

# SADC REGIONAL PROGRAMME FOR RHINO CONSERVATION

## OPTIONS FOR THE FUTURE MANAGEMENT OF THE BLACK RHINOS (*Diceros bicornis minor*) IN LIWONDE NATIONAL PARK, MALAWI

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*Ecological Evaluation and Development of Guidelines  
for future management of black rhinos at Liwonde NP, Malawi  
Semester 4 task 1.2-4.1*



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**ABOUT the SADC Regional Programme for Rhino Conservation:**

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The Programme is funded by the Italian Ministry of Foreign Affairs, Directorate General for Development Cooperation (Project AID 5064).

The Programme is contracted to CESVI and implemented through a regional consortium which comprises:

- The Secretariat of the Southern Africa Development Community (SADC)
- IUCN-ROSA (The World Conservation Union - Regional Office for Southern Africa)
- The IUCN African Rhino Specialist Group
- WWF-SARPO - (World Wide Fund for Nature - Southern Africa Regional Programme Office)
- CESVI (Cooperazione e Sviluppo)

The **Programme goal** is to contribute to maintain viable and well distributed metapopulations of Southern African rhino taxa as flagship species for biodiversity conservation within the SADC region.

The **Programme objective** is to implement a pragmatic regional rhino strategy within the SADC region following the acquisition of sound information on, firstly, the constraints and opportunities for rhino conservation within each range state and secondly, the constraints and opportunities for rhino metapopulation management at the regional level.

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**DISCLAIMER**

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## OBJECTIVE

To evaluate possibilities for the future management of the black rhinos *Diceros bicornis minor* in Liwonde National Park, Malawi and develop guidelines for the conversion from a sanctuary system to a viable free-ranging population within the entire park.

## BACKGROUND

The reintroduction of black rhino to Malawi was the direct result of the Malawi/South Africa Wildlife Project. This project was initiated in 1990 and funded by both governments. Technical assistance came from South African National Parks (SANP). The goals of the project were to develop the infrastructure within the park, including the construction of a 117km electrified perimeter fence and tourism facilities and at a later stage, reintroduce certain game species, including black rhino (Hall-Martin 1993). During 1993 a group of businessmen from Malawi started the J&B Circle and, with the assistance from the J&B *Care for the Rare* program of London, offered financial and logistical assistance for the reintroduction of black rhino.

## FIRST RHINO INTRODUCTION TO MALAWI - 1993

During October 1993 a pair of young black rhino, both aged about 4 years, were airlifted from Kruger National Park (KNP) in South Africa to Liwonde National Park (LNP) in Malawi. The rhino were purchased by the J&B *Care for the Rare* program and donated to the Malawi government. After 55 days in the holding pens the pair were released into a 15 km<sup>2</sup> fenced sanctuary (Labuschagne 1994, Bhima & Dudley 1996).

### Capacity at the time of the first introduction

#### Department of National Parks and Wildlife (DNPW)

Park management had a reasonable budget at this stage. The Park Warden was very involved with the planning of the rhino project. Salaries of the Rhino Protection Unit (RPU) were provided. There was a functional vehicle and tractor available for transport.

#### Malawi/South Africa Wildlife Project

The project had an experienced Development Officer stationed in the park. The project had completed fencing the perimeter fence from the confluence of the Likwenu and the Shire rivers in the south-west to the corridor in the north-east. The fence was electrified and operating, with a maintenance team in place. Six game scouts were equipped and trained in rhino protection and monitoring in the KNP. They were based at Makanga scout camp (built by the project) and patrolled and monitored the rhino in the sanctuary under supervision of the Development Officer and his counterpart, the Park Warden. A VHF radio system, with a repeater station, to ensure communication to all critical points was installed. The project provided general maintenance and supervision to park staff, as well as assistance with anti-poaching activities outside of the sanctuary.

#### J&B Circle

The Circle continued to provide financial and logistical support to the rhino project.

### WWF

Research project on the carrying capacity of the sanctuary was initiated with a donation of US\$10,000.

While the rhinos were in the bomas the officer in charge of training the RPU, visited Liwonde and it was agreed by all parties that because snaring was still problem in the rest of the park, the situation would have to be stabilised before the animals could be released out of the sanctuary (Greeff 1993).

In February 1995 the Malawi/South Africa Wildlife Project was concluded with most of the goals having been met. A project proposal for a specialist Training Officer to take over from the Development Officer was at this stage submitted to the Frankfurt Zoological Society (FZS) as attempts to procure funding from the SA High Commission had failed.

Two factors had a great effect on the condition of the perimeter fence and poaching activities in the park at this stage:

- During the run-up to the 1994 elections there was a marked breakdown in discipline in the country that filtered through to all aspects of park management. The electrification wires of the perimeter fence were removed during early 1995 as a result of this - the fence was being vandalized and the wire reappearing as snares at an alarming rate. This again resulted in a postponement of the release of the rhino from the sanctuary.
- There was a considerable lapse in time between the departure of the Development Officer (in March 1995) and the arrival of the Training Officer (arrived Liwonde July 1996, but only started training there in January 1997).

In 1996 the Liwonde Game Scout Training Project was started. This project is still functioning and is funded by FZS. In June 1997 a male calf was born to F1 and M1. The population now totaled 3. At the end of 1997 the adult male escaped from the sanctuary because of elephant damage to the fence and was found in the south of the park. A recapture operation by the SANP capture team was funded by J&B Care for the Rare and the J&B Circle, and although costly, was successful (Pienaar & Dudley 1998, J&B Circle).

### **Restraints following the first introduction**

- With the end of the Malawi/South Africa Wildlife project maintenance of the fences (both perimeter and sanctuary) became the responsibility of DNPW. Due to budget cuts this could not be fulfilled and resulted in the escape of the male rhino and, together with other factors, the deterioration of the perimeter fence.
- In the year and a half before the FZS project was initiated, snare poaching in the rest of the park became rampant, resulting in the death of many ungulates and lions.

During 1998, before the second introduction, two reports were circulated that gave a clear indication of the situation on the ground at the time of the second introduction. The one report expressed concern about the security around the sanctuary and made recommendations for improvements and the future capability of FZS to become more involved in the rhino project (Labuschagne 1998). The other report assessed the habitat suitability of sanctuary 2, and also expressed concern about

the maintenance and management of the sanctuary fence and the poaching situation outside the sanctuary (Pienaar & Dudley 1998).

## **SECOND RHINO INTRODUCTION TO MALAWI - 1998**

In the last quarter of 1998 another two black rhinos (a male aged ~6 years and a female aged ~10 years) were introduced to an adjacent sanctuary (14 km<sup>2</sup>) constructed and financed by the J&B *Care for the Rare* program and the J&B Circle. Following the introduction the population totalled 5 animals. The animals were kept in newly constructed bomas in sanctuary 2 before release.

### **Capacity at the time of the second introduction**

#### DNPW

At this stage the park budget was low, and only one vehicle was functional. Field staff were by now well trained, but there was a problem with under-staffing.

#### J&B Care for the Rare and J&B Circle

Main sponsors and organisers of the introduction, they had the capacity to maintain the rhino sanctuary system and to assist in the event of an emergency. The Circle became more involved in the day to day running of the sanctuaries. Monitoring of the rhinos was taken over by the Circle.

#### Liwonde Game Scout Training Project

The training of field staff was still continuing and on request from SANP the Project Officer became more involved in the security of the two rhino sanctuaries. A full VHF radio communication system was installed by the project (including repeater station and 17 stations). This project had the capacity to assist with a budget during emergencies.

In 1999 several species of game were translocated to LNP and released in the rhino sanctuaries. A decision was made to remove the fence dividing the two sanctuaries, enabling the two groups of rhinos to interact and the introduced species access to a larger area (now 29km<sup>2</sup>). In 1999 another male calf was born to the original pair introduced in 1993 (F1 and M1). This brought the total population up to 6 animals. In 2000 the skeleton of the original male, M1, was found. The horns were retrieved but unfortunately the actual cause of death is unknown. The population now totalled 5 animals. In December 2000/January 2001 a calf was born to F2. The population now again totalled 6 animals.

### **Restraints following the second introduction**

- The discovery of the carcass of M1 months after his death indicated that the monitoring system was not adequate.
- Too many bulls in the sanctuary system.
- Regular replacement of park wardens resulted in the park managers becoming completely out of touch with the rhino project.
- Research and ecology staff of DNPW not part of decision making in the sanctuaries, mainly due to budget restraints and inability to fulfil their roles, resulting in an increase in control by the donors.

## **THIRD RHINO INTRODUCTION TO MALAWI - 2000**

During October 2000 another two black rhinos (a male aged ~6 years and a female aged ~9 years) were introduced into another sanctuary (16km<sup>2</sup>) built to the east of the existing combined one. During this operation, the sub-adult male, M4, was relocated to KNP because of an excess of bulls in the sanctuary. The population now totaled 7, however, shortly after release the female, F3, died of unknown causes.

## **THE PRESENT SITUATION**

Today, Liwonde National Park has a population of 6 black rhino within the sanctuary system close to Mvuu camp. The total area within this system is 45km<sup>2</sup>. There is an internal fence subdividing the sanctuaries. Sanctuary 1 & 2 is 29km<sup>2</sup> and contains 5 rhinos (3 adults, 1 sub-adult and 1 calf) while Sanctuary 3 is 16km<sup>2</sup> and contains a single adult bull.

The maintenance of the sanctuaries and the protection and monitoring of the rhinos is done by the three main stakeholders, namely DNPW, J&B Circle and the Liwonde Game Scout Training Project.

## **INFRASTRUCTURE**

The sanctuary fences are well maintained and functional. An extensive road system, waterholes, pumps and pipelines are in place and operational. The first bomas built are now obsolete. The bomas built in Sanctuary 2 are at present still in good condition. A small workshop/storeroom complex is located at Mvuu camp under the J&B Circle with a vehicle, tractor and trailer specifically for the rhino project. Emergency capture equipment such as sledge, crate, chains, etc. are also kept at this storeroom. The 10km Naifulu fence is well maintained and serves the purpose of strengthening the security of Sanctuary 3. A scout camp has been constructed at Naifulu from which game scouts patrol and monitor Sanctuary 3. Masanje scout camp has all the necessary infrastructure to house four game scouts and they have a motorcycle for general use.

## **MANAGEMENT, SECURITY AND MONITORING**

An agreement, valid until 31 March 2002, between the two donors relating to their responsibilities is quoted below.

*“The J&B Circle will be responsible for the following:*

1. The grading and maintenance of the road network in the Rhino Sanctuary System.
2. The pumping of water in the dry season to the various waterholes in the Rhino Sanctuary System.
3. Monitoring the daily activities and effectiveness of the three fence attendants based at Makanga and the three fence attendants based at Masanje, who are

jointly responsible for patrolling and maintaining Sanctuary 1 and Sanctuary 2's fence.

4. Covering the costs of the labourers employed to clear Sanctuary 1 and 2's fence line of any other activity requiring labour in Sanctuary 1 and 2.
5. Monitoring and controlling the activities of all labour employed in Sanctuary 1 and 2.
6. Controlling and co-ordinating the monitoring of rhino in Sanctuary 1 and 2. Mr Bentley Palmer will be overall in charge of all rhino monitoring in the Rhino Sanctuary System and will receive monthly reports on the rhino in Sanctuary 3 from the scouts based at Naifulu.
7. The maintenance of batteries, solar panels, regulators and all other equipment and materials associated with the functioning of an electrical fence pertaining to Sanctuary 1 and 2.
8. The maintenance of poles, metal standards, Bonnox wire and other materials associated with the physical integrity of the fences of Sanctuary 1 and 2.

*The Liwonde Scout Project will be responsible for the following:*

1. Covering the cost of the salaries and allowances for all nine fence attendants involved in maintaining the Rhino Sanctuary System.
2. Providing housing, uniforms, equipment and ammunition to all nine fence attendants involved in maintaining the Rhino Sanctuary System.
3. Monitoring the daily activities and effectiveness of the three fence attendants based at Naifulu, who are responsible for patrolling and maintaining Sanctuary 3's fence.
4. Covering the costs of the labourers employed to clear Sanctuary 3's fence line or any other activity requiring labour in Sanctuary 3.
5. Monitoring and controlling the activities of all labour employed in Sanctuary 3.
6. Controlling and co-ordinating the monitoring of rhino in Sanctuary 3. Reports of this activity must be given to Bentley Palmer on a monthly basis.
7. The maintenance of the batteries, solar panel, regulators and all other equipment and materials associated with the functioning of the electric fence pertaining to Sanctuary 3.
8. The maintenance of poles, metal standards, Bonnox wire and other materials associated with the physical integrity of the fences of Sanctuary 3."

The DNPW staff at Chiunguni (research and management) are at present hardly involved in the management of the sanctuary system other than paying the salaries of the 3 scouts allocated to sanctuary security. This is mainly due to budget and transport constraints within the department.

In Sanctuary 1 and 2 (monitored by J&B Circle) two game scouts actively try and get sightings of the rhinos as often as possible. Data is collected and kept by the Circle. One of these scouts is from the original RPU sent to SA for training before the arrival of the first animals in 1993. The adult bull in sanctuary 3 (monitored by FZS) has a collar with a transmitter fitted. The staff have the necessary equipment to monitor this animal by using radio telemetry. Two scouts (one of which is from the original RPU) are deployed in the sanctuary 3 times a month to actively search for the rhino and try and get a sighting.

The security and monitoring operations are combined and except for one or two relatively minor incidents the sanctuaries have up to now been regarded as secure.

The game scouts at Masanje and Naifulu scout camps are responsible for the security between the sanctuaries and the perimeter. Although low in numbers, these game scouts are well trained and equipped and their morale is high, mainly due to the personal involvement of the FZS Project Officer. However, the morale of scouts staying in the Makanga scout camp was found to be generally low.

The high tourist activity (boat, foot and vehicle) on the western and northern sides of the sanctuaries has resulted in improved security and a low poaching incidence.

## **STAFFING**

At present there are nine fence attendants employed to monitor the sanctuary fences. A total of six game scouts are involved in monitoring and security (1 game scout per 7,5km<sup>2</sup>).

The twenty four game scouts allocated to the general security of the park is not adequate if the park is to be secured for the release of the rhinos. Six village scouts and a number of fence attendants are employed by the Liwonde Scout Training Project for maintenance of the Naifulu fence and the remainder of the perimeter fence. A research assistant is based at Chiunguni, however, he is not involved with monitoring or research activities in the sanctuary system.

## **CAPACITY DURING EMERGENCIES**

A security crisis can be handled by the Liwonde Scout Training Project with its financial and logistical capabilities. Central African Wilderness Safaris (CAWS) at Mvuu camp can also assist with any emergencies regarding the rhinos, such as communication, vehicles and manpower. In the event of an animal requiring immobilisation, capture or transport, the J&B Circle have the capacity to fund, organise and execute such an operation with specialist assistance from SANP. The capacity to protect the rhinos is at present satisfactory, although DNPW management is not involved in this aspect except to pay salaries. The capacity to manage and monitor the rhinos needs to be reviewed.

## **FUNDING SUPPORT**

South Africa - the main donor of the original project and through SANP there is still committed support of the rhino project. SANP will still assist in short term emergencies and the direct management of the rhinos, however, there will be no long-term funding from this source.

J&B - funds are provided by J&B Care for the Rare program of the UK and are also raised locally by the 12 members of the J&B Circle, all prominent businessmen resident in Malawi. The external funding will run for another year. The Malawi based J&B Circle is confident that they will be able to maintain the existing sanctuary system, without external funding, by raising their own funds. They will, however, not be able to fund any new developments.



FZS Liwonde Scout Training Project - the current Project Officer will be in Liwonde for another year, but hopes to remain involved in the training program for short term periods in the future. This project is at present funding a huge portion of the rhino project. The project has to date also secured funding from the German Embassy, SANP, the International Fund for Animal Welfare and COMPASS. These funds are controlled by the Project Officer. It must be noted that these organisations were willing to provide funds under the umbrella of the Liwonde Scout Project, mainly because of the excellent financial accountability by the project officers and because of positive results on the ground.

This project is making a huge attempt at assisting park management and staff in capacity building, i.e. transport and communication. The main goal, however, stays the intensive training of DNPW staff from all parks and the issuing of appropriate equipment and uniforms.

The Project Officer is confident that FZS will maintain their presence in LNP for the next few years.

DNPW - at present, the department contributes very little in funding, except for salaries and allowances. DNPW, however, has a strong sustainable source of funding in the two lodges at Mvuu camp, which at present is not utilised.

## **TOURISM AND RHINOS**

The rhino introductions were well advertised in Malawi and other countries. Articles and advertisements regarding LNP continually use the presence of the rhinos as an attraction to the park. Actual rhino sightings by tourists are rare, however, a game drive with the prospect of a sighting, enriches the experience and footprints and dung are enough to satisfy the average visitor of rhino presence in the area.

## **RHINO MORTALITIES**

Unfortunately the two rhinos that have so far died, were only found once total decomposition had taken place, resulting in uncertainty as to the cause of death (the horns were recovered, therefore shooting can probably be excluded). Death by protozoal parasites (Trypanosoma or Babesia/Theileria) must not be discarded as the cause, therefore all efforts need to be made to ensure that future mortalities are discovered timeously (Lorenz 2001). It is essential that the correct protocols be followed and the necessary samples taken to determine cause of death. This is particularly important in small, intensely managed populations where one or two such mortalities can alter future decision-making.

### **Restraints following the third introduction**

- The female, F3, had obviously not been sufficiently boma and crate trained before translocation.
- The subsequent death of this female, probably due to stress related causes.
- The discovery of the carcass of F3 months after death, even though she had a transmitter, again showed a defect in the monitoring of the animals.
- Use of transmitters without a mortality sensor.
- An excess of bulls.

- No rhino management plan or plan of action for the rhino project.
- Sanctuaries well maintained and patrolled but the situation in the rest of the park and the condition of the perimeter fence badly neglected.
- Rhino monitoring not controlled by one body.
- No centralised method of gathering and storing data on the rhinos.
- Systematic reporting on the population performance, dynamics and home ranges is lacking.
- There is a deficiency in the flow of monitoring information from the J&B Circle to the DNPW.
- The number of roads in Sanctuary 1 and 2 are excessive and this should be re-evaluated.

## **IMPROVEMENTS TO PRESENT SANCTUARY SYSTEM AND MONITORING**

The fact that no rhinos have been killed by poachers during the past 8 years shows a commitment by all parties involved. The maintenance of the sanctuary fences, provision of water, maintenance of roads, etc. appears to be good. It will be a good exercise if one of the donors can supply and train the present scouts in the use of GPS. A simple method of taking a reading, recording the co-ordinates and later plotting it on a 1:50,000 map can already assist in improving patrol efficiency and coverage. The one area of concern, however, is the monitoring and data collection. Intensive monitoring goes hand in hand with security operations and often acts as an early warning for illegal activity in the rhino zone (Emslie 1999). Monitoring is also necessary for the gathering of information on the population. Data sheets need to be developed for all the monitoring staff to use (in both sanctuaries) on which important information is recorded. It is important to try and get a visual sighting at least 4 times a month of each rhino. The use of GPS should also be brought into the rhino monitoring with sightings plotted on a map so that more scientific home ranges can be produced. An effort should be made to report the sanctuary activities to the Park Manager.

## **THE FUTURE OPTIONS FOR SUCCESSFUL RHINO MANAGEMENT**

There are three basic future options for the LNP rhino program.

1. In the event of no adequate donor funding and a high risk of future political and human pressures on LNP, the rhinos should be removed to a more manageable, safe area in Malawi or to one of the other secure SADC black rhino programs. Rhino sanctuary 3 should be removed and sanctuary 1 and 2 kept intact to protect a core sable and roan population in LNP.
2. To continue with the sanctuary system as it is now with the involvement of the present donors. Remove the single bull from sanctuary 3 to another SADC programme (possibly Zambia?) and remove all fences and structures from sanctuary 3.
3. The rhino project will then concentrate on sanctuary 1 and 2 and maintain a maximum population of 6 rhinos (including juveniles). All excess animals to be removed to other rhino programmes.
3. Secure adequate long-term funding (including the appointment of an experienced Project Manager) and, in different phases, develop LNP to a standard where the rhinos can be safely released and managed with the park boundaries.

*Phase I:* reconstruct the perimeter fence and focus on its potential as a community outreach program.

*Phase II:* the installation and proper functioning of a VHF radio system, a Mobile Control Room, a Liwonde National Park GIS system and a River Unit on the Shire river. Increase the field staff in LNP to at least 40 well trained and equipped scouts. Initiate and test an improved security operation in the park. *Phase III:* while the animals are still in the sanctuaries do transmitter implants and set up an intensive monitoring program using radio telemetry and GIS.

*Phase IV:* if all these phases have been completed, evaluated and are functioning well, release the rhinos from the sanctuaries.

This is the only option available if a viable rhino population in LNP is to be realised.

## **FUNDING FOR LIWONDE NATIONAL PARK AND THE RHINO PROGRAM**

The Malawi government and DNPW strongly support the rhino program in LNP, and understand the responsibility, both nationally and internationally, they have. At the same time, they also realise their dilemma with funding and with the management problems of LNP, including the perimeter fence and the rhino program. It is very clear that LNP can only succeed, with initial donor funding and a strong commitment and effort from DNPW, both in the management and the effective utilisation of sustainable resources in LNP (i.e. tourism leases and sale of valuable game species, such as sable and roan antelope).

### ***Three possible funding options:***

1. Malawi proceeds to manage LNP as at present - this will, however, continue to be crisis management with smaller donors assisting during emergencies. There will be little chance of effectively expanding the project and any release of rhinos will be foolhardy.
2. Privatisation - Malawi seeks a private investor, who in partnership with the government, takes over the management of LNP, and runs it as a business within the guidelines of the Liwonde Management Plan (Thomson 1998). The rhino project can be written into this agreement, under the supervision of an independent conservation organisation (e.g. WWF or IUCN). Privatising LNP will, however, have its problems regarding the park neighbours. The idea of a resource like LNP being given to a private company will be difficult to explain, although, if well managed and the communities see the benefit of an efficient fence and utilisation programme, it will be accepted easier. The difficulty of privatisation is also the complicated negotiations between government and a private partner especially in a high profile and popular park such as LNP.
3. Donor/DNPW partnership - a suitable and highly experienced Project Manager, employed by a donor for at least six years, should work directly with three park managers (Park Manager, Manager: Training and Manager: Security and Monitoring). For this partnership to function properly, DNPW will have to make some allowances towards the Project Manager, allowing him to independently raise, secure and utilise funds from different donors and channel these funds to the different aspects of LNP management, including the rhino project. An environment should be created where donors will have the confidence to invest in LNP, through an independent Project Manager (who will be accountable for all funding and equipment). LNP has an excellent Management Plan, which can act as a clear guideline for the joint management (donors and DNPW) of the park. During the establishment, frequent reporting directly to the Director will assist in

building up trust and a good working relationship. It is also important that salaries, or at least a portion thereof, paid to LNP staff (fence, monitoring, security) must come from the government. Although initially funded by the donors, the Fence Outreach Project should leave no doubt in the minds of the community that they are still working and negotiating with their own government, when the utilisation of natural resources comes into question. The goal should be to develop LNP to such a point that it survives on lease incomes and annual sale of live game species and together with low donor funding. This donor/DNPW option has the best chance of successfully implementing the four phases mentioned above in a controlled environment.

## **SUSTAINABLE INCOME FROM LNP**

Mvuu camp - presently the prime tourist destination of Malawi's national parks, the camp is already generating an income for the park. Unfortunately this relatively low income does not reach the LNP to make any real difference in the management problems. With the reassessment of the lease, an effort must be made by the Malawi government to negotiate a deal whereby a portion of the lease payment is supplied as a set amount of fuel for park management.

Sable population - LNP has an increasing, healthy sable antelope population and with proper security measures in place, at current levels at least 50 animals can be removed annually without doing damage to the core population (this figure can easily be doubled if the population reaches 1000). Current sable prices in South Africa are US\$10,000 per head. Game capture units are willing to pay US\$4,500 per head in Malawi (P. Morkel pers. comm.). This gives an annual sustainable income of US\$225,000 for sable antelope alone (sable are today regarded as the prime antelope for live sale). Other species such as the roan antelope and Lichtenstein's hartebeest have the potential of also providing an income to LNP. The difficulty will be ensuring that the funds paid for wildlife species is channelled back into LNP. One solution to this problem is that an exchange is negotiated between DNPW and the purchaser, whereby vehicles, fencing equipment, etc. are supplied directly to the park.

This sustainable income can be used, once the development work is complete, to efficiently manage the park with no or very little outside donor funding. The fact that LNP has the capability to sustain itself in the near future through wise and committed management, should be used as a draw card for a potential donor willing to invest in this exciting park.

## **SOME THOUGHTS BEFORE CONSIDERING EXPANDING THE RHINO PROGRAM IN LNP**

### **Against**

- The LNP cannot be completely enclosed in a fence due to the corridor that needs to be left open to allow access to the Mangochi Forest Reserve by the elephant.
- The Shire River offers easy access to the park by illegals using dugout canoes.
- Snare poaching, which is lethal to a rhino population, remains rampant in certain parts of the park. Bushmeat is now only available in protected areas in Malawi, and

with the dwindling fish resource and increasing human population, it can be expected that the snaring pressure will increase in LNP (Barnett 1997).

- The park is largely inaccessible by vehicle throughout the wet season, which hampers proper management.
- DNPW has a totally insufficient budget to work from and the situation will only deteriorate in coming years.
- The judicial system still treats poaching as a minor offence, with very few serious convictions.

#### **For**

- Liwonde contains valuable endangered wildlife populations (at current prices the sable population alone is worth US\$ 3 million) that are worth conserving.
- LNP protects a critically important fish reservoir in the stretch of Shire River.
- Malawi plans to upgrade its ecotourism industry, and LNP will play a vital role in this initiative.
- Valuable antelope species and the privately managed Mvuu Lodges have the potential of being a good, sustainable source of income for the park.
- LNP protects a number of important fauna and flora (e.g. Mopane Woodland).
- For the past eight years, the endangered black rhino have been protected in, and associated with, LNP.
- Due to the geographic position of the park, the tourism potential is high.
- The Shire River, if dominated, is a valuable 'tool' for scout deployment and security.

### **IMPLEMENTATION OF OPTION 3**

#### **Phase I - LNP perimeter fence**

For the Liwonde rhino program to continue from the present sanctuary situation to a viable free-ranging population in the park, a functional perimeter fence is essential. The fence of 1990 (Malawi/South Africa Project) played a big role in the decision to reintroduce rhino to LNP. Fencing LNP has failed twice. There are many arguments as to why, however, two reasons are clear.

- Lack of long-term maintenance
- Lack of community involvement in the management of the fence to the benefit of both parties

#### **The Naifulu model fence**

The Liwonde Scout Training Project has secured funds from a donor and constructed a 10km stretch of fence at Naifulu Hills, the only stretch of fence still functioning today. Emphasis was put on the maintenance and the community involvement (Labuschagne 2000). Naifulu can act as a reference and developments here should be carefully studied to be incorporated in the future planning and reconstruction of the entire perimeter fence. The fencing program must be advertised as a community outreach project. The fence must be seen as a point where the park and community meet. It must neutralise conflict and benefit both parties. LNP does not have a buffer zone. Elephants feed meters from cultivated lands, with only the fence in between. The future will only see an increase in pressure from both sides. The perimeter fence is therefore vital, not only to the rhino program, but to LNP as a whole.



### **The main objectives of the perimeter fence**

- Demarcate the park clearly
- Protect the crops of the park neighbours.
- Protect the lives of park neighbours (25 people have been killed by elephant and hippo in the last few years).
- Protect the park from uncontrolled use of natural resources (wood, thatching grass and snare poaching).
- Acts as a mechanism to allow the controlled sustainable use of natural resources by its neighbours through the village scout system.
- Contain LNP's valuable wildlife populations, especially sable, roan, buffalo and rhino, and enable management to monitor and protect these populations within the barrier.
- The fence and personnel must act as an early warning system of criminal activities and possible points of developing conflict .
- Fencing program must act as a conduit of information and communication between park management to its neighbours and vice versa.

### **Construction**

Bonnox wire proved ideal. It is difficult to use for snares but is easy to erect and maintain. It is also efficient in keeping bush pigs within the park. The poles must be treated properly - the painting or drenching in poison locally to be avoided at all costs. Malawi has a critical shortage of building material, and cannot afford poles to be replaced every three years due to rot and termites. The feasibility of setting up a tanalite treating facility at Chiunguni should be investigated. These facilities successfully operate in some rural areas in Tanzania. The construction of the fence will use a few thousand poles that will justify the cost of such a plant.

Lessons learnt from the first two fences, as well as the valuable feedback from the Naifulu fence, should be incorporated in the construction of a new fence.

### **Community attitude changes**

In 1990 the fence was a totally new concept in most villagers around the park. The feeling was more of exclusion than inclusion. Over the last 10 years their attitude has become more positive. The value of the fence has now been realised by the majority of villagers. This change of attitude was very noticeable during the recent visit and was also mentioned in the Management Plan for LNP and an intensive survey undertaken (Powell 1996).

### **The Mvela situation**

Opposite the Mvela village the park is only 3km wide. It is the beginning of the corridor to the north, which is vital to free elephant movement and therefore needs to be left open. Communities on the eastern boundary are using the route through the park to the Mvela ferry pick up point to gain access to the town of Ulongwe. With the constant and uncontrolled movement through the park, snare poaching is rampant in this area. These factors will strongly influence the release of rhinos in LNP.

### **Short-term option**

To construct a passage consisting of two parallel electrified fences from the hollow baobab on the Shire River to the eastern boundary fence. This will allow people safe passage through the park and contain them on the route. The area between the baobab and the Shire (approximately 300m) is left open for elephant and wildlife to move freely to the Mangochi Forest Reserve. Construct a scout camp near the

baobab to control the system. With intensive rhino monitoring following release, preventative action can be taken from this post in the event of a rhino heading towards this opening. Human traffic along this passage should be restricted to daytime only to allow wildlife nocturnal use.

#### Long-term option

All efforts should be made by NGOs, donors and government to include the Mangochi Forest Reserve in LNP and fence the entire area.

#### **Fence maintenance**

The donor must be aware of the long-term responsibility towards the maintenance of the structure. The fence attendants must be employed on the same level as other DNPW field staff. No short cuts should be taken regarding housing, equipment or budget. The fence attendants must have a good relationship with the local communities and assist the extension workers with the day-to-day communication with the parks neighbours. The village scout system at Naifulu should be closely monitored and lessons learned. Community involvement in every step and phase of the perimeter fence is vital. The Park Manager: should be given the capacity to be actively involved during the implementation phase of the fence.

#### **Transport**

Transporting materials along the fence for general maintenance has always been a problem. Because of the conditions during the wet season, access is only possible for 6 - 7 months of the year. Many river crossings need to be rebuilt every year. A diesel-driven four-wheel quad, the Buffalo 400, approved by the British Special Forces and now manufactured and used in the mines in South Africa, could be a good option for a perimeter and sanctuary fence maintenance. These units are:

- lightweight
- easy to operate and maintain
- can operate on narrow paths
- can operate on cotton soil during the wet season
- safely operate on steep gradients
- specific in function (i.e. cannot be used to go into town)
- can carry 3 people
- can pull a one-ton trailer
- has a minimal impact on wet roads (i.e. broad wheels)
- cost 30% of average pick-up or tractor and trailer
- These units must not replace foot patrols on the fence line, but be used for:
  - delivering materials on fence line during maintenance
  - delivering water and rations to field staff and fence attendants
  - maintenance of the sanctuaries, and later to deliver rhino monitoring personnel to certain points in the park

#### **Information and extension**

The fence and its village scout system should be used as a conduit for information, specifically on the rhino project. The following are points to consider:

- wildlife clubs, chiefs, schools, community gatherings, etc. should be targeted.
- the decrease in value of rhino horn, increase in value of live animals, rhino ecology, tourism importance, negative human presence during collection of resources in rhino zone, etc. should be explained.

- in the months leading up to the release, a concerted effort needs to be made to educate the park neighbours (utilising a specially produced video in Chichewa if necessary) on the importance of the rhino project for Malawi.
- A huge effort should be made, especially with the schools and wildlife clubs in the area, to enable them all to visit the park.

### **Western boundary fence**

The eastern boundary fence will be the priority because of the rhino program. The western boundary, however, must be constructed during the same operation to contain the heavy crop damage (mainly elephant and hippo) and establish a healthy relationship with the villagers of that area. Issues such as water collection from the Shire and subsistence fishing, can be addressed in the same way through the village scouts and park management.

## **Phase II - security, monitoring and GIS**

### **Radio Communication**

A properly installed VHF radio communication system covering the whole park is one of the most important components of successful rhino management. This point cannot be stressed enough. During the recent visit, the repeater in LNP was in Zomba for repairs. The Park Manager did not have the funds to fetch, return and reinstall the repeater. A situation like this is unacceptable. It is better to keep such equipment under the control of the donor who has the international contacts and budget to do repairs at short notice and ensure replacement where necessary. Radios are very expensive and relatively fragile. The Liwonde Scout Training Project should set up a training course in procedures, operating, field maintenance, economical battery use and care of their radios. All installations should be professionally done with the proper charging set-up.

### **Mobile Operations Room (MOR)**

A solid, basic caravan of the type used on construction sites modified on the inside as an office/accommodation for one person. The following should be professionally installed:

- Battery power supply for laptop computer, radios and lights, including adequate solar panels and a small back-up generator
- 2 VHF base stations - one with the general park frequency and the other with the security frequency.
- Extended antennae for the VHF radios.
- Laptop computer with GIS software

### **Why a caravan?**

It is mobile especially during the beginning stages of the project, it is important that it can be moved anywhere.

- The control centre needs to be away from any complex, such as Headquarters or a scout camp.
- The operator must do a ±seven-day shift staying at the centre, away from any other distractions.
- The caravan is relatively dust-free and clean which is important for radio and computer equipment.
- With the neat, functional interior of a professionally modified caravan it is possible to set a high standard of equipment use, care and procedures.

- The caravan can be purchased and modified in South Africa, towed to Malawi and immediately become functional.
- It can act as accommodation and office.

### Training

At least 3 people in LNP should be properly trained in the operating procedures of the MOR. This will include:

- training in the basic operation of GIS, such as the input of all information relating to monitoring and security onto the computer for the use of park management.
- training in the administration and maintenance of the control centre.
- making back-ups of data.

The primary objective of the MOR is to enter all rhino monitoring information in the GIS and to enable the Manager: Security and Monitoring to plan and deploy his security personnel accordingly. At the same time the centre will receive all other relevant management information.

### **The River Patrol Unit**

Fishermen use the river and lagoons to enter the park, often to set up fishing camps and snare lines. To effectively secure LNP, management must have FULL control of the river. To achieve this, a small unit must be trained to operate a suitable boat on the river on a daily basis. As the river is navigable throughout the year due to the barrage at Liwonde town and the park is inaccessible by vehicle for at least 4 months of the year, this is an ideal method for the deployment of scouts in the park. From any drop off point on the river in LNP, it is a  $\pm 2$  hour walk to the eastern boundary. The River Unit, and patrols deployed by this unit will operate on a different frequency to the rest of the park. The village scouts, fence attendants and park neighbours will know that the scouts are patrolling the park, but not where, when and how.

### Training

The River Unit must be trained in the use and maintenance of the boat, boat engine and equipment, as well as a basic course in life saving.

### Suitable boat

Aluminium boat or semi-rigid inflatable

Must operate in shallow water

Able to plane with six people and full kit

Radio, GPS and spotlight installed and protected from elements

All safety equipment

Night vision equipment will be very effective with this unit

### Maintenance and fuel

The efficient deployment of scouts will rely heavily on the boat. It must be operational all year round. Wilderness Safaris at Mvuu camp use and maintain boats for their tourist operation. It will be ideal if they could, as part of their lease agreement, supply fuel as well as maintain the boat and engine for the unit. Ideally a spare outboard engine must be available at all times.

### Chiunguni landing site

A suitable landing site opposite Chiunguni HQ should be developed for the use of the River Unit. It should be a strict rule that the boat never goes downstream to the

Liwonde town, as this is a waste of fuel and a potential breach on security. The River Unit will be based at Makanga.

#### Boat versus road transport

A boat is a vehicle that can only be used on water, in this case the Shire. This ensures that the security system inside LNP, relying on a 24-hour deployment method by boat, has a better chance that the vehicle (the boat) will always be available for this specific use. Apart from the fact that motor vehicles are expensive to buy and maintain, chances of a vehicle being called away for other 'emergencies' are very high.

#### **Liwonde GIS**

GIS technology is well known, but little used as a tool by national parks in day-to-day management. The main interest of this report is Liwonde's rhinos. The aim will therefore be, to set up this system where all information regarding the rhinos and exact positions (by GPS) is immediately communicated by radio to the MOR and entered into the system. Any other relevant information such as poaching activities, availability of water, etc. will also be entered into the system. This will enable management to build up a centralised databank, not only on the black rhinos, but on all important aspects for the efficient management of the park. The daily movements and positions of scouts on patrol will also be relayed to the MOR every few hours. This will enable management to know their strength on the ground and is an efficient way of eliminating 'lazy' patrols.

#### Staff turnover

Over the past 5 years LNP has had 7 Park Managers, a total change in the research staff and a change of donor. All of them had a good knowledge of the situation on the ground. With the high turnover, most of this information is lost, or saved in a file 'somewhere'. During our visit, it was clear that information relating to wildlife numbers, security and rhino monitoring was 'available', from bits and pieces here and there, and we never got a clear indication of what the present situation really is. A properly run GIS operation will solve these problems, as all information will be consolidated at one point and be available to managers and donors alike, new or old.

#### Staff morale

High staff morale is essential. With a basic knowledge of how GIS operates, all park staff, can be involved in this system. This will create an environment where they will become eager to add information and thereby help them realise they are important to the management of LNP. Regular feedback should be given to field staff on their input. For example, the fence attendants reporting the elephant damage over a 6 month period, can be shown the results on a map showing high impact areas and frequencies.

#### Rhino monitoring

Once the GIS is up and running, it is essential that all rhino information gathered is entered into the system. A centralised database needs to be developed for the Liwonde rhinos, including information on home ranges, life history's, population dynamics and associations. This data collection must be ongoing, even when there is staff or donor turnover.

A properly run GIS will give an immediate, clear evaluation to a visiting director, potential donor or outside advisor on rhino issues on what is happening at that



moment in the park and greatly assist in future decision making. A committed donor and Project Manager is essential to not only initiate the system, but also to ensure ongoing training and improvements to the GIS.

#### **Additional field staff**

To set up a strong security system for LNP at least 40 trained and equipped game scouts will be needed, based mainly at Makanga and Chiunguni. The field force will have to be deployed with the clear objective of keeping LNP clear of snares and poachers to the extent where the rhino population can survive outside of the sanctuary system. DNPW will have to make a strong commitment to the upkeep of necessary staff levels. It is essential that the additional staff be properly housed with their families. The security system should focus on two-man foot patrols, rotating, but with teams constantly in the field. With the assistance of GIS, certain 'red' areas (e.g. where core rhino areas are found in previously high poaching zone) should be visited at least twice a week. Training must be ongoing through the training section at Chiunguni and the system must be adaptable and strengthened continually. The donors through the Project Manager must make a constant effort to keep morale high.

#### **Phase III - intensive monitoring of rhino population**

With phases I and II fully functioning, a capture operation should be launched to recapture all individual rhinos and do transmitter and transponder implants, ear-notch if necessary and do essential veterinary sample collection (i.e. for presence of *Trypanosoma* and *Babesia* parasites). While in the sanctuaries an intensive monitoring program should start, where all information is entered into the centralised GIS. The Chiunguni and Naifulu hills can be used to gain signals of the rhinos (the transmitters should preferably have a mortality sensor built in). There will be a rotational two-man team based at the MOR who will be delegated to rhino monitoring alone. Routine anti-poaching patrols will complement this team in information gathering. Specialist training should be given to field staff on rhino ecology, behaviour, monitoring techniques, data collection, procedures following a mortality, etc. A uniform data form should be developed on which relevant information is recorded.

#### **Phase IV - release the rhino from the sanctuary system**

Once monitoring has been functioning well for a period of time (e.g. 4 - 6 months), all the stakeholders, together with outside experts, should evaluate the situation before a joint decision is made to release the rhinos. Monitoring will now be even more critical and the aim will be to establish individual home ranges and core rhino areas. Behaviour of the animals following release should be well documented to assist rhino managers in the future. The whole system must be adaptable at this stage. It will be ideal if an aircraft can be made available during the first 6 months post-release to assist with monitoring if necessary. It should be stressed that efficient monitoring and data usage is essential for the understanding of population trends and for future management decisions. Sanctuary 1 should be maintained for possible future black rhino introductions to the ecosystem.

## **CONCLUSION**

Today Liwonde National Park is an island under huge human pressure. The key to success will be to turn this pressure into a positive relationship. Not only does the park protect valuable natural resources, such as the black rhino and sable antelope, but it is vital to Malawi's tourism industry. Donors have been involved in the park for over ten years and funding will continue to be needed on the road forward. Solutions found to the problems in Liwonde National Park in general and the rhino program in particular, will not only benefit the people of Malawi, but will give valuable answers to other conservation areas under similar pressure.

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<b>BUDGET ESTIMATE</b>		
<b>DESCRIPTION</b>	<b>CAPITAL (US\$) (over 3 years)</b>	<b>RECURRENT (US\$) (in 3rd year)</b>
Project Manager (expatriate)		50,000
Start of contract	2,000	
Vehicle - purchase and running costs	20,000	3,000
Accommodation*, generator and water		3,000
Project Administration Officer (Malawian)		3,000
Communication and administration		3,000
<b>Phase I</b>		
Sanctuary maintenance		10,000
Fencing material (120km)	130,000	
Fencing construction costs	120,000	
15 x staff houses along fence	50,000	
Solar equipment (bateries, energizers, etc.)	10,000	
2 x Buffalo quad and trailer - purchase & running	18,000	800
1 x 4-tonne truck - purchase & running costs	35,000	3,000
1 4x4 pick-up (Park Manager) - purchase & running.	20,000	3,000
Repair 4 wheel trailer Chunguni	1,500	
Repair LNP tractor	1,500	2,000
36 Fence attendents Training	2,000	
Uniform	2,800	300
Salaries (DNPW)		24,000
50 Village scouts Training	2,000	
Uniform	3,000	300
Allowances (DNPW)		6,000
Perimeter fence maintenance		10,000
Village outreach	5,000	
<b>Phase II</b>		
VHF repeater for security frequency	4,000	
Additional radios	10,000	
GIS - computer, program and back-up	5,000	
Caravan for MOR	5,000	
Radios for MOR	1,500	
1 Buffalo 4-wheeler - purchase, running costs	8,000	400
Shire patrol boat - purchase, running costs	6,000	5,000
2 x 40hp outboard engine - purchase & maint.	5,000	200
10 x handheld GPS - purchase and AA batteries	4,000	300
18 additional staff - uniforms	2,000	200
training	2,000	500
salaries (DNPW)		12,000
Additional staff housing	50,000	1,500
<b>Phase III</b>		
Capture operation	8,000	
7 x transmitter	3,000	
Telemetry equipment (receiver, Yagi, etc.)	5,000	
Contingency	10,000	
<b>TOTAL ESTIMATED BUDGET</b>	<b>\$541,300</b>	<b>\$141,500</b>

\* It is assumed that the Project Manager will be able to utilise the current FZS project house.

<b>BLACK RHINO POPULATION DYNAMICS</b> LIWONDE NATIONAL PARK, MALAWI JULY 2001						
<b>IDENTIFICATION</b>	<b>SEX</b>	<b>EAR NOTCH POSITION (RMG *)</b>	<b>INTRODUCTION DETAILS</b>	<b>LIWONDE BORN</b>	<b>DATE OF BIRTH</b>	<b>STATUS</b>
JUSTERINI - F1	F	20	1993 - KNP <sup>~</sup>		± 1988	Resident - sanctuary 1 & 2
<b>BROOKS<sup>1</sup> - M1</b>	<b>M</b>	2	<b>1993 - KNP</b>		<b>± 1989</b>	<b>Died - 2000</b>
<b>JET - M4</b>	<b>M</b>	none		<b>born to F1 &amp; M1</b>	<b>1997</b>	<b>Removed to KNP 28-10-2000</b>
RYDON - M5	M	none		born to F1 & M1	1999	Resident - sanctuary 1 & 2
JULIA - F2	F		1998 - KNP		± 1988	Resident - sanctuary 1 & 2
BENTLEY - M2	M		1998 - KNP		± 1992	Resident - sanctuary 1 & 2
<b>CHIMWEMWE<sup>2</sup> - F3</b>	<b>F</b>		<b>2000 - KNP</b>		<b>± 1991</b>	<b>Died 2001</b>
CHIMPANJE - M3	M		2000 Pilanesberg NP		± 1994	Resident - sanctuary 3
CALF 3 - unsexed	?	none		born to F2 & ?	2000/2001	Resident - sanctuary 1 & 2

\* Rhino Management Group

~ Kruger National Park

Bold print - animals lost to the population

<sup>1</sup> It is presumed that M1 died from injuries sustained during a fight with another rhino, or even perhaps with an elephant.

<sup>2</sup> It is likely that F3's death was stress related following release as she was unsettled in the bomas in Liwonde.

<sup>3</sup> M4 was relocated to KNP in 2000.



## **SADC REGIONAL PROGRAMME FOR RHINO CONSERVATION**

### **Ecological evaluation and development of guidelines for future management of black rhinos at Liwonde NP, Malawi Semester 4 Task 1.2-4.1**

#### **Draft Terms of Reference for External Consultant Component: Development, Security and Management Capacity**

1. Review all past rhino conservation activities and developments at Liwonde NP from 1990 to date, including strengths and weakness of current approach and key components of black rhino conservation efforts (infrastructure, security, monitoring, management, staffing, capacity and funding support).
2. Through site visits and interviews with all relevant stakeholders (Government: DNPW senior and local staff; NGOs: e.g. FZS, J&B Circle of Friends, Peace Corps; and Community representatives), examine future options for successful rhino protection, monitoring and management, and development of a viable rhino population (20 rhinos) at Liwonde NP.
3. Identify capacity needs for rhino protection, monitoring and management at Liwonde NP, including minimum staffing by DNPW (and/or private sector) and training requirement.
4. Identify strategies for future community involvement in rhino conservation at Liwonde NP, with emphasis on resource sharing and fence maintenance.
5. Provide recommendations on necessary future actions and a sequence of phases of implementation necessary to develop infrastructure, staffing and management at Liwonde NP to a position where the whole park is secured (e.g. perimeter fence completed and well-maintained) and a viable rhino population is in place.
6. In coordination with DNPW staff and SADC consultants, produce consolidated evaluation report containing all elements for an integrated management plan for future rhino conservation at Liwonde NP.