

RHINO / FIELD NOTES

Notes on black rhino mortalities in North Luangwa National Park, Zambia

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In May 2010 reintroduction of the black rhino founder population in North Luangwa National Park (NP) was completed with the release of 5 animals, bringing the total to 25. The rhinos were released in a fenced rhino sanctuary measuring 220 km² compartmentalized into 55 km² and 165 km². Between 2009 and July 2010 4 rhinos died from injuries from intraspecific fights, failure to adapt and trypanosomiasis, reducing the number to 21. During the same period newly born calves increased the population to 30 rhinos, a rate greater than the yearly rate of increase of 5% recommended by the Southern African Development Community for Rhino Conservation. During the first two weeks of November 2011, 6 rhinos died from injuries caused by intraspecific fights and disease, which reduced the number to 24.

The records at Zambia Wildlife Authority (ZAWA) indicate that there are no definite figures for black rhino population density for North Luangwa NP and surrounding Game Management Areas (Table 1).

It is generally accepted that black rhino density should not exceed 0.1 rhinos/km². It was for this reason that before black rhinos were reintroduced in Zambia, Kelvin Dunham was engaged to evaluate areas in which to reintroduce them. Dunham (2001) recommended a density of 0.1 rhinos/km² as being the most reasonable stocking rate for rhino reintroduction in North Luangwa NP. This low figure was chosen to eliminate any ecological danger that rhinos confined in a fenced area might be over-stocked.

Based on the recommendations provided by

Dunham (2001), ZAWA in collaboration with the Frankfurt Zoological Society (FZS) formulated a plan to reintroduce black rhinos in North Luangwa NP. The plan provided for the release of a founder population of 20 animals in a fenced area. It was recommended that the adjoining fences be removed to create a single fenced sanctuary large enough to accommodate 20 founders and their offspring.

In 2011, despite the loss of four rhinos through disease, failure to adapt and injury arising from intraspecific fights, the total number of rhinos increased to 30 in the fenced area. In the interim, ZAWA and FZS prepared a comprehensive rhino management plan for North Luangwa NP which, among other things, recommended a partial removal of the fence to allow the animals to disperse over a wider area and prevent unnecessary mortality that might arise from intraspecific fights. By November 2011, just before the rhino plan was approved and implemented, 6 rhino mortalities were recorded between 4 and 13 November 2011.

On 2 November 2011 the carcass was discovered of a 6-year-old female code-named Buntungwa. Scavengers had consumed much of the body, leaving the head with horns and a few other parts. Eight weeks before Buntungwa died Dr Chap Masterson of the International Rhino Foundation had rated its body condition as very good. The presence of horns on the skull and the absence of any bullet marks on the skin ruled out the possibility of poaching. Its calf, which had still depended on it, also died.

Table 1. Black rhino population estimates in Luangwa Valley, Zambia

Author	Year	Method	Area covered	Density/km ²	Total	Remarks
Ansell, W.F.H.	1969	Field patrol sighting records, other records	Luangwa Valley		12,000	Total population for all NPs and game management areas
Caughley, G.	1973	Aerial	North and South Luangwa NPs	0.03	2,800	Total was for South Luangwa NP
Kuper, J.H.	1975	Aerial	Luangwa Valley	0.01 for North Luangwa NP	445	Total was for North Luangwa NP
Douglas-Hamilton I. et al.	1979	Aerial	20,000 km ² of Luangwa Valley	0.31		
Leader-Williams, N.	1985	Dung piles, tracks, scrapes per km ² observed by scouts	South Luangwa NP	0.4		
Leader-Williams, N.	1988	Individual recognition, sightings by scouts	200 km ² of South Luangwa NP	0.39	77 (66 adults and 11 calves)	

On 4 November 2011 an 18-month-old calf of a female code-named Twatemwa was found dead. The carcass had horns but there were extensive horn injuries on the skin. Deep wounds were recorded in the groin area, rib cage, right armpit, lower jaw and front legs (Fig. 1). It was assumed that the calf was killed by a mature male trying to mate with the mother, Twatemwa.

On 10 November 2011 a 7-year-old female code-named Ithala was found dead. This female originated from Ithala Game Reserve, a tsetse-free (*Glossina* spp.) area in South Africa. Upon release in North Luangwa NP, which is a tsetse-infested area, the rhino started showing signs of trypanosomiasis, a disease caused by a protozoan of the genus *Trypanosoma*, which is spread by blood-sucking tsetse flies. A trypanosomiasis prophylactic, Samorin, was administered in June 2010. In April 2011 Ithala showed loss of body condition and supplementary feeding was initiated. On 29 August 2011 the animal was immobilized and fitted with a VHF radio transmitter. At the time of fitting the transmitter, the body condition rating was 3 out of 5, which was fair. Her teeth were examined and one of the molars had just erupted out of the gum; this was assumed to be the cause of the fair instead of good or very good body condition rating. On 7 November 2011 rhino monitoring staff recorded poor body condition with clinical signs of trypanosomiasis: observed drowsiness, drooping head, stumbling when walking and sometimes falling over. On 10 November

2011 the rhino was found dead and post-mortem was done. Post-mortem results showed lower jaw abscess, broken molar, gum inflammation, hydro-pericardium (fluid around the heart), enlarged adrenal glands, worm infestation and general paleness of the carcass. The cause of death was recorded to be inability to browse due to painful gum, fluids around the heart and heavy worm burden (Fig. 2).

On 13 November 2011 a 14-year-old bull, which was released in 2006, was found dead. This male had always been involved in fights as was observed from



Figure 1. Twatemwa's carcass showing injuries sustained from fighting.



Figure 2. Post-mortem results of Ithala showing enlarged heart muscle (left) and worm infestation (right).

the scars on the skin. It was assumed that the animal died from injuries from intraspecific fights.

During the same period, a calf of less than one year old was not sighted and is assumed to be dead.

Chomba and Matandiko (2012) assert that the reintroduction of rhinos in Zambia has been a success and recommend securing additional financial support and increased manpower when the rhinos are released from the fenced sanctuary to the unfenced area of North Luangwa NP. It is now evident that it is not sufficient to emphasize law enforcement alone but biological management of the species as well. Records from observations made on the reintroduced black rhino population in North Luangwa NP suggest that appropriate biological management, including measures to prevent overstocking, are critical. All the 10 rhino mortalities recorded in the park between January 2009 and November 2011 were associated with biological management and not poaching. The continued confinement of the North Luangwa population in a fenced area may reduce the population's yearly rate of increase to $< 5\%$. ZAWA management should carefully balance its desire to encourage population growth by spreading rhinos to new areas outside the current fenced sanctuary while at the same time securing the species from poaching incursions in less secure areas.

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