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### The re-introduction of the black rhinoceros to North Luangwa National Park, Zambia

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#### Introduction

Until the 1960s, the black rhinoceros occurred throughout much of sub-Saharan Africa, with Zambia as a major range state for the subspecies *Diceros bicornis minor* (Ansell, 1969). In many countries though, the black rhinoceros was eliminated by illegal killing, with its horns in demand as knife handles in Yemen and medicine in eastern Asia. The black rhinoceros is critically endangered (IUCN, 2009) and on CITES App. I (CITES, 2009). Zambia's wildlife suffered from extensive poaching during the 1980s and, in 1998, the black rhinoceros was declared nationally extinct. Zambia adopted a national rhino strategy during 2005. North Luangwa National Park covers 4,636 km<sup>2</sup> in the Luangwa Valley in north-eastern Zambia. It is topographically, botanically and spatially diverse, with a range of mainly-woody vegetation types. The North Luangwa Conservation Program (NLCP) was started during 1986 by the Frankfurt Zoological Society (FZS) to support and strengthen the Zambia Wildlife Authority (ZAWA), enabling effective management of the park and surrounding Game Management Areas. FZS and ZAWA signed long-term management agreements and, after 17 years of support,



Black rhino cow and calf in North Luangwa © NLCP

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wildlife numbers had increased and poaching was under control. Re-introduction of the black rhinoceros was an obvious next step in the conservation of the park.

### Goals

- Goal 1: The re-establishment of a viable, breeding, free-ranging population of the black rhinoceros in North Luangwa NP, to enhance the conservation status of the species and to improve the ecological integrity of the area.
- Goal 2: Establish the capacity within ZAWA to protect and monitor rhino populations over the long-term.

### Success Indicators

- Indicator 1: The transfer of at least 20 founders to North Luangwa NP within a three-year period.
- Indicator 2: The founders are breeding within sanctuaries.
- Indicator 3: The population is free-ranging, breeding and secure.

### Project Summary

Black rhinos are large, long-lived browsers that reproduce slowly. Males are territorial. The re-introduction proposal was assessed against IUCN and SADC RPRC guidelines (Dunham, 2001). North Luangwa vegetation is mainly *Combretum-Terminalia*, mopane and *Brachystegia* woodlands, and wooded grassland. The park contained 500+ rhinos (Caughley, 1973) before poachers eliminated them. ZAWA, with NLCP support, now controlled poaching and approved the re-introduction. No Zambian rhinos survived and animals were obtained and moved internationally. NLCP promised continued major support. Security was a priority and local involvement was important. Preparations included identifying a sanctuary, recruiting security personnel, training a rhino security team, and building staff houses, holding pens and the sanctuary fence. Considerations for sanctuary sites included browse availability and security, including all-weather access to the fences. Twenty rhinos were captured in South Africa (Kruger National Park (NP)-12, Marakele NP-1, Pilanesberg NP-2 and Great Fish River Reserve in Eastern Cape-5). They were penned for 4-6 weeks, in quarantine, and to ensure that they tolerated confinement, were suitable for translocation and ate browse, lucerne and cubes. Some were trained to feed in transport crates. All were treated for internal and external parasites to comply with Zambian veterinary regulations. Rhinos were flown in individual crates, in batches of five, in a transport plane to an airstrip in North Luangwa (May 2003 (2 males:3 females), June 2006 (3 males:7 females) and May 2008 (2 males:3 females).

At North Luangwa, the first animals spent 10-20 days in individual pens to recover from the stress of travelling and become accustomed to local browse. They were fitted with horn-implant radio transmitters, given a prophylactic drug against trypanosomiasis and their ears notched. All rhinos came from areas without tsetse flies and were naïve to trypanosomes. Pyrethroid-treated tsetse targets were placed near the pens and throughout the sanctuary. The first five rhinos were released one at a time over five days with sub-adults and adult females released first. This allowed more vulnerable and valuable animals to settle before meeting adult bulls. This sanctuary was 55 km<sup>2</sup> bounded by a four-strand electric

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fence, 1.2 m high. Security staff was deployed around the sanctuary. The next 10 rhinos were fitted with transmitters and, over four weeks, freed into a 150 km<sup>2</sup> sanctuary adjacent to the first. This sanctuary's fence had three strands and was 70 cm high. Later, this larger sanctuary was divided and two bulls removed from the section where the 2008 arrivals were freed. During 2007, concrete troughs were built for bone meal and salt and, during 2008, troughs were provisioned with *Kigelia africana* fruit, *Euphorbia* pieces, horse pellets, sweet potatoes, sugar cane, trace elements and vitamins. *Euphorbia* pieces injected with Ivermectin were fed to rhinos to reduce parasite loads. During March 2009, the fence separating rhinos released during 2003 and 2006 was removed.



Hercules aircraft delivering rhinos to North Luangwa © NLCP

Direct community involvement was difficult because the sanctuaries were far from the park boundaries and released rhinos were seldom seen. But many people including traditional leaders observed aircraft deliver the rhinos, or saw rhinos in pens. Local people suggested names for rhinos, and schoolchildren were given rhino information and coloring books. To minimize disturbance, initially monitoring was by aerial radio-tracking. Later, rhinos were radio-tracked from vehicles on the boundary, and monitoring on foot started three weeks after release. Condition assessment and collecting evidence that rhinos ate local browse were priorities. The monitoring strategy varied, with recently-released checked more frequently. An Eastern Cape cow, translocated during 2006, would not eat local browse in the pen at North Luangwa, but ate food from South Africa. She was released after three days in the hope she would find browse that she liked, but she did not. *Euphorbia* branches and *Kigelia* fruit were provided, but she ignored them. Later, she often returned to the pens. Twice she was immobilized, treated for possible diseases, given intravenous glucose and tube-fed. She died a month after release. Post-mortem examination provided no indication why she refused to eat local browse. Another Eastern Cape female died nine months after release: she had stayed close to the pens and lost condition. Post-mortem examination revealed a tooth abscess and that possibly trypanosomiasis contributed to her death. A month later, another female was lethargic and losing condition and so she was immobilized and treated with an antibiotic and antihelminthic. Her condition improved thereafter. Additional tsetse targets were placed in the sanctuary. One old bull died six years after release, following a fight between males. The first calf was born during 2005. By April 2009, its mother had calved

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again and two other cows released during 2003 had calved. A cow released during 2006 broke out of the sanctuary and was herded back, but escaped again. She remained outside, calving two months after release. By January 2010, no other cows freed during 2006 were known to have calved.

### Major difficulties faced

- A key aspect was sourcing an appropriate aircraft to transport the animals from South Africa directly to a bush strip in North Luangwa. This aircraft had to be booked well in advance and aspects such as bad weather, permits and the unavailability of fuel had to be managed. The dates of the flights were fixed and could not be rescheduled if, for example, the capture of rhinos in South Africa was delayed.
- Political and financial constraints meant that a founder population of 20 animals could not be moved to North Luangwa within three years.
- The degree and duration of stress, both nutritional and parasite related, that the rhinos suffered as a consequence of unfamiliar conditions in a new area was unexpected. The stress was obvious and exacerbated by the sanctuary fences limiting movement, and possibly by competition for food with elephants.
- Rising costs meant that securing the increased funding required for the effective protection and management of the founder population has been a significant challenge.
- Removing the sanctuary fences (as was originally intended) has become a further challenge, because management now believes that it is easier to protect and monitor rhinos within a fenced area.

### Major lessons learned

- Project preparation, especially on veterinary issues, required technical expertise of a high standard.
- Fighting between recently-released bulls and bulls freed earlier was prevented by releasing each group of rhinos into an empty sanctuary.
- A simple, low-cost, three strand electric fence was largely effective at containing rhinos within a sanctuary, but allowed some free movement by other species.
- Anecdotal evidence suggested that the pre-release pens should be positioned downwind of the sanctuary, so that when the rhinos (which have poor eyesight and thus rely strongly on their sense of smell) are released, they move both into the wind and into the sanctuary.
- There is a need for a formal strategy (based on key indicators) for removing sanctuary fences.
- The rhinos released in North Luangwa NP were donated by South Africa in a historic regional conservation effort that has furthered the conservation status of the black rhino and forged important bonds between the national wildlife authorities.
- This project required international and regional cooperation. The re-introduction of the black rhinoceros was an international initiative between the Governments of Zambia and South Africa, under the umbrella of the SADC Regional Program for Rhino Conservation. The implementing organizations

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included ZAWA, South African National Parks, the South African North West Parks and Eastern Cape Parks Boards, the Namibian Ministry of Tourism, Environment and Natural Resources, the North Luangwa Conservation Program funded by the Frankfurt Zoological Society, and the Frankfurt Zoo.

- Safely moving rare and big animals over large distances and across international borders, as well as providing long-term security at their release site, was expensive and required multi-donor support. Major financial support for this project was provided by the Conservation Foundation Zambia, the US Fish & Wildlife Service, the Save the Rhino Trust Zambia, the Beit Trust, Horny@50, the Prince Bernhard Fund for Nature, the European Association of Zoos & Aquaria, Save the Rhino International, and FZS.
- Project management requires a flexible, adaptive approach; if one plan does not work, be willing to try another.

### Success of project

Highly Successful	Successful	Partially Successful	Failure
	√		

### Reason(s) for success/failure:

- Survival of the rhinos has been relatively high (90% survival during the first year post-release) and no rhinos have been poached.
- Population number is increasing, with the number of births (five by January 2010) exceeding the number of deaths (three by January 2010).
- Several calves born since the releases were conceived after their parents were translocated.
- The release phase of the project is incomplete, because the number of surviving founders is less than the 20 recommended by the SADC RPRC and a further five animals are destined for release in North Luangwa NP during 2010.
- Most of the rhinos are confined to the fenced sanctuaries and thus are not yet free-ranging.

### References

Ansell, W.F.H. 1969. The black rhinoceros in Zambia. *Oryx* 10: 176-192.

Caughley, G. 1973. Game management. In Naylor, J.N., Caughley, G.J., Abel, N.O.J. & Liberg, O. (eds) *Luangwa Valley Conservation and Development Project*. UNDP/FAO, Rome. Pp. 50-157.

CITES. 2009. Appendices I, II and III, valid from 22 May 2009. <http://www.cites.org/eng/app/e-appendices.pdf>. Accessed 30<sup>th</sup> November 2009.

Dunham, K. M. 2001. Re-introduction of black rhino in the Luangwa Valley, Zambia. SADC Regional Program for Rhino Conservation, Harare. 39 pp. [www.rhinoresourcecenter.com/ref\\_files/1196853812.pdf](http://www.rhinoresourcecenter.com/ref_files/1196853812.pdf).

IUCN. 2009. IUCN Red List of Threatened Species. Version 2009.2. [www.iucnredlist.org](http://www.iucnredlist.org). Accessed 30 November 2009.