and to do monitoring.

Attached is the report from the Department of Water Affairs (DWA) showing the biological controls and monitoring being implemented, and their impact in controlling alien and invasive species. The report does not only cover control of Alien invasive species, but also hydrological monitoring, waste water management and pollution control, water quality monitoring and water levels monitoring in the World Heritage property. It also covers emerging threats such as hydrocarbons and waste water contamination which were not observed at the time of inscription and the interventions being put in place by the State Party.

7.6.4 Staffing and Resources

The State Party is committed to committing resources for the protection and management of the Okavango Delta as its obligation to the World Heritage Convention. Since April 2014, the Ministry of Environment, Wildlife & Tourism has purchased a fleet of vehicles for all its departments in the Ngamiland area so as to strengthen management and monitoring of the site. The State Party will further rationalize its staff to ensure some of them are deployed into the district, especially those in the DWNP at Moremi Game Reserve and regional office, DEA, DNMM & DWMPC, DOT and BTO which are key to the management of the site. The Ministry will further engage other departments which are crucial such as DOM to avail more resources for monitoring of mining and prospecting outside the property under the new governance and coordination framework being developed in consultation with all stakeholders.

7.6.5 Funding for the Conservation Plans

While funding remains constrained for most Departments of Government involved in the management of the property, the State Party remains committed to securing funding for the implementation of the ODMP and issues raised by the World Heritage Committee. The Ministry of Environment, Wildlife & Tourism (MEWT), through its National Environmental Fund (NEF) will support implementation of some of the activities. It will also seek funding through other available government funding programmes such as those from Ministry of Youth, Sports & Culture, Ministry of Local Government, Poverty Eradication Programme and the Ministry of Agriculture. The State Party will also seek assistance from its partners locally and internationally. Finally, government departments will continue to implement other activities through their normal budgets as part of their annual plans and these will be prioritized starting 2016/2017 financial year.

8.0 ILLUSTRATIVE MATERIALS

Below is the list of attachments accompanying this SOC report;

1. SAREP Concession Monitoring Protocol 2014
2. Guides Event Book
3. Office Register
4. SAREP Invasive & Alien Invasive species report
5. Table showing programs and projects on citizen empowerment
6. Revised Tourism Policy 2013
7. Department of Water Affairs report
8. Kalahari Conservation Society (KCS) – An trans-disciplinary Action Plan to secure the Okavango Delta
9. Action Plan for implementing Research on the Cultural components of the property

9.0 CURRENT CONSERVATION ISSUES

This SOC report notes the following emerging and potential threats to the OUV of the site;

9.1 Feasibility study for water augmentation by Namibia

Namibia has informed other Member States involved in the management of the Delta, as a shared resource, about the ongoing feasibility study for water augmentation to the central Namibia.

Central Namibia is experiencing one of the worst period of water shortage. This feasibility study is examining options for water augmentation either through inter-basin transfer from the Okavango, or via ground water exploration (Namibia has recently discoverd a huge ground water aquifer in the northern part of country/Cuvelai basin) or through desalination of sea water. Sea water desalination in Namibia is already taking place but, mostly to supply water to the uranium mining processes. The option of inter-basin transfer also indicates that, if done, it needs only 1 to 2% of the annual flow from the Okavango that would be pumped only during the peak flows. The pumped water would subsequently be stored on the ground by ground water recharge mechanisms. The feasibility study is still underway and once concluded, proper notification processes, will be done depending on the option selected to all Member States.

The State Party will inform and update World Heritage Committee, on the results of the feasibility study and implications on the Okavango Delta as a shared resource for Angola, Botswana and Namibia.

9.2 Irrigation project in Angola

There is viral information circulating around the media on the so called "**CHINA** 500,000ha for irrigation land", supposedly being implemented by Angola. This has neither been confirmed by Angola nor brought to the attention of Member States concerned. The only concept document in the possession of OKACOM, is the recently approved **"***Plano de Gestão Integrada dos Recursos Hidricos da bacia do Cubango***"**. This is the only official document that has been formally communicated to all parties. Records of the meeting and the digital version of concept document are available at OKACOM.

Once the information on the alleged Irrigation project is verified or confirmed by the State Party concerned as part of managing the shared resource, this will be shared with the World Heritage Committee.

9.3 Tourism Development Node

Angola has informed other Member States about the proposed development node, **"***Polo do Desenvolvimento Turistico do Cuando-Cubango***"** (Tourism Development Node). It is being implemented along the Cuito River all the way up to its confluence with the Kavango in Dirico. The ambition of this initiative is to take advantage of the intensive international tourism influx from Etosha to Victoria Falls up to the Okavango Delta. Through this project, Angola intends to build an upper class tourism facility in the section of Cuito to capture international visitors as part of a national strategy for tourism. This tourism node initiative is being directly driven by the Presidency of Angola. This initiative fulfills the OKACOM desire to promote some sort of a

trans boundary tourism venture from the source of the delta all the way to Botswana. This plan is at an advanced stage and an EIA will be conducted to identify and mitigate potential threats as would be informed by the completed architectural design of the tourism facilities. Angola has shared these designs, including the master planning document, with all concerned Member States; Botswana and Namibia.

Once the EIA is completed by the State Party concerned as part of managing the shared resource, this will be shared with the World Heritage Committee.

10. CONCLUSION

The State Party would like the World Heritage Committee and Advisory Bodies to note the progress made in the implementation of the Decision WHC 38 C0M 8B.5 and the ODMP in the overall. Since inscription, the State Party has made the following progress; (i) continued to implement the Okavango Delta Management Plan in order to maintain the Outstanding Universal Value of the property, (ii) developed protocols for wildlife monitoring in the Okavango Delta through the support of SAREP, including a web-based portal for analyzing the data, (iii) 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), (iv) continued and expanded implementation of livelihoods programmes in the Delta, (v) progress made in consulting the indigenous peoples on cultural heritage related issues, (vi) progress made in addressing the governance, stakeholder and coordination issues for the effective management of the property, and (vii) the continued control and monitoring of alien invasive species within the property.

The State Party would also like the World Heritage Committee and Advisory Bodies to note the following challenges; (i) little progress made in establishing population baseline for key species due to lack of resources but this is now earmarked for 2016/17, (ii) limited resources (financial and human resources) for implementing conservation programmes as outlined in the ODMP, (iii) challenge of dealing with outstanding prospecting licenses in buffer zone, which can be renewed up to 7 years, in terms of the existing laws, (iv) new developments in the implementation of CBNRM, which seems to takes away the privileges local communities used to have under the old arrangement, and (v), the ineffective coordination for the implementation of the management plan which is still a challenge due to lack of capacity and resources.

The State Party looks forward to continue working with all national and international partners in maintaining the outstanding universal value of ODWHS.

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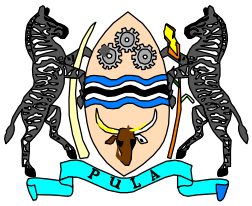

Republic of Botswana

GOVERNMENT PAPER NO 0f 2015

TOURISM POLICY

MINISTRY OF ENVIRONMENT, WILDLIFE AND TOURISM

PRICE

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TABLE OF CONTENTS

ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
BOTA	Botswana Training Authority
CBNRM	Community Based Natural Resource Management
DWNP	Department of Wildlife and National Parks
GDP	Gross Domestic Product
HIV	Human Immuno Virus
MICE	Meetings Incentives Conventions and Exhibitions
NES	National Ecotourism Strategy
SMME	Small Medium Micro Enterprises
SWOT	Strengths, Weaknesses, Opportunities and Threats
WMA	Wildlife Management Areas
NGOs	Non-Governmental Organisations
UNWTO	United Nations World Tourism organisation
WTTC	World Travel and Tourism Council

DEFINITIONS

The following definitions are adopted for the purposes of this policy.

Botho - *the* concept refers to one of the tenets of African culture - the concept of a person who has a well-rounded character, who is well-mannered, courteous and disciplined, and realizes his or her full potential, both as an individual and as a part of the community to which he or she belongs

Community Based Natural Resources Management (CBNRM) is a development approach that incorporates natural resources conservation, the ultimate aim of which is to manage and protect the natural resources base. For the purpose of this Policy CBNRM includes the management of cultural resources as defined in the National Ecotourism Strategy.

Community - is a group of people bound together by social and economic relations based on shared interests. A community may consist of a diverse group of people, living in one or more settlements, with varied socio-economic interests and capabilities sharing an interest in the development and management of tourism in their common area.

Cultural tourism - is tourism whereby cultural aspects which are of interest to the visitors are marketed, including but not limited to the customs and traditions of people, their heritage, cuisine, performing arts, cultural industry, history and way of life.

Domestic tourist **-** is a person resident in Botswana who spends at least one night away from home in another place in the country.

Eco tourism **-** is responsible travel to natural areas which conserves the environment and sustains the well-being of local people.

Environment **-** includes all natural, urban, human living and cultural environments.

Protected area – refers to a geographically defined area which is designated or regulated area to achieve specific conservation objectives in the areas of wildlife, forests, cultural heritage, monuments, etc.

Small Micro Medium Enterprises **(SMME) -** are small, micro and medium-sized enterprises owned and/or operated by ~~local~~ citizens

Sustainable Tourism **-** concerns tourism development, management and any other tourism development activities which optimise the environmental, economic and other societal benefits available without jeopardising the potential for similar benefits in the future.

Tourism - comprises all activities of persons travelling to and staying in places outside their usual environment for not more than a one consecutive year for leisure business and other purposes.

Tourist **-** is a person who travels to and stays in places outside their usual environment for more than twenty-four (24) hours and not more than one consecutive year for leisure, business and other purposes not related to the exercise of an activity remunerated from the place visited. A tourist may be a domestic tourist or international tourist. Tourists travel for different purposes including business, leisure, conferences and incentive.

1.0 BACKGROUND

1.1 **Introduction**

During the past few decades, Botswana has emerged as one of the most impressive economic performers in Africa, boasting of a track record of spectacular economic growth, stability and transparency. However, the economy is not well diversified and depends heavily on diamonds. This does not bode well for sustainable, long term economic and social prosperity. In addition to being a finite resource, diamond mining's high capital intensity makes it a low employment generator. As evidence from the recent Global Economic Crisis shows, Diamond mining is highly vulnerable to demand and price fluctuations. It is against this backdrop that the Tourism Sector has been viewed as one of the potential growth engines for economic diversification.

The existing National Tourism Policy was formulated in 1990 (Botswana Government, 1990), with the prime objective of shifting the mix of tourists away from those who were casual campers towards those who occupied relatively permanent accommodation. The policy also sought to increase the financial returns deriving from tourism to the people of Botswana. Its major interventions were to take root through taking control of the industry via licensing and regulation. Tourism concessions governing state and private lands as well as leasing conditions were also used to regulate the sector. Similarly, taxation laws that covered sales and corporate taxes, licensing fees as well as localisation strategies were applied for the same purpose.

Subsequent to the formulation of the 1990 Tourism Policy there were a number of policy instruments that were enacted and these included the Tourism Act (1992) and Tourism Regulations (1996).The Tourism Master Plan (2000), the Tourism Development Frame Work (2001) and the National Ecotourism Strategy (2002) were also formulated.

The Tourism Master Plan undertook a SWOT analysis that identified factors that were critical for the future development of tourism. It also identified various development objectives of the sector, among them employment generation particularly in rural areas, as well as the stimulation of other services and strengthening of linkages with the broader economy. These objectives were to be addressed through the strategies of; Product Diversification; Community/citizen participation; Private/Public Sector Partnership and Ecological/economic sustainability. On evaluating different tourism development models it concluded that a modified high volume/mixed priced model would be the most appropriate and the preferred option for Botswana. Regarding Private/Public Sector partnership the plan argued that the most significant tool for strengthening collaboration and partnership between these two sectors would be the establishment of a National Tourist Board. Three years later the Botswana Tourism Board Act (2003) was enacted thereby creating the Botswana Tourism

Board later renamed the Botswana Tourism Organisation by the Botswana Tourism Organisation Act (2009).

The Botswana Tourism Development Framework was set up to assist the Department of Tourism in implementing the Botswana Tourism Master Plan. It exclusively focused on continued product development and diversification of tourism in the most underdeveloped southern and western areas of Botswana namely, Ghanzi, Kgalagadi and the Central Districts, and Gaborone.

The Botswana National Ecotourism Strategy was formulated to enhance travel packages to Botswana's historical, cultural and natural environments. This would also increase knowledge about the environment thus promoting financial development opportunities for the local host communities.

1.2 **Need for the Review of the National Tourism Policy of 1990**

While many of the provisions of the Tourism Policy (1990) are still valid, significant changes in the tourism environment during the past two decades require policy revisions and additions. Specific reasons for change include:

i) The policy follows a strong regulatory and public interventionist approach with various key aspects of competitiveness, (e.g. differentiation, access and infrastructure, marketing, investment and business promotion and others), not receiving adequate attention.

ii) Various aspects of the policy have become outdated through having either been implemented or having been overtaken by events and changes in the tourism environment, such as: The enactment of the Tourism Act of 2009 and Tourism Regulations of 2010, the establishment of the Tourism Board and other related issues.

iii) Some directives contained in the policy are broad and do not provide clear direction for addressing key issues.

1.2.1 The Review Process

The Policy review process was undertaken by the United Nations World Tourism Organisation (UNWTO), it involved extensive consultation with stakeholders through personal interviews, surveys with key stakeholders at various locations and stakeholder workshops.

Subsequent to stakeholder workshops, an issues paper was drawn, with recommendations on how to address key issues and a comprehensive review report was produced.

1.3 **Tourism Sector's Current Status and Constraints**.

1.3.1 **Resource Endowment**

Botswana is endowed with diverse and abundant wildlife and wilderness resources. It also has other wilderness resources, cultural practices and monuments that the world needs to see. These range from the Kalahari Desert in the South to the Okavango Delta which is the World's famous 1000th Heritage Site and the Chobe Plains in the North and the Makgadikgadi Pans in the North Central. The Government has set aside more than 17 per cent of all available land for National Parks and wildlife sanctuaries and a further 23 per cent as Wildlife Management Areas (WMA). These resources are sought after by tourists globally and strongly compliment the global tourism trend towards greater environmental awareness and the need to experience nature in its original state. In addition to the pristine wilderness and wildlife, Botswana tourism has indigenous cultural practices and knowledgethat offer more diverse leisure enjoyment. Different cultural interpretations of the natural wilderness and ancient traditions such as rock art and others offer unparallel tourism experience.

1.3.2 **The Importance of Tourism in the Economy**

Tourism plays a significant role in the Botswana economy with comparatively high visitor population ratios and a significant contribution to GDP. Through the elaboration of a Tourism Satellite Account for Botswana by the UNWTO, it was estimated that the direct tourism consumption contributed 3.7 percent of GDP in 2009 and the combined direct and indirect contribution to GDP is between 4.6 percent and 6.5 percent respectively. Direct and indirect tourism employment was estimated to range between 17 000 and 24 000 excluding the induced effect of tourism, which is the multiplier effect (Statistics Botswana 2010).

While visitor arrivals in the region have significantly increased, Botswana's figures have remained relatively limited and the country's global market share remains very small. The "business as usual" approach will not be adequate to elevate Botswana to the next level. Travel and tourism are discretionary expenditure items and as such only those with a competitive edge in industry will benefit most.

1.3.3 Constraints to the Tourism Sector

Despite its rareness Botswana's pristine and exclusive tourism environment does not seem to have generated commensurate benefits for the economy and its population. Existence of limited linkages between this sector and other sectors has led to high economic leakages from the sector. The net effect of these constraints has been that Botswana has ended up being an "add-on destination" to other regional tourist attraction centres instead of being a "destination of choice". All this is the consequence of:

i. Lack of a growth-directed positioning.
ii. Inadequate product range and diversity.
iii. Limited brand equity and inadequate marketing.
iv. Key access and infrastructure shortcomings.
v. Limited citizen tourism participation in major business areas and prime locations.
vi. Weaknesses in tourism planning, governance and environmental management.
vii. Limitations in human resources capacity, skills and services.
viii. Institutional weaknesses.
ix. Insufficient funding for tourism development and marketing
x. Lack of pooling of resources and support services amongst the various role players
xi. Limited tourism capacity and focus at local level and limited synergy between national tourism programmes and those at district councils.

2.0 BOTSWANA'S TOURISM VISION

2.1 Vision 2030

A vision for 2030 and beyond, Botswana will be globally renowned as the most authentic and exciting wilderness in the world offering unparalleled nature, heritage and local lifestyle experiences in a safe and easily accessible environment.

Mission: This Policy aims at elevating the recognition of tourism as a priority growth sector in Botswana and to aggressively develop and promote the sector. Sustainable tourism will be developed in harmony with the environment and it will be highly valued as a cornerstone of the national economic strategy, with large numbers of Batswana participating and benefiting from a growing tourism industry. (*The purpose and aim of the policy are reflected on the above paragraph)*

2.1 **Critical Success Factors**

For this policy to be successful the following factors will have to be realised:

i. Efficient management of National Parks, Forests and Game Reserves and other Wildlife Management Areas
ii. Mainstreaming of tourism in Government planning process
iii. Improvement of access and infrastructure
iv. Meaningful citizen and community participation in the industry
v. Availability of Government and Private sector funding
vi. Availability and Access to land for tourism purposes
vii. Enhanced Public Private Sector Partnerships

2.2 Key Goals

The following key goals will be pursued in striving for the vision:

i. To ~~elevate the~~ recognise of tourism as a priority growth sector in Botswana.
ii. To adequately fund and aggressively develop and promote the sector.
iii. To increase and grow the contribution of tourism to the GDP
iv. To develop world class infrastructure for facilitation of tourism.
v. To substantially increase the share of local ownership, and community participation.
vi. To advance investment in tourism and create a conducive and stable business environment.
vii. To promote Domestic Tourism.
viii. To encourage other forms of tourism such as, Sports, Health, Religious, etc.
ix. To employ best practices of environmental management and conservation in the tourism sector in order to be a globally acknowledged leader in environmental and nature conservation
x. To ensure easy and unhindered access for prospective tourist to and within Botswana.

3.0 OBJECTIVES AND STRATEGIES

In the international arena, over two decades considerable changes have taken place in the world economy brought about by the growing intensity of international competition spurred by the advent of globalization. As tourism continues to grow globally it is therefore necessary to maximize Botswana's share of the market.

This section therefore, defines policy objectives and their strategies according to the following key building blocks; Product Development and Diversification,

Marketing and Promotion,Investment and Business Development, Research and Information Management,Planning and Coordination, Citizen Ownership and Community Participation, Proper management of the country's Environment Resource Base, Management and Development of Protected Areas, Training and Education, Safety and Security, and Access and Infrastructure.

3.1 Product Development and Diversification

The Botswana Government realises that the tourism sector is narrowly focused on wildlife and wilderness tourism. The development, diversification and expansion of tourism attractions and experiences are a pre requisite for Botswana to expand its market reach and share. To achieve this, Policy Intervention for Product Development and Diversification will include the following:

3.1.1 Objectives

i. To broaden the tourism base by adding new product components and opening up new areas
ii. To encourage the development of cultural tourism based on Botswana's rich heritage and history, and on diverse traditions and hospitality of its people.
iii. To promote responsible tourism.

3.1.1.1 Strategies

i. Planning and encouraging the development of a vibrant urban tourism circuit in Gaborone and other towns with community entertainment, social venues, recreation areas, shopping and adjacent nature experiences.
ii. Pursuing tourism linkages with other industries such as mining (e.g. diamond tours, diamond shopping, etc.) and agriculture (cattle ranch stays, etc). Give preference to leases and concessions that involve a range and variety of tourism activities and that appeal to various market segments.
iii. Developing an events strategy to attract and develop high-calibre outdoor and nature-oriented sport and cultural events.
iv. Identifying underdeveloped cultural natural attractions and sites with tourism potential and initiate a programme for upgrading and improving visitor access, interpretation and amenities at such locations.
v. Expanding the national grading and classification system to include the eco tourism standards.
vi. Encouraging the use of new technologies and innovation to transform the tourism products base.

3.2 **Marketing and Promotion**

International tourism competition is fierce and competitor destinations are becoming increasingly equipped and skilled at expanding their market shares. Botswana will adopt an aggressive marketing approach to maintain and expand its market. Policy objectives and strategies to address this problem are as follows;

3.2.1 Objective

To market and promote Botswana as an exclusive and unique tourist destination by re-positioning it through unique selling strategies and Niche Markets.

3.2.1.1 Strategies

i. Promote and position Gaborone as a superior MICE tourism destination and establish the necessary capacity and infrastructure to grow this market.
ii. Formulating a growth-directed marketing strategy aimed at broadening the market range, with special emphasis on expanding markets segments.
iii. Developing a vibrant and exciting tourism brand identity.
iv. Increasing domestic tourism marketing, with special emphasis to encourage Batswana to explore their own country.
v. Partner with local authorities in tourism marketing and promotion.
vi. Improving the e-marketing infrastructure and capacity.

3.3 **Investment and Business Development**

Investment and Business Development into tourism has two distinct aspects, one being access to land and finance and smooth licensing procedures. The other aspect pertains to the nature and availability of entrepreneurship that is needed into this sector**.** The Government is aware of inadequate coordination of activities and the existence of high levels of bureaucracy in obtaining government approval on permits, licenses and land allocation. Access to prime land in lucrative Wildlife Management Areas by SMMEs has been limited and similarly their access to finance has been constrained. This notwithstanding, ample opportunity for tourism activities outside of lodges and accommodation such as in restaurants, art and handicraft etc. has not been effectively exploited.On entrepreneurship, therealso exists limited general entrepreneurial and risk taking spirit among Batswana particularly at SMME level. The few who venture into the sector are inexperienced in the tourism hospitality industry and do not have the financial, operational, marketing and other experience and expertise required to operate high quality businesses. Policy objectives and strategies to make this sector vibrant are as follows;

3.3.1 Objective:

To advance investment in tourism, create a conducive and stable business environment.

3.3.1.1Strategies:

i. Encouraging and giving special preference to Foreign Direct Investment (FDI) in tourism that embraces public floating of shares through stock markets, joint ventures with citizens, entrepreneurial and Management skills development and international market access.
ii. Developing a framework of incentives to encourage investments that meet strategic criteria such as: investment in rural areas and investment in diversified products such as cultural and heritage tourism, adventure and sport tourism, community based tourism etc.
iii. Strengthening of the tourism land bank
iv. Supporting an investment promotion drive to encourage investment by international tourism brands.
v. Encouraging citizen owned consortia

3.3.2 Objective

To promote and support backward and forward linkages between tourism and other sectors.

3.3.2.1 Strategies:

i. Establish practical training and mentorship opportunities for emerging tourism businesses to learn from, be guided by and create business linkages with established tourism businesses.
ii. Creation of linkages with other sectors and other tourism ventures.

3.3.3. Objective

To encourage growth in tourism entrepreneurship and facilitate opportunities for SMMEs.

3.3.3.1 Strategies:

i. Establishing a dedicated tourism SMME financing and technical support scheme implemented through the existing enterprise development and financing bodies.

3.4 **Research and Information Management**

High quality and timeliness of information and research intelligence are key success factors for successful tourism development and marketing. It also makes it possible for actors in the sector to deduce on strategic trends as well as benchmark performance with competitors. Data availability and improved market research are therefore crucial for the formation of appropriate marketing strategies and decisions. In light of this the following objectives shall apply;

3.4.1 Objective

To develop research expertise, infrastructure and create a conducive environment to meet tourism research.

3.4.1.1 Strategies:

i. Improving the quality, detail and timeliness of tourism performance information, in particular tourist arrival statistics, employment statistics, business growth and receipts.
ii. Improving market intelligence to be able to monitor international and domestic trends as well as identify the most lucrative market segments, their profiles and for achieving the best returns on marketing investment
iii. Make information and research outputs available to the stakeholders on regular and transparent manner.
iv. To collaborate with Statistics Botswana in all aspect of tourism statistics

3.5 **Planning and Coordination**

Government realises that activities of the tourism sector have a bearing on other sectors and vice versa. Laws, regulations and mandates of different ministries have effects on this sector. It is of paramount importance for an Integrated Development Planning approach to be applied when planning for this sector. The need to synchronise and coordinate local, district and national tourism planning initiatives is critical.

In order to achieve the obligations of an improved planning and coordination in the tourism sector, the following objectives and strategies shall be adhered to;

3.5.1 Objective

Promote and support inter-sectoral coordination between the tourism sector and other sectors.

3.5.1.1 Strategies

i. Establishing inter-ministerial coordinating mechanisms to ensure greater coordination of policies, plans and resources among the various ministries that impact on tourism.
ii. Developing dedicated tourism development plans in all key districts as guidelines for future tourism developments feeding into the National Development plan.
iii. Strengthening tourism planning expertise in the Government sector.
iv. Decentralise tourism powers to improve and elevate the role of local authorities in the development of the sector.

3.6 **Citizen Ownership and Community Participation**

While there has been increased citizen participation in this sector in the recent years, ownership of major tourism business is still skewed. There are few success stories regarding community-based tourism enterprises and community private partnerships. Participation in Small Medium Micro Enterprises (SMME) is increasing but still relatively low. Very few tourism related companies have floated their shares for a wider citizen participation. The issues identified shall be addressed through the following objectives and strategies

3.6.1 Objective

To increase the level of community participation, partnerships and involvement in the tourism sector

3.6.1.1 Strategies

i. Agreeing on clear and transparent criteria for foreign concessionaires and local business owners pertaining to local community participation and benefits.
ii. Identifyingactivities in the tourism value chain that are suitable for local entrepreneurship.
iii. Supporting the implementation of Community Based Natural Resources Management Policy (CBNRM) initiatives in fostering tourism growth and development.
iv. Developing and promoting programmes for identifying and capacitating individual community entrepreneurs to engage in business ventures and empowerment with business management skills.
v. Capacity building for technical teams for the support of communities.

3.6.2 Objective

To increase the share of citizen ownership and management of the tourism industry

Strategies

i. Floating of shares to the general public by public and private tourism enterprises; Joint ventures between citizen and foreign investors; and between large and small local tourism entrepreneurs shall be encouraged and incentivised.
ii. Earmark suitable state and tribal land for emerging local entrepreneurs.
iii. Reserving certain activities for citizen investments

3.7 **Proper Management of the Country's Environmental Resource Base**

There has been over concentration in some tourist attraction centres that have produced some negative environmental impacts. Furthermore, planning, cleanliness and aesthetics of some urban wilderness frontier centres have been compromised. The following objectives and strategies willapply;

3.7.1 Objective:

To promote environmental management best practices including ecotourism.

3.7.1.1 Strategies

i. Promoting, encouraging and rewarding sustainable tourism practices such as recycling of waste, use of renewable energy, water saving systems etc.
ii. Maintaining the aesthetic image of wilderness centres and tourist centres by working in close collaboration with local communities and other stakeholders.
iii. Monitoring of environmental impacts and trends in unique and sensitive areas through partnerships with academic institutions and civil society.

3.7.2 Objective:

To promote and develop land resources for tourism in a coordinated manner.

3.7.2.1 Strategies

i. Developing guidelines and Management systems for the preservation and further development of cultural heritage sites.
ii. Identification of suitable sites for tourism.

3.8 **Management and Development Of Protected and Wildlife Management Areas**

i. Botswana's National Parks, conservation and protected areas and Wildlife Management Areas are its tourism jewels and shall be managed and developed with great care and in the interest of current and future generations by maximising benefits in a sustainable manner. The issues shall be addressed through the following objectives and strategies.

3.8.2 Objective:

To develop protected and wildlife management areas according to their unique characteristics and attributes.

3.8.2.1 Strategies:

i. Designing facilities and amenities to compliment the unique position of each area in terms of development densities, range and type of tourism activities.
ii. Commercialisation and privatisation of tourism operations in an open and transparent manner.
iii. Conducting an assessment and evaluation of the benefits and achievements of the trans-frontier conservation areas with the view to maximise Botswana's benefits from such arrangements.
iv. Assessing the tourism potential of forest reserves to open up suitable sites for tourism purposes.
v. Develop individual management plans for each site.

3.8.3 Objective:

To manage carrying capacities in protected and key tourism areas.

3.8.3.1 Strategies:

i. Varying accommodation facilities according to the capacity and positioning areas.
ii. Monitor visitors, vehiclesand other means of transport, and wildlife numbers

3.8.4 Objective

To promote efficient management of wildlife resources.

3.8.4.1 Strategies

i. Establishment of a Parks Board for efficiency and effectiveness in management of parks.
ii. Developing a national protected areas tourism strategy

3.9 **Training and Education**

Tourism success depends heavily on personalised service and hospitality. Therefore an appropriately skilled and educated workforce is a key success factor for tourism. Government shall pursue the following objectives and strategies;

3.9.1 Objective

To develop and improve tourism skills and provide appropriate tourism education and training for potential and existing tourism entrants.

3.9.1.1 Strategies

i. Facilitate the establishment of a tourism school of excellence of international standards, offering a unique combination of ecotourism and hospitality training in support of the Botswana tourism brand.
ii. Identifying suitable training centres to be encouraged and supported to provide appropriate tourism training.
iii. Developing an incentive package for those tourism businesses that actively support tourism and hospitality vocational training programmes.
iv. Improving access to tourism training opportunities for learners with flair for tourism.
v. Improving and monitoring the application of the national tourism levy and communicating the results to the industry on regular basis.
vi. Inculcating into its culture and practice, superior service and *botho* across the industry. Such strategy will target frontline staff in the public service sector and the private sector.
vii. Introducing tourism as a learning area throughout the schools programme, from primary level upwards.

3.10 **Safety and Security**

Safety and security are major determinants of the choice of a holiday destination by tourists. For Botswana to be the destination of choice the following policy objectives and strategies will be used in line with the Vision pillar of “a Safe and Secure Nation”. Botswana’s reputation as a safe and secure tourism destination should be protected at all costs.

3.10.1 Objective

To promote Botswana as a safe and secure destination

3.10.1.1 Strategies

i. Training and educating the law enforcement agencies on the importance of tourism and the need to create a safe and secure tourism destination.
ii. Encouraging local tourism role players to engage and liaise with local police regarding initiatives to secure tourism areas and to be alert to potential safety threats.
iii. Developing a crisis management strategy for tourism.
iv. Sharing of Botswana's health, safety and security strategies such as neighbourhood watch, communicable and non communicable programmes such as HIV AIDS prevention, etc.
v. Collaborate with relevant stakeholders to reduce malaria in the country.
vi. Strengthen international collaboration on security and information sharing

3.11 **Access and Infrastructure**

Given the substantial travel distances from key markets, easy and affordable access to and within Botswana is a key to future tourism expansion.

3.11.1 Objective

Improve access to Botswana through efficient and competitive travel infrastructure environment so that Botswana is not treated as an "add-on" destination but a destination of choice.

3.11.1.1 Strategies

a) **Air Access**

i. Taking urgent steps to liberalise the Botswana airspace to encourage new airline entrants, ensure increased frequencies on main routes, facilitate price competitiveness and expand the route network.
ii. Allowing and encouraging Local private airline operators to operate on scheduled routes within Botswana.
iii. Following a hub-and-spoke approach by upgrading the Gaborone airport as a global airline hub, supported by secondary airports in key tourism towns and high quality airstrips at other tourism points.
iv. Encouraging the development, upgrading and maintenance of airstrips in tourism areas.

b) **Road Access**

i. Developing of ablution and resting facilities within reasonable distance along major highways.
ii. Developing a "tourism priority roads strategy" to identify key tourism roads and initiate a consistent programme of upgrading, maintaining and safeguarding identified priority roads.
iii. Encouraging control of animal movement along major highways and tourists routes to ensure the safety of tourists and other road users
iv. Assessing the quality of the local tourist taxi industry and improving tourist taxi education and standardisation programme.
v. Improving road signage to facilitate smooth tourist movements.
vi. Collaborating with Immigration,Police and Customs Authorities in issues of excellent customer service at ports of entry.
vii. Improving on the quality and efficiency of all border entry points facilities and upgrading entry conditions where necessary.

c) **Rail Access**

Rail offers a variety of experiences in tourism such as scenic, guided tours, special interest tours and transportation. There is need to develop the railway infrastructure for tourism purposes.

i. Identification and development of tourist rail routes such as scenic routes
ii. Developing appropriate infrastructure and administrative structures for the smooth running of rail for tourism purposes.

d) **Communication Technology**

i. Ensuring that required telecommunication infrastructure is readily available to promote efficiency and effectiveness in the tourism sector.
ii. Liberalising the internet service provider sector in order to ensure competition and efficiency in the sector.
iii. Improving e-business capabilities of using the internet as a management tool for tourism development, marketing and transacting(e.g. payments and reservations)

4.0 TOURISM FUNDING AND FINANCING

The execution of this policy will require substantial financial resources therefore, Government shall review and improve its financial contribution to tourism taking into account international benchmarks and strategic requirements. Government funding for tourism marketing, attractions development and infrastructure will be increased substantially for the policy to succeed.

5.0 ROLES OF STAKEHOLDERS

The successful implementation of the tourism policy will largely depend on the effectiveness and efficiency of several institutions to deliver on the various recommendations and subsequent initiatives. As indicated in the policy principles, tourism in Botswana will be Government led, private sector driven and Community based.

5.1 **Government Role**

The leadership role of Government will take the form of the creation of an enabling environment for investment through sound policies, facilitation of easy and suitable access to factors of production and entrepreneurial opportunities. Government will establish appropriate legal and fiscal framework to guide and encourage sustainable tourism growth. In undertaking this role, a "whole of government" approach will be applied and nurtured.

5.2 Private Sector Role

The private sector will own and operate tourism businesses, and will take business risks, engage in joint ventures, employ and train and improve workforce skills and career opportunities. It will provide suitable value-for-money and client satisfaction at all times by promoting individual tourism products in accordance and association with the country brand identity. The private sector shall collaborate with Government bodies in planning and implementing appropriate tourism development and strategies.

5.3 Role of Sector Clusters

Government will facilitate formation of tourism sector clusters. The Clusters will be formed by private sector entities and supported by government to promote collective efficienciesand to heighten product, and destination competitiveness.

5.4 Role of Communities

Participation in planning and decision-making regarding tourism development and promotion of local areas increase community awareness regarding the value of tourism and its associated benefits. By organising themselves appropriately and transparently engaging with Government and the private sector to identify potential tourism opportunities and resources in their areas, communities will serve as the base for the sector. Promote resource base management through the Community Based Natural Resource Management programme.

5.5 Role of Non Governmental Organisations (NGOs) and the Academic Sector

The roles of the NGOs and the academic sector shall include but not limited to the following;

i. Monitoring the environment, social and cultural effects of tourism growth.
ii. Support the promotion of community-based tourism
iii. Conduct research and information management in the tourism sector.
iv. Provide an advisory role to government and other stakeholders on tourism development.
v. Lobby constructively and engage government on issues critical to the tourism sector.

5.6 Role of Political Leadership

The tourism sector has great potential and is well suited to contribute significantly to the diversification of Botswana economy as well as addressing social disparities. It is therefore of utmost importance that the political leadership of Botswana fully supports the tourism agenda including influencing the allocation of resources to the sector and advocating for development of tourism programmes and highlighting the benefits of tourism to community. Political leadership includes Councillors, Members of Parliament and Cabinet Ministers.

5.7 Role of the National Advisory Council on Tourism

This policy advocates for the re-introduction of the National Advisory Council on Tourism which will be established by a statute. The Council will advise the Government on pertinent issues of the sector. It will ensure effective partnership amongst stakeholders and efficient planning and that tourism priority areas are given the deserved attention. It will comprise of public and private sector representatives with great passion and knowledge on tourism, and interest in the growth and development of tourism.

5.8 Linkages with International Cooperating Partners

Emphasis will be placed on the enhancement of strategic regional and international partnerships that boost tourism development in Botswana.Government will where appropriate accede to and sign international agreements for the pursuit of enhancing sustainable tourism.

5.9 Local Authorities

While central government through the Ministry of Environment,Wildlife and Tourism assumes the responsibility of policy formulation, the local authority is best placed to carry out advocacy, promotion and implementation of tourism plans and projects in the interest of achieving sustainable tourism practices at all levels of society.

5.10 Inter-Governmental Coordination in Tourism

A key success factor in implementing a growth directed tourism strategy is coordination among Government ministries and spheres. Tourism success is highly dependent upon appropriate action and implementation by key related Ministries and Departments responsible for transport, roads, aviation, conservation, culture, telecommunications and many others. Some of the strategies to apply are as follows:

i. Establishing a coordinating structure (Tourism Hub) to oversee and monitor the implementation of key tourism policy decisions, consisting of senior officials of relevant Government ministries and the private sector and mandated at the highest political level.
ii. Involving senior representatives of local Government structures in key tourism areas inthe coordinating structures.
iii. Establishing an information and statistics coordinating mechanism consisting of key parties involved in delivering tourism statistics to ensure timely and valid tourism performance information includingStatistics Botswana, Bank of Botswana, Immigration Authorities, the Department of Tourism, Botswana Tourism Organisation, the Parks and Conservation Authorities and other relevant parties.

6.0 PUBLIC SECTOR ORGANISATIONAL RESPONSIBILITIES

Given the limited tourism financial and human resources and substantial tourism development challenges in Botswana, it is important that public sector tourism institutions should cooperate within a clear organisational framework and that the roles should be clear in order to avoid duplication and wastage of resources. Tourism cuts across all sectors and hence to drive this Policy and to achieve the laid down objectives would require participation by all public sector organisations and through the direct participation of the following:

6.1 Department of Tourism

The Department of Tourism is the main actor in implementing andfacilitating tourism policy planning, regulatory and financing framework and programmes in order to stimulate guidance and control tourism growth. It will coordinate and influence the efforts of the public sector departments and agencies to deliver

appropriate public tourism infrastructure, tourism attractions and support programmes, in support of the tourism policy.

6.2 Botswana Tourism Organisation (BTO)

The Botswana Tourism Organisation (BTO) serves as an implementing agent of the Botswana Government for development and marketing the country as a preferred tourism destination including product development and packaging. For the successful implementation of this policy, BTO will serve as a public-private coordinator in harnessing and coordinating the efforts and resources of the public.

6.3 Department of Wildlife and National Parks

For protected areas to be key catalysts to tourism growth, the tourism capacity and capabilities of the conservation authority should be substantially strengthened and improved. The policy advocates for the following for the efficient management of wildlife in general:

i. The establishment of a Parks Board with executive powers and directed by a board of specialist directors, could offer major advantages including:

   a. Ability to employ high quality, commercial minded leadership and management outside of the confines of the Government system resulting in a less bureaucracy in administration and less red tape;

   b. Allows for a competitive and financially sound mindset and a dynamic with which partners will be keen to associate;
   c. Flexibility to manage resources in accordance with both conservation and tourism objectives;

   d. Quicker action and decision-making, especially dealing with private investors and striking up partnerships;

   e. Ability to earn, invest and re-invest finances with a commercial intent in the interest of tourism and conservation;

   f. Easier to establish a service-oriented culture and vision not being a small cog in a massive Government machine; and

   g. Easier to performance manage setting financial targets and evaluating the Board's performance based on these.

6.4 Department of National Museum and Monuments

The National Museum and Monuments will develop a national master plan for the conversation and management of Heritage Sites, formulation of management plans and monument inspections. The development of culture and heritage monuments plays a key role in diversifying the Botswana tourism base; hence the Department is among the crucial implementers of this policy.

6.5 Department of Forestry and Range Resources

Opening up forest reserves to tourism will require proper management of this resource if it is to be sustainable and this lies within the Department of Forestry and Range Resources' mandate as specified in the Forest Act.

7.0 IMPLEMENTATION, MONITORING AND EVALUATION OF THE POLICY

Tourism is a cross cutting sector hence implementation of this policy will require concerted efforts and active participation by all stakeholders in order to ensure growth and maximum contribution of tourism to the country.A Policy Implementation Framework was developed alongside this policy which outlines the main actions to be undertaken with regard to the implementation of the Tourism Policy for Botswana. Other strategies emanating from the core areas of the Policy will be developed.

This Policy also advocates for the development of monitoring and evaluation tools at sectoral level.

ACTION PLAN 2016-2017 CULTURAL HERITAGE PROJECT OKAVANGO DELTA NATURAL WORLD HERITAGE PROPERTY

OBJECTIVE	ACTIVITY	DURATION	RESPONSIBILITY	OUTPUT	RESOURCES
1. To secure funding and resources for implementing the project	a) Develop proposals for funding and resources	January – February 2016	DNMM MYSC	- Funding	
2. Collaborate with Academia to do the research project	b) Develop and sign a MOU with the University of Botswana (ORI) on the research project	January 2016	DNMM	- MOU	
1. To consult stakeholders and indigenous peoples and local communities on the need to recognize the cultural heritage of the ODNWHS	a) Workshop for traditional leaders b) Stakeholder workshop c) Kgotla meetings	May 2016 June 2016 July – Sept 2016	DNMM MYSC DNMM MYSC Steering Committee	- Report - Report - Establishment of Steering Committee - Report	Funding to cover accommodation, transport, subsistence
2. To identify ,document and map the tangible and intangible heritage of indigenous peoples and local communities	a) Identification of participants for the documentation process b) Training of participants on documentation of intangible &	October 2016 October – November 2016	Steering Committee Steering Committee	- Report - List of Participants - Report	Funding to identify, document & map the heritage

	tangible heritage c) Workshop to identify & document the tangible heritage d) Site visit to Map the tangible heritage e) Workshop to identify and document the intangible heritage			- Report - Map of cultural heritage sites - Report - Documentary/Video	
3. documentation of the cultural heritage of the ODNWHS to be included in the ODMP	a) Produce a report on the cultural heritage of the ODNWHS	April 2017	Steering Committee	- Research Report	

OKAVANGO DELTA WORLD HERITAGE – CONSERVATION REPORT

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Maun
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Date 13 November 2015

Introduction

The Department of Water Affairs (DWA) has a mandate of water resources management through assessment, development, managing and protecting Botswana's water resources for sustainable contribution to socio economic growth. In its endeavor to manage the water resources and to ensure the sustainability, the department has established human resources and infrastructure to fulfill the tasks in Maun Station. Maun and Gumare DWA Regional stations are responsible for hydro-monitoring of the Okavango Delta while Maun station is also mandated to protect the Delta through the process of water quality monitoring, wastewater management facilities for compliance and protecting the surface waters from the alien invasive species salvinia, *Salvinia molesta* Mitchell.

The Monitoring section in the "Okavango Delta World Heritage Nomination Dossier" clearly states that effective monitoring for the system requires a spatially distributed network to incorporate basic hydrological and water quality variables at important locations along each of the major distributary systems, the inflow (Mohembo) and all of the outflows with a representative climatic data and rainfall. Therefore rainfall monitoring at strategic stations to cover a more extensive area of the property both within and peripheries of the Delta is essential. Very little is known about how the rainfall and environment "inside" the Delta differs from that on the "peripheries".

Hydrological monitoring

At the time of writing the Hydro network section for the Delta Nomination Dossier, only few important hydro-stations were presented due to lack of sufficient information. After the inscription, considerable efforts were put on to develop the complete database for hydro-

monitoring network for the Delta. There are a total of 129 hydrological stations in the delta. Of which 87 stations are accessible and constantly monitored while the rest either not accessible due to vegetation blockages or abandoned as the stations are not strategically placed. The core zone of the World Heritage Site area has 67 stations across and 47 are operational. All these stations are in perennial riverine areas and being monitored for water flow discharges and water levels. Almost all rain gauges are not operational in the core zone and efforts are on to maintain them by 2016/17 financial year. Mohembo inflow station is out of the core zone area and its daily inflows determine the wet and dry conditions of the delta (Figure 1). The scale of flooding in the delta influences water resource use for tourism and communities especially in the out flow rivers.

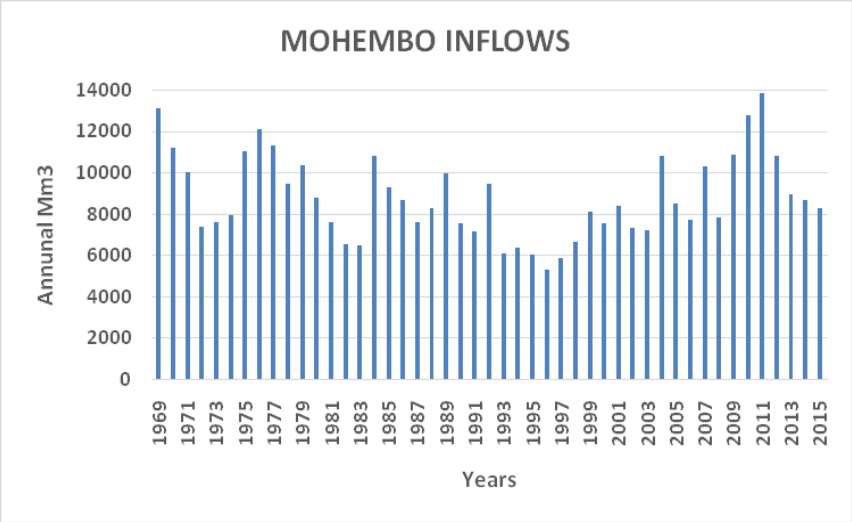


Figure1: Declining trends in Mohembo Inflows after 2012

Alien Invasive *Salvinia molesta*

The mitigation measure for salvinia control has been in place in the form of the host-specific biological weevil, *Cyrtobagous salviniae* Calder and Sands. With established norms and policy, the Aquatic Vegetation Control Unit (AVCU) has been continuously assessing the salvinia control biologically as well as applying the physical control wherever is warranted. The array of activities involved monthly field new infestation surveys and biological control weevil establishment by sampling and assessment. There are 66 salvinia monitoring sites in the Okavango Delta (Figure 2). Salvinia control has been thoroughly established in 64 sites within the core zone except the two sites outside the core zone namely Boro and Thamalakane rivers where the biological control is yet to be established to ecologically acceptable levels. The aim of the biological control program is not to eradicate the weed, but to reduce abundance to the level where it no longer causes a problem. Small residual mats of salvinia will continue to harbor the weevils so that if regrowth of salvinia occurs as a result of favorable conditions with sufficient nutrients, control agents can build up rapidly to restore control. No salvinia infestations of significant nature were observed in 2013 but new infestations started in the later months of 2014 and increased in proportions by July 2015 in four hippo pool areas of Moreni Game Reserve. Monthly monitoring of these new infestations revealed that the biocontrol weevil has slowly established by the weevil-infested mat floating from the upstream and control has been achieved (Figure 3a and 3b). This clearly indicates that the weevil has been widely established well in most of the sites/areas of Moremi Game Reserve. All the other sites monitored in the core zone have requisite number of adult weevils as determined by scientific methods.

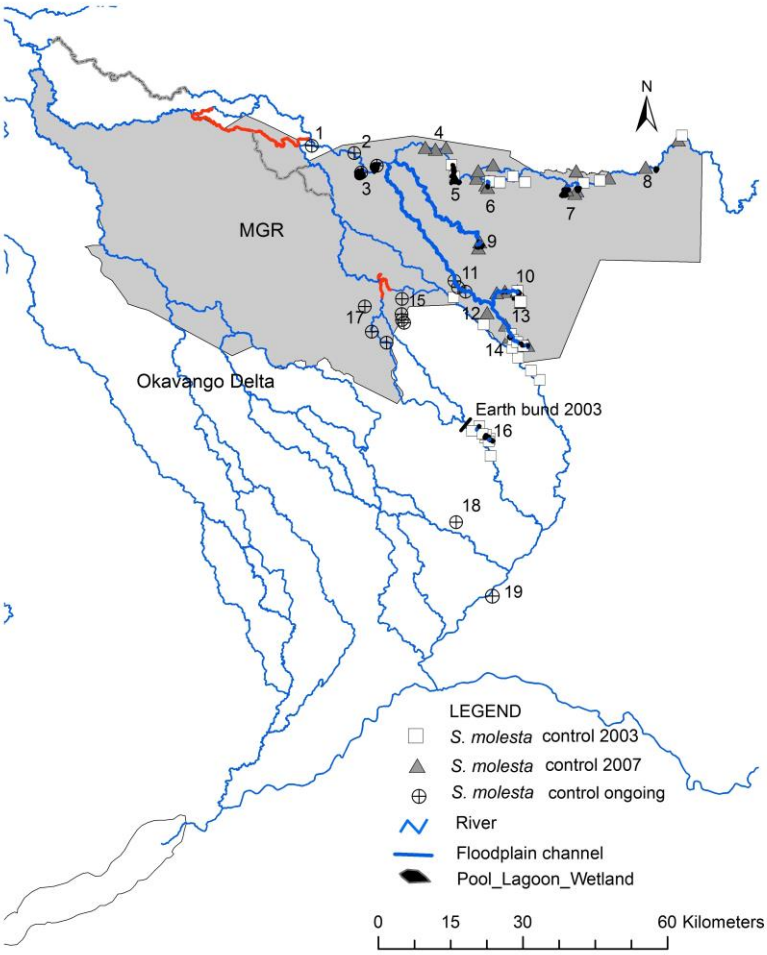


Figure 2 Distribution and successful control of *Salviniae molesta* with its weevil *Cyrtobagous salviniae* in the Okavango Delta. Established Biocontrol sites: 1, 2, 3, 4 and 5 Maunachira River = 11 sites; 6, 7 and 8 Khwai River = 19 sites; 9 Bodumatau = 2 sites; 10 Xini = 4 sites; 11, 12 and 13 Abaqao and Mogogelo Rivers = 9 sites; 14 Gomoti River = 6 sites; 15 and 16 Santantadibe River = 10 sites; 17 Matsibe River = 3 sites; Biological control ongoing: 18 Boro River = 1 site; and 19. Thamalakane River = 1 site. Total monitoring sites = 66 sites

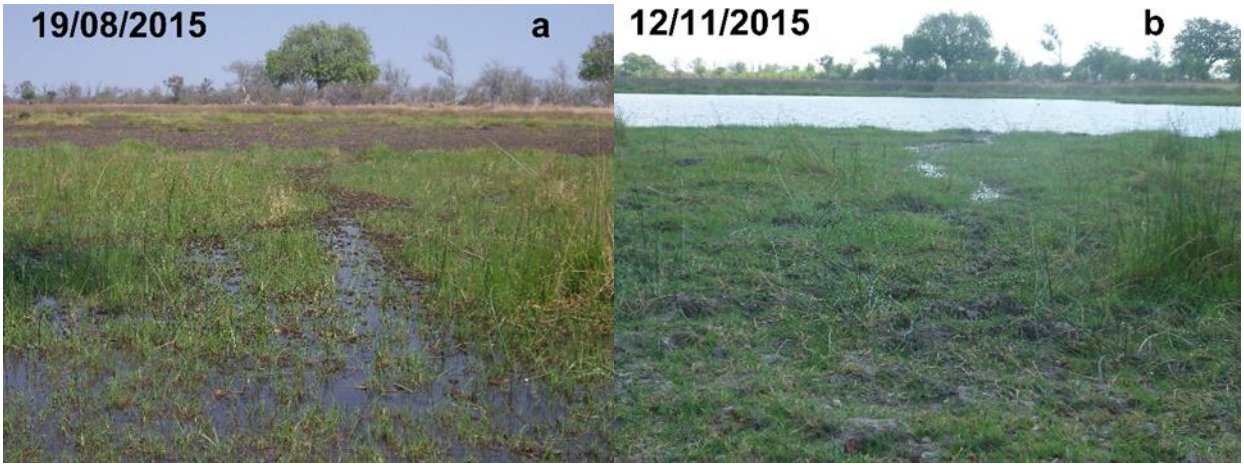


Figure 3a and 3b *Salviniae molesta* biocontrol in the presence of *Cyrtobagous salviniae* at 4th Bridge Hippo Pool, Okavango Delta (Photo: By Kurugundla).

Salvinia – Water quality

Salvinia distribution in the Okavango Delta at acceptable levels did not have any impact on surface water quality. Low dissolved oxygen levels were observed between 1.5 and 2 mg/L during the surface coverage as well as during the salvinia biocontrol process. Release of higher nutrients, due to damages of the salvinia caused by the weevil and their subsequent leaching from the tissues leading to sinking is a common feature and a transition phase in any biocontrol process of weeds. High nutrient release in water ultimately leads to dilution through various transport mechanisms (e.g., bioturbation, water currents and diffusion) and finally normalcy would be restored after the control. Fish was observed only after restoration of the infested water bodies.

Salvinia Control - Stakeholders

The ecotourism businesses and riparian communities have benefitted and secured enormously from the control of salvinia weed in the Okavango Delta. No complaints of difficulty in navigating the streams due to thick blockage of salvinia mats, for tourism recreation and other

activities have been reported. Because of DWA's sustainable monitoring the water quality in the salvinia areas has improved considerably and several pools and lagoons accessible to wildlife for water use.

Tourist Guides in the Moremi Safaris and Camp Moremi (Desert & Delta), Sandibe (& Beyond) and Khwai River Lodge (Belmond) in the core zone have been trained to monitor and control salvinia within their areas of operation as a continuous capacity building program and weevils breeding portable pools have been assembled to comprehend reliability and continuity of the program. Replication of the program is delayed due to lack of funds. In some lodges the program is part of sightseeing, environmental education and tourism marketing. Communities have been involved in the physical control of salvinia.

Public Complaints: About three (3) complaints were received regarding the weed intensive coverage only along the Khwai River. Timely field observations showed weevil abundance. Therefore, it indicates that biological control progress in the Salvinia infestations has been under constant progress and maintained in most of the core and buffer zones of the Okavango Delta.

Water Conservation

The water conservation section aims to intensify the promotion of the water conservation and demand management practices, which are intended to increase the utilization level of alternative water sources such as effluent utilization and grey water recycling in the core zone area of the Delta.

Mbiroba (Seronga) Grey Water Recycling Project

In align with the policies of conservation, a pilot project on grey water recycling was established at Mbiroba Campsite in the Okavango Delta. The project was constructed by "Biokavango and Kalahari Conservation Society" and inherited by the DWA in 2010. Currently the project is managed by the Okavango Polar Trust and maintained by the DWA-Maun. The purpose of the project is to collect the generated wastewater and treat through the constructed wetland system for use in the backyard garden.

Pollution Control

The DWA through Pollution Control section has been doing systematic monitoring of the wastewater generating facilities since 2013. This is done through surveillance inspections, where the effluent from these facilities is sampled and analyzed to check if they comply with the Botswana standard for discharging into the environment (BOS 93:2012). The facilities are also encouraged to reuse their treated wastewater as a way of water conservation.

There are more than 30 facilities (correct inventory to be known by March 2017). Inspections are done periodically and regularly for special cases. A total of **18** facilities were inspected so far in the delta. Out of the inspected facilities **8 complied** while **10 did not comply,** i.e. 44.4% compliance. After inspection a report is produced to share the results with the facilities. There are also some recommendations to help them improve if they do not comply. This would then be followed by regular follow ups to see if they took any actions trying to improve. The facilities that consistently do not comply are shared to the Department of Waste Management and Pollution control-Maun so that they would take actions that are laid on the Waste Management Act 2009.

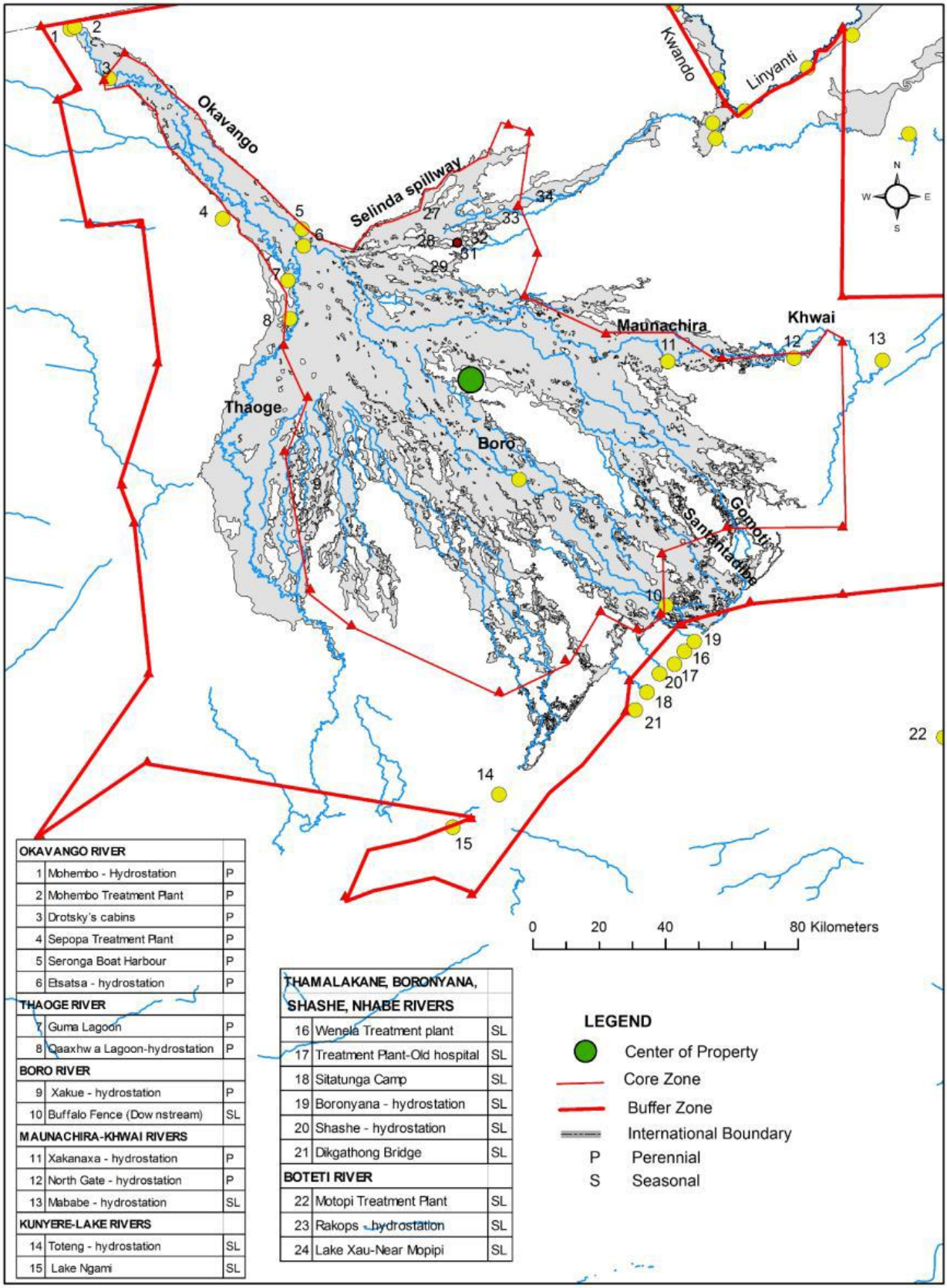
Water Quality Monitoring

The overall aim of the monitoring programme is to ensure the long-term water resources management and protection of the Okavango delta and to illustrate the baseline condition of the delta.

In the year 2007 water quality monitoring was started in the Okavango Delta Panhandle (Mohembo-Sepopa), Thamalakane and Boteti rivers. This led to the systematic water quality project, was initiated by Biokavango. Biokavango project was implemented between 2008 and 2011 by the Okavango Research Institute (ORI), Botswana. DWA in collaboration with ORI and Tourist Operators has developed a systematic water quality monitoring at sixteen (16) sampling sites spreading across the delta.

On the basis of Biokavango water sampling experience, DWA started a revised systematic water quality programme for the surface water component of the Okavango Delta between 2011 and 2012. Presently there are twenty four (24) sampling sites in the Okavango Delta (Figure 4) of

which nine (9) are in the Core Zone. Sampling is done quarterly and the samples are analyzed for Electrical Conductivity, Dissolved Oxygen, total phosphate, Ca, Mg. Na, K, Fe, Mn, Cl, SO_4, NO_3, CO_3, HCO_3 and Hydrocarbons to identify trends in the water quality over time and infer its influence on the ecosystem. Unlike other parameters, hydrocarbons are done on special cases only.



OKAVANGO RIVER		
1	Mohembo - Hydrostation	P
2	Mohembo Treatment Plant	P
3	Drotsky's cabins	P
4	Sepopa Treatment Plant	P
5	Seronga Boat Harbour	P
6	Etsatsa - hydrostation	P
THAOGE RIVER		
7	Guma Lagoon	P
8	Qaaxhw a Lagoon-hydrostation	P
BORO RIVER		
9	Xakue - hydrostation	P
10	Buffalo Fence (Dow nstream)	SL
MAUNACHIRA-KHWAI RIVERS		
11	Xakanaxa - hydrostation	P
12	North Gate - hydrostation	P
13	Mababe - hydrostation	SL
KUNYERE-LAKE RIVERS		
14	Toteng - hydrostation	SL
15	Lake Ngami	SL

THAMALAKANE, BORONYANA, SHASHE, NHABE RIVERS		
16	Wenela Treatment plant	SL
17	Treatment Plant-Old hospital	SL
18	Sitatunga Camp	SL
19	Boronyana - hydrostation	SL
20	Shashe - hydrostation	SL
21	Dikgathong Bridge	SL
BOTETI RIVER		
22	Motopi Treatment Plant	SL
23	Rakops - hydrostation	SL
24	Lake Xau-Near Mopipi	SL

Figure 4 Systematic water quality monitoring sites in the Okavango Delta

Emerging Threats - Monitoring

Hydrocarbons

In October 2015 there was a concern at the Okavango Delta panhandle about the oil contamination in the Okavango River. The probable sources are the ferries that are used to transport people across the river, house boats and boat harbours. A team comprising Department of Environmental Affairs (DEA), Department of Waste Management and Pollution Control (WMPC) and DWA surveyed the panhandle and collected the water samples. The analysis showed that the water exceeded its limits of hydrocarbons. The maximum allowable limits of hydrocarbons are 5 mg/L. Awareness and further assessment on the subject is ongoing.

Wastewater contamination

There was a query of possible contamination of the river by the campsites in the Xakanaka area. A joint investigation by a team comprising DEA, DWA, Department of Wildlife and National Parks (DWNP), Department of Tourism (DOT) and DWMPC showed that one of the boat hire stations in the area is the source of contamination. The evidence has been collected and an invitation has been extended to the concern stakeholder and the investigations are still ongoing.

Wastewater from a “Boat Hire Station" ablution is collected in black tanks burried in the ground. From these tanks wastewater is disposed off through a pipe into a dug trench on bare soil leading into the environment.

Challenges

The following array of challenges was encountered during the Financial Year 2014/2015:

- Notable lack of both land and water transport due to unavailability of funds to maintain and repair detected mechanical defects.

- Weed propagation due to transportation of weeds from one water body to another by a process of flooding, tourism and radical community fishing activities including the Game (Hippos and elephants) movement carrying the weeds unavoidable.

- Insufficient funds for regular monitoring and implementation of projects. Funds required for the following projects:
    - ✓ Maintenance of Rain Gauges in the core zone at strategic locations
    - ✓ Salvinia weevil breeding project – Tourist operators and communities
    - ✓ Mbiromba project maintenance

Protocol for the Monitoring of Fauna and Flora within Ngamiland, Botswana
Guide Event Books

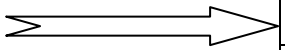
Name: _____

Company:_____

Concession:_____

Guide's daily FIELD EVENT BOOKS

1. Always carry your field event book
2. The field event book never sleeps
3. The field event book never shares information with other field event books (check the Office Register to ensure that the incident has not already been reported)
4. The field event book never assumes – only report information that you are SURE of
5. Keep the field event book neat
6. Never remove pages from the field event book
7. Transfer all information to the office register as soon as possible
8. List of threatened and indicator species to be monitored



9. Vegetation Types

Acacia Scrub
Apple leaf
Floodplain
Grassland
Mixed spp. scrub
Mixed spp., mixed age
Mixed spp. woodland
Mopane (scrub)
Mopane (mixed age)
Mopane (mature)
Open/pan
Riparian/riverine
Riverine scrub
Silver leaf terminalia
Water

Scientific Name	Common Name
Ceratotherium simum	White Rhinoceros
Diceros bicornis	Black Rhinoceros
Felis nigripes	Black-footed Cat
Hippotragus equines	Roan Antelope
Kobus vardonii	Puku
Hippotragus niger	Sable Antelope
Tragelaphus spekii	Sitatunga
Smutsia temminckii	Pangolin

Gyps coprotheres	Cape Vulture
Necrosyrtes monachus	Hooded Vulture
Trigonoceps occipitalis	White-headed Vulture
Torgos tracheliotos	Lappet-faced Vulture
Gyps africanus	White-backed Vulture
Rhynchops flavirostris	African Skimmer
Bucorvus leadbeateri	Southern Ground-Hornbill
Bugeranus carunculatus	Wattled Crane
Ephippiorhynchus senegalensis	Saddle-Billed Stork
Egretta vinaceigula	Slaty Egret

Date	Grid	Species	Pride/Pack	Adults	Sub-Adults	Juveniles	Undetermined	Cubs/ Puppies	Vegetation	Activity	Photo Id?	Notes	Recorded by
				M F ?	M F ?	M F ?		M F ?			L / R		

Predator Data Sheet (one individual per line) ***50**

Date	Grid	Species	Age	Sex	Poachers/Predator/Natural	Predator Age	Predator Sex	Predator ID	Notes	Reported by

Poaching and Mortality Datasheet *5

Date	Place	Grid	Species	Nature of Problem	Notes	Complainant	Action Taken	Reported by

Problem Animal/Human-Wildlife Conflict Data Sheet *2

Date	Species	Grid	Number of Plants/ Extent (m^2 or km^2)	Notes	Reported by

Invasive/Alien plants *10

Date	Grid	Hot OR Cold Fire	Habitat	Extent (m^2 or km^2)	Origin of Fire	Notes	Reported by

Fire Datasheet * 2

Date	Grid	Species	Adults	Sub-Adults	Yearlings	Calves/ Foals	Undeter-mined	Vegeta-tion	Notes	Recor-ded by
			M F ?	*M F ?*	*M F ?*					

Rare or Endangered Animal Sightings *10

Date	Grid	Species	Adults	Sub-Adults	Juveniles	Undetermined	Habitat	Nest/Notes	Recorded by
			M F ?	***M F ?***	***M F ?***				

Birds datasheet *10

A trans-disciplinary Action plan to secure the Okavango Delta

Inception Report

Introduction

Kalahari Conservation Society partnered with the United State of America Embassy in Botswana *(under the U.S Department of State Federal Assistance award program)* in a trans-disciplinary Action Plan to Secure the Okavango Delta project. The project started on the 31st July 2014 and was expected to end by May 2015 but due to the delay in the internal consultations with the Government, KCS requested for an extension of a year and was granted hence the project will be ending in May 2016.

The objective of the project is to draw together Okavango Delta (OD) stakeholders and the myriad of strategic plan into an interdisciplinary platform that begins the implementation of the recommended management activities. The project is to facilitate and develop a more strategic approach and integrated frame work for programs and delivery of plans for the Okavango Delta in order to secure the future the Delta.

Background

The Okavango Delta is one of Botswana's important and largest wetlands. Botswana deposited its instrument of accession to the Ramsar convention in 09th December 1996. By 9th April 1997 the great Okavango Delta System was designated as the first Botswana Wetland of International Importance. The Convention on Wetlands, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. This Ramsar site is measured at approximately 68,640 square kilometers (6,864,000 hectares), which places it ahead of Canada's Queen Maud Gulf (6,278,200 ha) as the world's largest Ramsar site. The designated area includes the Okavango River, the entire Okavango Delta, Lake Ngami, and parts of the Kwando and Linyanti river systems that fall along the western boundary of the Chobe National Park.

Once again in June 2014 following the Government's request, the Okavango Delta was listed as the UNESCO World Heritage site. The heritage site covers the Core zone and the buffer zone of the Delta system. These demarcations are entirely placing the whole Okavango Delta system under very important recognition.

Beside these two international statuses the Okavango Delta has also enjoyed high recognition locally, as a tourism hub and ecosystems functions and services to local communities and the nation at large. This is attested by several national policies and plans developed to protect and monitor the sustainable utilisation of this resource. Among all the plans developed it is the Okavango Delta management Plan which acts as the overarching guiding document on the Delta Management.

Problem statement

The Okavango Delta Management Plan has highlighted a number of issues faced by the Delta. Some of challenges include; the growing human population, evasive species, pollution, biodiversity conservation, land degradation and water resources management.

The Department of Environmental Affairs together with other stakeholders have already started the revision process of the ODMP and also undertaking the Strategic Environmental Assessment of the delta. Borrowing from the two processes it has become evident that there are gaps in the management process. It has become clear that even though several good and important management plans and strategies are developed, there is limitation on the implementation of such plans. This statement may be argued but what remains obvious is that there is lack of information sharing in terms of reporting on activities taking place in the delta and feed back to stakeholders and communities. This then leaves the aspect of monitoring and coordination of the activities undertaken in the Delta not being done as it could have.

This coordination, monitoring and reporting problem is influenced by challenges like lack of direct budget for implementation of the ODMP, unclear stakeholder reporting platforms within the region, and limited monitoring tools hence posing a challenge to the Okavango Wetlands Management Committee (OWMC) to function well.

Understanding the scope of work

The overall objectives of the this project are understood to be;

- To mobilise Okavango Delta (OD) stakeholders in lobbying and advocating for the review of the coordination and monitoring of activities in the Okavango Delta, and enhancement thereof.
- To facilitate the development of shared integrated action plan deriving activities from the numerous available strategic plans.
- Facilitate training of relevant stakeholders to promote monitoring and information sharing within stakeholders.

Comments on Terms of Reference

The above scenario on the delta clearly depicts an area where there is need for change from business as usual approach. It is acknowledged that it is not a one agency responsibility to advocate for change, hence the need to consult with other several stakeholders, to share ideas and advice the way forward. KCS however have noticed the limited participation of the community in the monitoring process and would like to further advocate that there be a community platform e.g. a Community Cluster Representative Committee (CRC), which will in turn choose their representative to represent them in the OWMC. The CRC membership is envisaged to consist of nominated members

by the community from the cluster villages (*a number of villages sharing a location).* This trend would give a way to community ideas and issues to be presented at OWMC meetings hence influence planning. On another note it goes without saying that the ODMP is a multi-faceted plan this then encourage the vision may be to think along establishment of sector or thematic committees to feed the OWMC reporting. The expectation would be Departments according to their mandates will be given chairmanship of these different committees and could coordinate the meeting schedules.

Project Methodology and Approach

KCS held an inception meeting on the 17th September 2015 in Maun with DEA staff from the district and headquarters and also Department of National Museums and Monuments. The objective of the meeting was to introduce the project to the district and also build road map in terms of the approach of the project. After highlights on the challenges faced by the district office in coordination and monitoring of the ODMP the meeting resolved that the funding be directed to capacitating and strengthening the existing management structure (OWMC). In progressing the meeting also agreed on the following activities;

- The project team should inform the Department of National Museums and Monuments and the MEWT TFCA Coordination office about the project.
- Through the TFCA office support the project team should do a presentation to both the Director of Department of Environmental Affairs as the secretariat of the Ramsar Convention and the Director of National Museum as the World Heritage Site secretariat. The two directors will act as representation of the MEWT ministerial management Committee for endorsement.
- To facilitate a workshop of the OWMC to develop the shared Integrated Action plan.
- To train stakeholders to better understand the obligation of the international recognitions (RAMSAR Site listing and UNESCO World Heritage Listing), and monitoring and governance measures.
- To conduct consultative workshops at community level to have community clusters that will feed the OWMC with grass root information for better planning.
- To review Terms of Reference of OWMC to inculcate the new roles as per the UNESCO World heritage site listing obligations.
- To interrogate the structure of OWMC for sectorial working groups and community representation and participation.
- Device monitoring tools that will be used for reporting back by stakeholders.
- To support the quarterly committee meetings

Main Project Activities

Main Activities	Outcomes
Project Support mobilisation	- Government ownership and buy in - Foster a clear line of reporting for OWMC
District Stakeholder Consultations	- Reviewed OWMC Tors - Reviewed OWMC structure - An integrated plan of action - Schedule of OWMC meetings - Community participation and feed back
Training	- Understanding of roles and responsibilities in meeting the requirements of the Delta status - Creation of simple easy to follow monitoring and reporting tools
Committee meetings	- Resuscitated and well functional committee (OWMC) - Community participation in Delta governance - Thematic/Sectorial reporting - Improved coordination and monitoring

Project implementation plan and schedule											
Table 1: Activity Planning *(below)*											
General Objective of Project 1: **Project Support mobilisation**											
Specific Objectives : Organise and facilitate meetings											
List the activities necessary to fulfil this objective. Indicate who is responsible for each activity and an indicator of activity accomplishment.			Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Activity	Responsible Party	Indicator									
1.1 Mobilisation meeting (DEA HQ)	DEA	Meeting minutes									
1.2 Mobilisation Meeting DEA DO for approach and buy in	KCS/DEA	Meeting minutes									
1.3 Mobilisation meeting DNMM	KCS/DEA	Presentation of the project									
1.4 Project presentation MEWT TFCA office	KCS/ DEA	Presentation of the project									
1.5 MEWT meeting DEA/DNMM	KCS/MEWT	Agenda for district consultations with Ministerial buy in									
General Objective of Project NO 2: District Stakeholder Consultations											
Specific Objective: Organise and facilitate Workshops at the district level											

2.1 OWMC consultative workshop to review TORs, develop the integrated action plan, set in place sector committees and get commitment of members to report back	MEWT/KCS	Developed integrated plan									
2.2 Planning meeting for Project proponents	MEWT/KCS	Progress monitoring report									
2.3 Community Consultative Kgotla meeting 1 (Seronga)	DEA/KCS	Cluster formation and cluster representative									
2.4 Community Consultative Kgotla meeting 2 (Gumare)	DEA/KCS	Cluster formation and cluster representative									
2.5 Community Consultative Kgotla meeting 3 (Maun)	KCS/DEA	Cluster formation and cluster representative									
General Objective of Project NO 3: Training											
Specific Objective: Organise and facilitate OWMC members training											
3.1 Training OWMC on Roles and responsibilities of the committee, reporting requirements and monitoring of the	MEWT/KCS	Comprehensive monitoring tool developed									

Action Plan implementation											
3.2 Training the Community Cluster Committee of OWMC on their Roles and responsibilities as the committee, monitoring of the Action Plan implementation	MEWT/KCS	Community action plan									
General Objective of Project NO 4: Committee meetings											
Specific Objective: facilitate and support Committee meetings											
4.1 Community Cluster Committee of OWMC meeting	MEWT/KCS	Action plan implementation and reporting									
4.2 Sector/thematic committees of OWMC meetings	MEWT/KCS	Action plan implementation and reporting									
4.3 OWMC meetings	MEWT/KCS	Action plan implementation and reporting									
Final Report writing	KCS	Final report produced									

Invasive and Alien Species

Standardised Wildlife Monitoring Protocol

SAREP, 2014

Invasive/exotic plant species

This booklet contains the descriptions and threats posed by some of Botswana's most prevalent invasive flora. When observed, please record as outlined on the "Invasives" datasheet.

Salvinia molesta - Kariba Weed (aquatic plant, herb)

Description

Salvinia molesta is a complex of closely related floating ferns. The primary growth form is an invading form with small flat leaves to the tertiary or mat form with large, crowded, folded leaves.

Threats

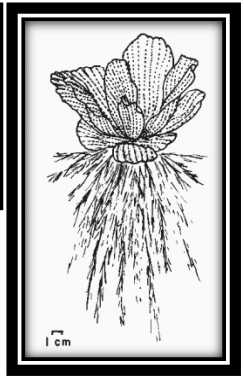
Under the best conditions plants can form a mat that is two feet thick that reduce water-flow and lower the light and oxygen levels in the water. This stagnant dark environment negatively affects the biodiversity and abundance of freshwater species, including fish and submerged aquatic plants. *Salvinia* invasions can alter wetland ecosystems and cause wetland habitat loss. *Salvinia* invasions also pose a severe threat to socio-economic activities dependent on open, flowing and/or high quality waterbodies, including hydro-electricity generation, fishing and boat transport. ***S. molesta*** **in 2013 was elected as the one of the '100 of the World's Worst Invasive Alien Species' to replace the Rinderpest virus which was declared eradicated in the wild in 2010.**

Pistia stratiotes – Water lettuce (aquatic plant, herb)

Description

P. stratiotes is a free-floating perennial of quiet ponds. It is stoloniferous, forms colonies, and has rosettes up to 15cms across. It has long, feathery, hanging roots. Its leaves are obovate to spathulate-oblong, truncate to emarginate at the apex, and long-cuneate at the base. Leaves are light green and velvety-hairy with many prominent longitudinal veins. Inflorescences are inconspicuous and up to 1.5cms long. Flowers are few, unisexual, and enclosed in a leaflike spathe.

Threats
See *S. molesta*



Eichhornia crassipes – Water Hyacinth

Description

E. crassipes is a free-floating aquatic macrophyte growing generally to 0.5m in height but to nearly 1 metre in height in some southeast Asian locations. *E. Crassipes* may form dense floating mats. Its leaves are thick, waxy, rounded, and glossy and rise well above the water surface on stalks. They are broadly ovate to circular, 10-20cm in diameter, with gently incurved, often undulate sides. The stalk is erect, to 50cm long, and carries at the top a single spike of 8-15 showy flowers. The flowers have six petals, purplish

blue or lavender to pinkish, the uppermost petal with a yellow, blue-bordered central splotch. Its roots are purplish black and feathery. *E. Crassipes* forms a shoot consisting of a branched, stoloniferous rhizome, 6cm in diameter and up to 30cm in length, with several short internodes. Each node bears a leaf and roots. Axillary buds, which can also form stolons, grow at an angle of 60 degrees from the rhizome and remain at that angle or bend upward in dense stands, or become horizontal in open stands. Plants on the edge of a mat form stolon buds while those in the middle may not. Stolons are purplish violet and extend up to 50cm or more in length and are highly variable in diameter.
As much as 50% of a single water hyacinth's biomass can be roots. Roots are adventitious and fibrous, 10-300cm in length.

Threats

See S. molesta.

Leucaena leucocephala – White Leadtree

Leucaena leucocephala is a thornless long-lived shrub or tree which may grow to heights of 7- 20 m. Leaves are bipinnate with 6-8 pairs of pinnae bearing 11-23 pairs of leaflets 8-16 mm long. The inflorescence is a cream coloured globular shape which produces a cluster of flat brown pods 13-18 mm long containing 15-30 seeds.

Threats

The fast-growing, nitrogen-fixing tree/shrub *Leucaena leucocephala*, has been widely introduced due to its beneficial qualities; it has become an aggressive invader in disturbed areas in many tropical and sub- tropical locations and is **listed as one of the '100 of the World's Worst Invasive Alien Species**'. This thornless tree can form dense monospecific thickets and is difficult to eradicate once established. It renders extensive areas unusable and inaccessible and threatens native plants.

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Mimosa pigra – Catclaw mimosa

Description

The shrub/tree is sprawling, often thicket-forming and up to 6 m (20 ft) tall, with hairy stems bearing numerous recurved prickles to 7 mm (0.3 in) long. The leaves are alternate, twice compound, and sensitive to touch; leaf petiole and rachis to 20 cm (8 in) long, prickles at junctions, 5–12 pairs of pinnae; each pinna with 24–31 pairs of leaflets, these to 8 mm (0.3 in) long, often with threadlike hairs on margins. The flowers are small, mauve to pink, in stalked, dense, spherical heads; about 1 cm (0.5 in) across, with about 100 flowers per head; 8 stamens.
Fruit: A brown-bristly, segmented, flat pod to 8 cm (3 in) long and 1.4 cm (0.5 in) wide, with the 9–24 segments breaking free individually; each containing a seed. Pods in clusters, or “hands” (of usually 7) at stem tips.

Threats

May form dense under-stories in swamps, shading out native tree seedlings and altering bird, reptile, and vegetation communities

Bidens pilosa – Black Jack

Description

Bidens pilosa is an annual forb of gracile habit, growing up to 1.8 meters tall. It grows aggressively on disturbed land and often becomes weedy. The leaves areoppositely arranged and pinnate in form with three to five dentate, ovate-to-lanceolate leaflets. The petioles are slightly winged. The plant may flower at any time of the year. Flowers are borne in small heads on relatively long peduncles. The heads bear about four or five broad white ray florets, surrounding many tubular yellow disc florets. The fruits are slightly curved, stiff, rough black rods, tetragonal in cross section, about 1 cm long, with typically two to three stiff, heavily barbed awns at their distal ends. The barbed awns catch onto animals and the seeds are transported by animals and people. This mechanism has helped the plant become a cosmopolitan weed in temperate and tropical regions.

Threats

Bidens pilosa is a cosmopolitan, annual herb which originates from tropical and Central America. Its hardiness, explosive reproductive potential, and ability to thrive in almost any environment have enabled it to establish throughout the world. Generally introduced unintentionally through agriculture or sometimes intentionally for ornamental purposes, *B. pilosa* is a major crop weed, threat to native fauna, and a physical nuisance.

Lantana camara – Common lantana (shrub)

Description

Lantana is a perennial, summer-growing, erect or scrambling shrub, growing up to four metres high and often forming dense thickets. Flesh of the plant produces a strong, aromatic odour when crushed. The plant is a member of the Verbenaceae (verbena) family. Lantana is characterised by square-shaped stems with short, curved and hooked prickles. The leaves are opposite and curved on a short stalk and are about 10 mm long. They are egg-shaped (ovate) to spearhead-shaped (lanceolate), with toothed edges; rough and bright green on the upper surface and hairy and pale green below; 2–10 cm long and 2–8 cm wide. Flowers form in dense clusters and vary in colour from red–yellow, orange–pink, and white; depending on the type, maturity and location. Flowering and fruit production can occur almost year round in suitable areas where there is adequate soil moisture, high air humidity and high temperatures.

Threats

The plants can grow individually in clumps or as dense thickets, crowding out more desirable species. In disturbed native forests it can become the dominant understorey species, disrupting succession and decreasing biodiversity. At some sites, infestations have been so persistent that they have completely stalled the regeneration of rainforest for three decades. *Lantana camara* has been the focus of biological control attempts for a century, yet still poses major problems in many locations and is **listed as one of the '100 of the World's Worst Invasive Alien Species**'.

Ricinus communis – Castor oil plant (tree, shrub)

The castor oil plant can vary greatly in its growth habit and appearance. The variability has been increased by breeders who have selected a range of cultivars for leaf and flower colours, and for oil production. It is a fast-growing, suckering perennial shrub that can reach the size of a small tree (around 12 metres or 39 feet), but it is not cold hardy. The glossy leaves are 15–45 centimetres (5.9–18 in) long, long-stalked, alternate and palmate with 5–12 deep lobes with coarsely toothed segments. The stems (and the spherical, spiny seed capsules) also vary in pigmentation. The fruit capsules of some varieties are more showy than the flowers. The green capsule dries and splits into three sections, forcibly ejecting seeds

The flowers are borne in terminal panicle-like inflorescences of green or, in some varieties, shades of red monoecious flowers without petals. The male flowers are yellowish-green with prominent creamy stamens and are carried in ovoid spikes up to 15 centimetres (5.9 in) long; the female flowers, borne at the tips of the spikes, have prominent red stigmas.[4]

The fruit is a spiny, greenish (to reddish-purple) capsule containing large, oval, shiny, bean-like, highly poisonous seeds with variable brownish mottling. Castor seeds have a warty appendage called the caruncle, which is a type of elaiosome. The caruncle promotes the dispersal of the seed by ants (myrmecochory).

Threats

Ricinus communis is frequently found invading riparian areas where it displaces native vegetation. The seed of this species is toxic to variety of species including humans. Consuming only a few seeds can be fatal.

Xanthium strumarium - Rough cocklebur (Herb)

Xanthium strumarium is a species of annual plants that probably originates in North America and has been extensively naturalized elsewhere. The species is monoecious, with the flowers borne in separate unisexual heads: staminate (male) heads situated above the pistillate (female) heads in the inflorescence. The pistillate heads consist of two pistillate flowers surrounded by a spiny [involucre]. Upon fruiting, these two flowers ripen into two brown to black achenes and they are completely enveloped by the involucre, which becomes a bur. The bur, being buoyant, easily disperses in the water for plants growing along waterways. However, the bur, with its hooked projections, is obviously adapted to dispersal via mammals by becoming entangled in their hair. Once dispersed and deposited on the ground, typically one of the seeds germinates and the plants grows out of the
Bur.

Threats

The seeds and seedlings should not be eaten because they contain significant concentrations of an extremely toxic chemical, carboxyatratyloside. The mature plant also

contains at least four other toxins. Animals have also been known to die after eating the plants.

Cyperus rotundus – Nut grass

Cyperus rotundus is a perennial plant that may reach a height of up to 140 cm (55 inches). The leaves sprout in ranks of three from the base of the plant, around 5–20 cm long. The flower stems have a triangular cross-section. The flower is bisexual and has three stamina and a three-stigma carpel, with the flower head have 3-8 unequal rays. The fruit is a three-angled achene. The root system of a young plant initially forms white, fleshy rhizomes, up to 25 mm in dimension, in chains. Some rhizomes grow upward in the soil, then form a bulb-like structure from which new shoots and roots grow, and from the new roots, new rhizomes grow. Other rhizomes grow horizontally or downward, and form dark reddish-brown tubers or chains of tubers.

Threats

It prefers dry conditions, but will tolerate moist soils, it often grows in wastelands and in crop fields. *Cyperus rotundus* is one of the most invasive weeds known, having spread out to a worldwide distribution in tropical and temperate regions. **It has been called "the world's worst weed" as it is known as a weed in over 90 countries, and infests over 50 crops worldwide.** Its existence in a field significantly reduces crop yield, both because it is a tough competitor for ground resources, and because it is allelopathic, the roots releasing substances harmful to other plants. The difficulty to control it is a result of its intensive system of underground tubers, and its resistance to most herbicides.

ODNWHS PROGRAMS AND PROJECTS ON CITIZEN EMPOWERMENT

<table>
<tr><th>PROGRAM/PROJECT</th><th>PARTNERS</th><th>COMMUNITIES BENEFITING</th><th>IMPACT</th><th>DURATION</th></tr>
<tr><td rowspan="7">COMMUNITY BASED NATURAL RESOURCES MANAGEMENT</td><td rowspan="7">GOVERNMENT OF BOTSWANA, TOUR OPERATORS</td><td>Sankuyo Tshwaragano Management Trust (STMT) (Sankuyo village)</td><td rowspan="7">- Empowerment of community in conservation of natural resources.
- Socio-economic empowerment of communities
- Creation of employment

<table><tr><th>CBO</th><th>EMP</th><th>2013</th><th>EMP.</th><th>2014</th></tr><tr><td>STMT</td><td>50</td><td>2,046,629.00</td><td>64</td><td>669,639.00</td></tr><tr><td>OCT</td><td>180</td><td>4,127,508.00</td><td>179</td><td>4,396,381.00</td></tr><tr><td>MZCDT</td><td>25</td><td>3,546,939.45</td><td>23</td><td>658,713.34</td></tr><tr><td>OKMCT</td><td>134</td><td>4,685,712.85</td><td>42</td><td>2,621,603.00</td></tr><tr><td>KDT</td><td>102</td><td>5,967,824.00</td><td>80</td><td>6,083,734.00</td></tr><tr><td>OJCT</td><td>0</td><td>0.00</td><td>0</td><td>0.00</td></tr><tr><td></td><td>491</td><td>20,374,613.30</td><td>388</td><td>14,430,070.30</td></tr></table></td><td rowspan="7">On going</td></tr>
<tr><td>Khwai Development Trust (KDT) (Khwai village)</td></tr>
<tr><td>Mababe Zokotsama Community Development Trust (MZCDT) (Mababe village)</td></tr>
<tr><td>Okavango kopano Mokoro Community Trust (OKMCT) (Villages of Ditshiping, Xaxaba, Xuoxao, Daunara, Boro, Xharaxao)</td></tr>
<tr><td>Okavango Community Trust (OCT) (Villages of Seronga, Gunitsoga, Eretsha, Beetsha, Gudigwa)</td></tr>
<tr><td>Okavango Jakotsha Community Trust (OJCT)C(the villages of Etsha 13, Etsha6, Etsha1, Jao and Ikoga)</td></tr>
<tr><td>NORTHERN BOTSWANA HUMAN WILDLIFE CO-EXISTENCE PROJECT</td><td>World Bank and Government of Botswana</td><td>Communities of Gudigwa, Beetsha, Eretsha, Gunitsoga and Seronga</td><td>Improved livelihoods and reduction of incidents of Human Wildlife Conflict through the following programmes/projects;
- Livestock herding dogs – 4 Beneficiaries
- Tourism training – 78 Beneficiaries</td><td></td></tr>
</table>

			- Predator proof strong kraals- 21 Beneficiaries. - Use of beehives to scare elephants and produce honey – 17 Beneficiaries. - Use early maturing seeds – 32 Beneficiaries. - Use of chili pepper – 305 Beneficiaries.	2010 - 2016
Capacity building for Community Based Organisations	Local Enterprise Authority (LEA)	OKMCT OCT STMT MZCDT	Business coaching and mentoring on the following areas; - Development of governance, business development, financial management policies - Development of operations manuals	On- going
Citizen empowerment in the tourism sector	Department of Tourism	North West District communities	- Citizen empowerment in the tourism sector - Creation of job opportunities for citizens	On-going
Poverty Eradication Programme	Government of Botswana	National program for citizens	- Improvement of livelihoods - Creation of job opportunities 59 beneficiaries for fisheries projects 10 beneficiaries for guinea fowl farming projects	On going
Ipelegeng programme	Government of Botswana	National program for citizens	- Improvement of livelihoods - Creation of job opportunities 51 cluster scouts engaged under DWNP	On going
National service program	Government of Botswana	National program for citizens	- Improvement of livelihoods - Creation of job opportunities 52 beneficiaries under DWNP	On going

PROTOCOL FOR THE MONITORING OF FAUNA AND FLORA WITHIN NGAMILAND, BOTSWANA

Office Register

Name: _____

Company:_____

Concession:_____

USAID FROM THE AMERICAN PEOPLE | SOUTHERN AFRICA OKACOM

DEPARTMENT OF WILDLIFE & NATIONAL PARKS BOTSWANA

Guide's daily FIELD EVENT BOOKS

1. Always carry your field event book
2. The field event book never sleeps
3. The field event book never shares information with other field event books (check the Office Register to ensure that the incident has not already been reported)
4. The field event book never assumes – only report information that you are SURE of
5. Keep the field event book neat
6. Never remove pages from the field event book
7. Transfer all information to the office register as soon as possible

The OFFICE REGISTER

1. The office register never leaves the office The office register never sleeps
2. The office register records only incidents from the concession
3. Do not tear out any pages
4. Update the web-based database at the end of every month

January		February		March		April		May		June		July		August		September		October		November		December	
Day	Rain-fall (mm)	Day	Rain-fall (mm)	Day	Rain-fall (mm)	Day	Rain-fall (mm)	Day	Rain-fall (mm)	Day	Rain-fall (mm)	Day	Rain-fall (mm)	Day	Rain-fall (mm)	Day	Rain-fall (mm)	Day	Rain-fall (mm)	Day	Rain-fall (mm)	Day	Rain-fall (mm)
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30		30		30		30		30		30		30		30		30		30		30		30	
31		31		31		31		31		31		31		31		31		31		31		31	
Total		Total		Total		Total		Total		Total		Total		Total		Total		Total		Total		Total	

Rainfall Datasheet

January		February		March		April		May		June		July		August		September		October		November		December	
Week	Water-level (cm)	Week	Water-level (cm)	Week	Water-level (cm)	Week	Water-level (cm)	Week	Water-level (cm)	Week	Water-level (cm)	Week	Water-level (cm)	Week	Water-level (cm)	Week	Water-level (cm)	Week	Water-level (cm)	Week	Water-level (cm)	Week	Water-level (cm)
1		1		1		1		1		1		1		1		1		1		1		1	
2		2		2		2		2		2		2		2		2		2		2		2	
3		3		3		3		3		3		3		3		3		3		3		3	
4		4		4		4		4		4		4		4		4		4		4		4	
5		5		5		5		5		5		5		5		5		5		5		5	
Average		Average		Average		Average		Average		Average		Average		Average		Average		Average		Average		Average	
Notes		Notes		Notes		Notes		Notes		Notes		Notes		Notes		Notes		Notes		Notes		Notes	

Water Level Datasheet

Date	Species	Grid	Species	Adults	Sub-Adults	Juveniles	Cubs/ Puppies	Undetermined	Vegetation	Activity	Photo Id?	Notes	Recorded by
				M F ?	M F ?	M F ?	M F ?				L / R		

Predator datasheet (one individual per line) (50 pg)

Date	Place	Grid	Species	Nature of Problem	Notes	Complainant	Action Taken	Reported by

Problem Animal/Human-Wildlife Conflict Data Sheet (5pg)

Date	Grid	Species killed	Age	Sex	Cause of Death Poachers/Predator/Unknown	Age	Sex	# Poached/dead/prey	Notes	Reported by

Poaching & Mortality Datasheet (5pg)

Date	Species	Grid	Number of Plants/Extent (m^2)	Notes	Reported by

Invasive/Exotic Plants Datasheet (10)

Date	Hot OR Cold Fire?	Grid	Extent (m^2 or km^2)	Origin of Fire	Habitat	Notes	Reported by

Fire Datasheet (1pg)

Date	Species	Grid	Count	Adults	Sub-Adults	Yearlings	Calf/Foal	Undeter-mined	Habitat	Notes	Recorded by
				M F ?	*M F ?*	*M F ?*					

Rare or Endangered Animal Sightings (10 pg)

Date	Species	Grid	Count	Adults	Sub-Adults	Juveniles	Undeter-mined	Habitat	Nest/Notes	Recorded by
				M F ?	*M F ?*	*M F ?*				

Birds Datasheet (10 pg)

Bi-Annual Wildlife Count					Month			Year		
Start Odometer					Driver			Start time		Transect
End Odometer								End time		
Date	Habitat	Species	Grid	Adult	Sub-Adult	Yearling	Calf/foal	Undetermined	Perpendicular distance	Odometer reading
				M F ?	M F ?	M F ?	M F ?			

Bi-Annual Herbivore Count (10 pg)

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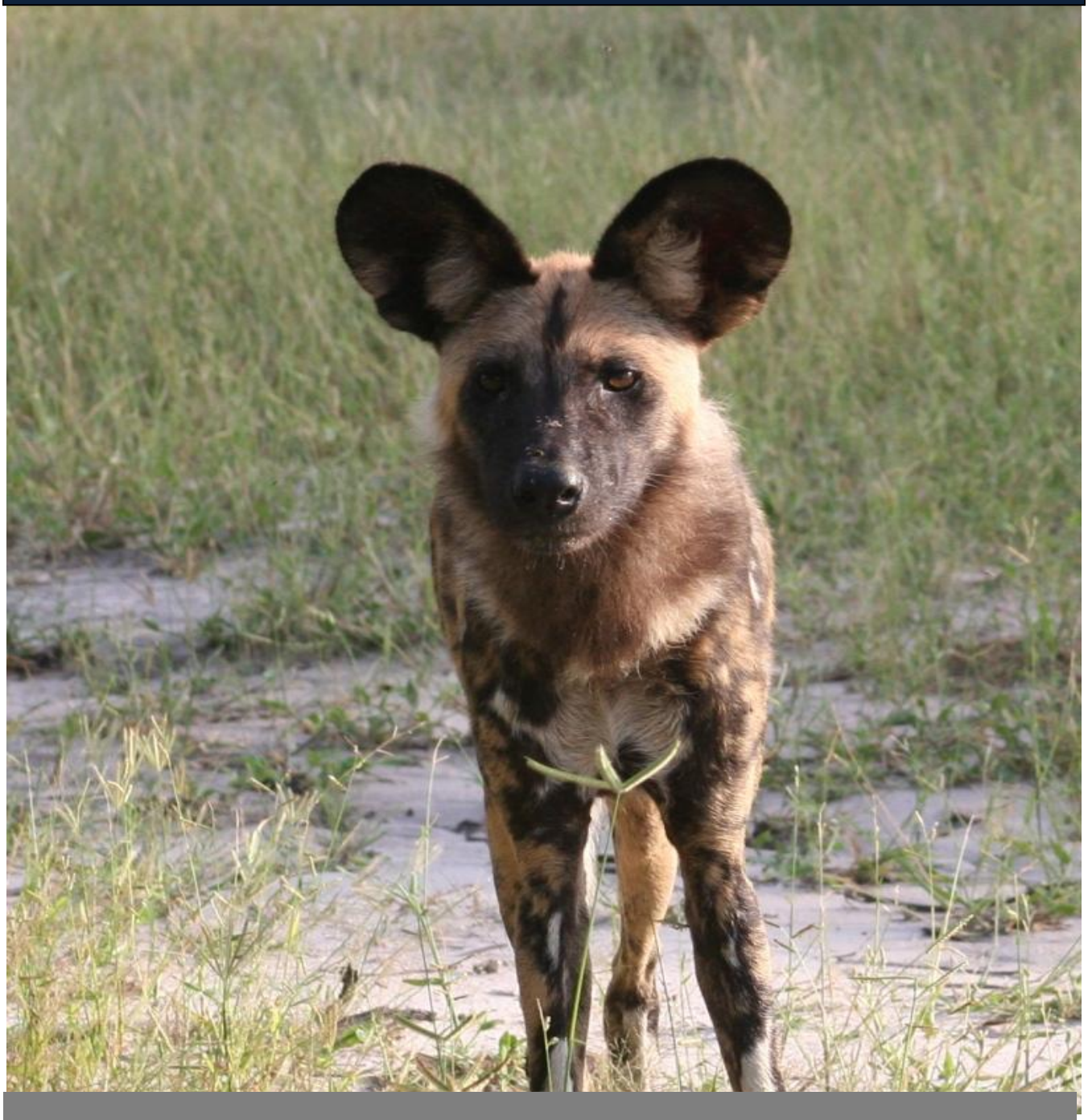
Protocol for the Okavango Wildlife Monitoring System



March 2014
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It was prepared by Chemonics International Inc.

PROTOCOL FOR THE OKAVANGO WILDLIFE MONITORING SYSTEM

March 2014

Sven Bourquin and Chris Brooks

Implemented by:
Chemonics International
1717 H Street NW,
Washington,
DC 2006

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS

AFIS	Advanced Fire Information System
CBD	Convention on Biological Diversity
CBNRM	Community-Based Natural Resources Management
CBO	Community-Based Organization
CEG	Community Escort Guide
DEA EIS	Department of Environmental Affairs Environment Information System
EOSDIS	Earth Observing System Data and Information System
DWNP	(Botswana) Department of Wildlife and National Parks
GDP	Gross Domestic Product
GIS	Geographic Information System
GPS	Global Positioning Device
HWC	Human-Wildlife Conflict
IDF	Institute for Forest Development (Angola)
IUCN	International Union for Conservation of Nature
MOMS	Management Orientated Monitoring System
NASA	National Aeronautics and Space Administration
NDVI	Normalized Differential Vegetation Index
PA	Protected Area
PAC	Problem Animal Control
PI	Photo Identification
SAREP	Southern Africa Regional Environmental Program
USAID	United States Agency for International Development
WMA	Wildlife Management Area

EXECUTIVE SUMMARY

During a wildlife expert workshop held at Maun Lodge, 26th & 27th January 2012, the Southern Africa Regional Environmental Program (SAREP) and the Department of Wildlife and National Parks (DWNP) co-hosted a seminar aimed at tackling the issue of the decline of wildlife in Botswana. This document details the outputs of this seminar, and the deliberations that took place follow its conclusion. These deliberations included several additional meetings between SAREP, DWNP and various experts, who subsequently the guidelines for the basic monitoring of flora and fauna within the Ngamiland concessions in Botswana. Designed to mesh seamlessly with the Management Orientated Monitoring System (MOMS), these monitoring data are collected by guides, under the responsibility of concessionaires, for the long-term trend assessment of flora and fauna and observation of wildlife population demographics in Ngamiland. The data collected from the protocol will be applicable at the local and national level. Predator densities and movements, as well as long-term herbivore population trends, will be obtained for management purposes; local game hotspots can be determined, rare species recorded and general dynamics (bush encroachment, stochastic local processes such as disease outbreaks etc.) can be observed and addressed fairly rapidly. The table below outlines wildlife monitoring activities that have been selected for standardised monitoring:

Wildlife Monitoring Activity	**Timing**
Rainfall (rain gauge)	Continuous
Flood level (meter gauges daily or weekly)	Continuous
Predator Sightings And Identification	Continuous
Mortality: Poaching incidents, Natural and Predation	Continuous
Human Wildlife Conflict reports	Continuous
Poaching Incident and Mortality reports (simple reports - not patrols)	Continuous
Presence of invasives and exotics	Continuous
Fire Occurrence (fire scars / presence / location - simple records)	Continuous
Monitoring Threatened or Indicator Species	Continuous
Wildlife Population Trends (Strip transects)	Bi-annual
Static Photo records (woody vegetation and seasonal floods)	Bi-annual

INTRODUCTION

Botswana has a wide range of ecosystems, driven by various levels of precipitation, geological and hydrological conditions, with a very distinct annual flooding cycle in the Okavango Delta (Mendelsohn *et al.*, 2010, Wolski and Murray-Hudson, 2006). The country has an extreme xeric as well as an extensive wetland fauna. Inevitably, this means many important faunal elements are present from the various ecosystems that stretch across southern Africa. Ecotourism supplies Botswana with 10% of its GDP and 16% of its non-mining GDP. In fact, tourism and the natural environment is so important that the Botswana government has set aside 17% of Botswana's land area as National Park or Game Reserve, and a further 22% as wildlife management areas, which form the basis for the most profitable Community-Based Natural Resource Management projects. Botswana has adopted and continues to adopt a number of policy frameworks on environmental management including the governance and management of protected areas and their surrounds, such as the Wildlife and Environment Act (1992) the Environmental Impact Assessment Act (2005) and the Wildlife Management Area Regulations of 2009 (Draft). These policy frameworks not only guide direct activities of various stakeholders in favour of conservation and protection but also adopt an adaptive approach to environmental management through evaluation of existing methods, criteria and indicators used to govern protected areas.

The DWNP and SAREP co-hosted a seminar in January 2012 (The future of Okavango's wildlife: "An urgent call to define an improved adaptive management and research strategy for the Delta", Maun Lodge, 26, 27 January 2012, SAREP & DWNP) to discuss the issue of declining wildlife within the borders of Botswana. One of the main recommendations of the workshop was to standardise monitoring throughout concessions in order to:

1. Improve our understanding of what regulates wildlife populations in the Ngamiland,
2. Develop data that can "flag" potential concerns or declines in wildlife populations,
3. Assess the threat and spread of alien and invasive species
4. Collect and analyse data on aspects of wildlife populations that aerial surveys cannot provide, including information on predator populations information and wildlife population dynamics.

Listed below are the main monitoring focal points that were suggested by the experts at the Maun Lodge workshop:

Wildlife Monitoring Activity

1 Wildlife population estimates
2 Rangeland Monitoring
3 Wildlife movement
4 Wildlife recruitment rates
5 Wildlife sex ratios
6 Poaching incident reports
7 Human wildlife conflict reports
8 Flood maps
9 GIS land use mapping
10 Fire maps
11 Poaching conviction rates
12 Wildlife body condition scores
13 Legal off take rates
14 Normalized Difference Vegetatio Index (NDVI) assessments
15 Trophy Quality

WHY MONITOR?

The verb "monitor" means to watch or to check, often for the purpose of detecting change. These are the reasons that we require monitoring to be done within Botswana:

- ***to describe or document current (normal) conditions (BASELINE MONITORING)***
- ***to describe or document abnormal or catastrophic events (such as disease outbreaks)***
- ***to confirm DWNP/ Research assessments***
- ***to investigate perceived problems (such as poaching, invasive species inundation)***
- ***to document the application or implementation of management practices (such as anti-poaching programs) (IMPLEMENTATION MONITORING)***
- ***to document the effectiveness of management practices (EFFECTIVENESS MONITORING)***

Following the guidelines by the IUCN and CBD requirements for protected area management, and the results of the above-mentioned workshop consistent monitoring of fauna and flora is essential. This is especially with regard to fluctuations in group dynamics including demographics, recruitment, mortality and movement and changes in ecosystem conditions including the encroachment of exotic or undesirable species is essential for making management decisions on the maintenance of ecosystems. Following the expert workshop, further discussions between the DWNP, SAREP and researchers were held in order to refine and prioritize monitoring activities (Table 1). These prioritized activities were then presented to concessionaires, who supported this initiative. **It will be the responsibility of the concessionaires to implement this protocol within their concessions or areas of operation.**

The following monitoring data was prioritized for each of the concessions in Ngamiland:

Table 1. Monitoring activities to be carried out in Ngamiland concessions by concessionaires.

Wildlife Monitoring Activity	Timing
Rainfall (rain gauge)	Continuous
Flood level (meter gauges weekly)	Continuous
Predator Sightings And Identification	Continuous
Mortality: Poaching incidents, Natural and Predation	Continuous
Human Wildlife Conflict reports	Continuous
Poaching Incident and Mortality reports (simple reports - not patrols)	Continuous
Presence of invasives and exotics	Continuous
Fire Occurrence (fire scars / presence / location - simple records)	Continuous
Monitoring Threatened or Indicator Species	Continuous
Wildlife Population Trends (Strip transects)	Bi-annual
Static Photo records (woody vegetation and seasonal floods)	Annual

MANAGEMENT ORIENTATED MONITORING SYSTEMS

The DWNP has been supporting the introduction of the Management Orientated Monitoring System (MOMS) into communities, while also using this system in the protected areas of Botswana. This system involves field staff and community members deciding what information is important for them to collect. They are then assisted in designing and undertaking the data collection, recording and analysing with minimal support from external or senior technicians. It is a simple and cost effective approach that was initially developed for community managed conservation areas that had limited long term funds and resources to conduct high-tech monitoring systems. The paper based system provides sufficient data to guide management decisions, build capacity of field staff, stimulate discussion amongst local resource users and encourage local participation. The MOMS process ensures that monitoring objectives are clear, that expectations and information needs are met, and that the end user of data is identified.

The MOMS system is designed to collect information on those natural resources, resource processes and events that are of significance to the user on an ongoing basis through events books. These data are

captured monthly into monthly report cards called Field Events Cards (Yellow), which are transferred into an Occurrence Book. This is a monthly summary that can then be used to produce quarterly reports, and finally all information is updated annually (Red charts). During a recent MOMS workshop with the DWNP, feedback was obtained for the MOMS data collected in each of the protected areas in Botswana, and the usefulness of the system was self-evident in a management role. Managers obtain vital information from each of their stations, and this information can then be used in a constructive manner. The MOMS approach has been adopted with good results in the communal areas of Namibia and been expanded to other state protected areas in Namibia, Botswana, and Mozambique. The MOMS approach uses a geographical grid-based approach to identifying localities in the absence of GPS units. The grid system allows field operatives to develop spatial data, without the use of expensive equipment, within their areas of operation. As a result of this accurate local information, a clear picture emerges over the entire region. This is because local knowledge of the conservation areas is very accurate and, given maps with geographic grids on them, individual localities can be plotted precisely by community escort guides (CEG's) and safari operators.

The standardised protocol, outlined in this report, is designed to mesh seamlessly with the MOMS approach, with the addition of a more scientifically rigid approach to the monitoring of fauna and flora in the concessions in the form of a bi-annual series of transects, in March and October, specifically undertaken in each concession and aimed at observing population demographic patterns of both herbivores and carnivores. These data will augment the continuous sightings and events data that is already collected by CEG's and professional guides within the various concessions, and assist in providing a reliable and effective monitoring approach in order to answer the many questions surrounding the reduction of many species of wildlife in Botswana.

It must be understood that the information collected on a continuous basis and those collected during the bi-annual surveys are an invaluable source of information, not only to environmental managers and decision-makers, but also to the guides that are collecting this information. The information collected reflects, in a reliable manner, the circumstances locally and regionally. It allows guides to follow precisely the movements and habits of individual predators and give tourists an

experience that has not been possible to date.

Concessionaires operating in wildlife areas within Botswana have an obligation, as per their lease agreement, to monitor all forms of wildlife in their concessions. In the past, this has been incompletely performed and in most instances monitoring is non-existent. In the case of obligatory monitoring within the Ngamiland concessions, expertise and resources (time, funding, staff, vehicles etc) may be limited, and it is for this reason that SAREP and the DWNP have drawn up a standardized monitoring protocol that is cost effective, efficient sustainable, and integrated with existing MOMS.

INTERACTIVE WEB-BASED DATABASE AND BASIC ANALYSING TOOL FOR CONCESSIONS

SAREP and DWNP are in the process of designing a web-based tool that will allow concessionaires to enter the data they collect in a standardised manner and undertake basic analyses of the data, helping to visualise the results in the form of maps and graphs. One of the problems identified from previous monitoring exercises was the lack of direct feedback on the results of the monitoring activities. The field personnel undertaking the monitoring lost enthusiasm for the activities as they were unable to see the benefit, or learn from the process. The objective for the website is to provide on-going feedback, that captures the data, visualises it and collates the data from all the concessionaires to give a picture, or status report on the state of fauna and flora within the WMAs of northern Botswana. It is hoped that the website will stimulate on-going enthusiasm of field personnel to undertake these activities.

In summary the website will:

1. Store the data for all of the concessions.
2. Provide analyses and visualise the data, for example; defining hotspots for game, assessing species-specific population trends, compiling poaching information, storing predator ID photographs (diagrams), updates on disease outbreaks and invasive aliens, and providing background scientific information etc.
3. Provide concessionaires with database security.

It is essential that the data collected are entered onto this database for this project to yield significant results. The database will allow data from all of the concessions to be analysed simultaneously, a feat not achieved before in Botswana. It is the function of each concession manager to ensure that guides

are motivated and equipped to carry out the survey work as outlined below. The camp manager or senior guide will be responsible for the data once it has been collected, whether it is entered on a monthly basis onto the web-based database from his/her camp, or from a head office.

MONITORING ACTIVITIES

There are two principal forms of monitoring activity; those data that are collected continuously during the normal activities of the camps and those that are collected through specified transects undertaken twice per year in every concession.

Guides will collect continuous information (see below) using EVENT BOOKS that will be issued to them. Daily field observations will be recorded in these event books and these observations will then be transferred into an OFFICE REGSITER that will be kept at each camp office. Observations taken from the office register will be entered, on a monthly basis, into the interactive web-based database that is currently being developed.

A. DATA COLLECTION

Continuous (Daily/Weekly) data collection

It is the objective of the continuous data collection to standardise and structure information which is currently collected by most camps in the Delta with their sightings book. Most guides already record information on predator sightings, kills, observations of rare and endangered species as well as rainfall and flood patterns etc. The standardised protocol aims to collate these data in a manner that can help with the management of the Delta's wildlife populations as a whole.

In this manner guides and CEGs will be able to benefit from everyone else's observations, helping guides to build a better picture of where their lion prides go when they leave the concession, or how diverse or similar prey selection is across areas...By sharing these data everyone benefits.

Bi-Annual data collection

It is the objective for the structured transects to collect information on aspects of wildlife populations that cannot be collected through aerial surveys. Information on the population dynamics of herbivore species can inform us of the status, health and viability of that population and what might be causing its decline. Gathering these data from across the region will inform us if species in some areas are more prone to predation or even poaching than in other areas and how changes in flood dynamics may affect these species.

A. DATA TO BE COLLECTED CONTINUOUSLY

The aim of this data collection is to have all of the information that is collected by the guides in the field, during game drives, recorded in a sightings book (a hard copy). Camp managers or senior guides are responsible for the monthly data compilation onto the web-based database that will act as a repository for the data, and allow concessionaires to produce current reports for their areas.

RAINFALL

Seasonality determines the timing of growth spurts of plants and breeding and recruitment of animals (See eg. Boyes and Perrin, 2009, Cheney, 2006, Merron and Bruton, 1995). The timing of the annual rains also regulates flooding events that characterize Ngamiland and the Okavango Delta. Annual variation in rainfall can cause large fluctuations in annual flood levels, reducing areas that are navigable and available to flora and fauna for the resources that they depend upon for survival. The onset of the wet season also triggers mass movement (migration) of animals such as elephant, zebra, and wildebeest, timed to make use of high quality wet-season foraging regions. Rainfall will be recorded daily (Table 5) and compiled monthly for analysis. The camp manager, senior guide or head CEG will be responsible for recording these data using a standard rainfall- gauge. A rain gauge should be positioned so that water cannot splash into it and all vertical objects (e.g. trees) must be four times their height away. Gauges are usually emptied at a fixed time every daily. If visited less regularly, a little oil can be added to reduce evaporation (Krebs, 1998).

FLOOD LEVELS

Flood levels will be recorded weekly using a meter gauge, placed at a standard location, ensuring that that level is measured from the flood-base level. The data will be recorded on the sheets provided (Table 6) and will then be entered on a monthly basis into the natural resource monitoring website database, either in camp or in Maun. When taking flood level measurements, ensure that safety is maintained – crocodiles and *Hippopotamus* abound in many of the permanent channels of the Okavango delta.

PREDATOR SIGHTINGS AND IDENTIFICATION

Predators cannot be counted from the air as we do for herbivores. It is for this reason, and because of the importance of detailed knowledge of the status of the predator guild in any region (see below), that we pay special attention to the predators. Although there is predator research occurring in Botswana, this is localised and often very specific. This monitoring will be on a regional level and will allow stakeholders to assess the status of predators, including abundance and movement – even if these predators move into a different concession.

Predators greatly impact their environments, whether in an urban area or large wilderness complex. Animals that survive by preying on other organisms send ripples throughout the food web and regulate the effects that other animals have on that ecosystem. This process is called a "trophic cascade;" the progression of direct (predation-driven) and indirect (fear-driven) effects that predators have through lower trophic levels in a food chain (Predator Defense, 2013). Predators also have impacts throughout the predator guild through competition for resources, and dominant predators also kill and eat their competitors (intra-guild predation). Predators are important not only because they create biodiversity, but also because they indicate biodiversity. In addition to regulating natural systems as described above, predators (especially large predators) serve as a measure of the health of communities around them.

The health of the predator population is therefore an indicator of the health of an ecosystem, and the more information that can be gained over an ecosystem-wide scale, the deeper our understanding of the

ecosystem is, the faster we are able to recognise a potential problem, and the more effectively we are able to manage the ecosystem.

In the absence of dedicated researchers to monitor predators, it falls upon the guides and community escort guides to perform this task within the concessions. The most simple and effective way to keep track of individual predators (as there are fewer predators than prey in healthy systems) is with the use of Photo Identification (PI). All individuals are physically unique in one way or another and by taking a digital photo of that unique feature we can identify the individual. As soon as an individual can be identified there is a wealth of data that can be obtained from it, such as movement patterns, home range size, inter-species relationships and population estimated (gained from resighting data), that were not available before identification.

The predators that we will focus on for the purposes of this data collection are wild dogs (*Lycaon pictus*), lion (*Panthera leo*), leopard (*Panthera pardus*), spotted hyaena (*Crocutta crocutta*) and cheetah (*Acinonyx jubatus*). A general rule for identification is that both sides of the focal area (ie. left/right flank, left/right face) are photographed where possible. This can take a few sightings of the individual to obtain, but once good quality photos exist, the individual can always be recognised and identified. The idea behind this process is to build up an **online predator ID database from which a current, printable booklet** can be produced for each concession so that guides can identify predators in the field and be able to give a history of the individuals to the guests while keeping track of the animals. The text box below illustrates what information is recorded when a predator is sighted and the Predator sightings datasheet (Table 7) is the form used.

DATA RECORDED ON EACH PREDATOR SIGHTING WILL INCLUDE THE FOLLOWING:

a) Date
b) Species
c) Initial count of individuals
d) Adult numbers (males and females)
e) Sub-Adult numbers (males and females)
f) Juvenile numbers (males and females)
g) Cubs/Pups
h) Number of animals that are undetermined in terms of age and/or sex.
i) Locality (grid locality)
j) Vegetation type
k) Predator Activity (Sleeping, patrolling, hunting)
l) ID picture obtained? (yes or no, what profile, flank or face, photo number)
m) Notes
n) Who recorded the data?

Wild Dogs (Lycaon pictus):

Wild dogs are on the IUCN red list as "endangered', and have disappeared from much of their former range. The species is virtually eradicated from West Africa, and greatly reduced in central Africa and north-east Africa. The largest populations remain in southern Africa (mainly Botswana) and the southern part of East Africa. Population densities in well-studied areas suggest that between 3,000–5,500 free-ranging wild dogs remain in Africa (< 2,500 of these are mature individuals) (IUCN/SSC Canid Specialist Group, 2008). Population size is continuing to decline as a result of ongoing human-animal conflict, infectious disease and habitat fragmentation and local populations therefore require careful monitoring.

Monitoring of Wild dogs

Wild dogs have a unique tail and body patterns and are easily recognisable given a bit of practise (Figure 1). They are territorial, social animals, and so can generally be grouped by region, pack, sex, age and then tail pattern. Flank patterns and ear-notch patterns can then be used to identify the individual. When taking photos of wild dogs, try to follow an individual (without causing undue stress to the individual) until both a left and right sides are photographed; this will save a lot of time when trying to match the photos to an individual subsequently. When a pack is encountered a count should be made of the number of adult males, adult males, yearlings and juveniles. Mortality rates in wild dogs are high, especially in the case of younger dogs, and so close observation should be kept on all packs within the area. During the denning season (which begins in April in Botswana), great care should be taken by operators to ensure that activity around the den is kept to a minimum, to avoid the pack having to move to a new den site due to a perceived threat. Such moves are very dangerous to the puppies. Once PI's have been taken of an individual, it is best practise to draw the patterns (on blank outlines – see Figure 2) and make notes on the distinctive markings for each individual. Soon the whole pack can be identified from booklets that will be carried by guides.

Figure 1. A right flank photo of an adult male wild dog. Flank patterns are immediately obvious, as well as conspicuous ear-notches on the left ear. Given a number of photos, identity diagrams can be drawn for each wild dog in a given pack. Dogs can be grouped initially by pack, sex, age and characteristic tail pattern, before a detailed pattern analysis is done.

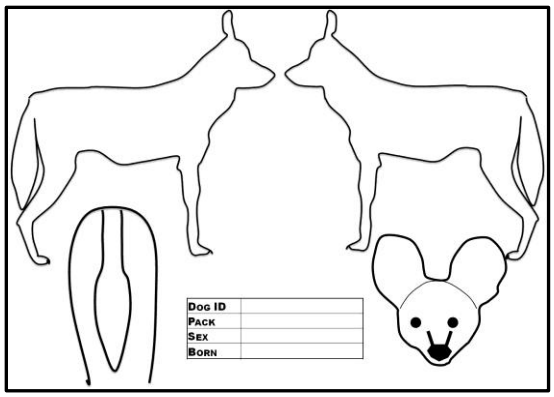


Figure 2. Blank diagram of wild dog on which ear notches, tail patterns and body patterns can be recorded along with individual's information.

Lions (Panthera leo):

While the lion is synonymous with wild Africa, few people realize that illegal killing, relentless habitat loss, and habitat fragmentation has left this species teetering on the brink of extinction. Nearly a century ago, there were as many as 200,000 lions living in the wild in Africa. Today, the most recent surveys estimate that there are fewer than 30,000 lions living in the wild in Africa today (Panthera, 2013). Lions are currently listed as "Vulnerable" on the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species; and in West and Central Africa, the species is now classified as "Endangered." Lions have vanished from over 80 percent of their historic range and currently exist in 28 countries in Africa and one country in Asia (India). They are extinct in 26 countries. Only 7 countries: Botswana, Ethiopia, Kenya, South Africa, Tanzania, Zambia and Zimbabwe are believed to each contain more than 1,000 lions.

Monitoring of lions

Lions have unique whisker spots on their muzzles that identify them as individuals. Once good left and right side photos are obtained for an individual, these can be plotted on a blank outline and carried by guides for identification in the following manner (Figure 3 and Figure 4).

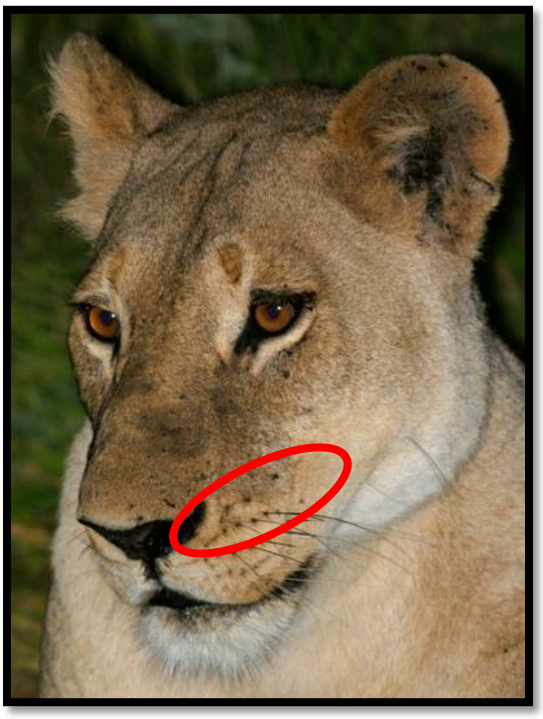


Figure 3. A left-face photograph of an adult female lioness, depicting the region where the identification whisker spots are located.

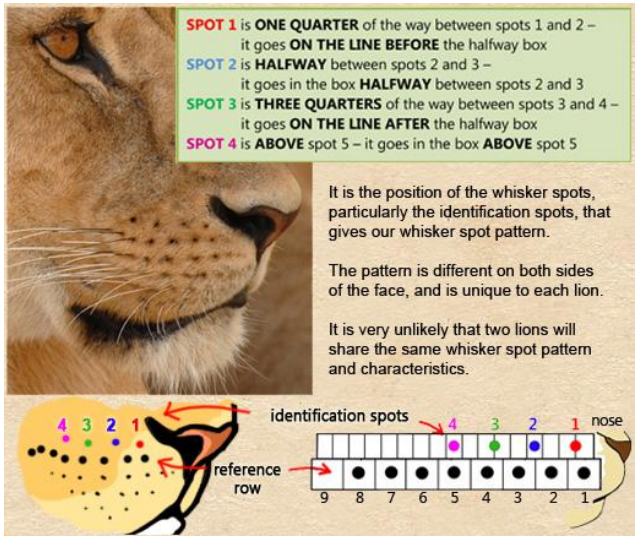


Figure 4. Two rows: the reference row and the identification spots. The reference row is the top complete row of whisker spots. The identification spots form an incomplete row above the reference row. There may be up to 5 spots **(Mara predator Project: Lion Database)**

In addition to the whisker pattern, unique scars, ear notches, sex, and pride can also be used to identify an individual, and these features can be plotted on the diagram below (Figure 5).

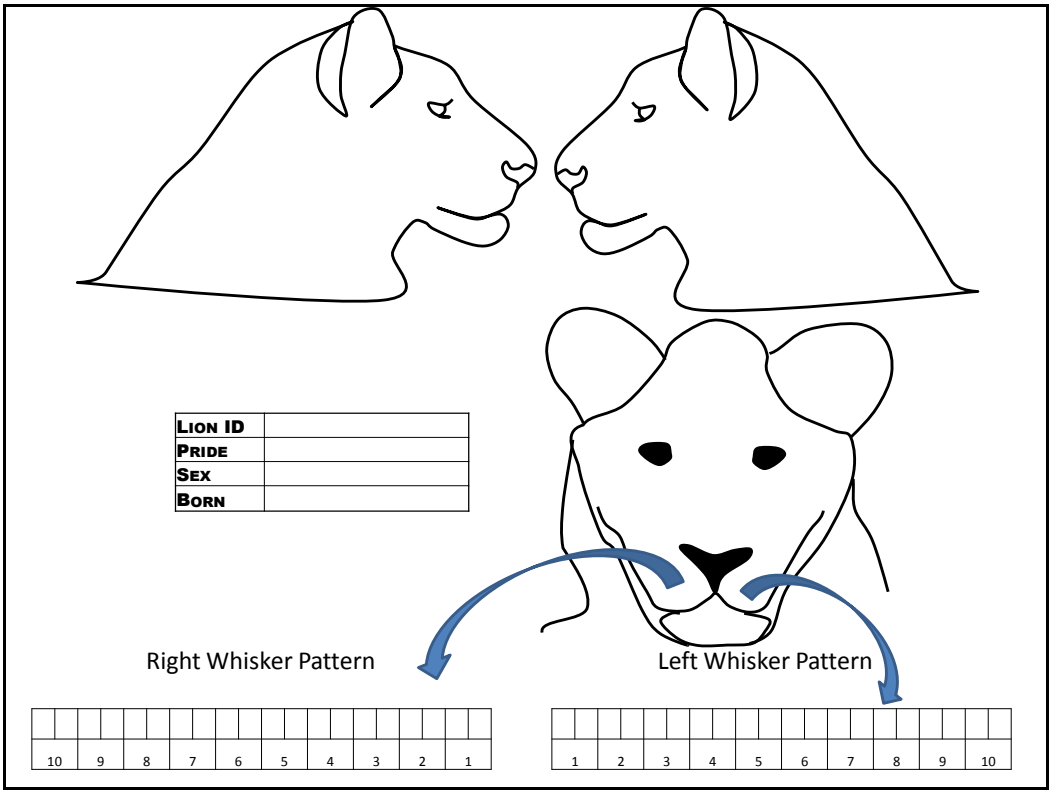


Figure 5. Lion "blank" diagram on which whisker spot patterns, facial scars and ear notches must be drawn in order to recognise individuals.

Leopard (Panthera pardus):

Leopards are listed as 'Near Threatened' on the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species. In 2008, the IUCN stated that leopards may soon move from a "Near Threatened" to a "Vulnerable" status.

Nine leopard subspecies have been recognized throughout the world. While leopards have the widest range of any big cat, they have vanished from almost 40% of their historic range in Africa and from over 50% of their historic range in Asia. In Africa, leopard populations are drastically declining due to the increasing demand among members of the Shembe Baptist Church for leopard skins, which are worn during religious celebrations. It is estimated that Africa is home to between five and eleven million Shembe followers. Other threats facing leopards in Africa and Asia include persecution

resulting from human-leopard conflict situations, poorly managed trophy hunting regulations and direct hunting for the illegal wildlife market (Panthera, 2013).

Monitoring of leopards

Individuals can be recognised by the pattern of rosettes that adorn their bodies. Once again, good photographs of the face of a leopard (Figure 6) will enable guides to identify individuals, although there is always some level of perspective change if the photo is not taken from exactly the same angle in subsequent sightings. For this reason we use the facial patterns rather than the markings from other parts of the body. It is always advisable to keep a file of all clear photos of known individuals in order to be able to match photos.

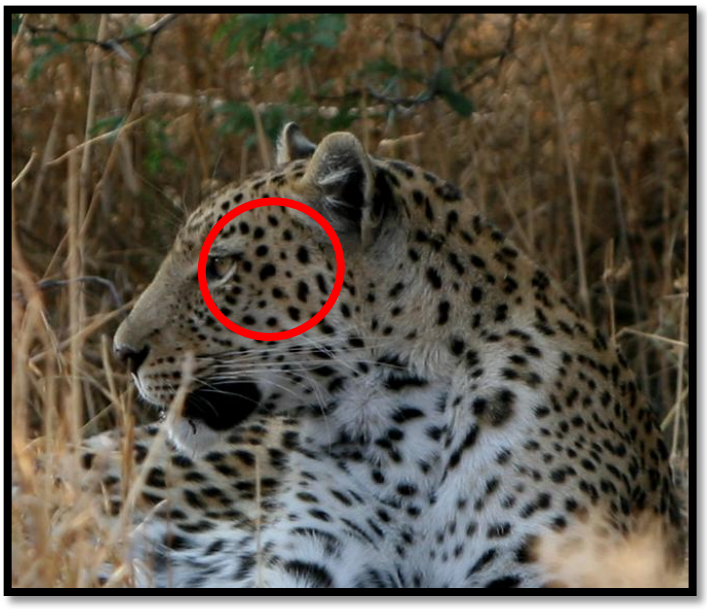


Figure 6. Left side of the face of an adult female leopard. The pattern of spots on the body (and face) is unique, and the face is less prone to perspective change than other parts of the body. It is better to work with photos for leopard due to the complexity of the patterning.

Cheetah (Acinonyx jubatus)

The known cheetah population is approximately 7,500 adults. Additional areas where cheetah status is poorly known are unlikely to raise the total to over 10,000. Given an estimate of 15,000 cheetahs in Africa in the 1970s, a decline of at least 30% is suspected over the past 18 years (3 generations). The

decline is primarily due to habitat loss and fragmentation, as well as killing and capture of cheetahs as livestock depredators, primarily, as well as for trade (IUCN Cats Red List Workshop 2007). Historically cheetahs were found throughout Africa and Asia from South Africa to India. They are now confined to parts of eastern, central and southwestern Africa and a small portion of Iran.

Monitoring of Cheetah

Cheetah can be individually identified by spot patterns – again, left and right face photos can be used to identify individuals (Figure 7).

Figure 7. Two photos taken of one individual female cheetah at different times. Note the same spot pattern of this individual.

MORTALITY: POACHING INCIDENTS, NATURAL MORTALITY AND PREDATION

There is a general paucity of data regarding the amount and types of prey that are taken by the various predators. While we know that certain predators favour certain prey species, it may be important to quantify this, especially in areas where prey species may be low or declining in order to manage this appropriately. This information can be collected and recorded easily by guides on the predator sighting forms (Table 8).

The actual extent of poaching in Botswana is not known, nor is the extent to which poaching has contributed to the decrease in Botswana's animal populations. In Botswana recent unpublished reports

estimate that up to 4,000 antelope, including buffalo, giraffe, zebra, wildebeest etc are killed per annum from around the Okavango Delta. These figures could also be a vast underestimate of what is increasingly becoming a commercialised operation for bush meat.

Anti-poaching efforts within Botswana are piece-meal and ineffective; they are not centralized or directed. When poachers are apprehended, they are, for the most part, not convicted. We suggest that poaching incidents are reported through this forum and uploaded onto the website. We can then identify those areas most in need of protection from poachers and react accordingly. The information that is required when a poaching incident is reported or observed, to be recorded on the poaching/mortality form (Table 8).

In order to detect disease outbreaks and other causes of mortality (fire, drought etc), carcasses should be reported on when encountered. These will also be reflected in the poaching/mortality datasheet.

a)	**Date**
b)	**Locality (grid)**
c)	**Species (Age, Sex)**
d)	**Poached/Predator/Natural**
e)	**Age/sex (predator)**
f)	**Number killed**
g)	**Notes**
h)	**Who reported?**

HUMAN-WILDLIFE CONFLICT REPORTS

Human-animal conflict is possibly one of the most important factors regarding the future of Botswana's wildlife. Elephants, followed by buffaloes have been most involved in the conflict especially within the Kasane/Kazungula development area (http://flowhoorc .blogspot.com/2010/12 /humanwildlife-conflict-in-botswana.html, accessed 03/04/2013). Elephants go into the townships at night and feed on the people's fruits and plants and

end up being shot and killed by Kasane residents. A DWNP report July 2010 indicates that 23 elephants were killed within the first half of 2010 in defence of property or human lives. Other species killed were buffalo (21), lion (3), leopard (2), hippo (3), warthog (4) and baboon (3). The collection of data on HWC in those areas that have settlements bordering them will give us an idea of the frequency and nature of HWC's. Hotspots can then be identified and targeted for mitigation procedures. The following information needs to be collected when a problem animal or HWC incident is reported, on the PAC form (Table 9):

a) Date
b) Locality (grid)
c) Species
d) Extent of Loss – cattle, Sheep & Goats, Fields & Gardens, Human, Other.
e) Complainant
f) Action Taken
g) Who reported?

PRESENCE OF INVASIVE/EXOTIC PLANTS

We have added a list of potential specific plant threats to Ngamiland and the Okavango Delta. This list will soon be combined, in a booklet form, with identification criteria for each species so that these plants can be identified in the field.

Salvinia molesta - Kariba Weed (aquatic plant, herb)

Description

Salvinia molesta is a complex of closely related floating ferns. The primary growth form is an invading form with small flat leaves to the tertiary or mat form with large, crowded, folded leaves.

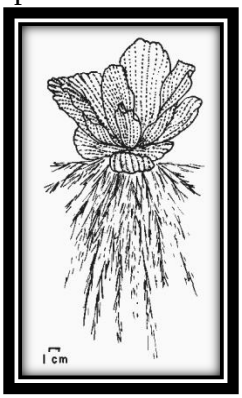
Threats

Under the best conditions plants can form a mat that is two feet thick that reduce water-flow and lower the light and oxygen levels in the water. This stagnant dark environment negatively affects the biodiversity and abundance of freshwater species, including fish and submerged aquatic plants. *Salvinia* invasions can alter wetland ecosystems and cause wetland habitat loss. *Salvinia* invasions also pose a severe threat to socio-economic activities dependent on open, flowing and/or high quality waterbodies, including hydro-electricity generation, fishing and boat transport. ***S. molesta*** **in 2013 was elected as the one of the '100 of the World's Worst Invasive Alien Species' to replace the Rinderpest virus which was declared eradicated in the wild in 2010.**

Pistia stratiotes – Water lettuce (aquatic plant, herb)

Description

P. stratiotes is a free-floating perennial of quiet ponds. It is stoloniferous, forms colonies, and has rosettes up to 15cms across. It has long, feathery, hanging roots. Its leaves are obovate to spathulate-oblong, truncate to emarginate at the apex, and long-cuneate at the base. Leaves are light green and velvety-hairy with many prominent longitudinal veins. Inflorescences are inconspicuous and up to 1.5cms long. Flowers are few, unisexual, and enclosed in a leaflike spathe.



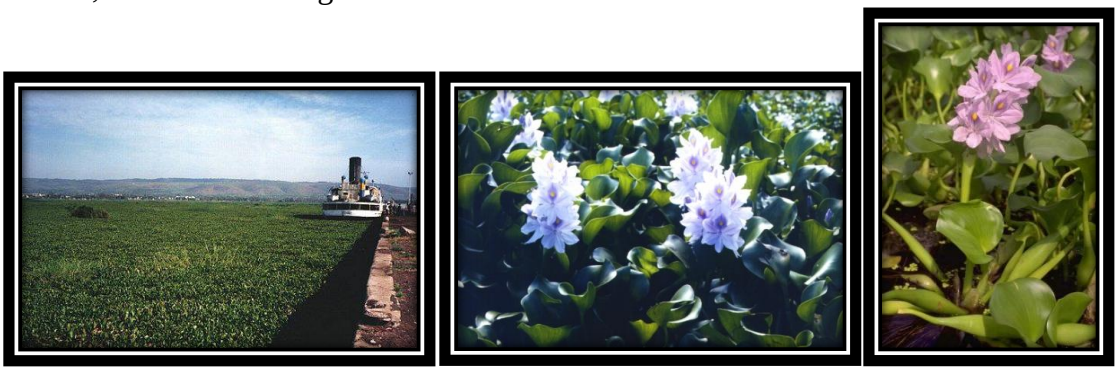

Threats

See *S. molesta*

Eichhornia crassipes – Water Hyacinth

Description

E. crassipes is a free-floating aquatic macrophyte growing generally to 0.5m in height but to nearly 1 metre in height in some southeast Asian locations. *E. Crassipes* may form dense floating mats. Its leaves are thick, waxy, rounded, and glossy and rise well above the water surface on stalks. They are broadly ovate to circular, 10-20cm in diameter, with gently incurved, often undulate sides. The stalk is erect, to 50cm long, and carries at the top a single spike of 8-15 showy flowers. The flowers have six petals, purplish blue or lavender to pinkish, the uppermost petal with a yellow, blue-bordered central splotch. Its roots are purplish black and feathery. *E. Crassipes* forms a shoot consisting of a branched, stoloniferous rhizome, 6cm in diameter and up to 30cm in length, with several short internodes. Each node bears a leaf and roots. Axillary buds, which can also form stolons, grow at an angle of 60 degrees from the rhizome and remain at that angle or bend upward in dense stands, or become horizontal in open stands. Plants on the edge of a mat form stolon buds while those in the middle may not. Stolons are purplish violet and extend up to 50cm or more in length and are highly variable in diameter.
As much as 50% of a single water hyacinth's biomass can be roots. Roots are adventitious and fibrous, 10-300cm in length.



Threats

See S. molesta.

Leucaena leucocephala – White Leadtree

Leucaena leucocephala is a thornless long-lived shrub or tree which may grow to heights of 7-20 m. Leaves are bipinnate with 6-8 pairs of pinnae bearing 11-23 pairs of leaflets 8-16 mm long. The inflorescence is a cream coloured globular shape which produces a cluster of flat brown pods 13-18 mm long containing 15-30 seeds.

The fast-growing, nitrogen-fixing tree/shrub *Leucaena leucocephala*, has been widely introduced due to its beneficial qualities; it has become an aggressive invader in disturbed areas in many tropical and sub-tropical locations and is **listed as one of the '100 of the World's Worst Invasive Alien Species**'. This thornless tree can form dense monospecific thickets and is difficult to eradicate once established. It renders extensive areas unusable and inaccessible and threatens native plants.

Mimosa pigrai – Catclaw mimosa

Description

The shrub/tree is sprawling, often thicket-forming and up to 6 m (20 ft) tall, with hairy stems bearing numerous recurved prickles to 7 mm (0.3 in) long. The leaves are alternate, twice compound, and sensitive to touch; leaf petiole and rachis to 20 cm (8 in) long, prickles at junctions, 5–12 pairs of pinnae; each pinna with 24–31 pairs of leaflets, these to 8 mm (0.3 in) long, often with threadlike hairs on margins. The flowers are small, mauve to pink, in stalked, dense, spherical heads; about 1 cm (0.5 in) across, with about 100 flowers per head; 8 stamens. Fruit: A brown-bristly, segmented, flat pod to 8 cm (3 in) long and 1.4 cm (0.5 in) wide, with the 9–24 segments breaking free individually; each containing a seed. Pods in clusters, or "hands" (of usually 7) at stem tips.

Threats

May form dense under-stories in swamps, shading out native tree seedlings and altering bird, reptile, and vegetation communities

Bidens pilosa – Black Jack

Description

Bidens pilosa is an annual forb of gracile habit, growing up to 1.8 meters tall. It grows aggressively on disturbed land and often becomes weedy. The leaves areoppositely arranged and pinnate in form with three to five dentate, ovate-to-lanceolate leaflets. The petioles are slightly winged. The plant may flower at any time of the year. Flowers are borne in small heads on relatively long peduncles. The heads bear about four or five broad white ray florets, surrounding many tubular yellow disc florets. The fruits are slightly curved, stiff, rough black rods, tetragonal in cross section, about 1 cm long, with typically two to three stiff, heavily barbed awns at their distal ends. The barbed awns catch onto animals and the seeds are transported by animals and people. This mechanism has helped the plant become a cosmopolitan weed in temperate and tropical regions.

Threats

Bidens pilosa is a cosmopolitan, annual herb which originates from tropical and Central America. Its hardiness, explosive reproductive potential, and ability to thrive in almost any environment have enabled it to establish throughout the world. Generally introduced unintentionally through agriculture or sometimes intentionally for ornamental purposes, *B. pilosa* is a major crop weed, threat to native fauna, and a physical nuisance.

Lantana camara **–** Common lantana **(**shrub)

Description

Lantana is a perennial, summer-growing, erect or scrambling shrub, growing up to four metres high and often forming dense thickets. Flesh of the plant produces a strong, aromatic odour when crushed. The plant is a member of the Verbenaceae (verbena) family. Lantana is characterised by square-shaped stems with short, curved and hooked prickles. The leaves are opposite and curved on a short stalk and are about 10 mm long. They are egg-shaped (ovate) to spearhead-shaped (lanceolate), with toothed edges; rough and bright green on the upper surface and hairy and pale green below; 2–10 cm long and 2–8 cm wide. Flowers form in dense clusters and vary in colour from red–yellow, orange–pink, and white; depending on the type, maturity and location. Flowering and fruit production can occur almost year round in suitable areas where there is adequate soil moisture, high air humidity and high temperatures.

Threats

The plants can grow individually in clumps or as dense thickets, crowding out more desirable species. In disturbed native forests it can become the dominant understorey species, disrupting succession and decreasing biodiversity. At some sites, infestations have been so persistent that they have completely stalled the regeneration of rainforest for three decades. *Lantana camara* has been the focus of biological control attempts for a century, yet still poses major problems in many locations and is **listed as one of the '100 of the World's Worst Invasive Alien Species**'.

Ricinus communis – Castor oil plant (tree, shrub)

The castor oil plant can vary greatly in its growth habit and appearance. The variability has been increased by breeders who have selected a range of cultivars for leaf and flower colours, and for oil production. It is a fast-growing, suckering perennial shrub that can reach the size of a small tree (around 12 metres or 39 feet), but it is not cold hardy. The glossy leaves are 15–45 centimetres (5.9–18 in) long, long-stalked, alternate and palmate with 5–12 deep lobes with coarsely toothed segments. The stems (and the spherical, spiny seed capsules) also vary in pigmentation. The fruit capsules of some varieties are more showy than the flowers. The green capsule dries and splits into three sections, forcibly ejecting seeds
The flowers are borne in terminal panicle-like inflorescences of green or, in some varieties, shades of red monoecious flowers without petals. The male flowers are yellowish-green with prominent creamy stamens and are carried in ovoid spikes up to 15 centimetres (5.9 in) long; the female flowers, borne at the tips of the spikes, have prominent red stigmas.[4]
The fruit is a spiny, greenish (to reddish-purple) capsule containing large, oval, shiny, bean-like, highly poisonous seeds with variable brownish mottling. Castor seeds have a warty appendage called the caruncle, which is a type of elaiosome. The caruncle promotes the dispersal of the seed by ants (myrmecochory).

Threats

Ricinus communis is frequently found invading riparian areas where it displaces native vegetation. The seed of this species is toxic to variety of species including humans. Consuming only a few seeds can be fatal.

Xanthium strumarium - Rough cocklebur (Herb)

Xanthium strumarium is a species of annual plants that probably originates in North America and has been extensively naturalized elsewhere. The species is monoecious, with the flowers borne in separate unisexual heads: staminate (male) heads situated above the pistillate (female) heads in

the inflorescence. The pistillate heads consist of two pistillate flowers surrounded by a spiny [involucre]. Upon fruiting, these two flowers ripen into two brown to black achenes and they are completely enveloped by the involucre, which becomes a bur. The bur, being buoyant, easily disperses in the water for plants growing along waterways. However, the bur, with its hooked projections, is obviously adapted to dispersal via mammals by becoming entangled in their hair. Once dispersed and deposited on the ground, typically one of the seeds germinates and the plants grows out of the bur


Threats

The seeds and seedlings should not be eaten because they contain significant concentrations of an extremely toxic chemical, carboxyatratyloside. The mature plant also contains at least four other toxins. Animals have also been known to die after eating the plants.

Cyperus rotundus – Nut grass

Cyperus rotundus is a perennial plant that may reach a height of up to 140 cm (55 inches). The leaves sprout in ranks of three from the base of the plant, around 5–20 cm long. The flower stems have a triangular cross-section. The flower is bisexual and has three stamina and a three-stigma carpel, with the flower head have 3-8 unequal rays. The fruit is a three-angled achene. The root system of a young plant initially forms white, fleshy rhizomes, up to 25 mm in dimension, in chains. Some rhizomes grow upward in the soil, then form a bulb-like structure from which new shoots and roots grow, and from the new roots, new rhizomes grow. Other rhizomes grow horizontally or downward, and form dark reddish-brown tubers or chains of tubers.

Threat

It prefers dry conditions, but will tolerate moist soils, it often grows in wastelands and in crop fields. *Cyperus rotundus* is one of the most invasive weeds known, having spread out to a worldwide distribution in tropical and temperate regions. **It has been called "the world's worst weed" as it is known as a weed in over 90 countries, and infests over 50 crops worldwide.** Its existence in a field significantly reduces crop yield, both because it is a tough competitor for ground resources, and because it is allelopathic, the roots releasing substances harmful to other plants. The difficulty to control it is a result of its intensive system of underground tubers, and its resistance to most herbicides.

When an invasive alien species is encountered, record the observation on the Alien/Exotic Invasives datasheet (Table 10).

FIRE OCCURRENCE

Fire and herbivory are two of the main determinants of savannah ecosystems (Masunga *et al.* 2013). The occurrence of fire can be monitored using the Okavango Research Institute's website (Okavango research Institute: Fire, 2012) and downloading the relevant maps. For example, during the seven days preceding 03/05/13, there were four fires recorded on NASA's EOSDIS website (with a link on the ORC website). The fires were downloaded as shapefiles and imported to ArcGIS (Figure 8).

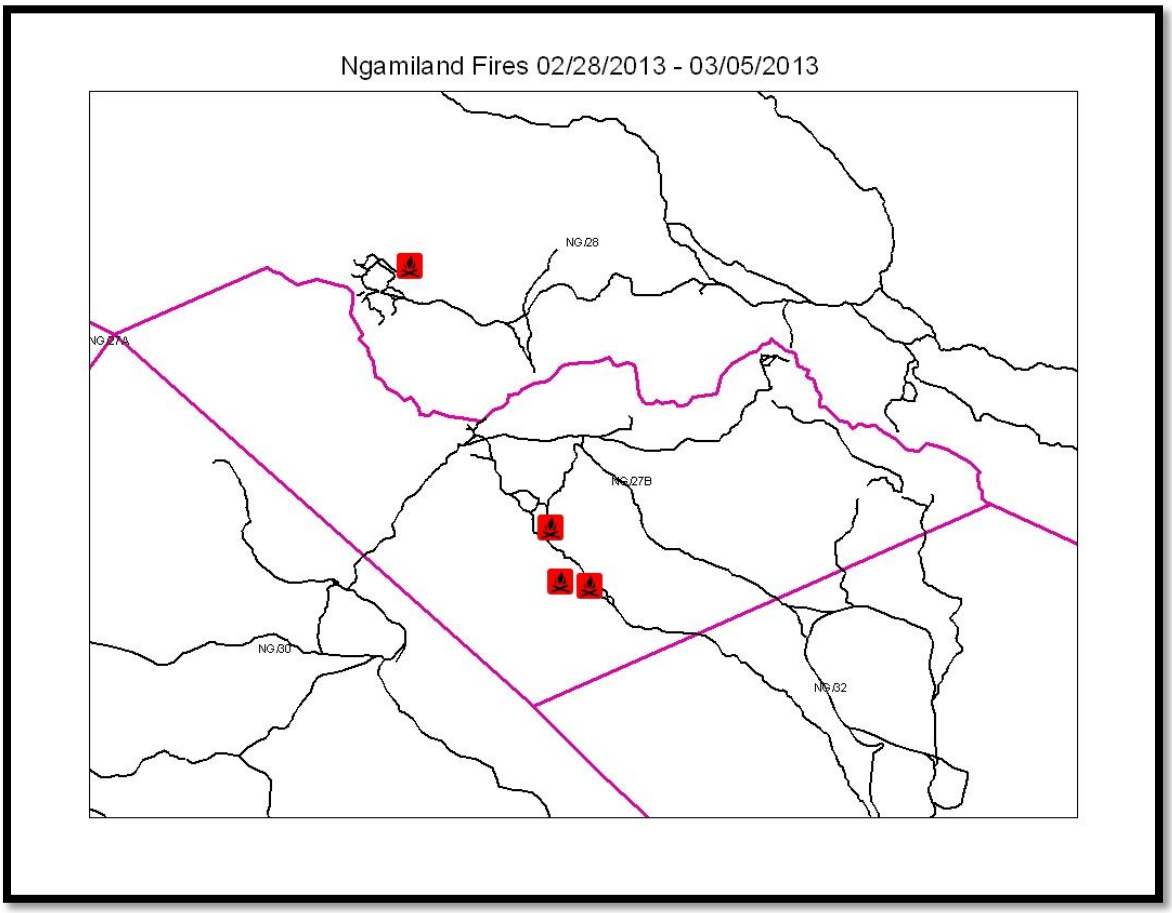


Figure 8. Fire occurrence map for the period 02/28/13 to 03/05/13 for NG 27B and NG 28.

It is interesting to note, just from these fires, that three of the fires, recorded on 28 February 2013 in NG 27 B, are along a road, indicating the possibility of man-made fires. While these data can be collected on the internet, it is important that it is ground-truthed by guides, using their event books to record locality, date and extent of fire; the area burnt, a hot or cold fire, and the damage caused. SAREP is also supporting the introduction of AFIS to all of the concessions.

MONITORING THREATENED OR INDICATOR SPECIES:

Rare/endangered mammals

Opportunistic sightings of rare or endangered animals need to be recorded by guides in the field, in case there is a hotspot for these animals that requires attention.

DATA RECORDED ON EACH RARE OR ENDANGERED ANIMAL SIGHTING WILL INCLUDE THE FOLLOWING:

a) Date
b) Species
c) Initial count of individuals
d) Adult numbers (males and females)
e) Sub-Adult numbers (males and females)
f) Yearling numbers (males and females)
g) Calves
h) Number of animals that are undetermined in terms of age and/or sex
i) Locality (grid locality, south and north)
j) Vegetation type
k) Notes
l) Who recorded the data?

Here follows a list (Table 2) of those animals that require recording based on their rarity or status, excluding those predators already covered or doing well in Botswana (eg. Elephant and Hippopotomus).

Table 2. List of Mammals to be monitored on a continuous basis

Scientific Name	**Common Name**	**Conservation Status**	**Population Trend**
Ceratotherium simum	White Rhinoceros	Near Threatened	Increasing
Diceros bicornis	Black Rhinoceros	Critically endangered	Increasing
Felis nigripes	Black-footed Cat	Vulnerable	Declining
Hippotragus equines	Roan Antelope	Least Concern	Declining
Kobus vardonii	Puku	Near Threatened	Declining
Hippotragus niger	Sable Antelope	Least Concern	Declining

Scientific Name	Common Name	Conservation Status	Population Trend
Tragelaphus spekii	Sitatunga	Least Concern	Declining
Smutsia temminckii	Pangolin	Least Concern	Unknown

Birds of concern

BirdLife Botswana has compiled a list of 20 Birds of Conservation Concern – species which are potentially or actually threatened based on our current state of knowledge. Some of these species are recognised as being globally threatened, but others have undergone declines within the Southern African region and may be under threat in Botswana. We have selected nine of these species to be monitored, based on their threat levels (Table 3).

Table 3. Birds of conservation concern within Botswana.

Gyps coprotheres	Cape Vulture
Necrosyrtes monachus	Hooded Vulture
Trigonoceps occipitalis	White-headed Vulture
Torgos tracheliotos	Lappet-faced Vulture
Gyps africanus	White-backed Vulture
Rhynchops flavirostris	African Skimmer
Bucorvus leadbeateri	Southern Ground-Hornbill
Bugeranus carunculatus	Wattled Crane
Ephippiorhynchus senegalensis	Saddle-Billed Stork
Egretta vinaceigula	Slaty Egret

When one of these birds is encountered, the information listed in the text box (below) must be collected and recorded on the bird sighting form. The data must be collated and entered into the web-based database on a monthly basis.

DATA RECORDED ON EACH BIRD SIGHTING WILL INCLUDE THE FOLLOWING:

a) Date
b) Species
c) Nest?
d) Initial count of individuals
e) Adult numbers (males and females)
f) Sub-Adult numbers (males and females)
g) Juvenile numbers (males and females)
h) Number of animals that are undetermined in terms of age and/or sex.
i) Locality (grid locality, south and north)
j) Vegetation type
k) Notes
l) Who recorded the data?

B. BI-ANNUAL DATA COLLECTION

HERBIVORE TRANSECTS

Population estimates and density distribution patterns are currently generated from the aerial surveys conducted by the Department of Wildlife and National Parks (DWNP). Over a long period of time, successive surveys conducted using the same methodology provides important information about long-term changes in population estimates. Across large, remote and often inaccessible terrain, aerial surveys become invaluable and can often, as is the case in Botswana, provide the only evidence of potential population changes. However, the data presented on herbivore populations from these surveys must be viewed in light of the limitations of aerial census. Aerial censuses do not provide information on the structure of the population, with data restricted to estimates of numbers for each species. Without an understanding of the population structure from each species it is hard to understand the cause of a populations increase or decline.

If a population is increasing you would expect to find an abundance of foals / calves and yearlings within the population, providing evidence of a healthy population structure. If these results are not evident, the increase could be attributed to immigration from other areas. Likewise if a population is declining you might expect to find a low rate of recruitment of yearlings,

expressed as the number of yearlings per 100 adult females, which could indicate that the population is resource restricted due to droughts for example. But if a declining population has a high recruitment rate, then the cause may be an unusually high loss of adults, from either predation of human related off-take.

The data that could be collected from these standardised protocols will not provide all the answers, but the information will provide clarity and help improve the adaptive management of the system.

Distance sampling: Bi-annual surveys (October and March)

Strip Transects

The distance sampling method makes use of the available road network in a concession, along which transects are placed. Transects are preferred to other methods because it is not possible in most instances to obtain accurate total counts for animals, especially those that are smaller, cryptic, nocturnal, or prefer denser vegetation types. The advantage of using the transect method is that all habitat types can be represented, and more of the area can be sampled than using the point-count method (Krebs, 1991). The likelihood of encountering rare, endangered, cryptic or shy species, and the accuracy of the analyses increases with increasing distance travelled. As mentioned earlier, this method, while able to estimate abundance will not be used primarily for this purpose as government-funded aerial surveys already perform this function. Rather, it will be used for observing population dynamics, including demographics, recruitment, and mortality rates. Over time long-term population trends will emerge for each of the concessions.

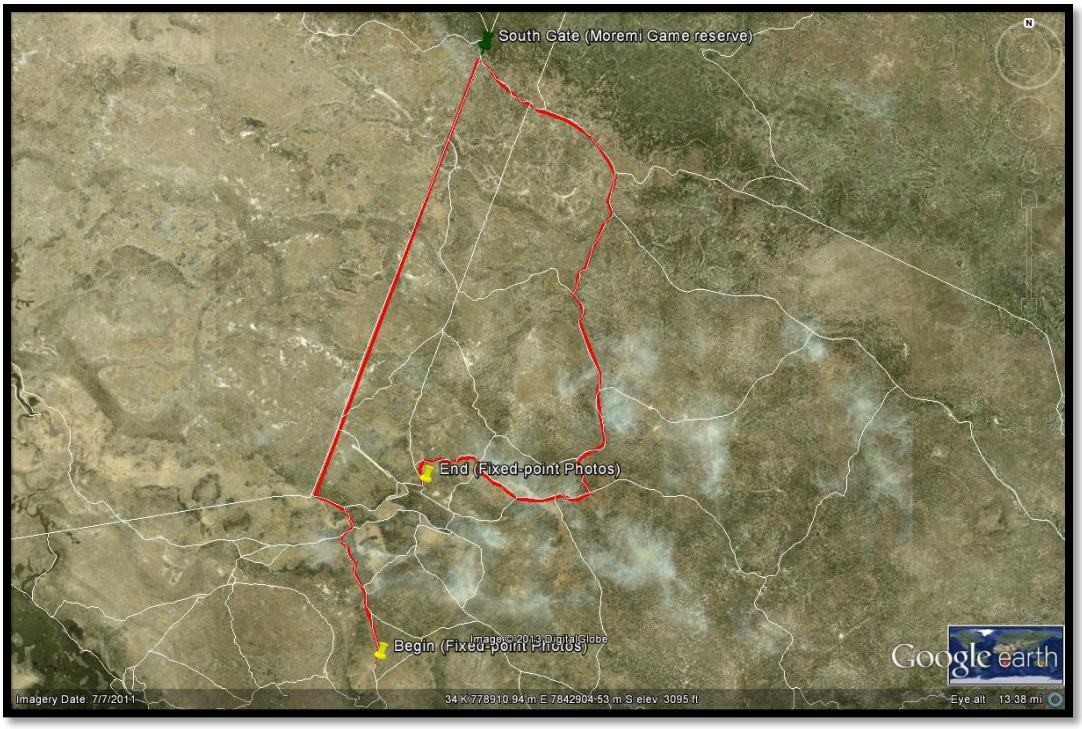


Figure 9. An example of a bi-annual herbivore transect in NG 33, encompassing Riverine woodland, Former floodplain (Savannah), Acacia woodland, and Mophane woodland. This transect takes 3.5 hours to complete.

Transects will be placed along roads in all concessions that will be decided upon as part of a consultative process with the concessionaires. It is expected that each road transect will be repeated three times in March and again in October, and these transects will take an average of 3.5 hours to complete. When an animal is encountered, it is identified to the species level, aged and sexed (Table 14). Ages are recorded as adult, subadult, yearling (1yr to 2yr) and calf / foal (new born to 1 yr). The habitat in which it is recorded, the distance along the transect and its perpendicular distance (for impala only) to the road is then recorded; In the case of a group of individuals (herd, pride etc), the average distance from the road is recorded along with group demographics and these data recorded onto the mammal survey form (Table 14). Transects should be carried out at a standardised speed, in the region of 10 $km.hr^{-1}$ in order to reduce the possibility of double counting an individual (too slow) or missing the animal entirely (too fast). Transects should be started at first light in order to avoid the heat of the day, when most animals are resting in shade and are therefore less visible.

For impala, perpendicular distance is recorded from the road in order to calculate a detectability function – the relationship between the probability of detection and the distance of the animal from the

observer. Obviously, this function is important when estimating abundance because animals in thickets are going to be less detectable than those in open floodplain. Distance should ideally be estimated using a range-finder, although a practiced observer can be fairly accurate and consistent. If an animal moves then its original position is recorded.

FIXED-POINT PHOTOGRAPHY FOR VEGETATION TRANSITION AND CHANGES

Photo monitoring is a valuable tool for documenting environmental management as well as conditions or events that affect management. While photographs cannot tell the entire story about an environment, much information can be gathered by comparing photographs taken of the same scene over a number of years. When you establish a photographic collection to monitor landscape conditions, you do not generate the large amounts of data often associated with monitoring projects. Still, photo-monitoring may surpass other forms of monitoring because it is simple, inexpensive, accurate and rapid. Fixed point photography is one of the most effective and robust method of monitoring vegetation change. This is especially true in a system such as the Okavango, where habitat succession through the encroachment of floodplains by Acacia trees and sage bushes or the reversal of this process with flood events and the emergence of sedges is an on-going process.

In order to successfully use this method, each site must be permanently and clearly marked. Finding old sites is extremely difficult and this often takes up most of the field time. The use of a GPS alone is not sufficient and it is strongly recommend that a GPS be used as an addition to detailed direction / location descriptions. If the exact point cannot be found years later then it is pointless photographing the site. Photographs will be taken by standing at the plot marker, at the beginning and end of each mammal transects, and taking photographs at the eight standard compass points (N, NE, E, SE, S, SW, W, NW) in March and October.

BIRDS: VOLUNTARY POPULATION MONITORING

Bird population monitoring is a suggested, but voluntary, activity that can be done in February and November. We outline the background and methodology below, from Birdlife Botswana, 2008.

"In 2008, there were 25 globally threatened bird species in Botswana, and a further eight species regarded as nationally threatened, or Birds of Conservation Concern in Botswana. This is an increase

from 2000, when just 11 Botswana species were listed in Threatened Birds of the World (BirdLife International, 2000). This is not due to a deterioration of the status of birds in Botswana; rather it is due to additional species being listed as globally threatened following declines elsewhere in the world. Indeed, many globally threatened birds are vagrants to Botswana, and little can be done within the country to improve their status. Nevertheless this represents an overall decline in the status of globally threatened birds in Botswana. Some species however, such as the Wattled Crane and Slaty Egret have their core populations in Botswana, and Botswana has a special responsibility for their well-being. They have been the subject of research and conservation action since BirdLife Botswana joined the BirdLife family and their populations appear relatively secure e.g. the Okavango Delta has the largest, single population of Wattled Cranes remaining, and the population is currently stable. It is also significant that Botswana has no Critically Endangered bird species. There are only two Endangered species (both vagrants), nine Vulnerable and 14 Near Threatened species. On the whole, the status of birds throughout the country is relatively good; however, there is no room for complacency."

Table 4. List of endangered, Vulnerable and Near Threatened Species that occur in Botswana.

Endangered species	These are species which face a very high risk of extinction in the wild in the near futu status of globally and nationally threatened birds in Botswana, 2008.
Egyptian Vulture	*Neophron percnopterus*
Basra Reed-warbler	*Acrocephalus griseldis*
Vulnerable species	These are species which face a high risk of extinction in the wild in the medium-term.
Slaty Egret	*Egretta vinaceigula*
Wattled Crane	*Grus carunculatus*
Lesser Kestrel	*Falco naumanni*
Cape Vulture	*Gyps coprotheres*
Lappet-faced Vulture	*Torgos tracheliotos*
Corn Crake	*Crex crex*
Black Harrier	*Circus maurus*
White-headed Vulture	*Trigonoceps occipitalis*
Blue Crane	*Anthropoides paradiseus*
Near Threatened	These are species, which are close to qualifying for Vulnerable status.
Lesser Flamingo	*Phoenicopterus minor*
Pallid Harrier	*Circus macrourus*
Denham's Bustard	*Neotis denhami*
White-backed Vulture	*Gyps africanus*
African Skimmer	*Rhynchops flavirostris*
Black-winged Pratincole	*Glareola nordmanni*
Great Snipe	*Gallinago media*
Latakoo (Melodious) Lark	*Mirafra cheniana*
Maccoa Duck	*Oxyura maccoa*
Chestnut-banded Plover	*Charadrius pallidus*
European Roller	*Coracias garrulous*
Red-footed Falcon	*Falco vespertinus*
Black-tailed Godwit	*Limosa limosa*
Eurasian Curlew	*Numenius arquata*

None of the birds of Botswana are endemic.

BirdLife Botswana has introduced a highly successful monitoring program in Botswana; **this event will be voluntary for concessions.**

The objectives of the project are:

1. To develop a Wild Bird Index for Botswana showing bird population trends over time and to use these trends to set conservation priorities, report on biodiversity changes/state of the environment in Botswana (and to contribute to African/global efforts – Convention on Biological Diversity (CBD), Department of Environmental Affairs Environment Information System (DEA EIS);
2. To show that changes in the overall condition of ecosystems can be used by decision-makers to influence politicians to find suitable biodiversity management solutions
3. To increase levels of community participation through building the appropriate capacity in bird identification and awareness.

Methods

Point Counts

Random transects are chosen within each concession. Each transect has 11 points, each point being 200m from the next (for guidance and help in estimating distances, 200m is the length of two football pitches). On arrival at each point, start counting birds immediately, recording and identifying all birds that you see or hear for a set period of 5 minutes. Record all of the birds you see or hear at each point. If you are working in a team of two or more, ideally, only one observer should record birds whilst the other is completing the Field Recording Sheet. Birds that are flushed as you approach a point may be recorded in the totals for that point, but do not record birds whilst moving the 200m between points. On arrival at each point, bring the vehicle to a standstill, switch off the engine and start recording birds immediately. Where possible, please stand outside your vehicle to carry out your count – you need not move away from the vehicle, but you may see and hear birds more clearly if you do.

Record the time that the count started at each point in the space provided on the recording forms. Do not exceed 5 minutes because you are sure a certain 'good bird' is there but not yet recorded. Remember to scan for birds flying overhead and include these in the count. Record all the birds you see and hear on the Field Recording Sheet in the appropriate point columns 1-11. Space is provided on the recording form to allow you to record different individuals of each species seen for each point. Try not to record the same individual bird twice, e.g. an individual that can be heard singing from several points should be recorded once, at the point where it was first detected. If you observe a bird during the point

count but do not identify it, it is OK to spend time after the end of the 5-minute period working on the id, recording the individual as being in the count at that point. Do not use any method of coaxing birds during the count – it is important that all counts are done consistently to produce reliable results. Please note the starting time of each 5-minute count period using a 24-hour clock, e.g. 0730 for 7:30am, 1300 for 1pm. As a guide, an average visit should last around 2 hours.

We would strongly encourage observers to use standard species names (e.g. that used in current field guides for the region). These should be written in the appropriate space on the Field Recording Sheet (Table 15).

The number of transects done per concession should be approximately 2 per 100 km^2, and an attempt should be made to incorporate as many habitat types as possible.

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Tables

Table 5. Rainfall datasheet

January		February		March		April		May		June		July		August		September		October		November		December	
Day	mm	Day	mm	Day	mm	Day	mm	Day	mm	Day	mm	Day	mm	Day	mm	Day	mm	Day	mm	Day	mm	Day	mm
1		1		1		1		1		1		1		1		1		1		1		1	
2		2		2		2		2		2		2		2		2		2		2		2	
3		3		3		3		3		3		3		3		3		3		3		3	
4		4		4		4		4		4		4		4		4		4		4		4	
5		5		5		5		5		5		5		5		5		5		5		5	
6		6		6		6		6		6		6		6		6		6		6		6	
7		7		7		7		7		7		7		7		7		7		7		7	
8		8		8		8		8		8		8		8		8		8		8		8	
9		9		9		9		9		9		9		9		9		9		9		9	
10		10		10		10		10		10		10		10		10		10		10		10	
11		11		11		11		11		11		11		11		11		11		11		11	
12		12		12		12		12		12		12		12		12		12		12		12	
13		13		13		13		13		13		13		13		13		13		13		13	
14		14		14		14		14		14		14		14		14		14		14		14	
15		15		15		15		15		15		15		15		15		15		15		15	
16		16		16		16		16		16		16		16		16		16		16		16	
17		17		17		17		17		17		17		17		17		17		17		17	
18		18		18		18		18		18		18		18		18		18		18		18	
19		19		19		19		19		19		19		19		19		19		19		19	
20		20		20		20		20		20		20		20		20		20		20		20	
21		21		21		21		21		21		21		21		21		21		21		21	
22		22		22		22		22		22		22		22		22		22		22		22	
23		23		23		23		23		23		23		23		23		23		23		23	
24		24		24		24		24		24		24		24		24		24		24		24	
25		25		25		25		25		25		25		25		25		25		25		25	
26		26		26		26		26		26		26		26		26		26		26		26	
27		27		27		27		27		27		27		27		27		27		27		27	
28		28		28		28		28		28		28		28		28		28		28		28	
29		29		29		29		29		29		29		29		29		29		29		29	
30		30		30		30		30		30		30		30		30		30		30		30	
31		31		31		31		31		31		31		31		31		31		31		31	
Total		Total		Total		Total		Total		Total		Total		Total		Total		Total		Total		Total	

Table 6. Flood datasheet

January		February		March		April		May		June		July	
Week	Water-level (cm)	Week	Water-level (cm)	Week	Water-level (cm)	Week	Water-level (cm)	Week	Water-level (cm)	Week	Water-level (cm)	Week	Water-level (cm)
1		1		1		1		1		1		1	
2		2		2		2		2		2		2	
3		3		3		3		3		3		3	
4		4		4		4		4		4		4	
5		5		5		5		5		5		5	
Average		Average		Average		Average		Average		Average		Average	
Notes		Notes		Notes		Notes		Notes		Notes		Notes	
August		September		October		November		December					
Week	Water-level (cm)	Week	Water-level (cm)	Week	Water-level (cm)	Week	Water-level (cm)	Week	Water-level (cm)				
1		1		1		1		1					
2		2		2		2		2					
3		3		3		3		3					
4		4		4		4		4					
5		5		5		5		5					
Average		Average		Average		Average		Average					
Notes		Notes		Notes		Notes		Notes					

Table 7. Predator sightings datasheet

Predator Data Sheet													
Date	Species	Count	Adults	Sub-Adults	Juveniles	Cubs/ Puppies	Undetermined	Grid	Habitat	Activity	Photo ID?	Notes	Recorded by
			M F ?	M F ?	M F ?						L R		

Table 8. Poaching/Mortality datasheet

Date	Grid	Species	Age	Sex	Poachers/Predator/ Natural	Age	Sex	# Poached/dead /prey	Notes	Habitat	Reported by

Table 9. Human-Animal conflict datasheet

Date	Place	Species	Damage	Notes	Complainent	Action Taken

Table 10. Alien/ Exotic Invasives datasheet

Date	Species	Grid	Number of Plants/Extent (m^2)	Notes	Reported by

Table 11. Fire datasheet

Date	Habitat	Hot OR Cold Fire	Grid	Origin of Fire	Notes	Reported by

Table 12. Rare/Endangered animal sightings (refer to list of rare/endangered animals)

Date	Species	Count	Adults	Sub-Adults	Yearlings	Calves/ Foals	Undeter-mined	Grid	Vegeta-tion	Notes	Recor-ded by
			M F ?	*M F ?*	*M F ?*						

Table 13. Bird datasheet

Date	Species	Adults	Sub-Adults	Juveniles	Undeter-mined	Grid	Habitat	Nest/Notes	Recorded by
		M F ?	*M F ?*	*M F ?*					

Table 14. Bi-annual herbivore count spreadsheet

Bi-Annual Wildlife Count				Transect			**Year**		**Odometer reading**
Start Odometer				**Month**			**Start time**		
End Odometer				**Driver**			**End time**		
Date	**Habitat**	**Species**	**Adult**	**Sub-Adult**	**Yearling**	**Calves/Foals**	**Undeter-mined**	**Perpendicular distance (Impala)**	**Grid**
			M F ?	**M F ?**	**M F ?**	**M F ?**			

Table 15. Voluntary bi-annual Bird life Botswana datasheet

BIRD POPULATION MONITORING

FIELD RECORDING SHEET

Name of compiler		Number of observers	
Site name/habitat type		Names of others involved in count	
Quarter degree square (eg 2124A2)			
Coordinates of the start point			
Coordinates of the end point			
Visit date (DD:MM:YY)			

Weather (1,2 or 3)	Cloud	Rain	Wind	Visibility	Tel.	
					Email:	

Time each point count started (24h clock)										
Point 1	Point 2	Point	Point	Point	Point	Point 7	Point 8	Point 9	Point	Point 11

	Species name	Number of individuals at each point											Total count
		1	2	3	4	5	6	7	8	9	10	11	
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													

What threats to or problems at the site are you aware of?
Use your local knowledge of the site (i.e. not just that observed on the day of the count) to provide the following information on the state of the landscape around your transect. Please use codes as described in the instruction to assess Timing, Scope & Severity

Threat	Habitat and/or population affected	Timing	Scope	Severity

PLEASE RETURN ALL FORMS TO YOUR REGIONAL ORGANISER OR TO BIRDLIFE BOTSWANA (education@birdlifebotswana.org.bw)