

First record of a breeding forest elephant herd in the Lomako Yokokala Faunal Reserve, Democratic Republic of Congo

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1 | INTRODUCTION

In spite of the keystone role of forest elephants (*Loxodonta africana cyclotis*) in the Congo basin, information about their presence and abundance in some key conservation landscapes is scant. Lomako Yokokala Faunal Reserve (RFLY) in the Democratic Republic of Congo, traditionally renowned for its healthy bonobo (*Pan paniscus*) population (Dupain, Krunkelsven, Elsacker, & Verheyen, 2000), was declared a protected area in 2006. At the time of its gazettement, there were no confirmed records of elephants which continued until 2010. This study outlines a first ever attempt to document elephant activity in the RFLY. Given that the reserve is fairly young and the short duration since elephants were first recorded, we wanted to explore the demographics of elephants found on the reserve. If the elephants were breeding, we expected to document juveniles including calves and adolescents among the individuals within the group. The results of this study would (a) suggest if further studies were necessary; and (b) inform conservation actions to intensify efforts to safeguard forest elephants in the reserve and the surrounding landscape.

2 | METHODS

RFLY covers an area of 3,625 square kilometres and has the following extent: north (1°13'0.42"); west (20°50'47.69"); south (0°39'38.19"); and east (21°39'38"). Two rivers, Lomako and Yokokala Rivers, border the reserve in the south and north, respectively. The forest in the reserve comprises (a) dry rainforest lacking a dense shrub layer; (b) dry rainforest with a dense shrub layer; (c) permanently flooded

swamp forest; and (d) a drier type of swamp forest (Dupain et al., 2000). There are two prominent bays near the south-western corner of the reserve, Boile Bai and Lokomo Bai (Figure 2). We conducted the survey in the western section of the RFLY where historical patrol records from the Institut Congolais pour la Conservation de la Nature reported elephant activity. Apart from the survey area, elephant activities have not been recorded elsewhere on the reserve. We followed the conventional sampling design for forest elephants (Barnes et al., 1997; Barnes & Jensen, 1987; Walsh and White 1999) by counting dung piles encountered along line transects and reconnaissance walks (recce). The sampling design produced eighty-four 1 km long transects. There were 3 km of recce between two consecutive transects. The total distance covered was 394 km (Figure 1).

In addition to line transects, we deployed seven Reconyx[®] HyperFire HC 500™ and one Reconyx[®] RM45 RapidFire™ camera traps. We placed (a) two camera traps at opposite ends of Lokomo Bai; (b) one camera trap on a game path 3 km southeast of Lokomo Bai; (c) one camera trap on an elephant path 5 km southeast of the Lokomo bay; and (d) four camera traps at Boile Bai (Figure 2). After approximately one month, we removed the cameras from the stations and uploaded the images into a computer for analysis. We scrutinised each image for the presence of elephants.

3 | RESULTS AND DISCUSSION

Survey teams encountered 22 and 27 dung piles for transects (84 km; 0.26 dung piles per kilometre) and for recces (228 km; 0.12 dung piles per kilometre) in the central and eastern parts of the survey area, respectively. That means the dung piles we encountered

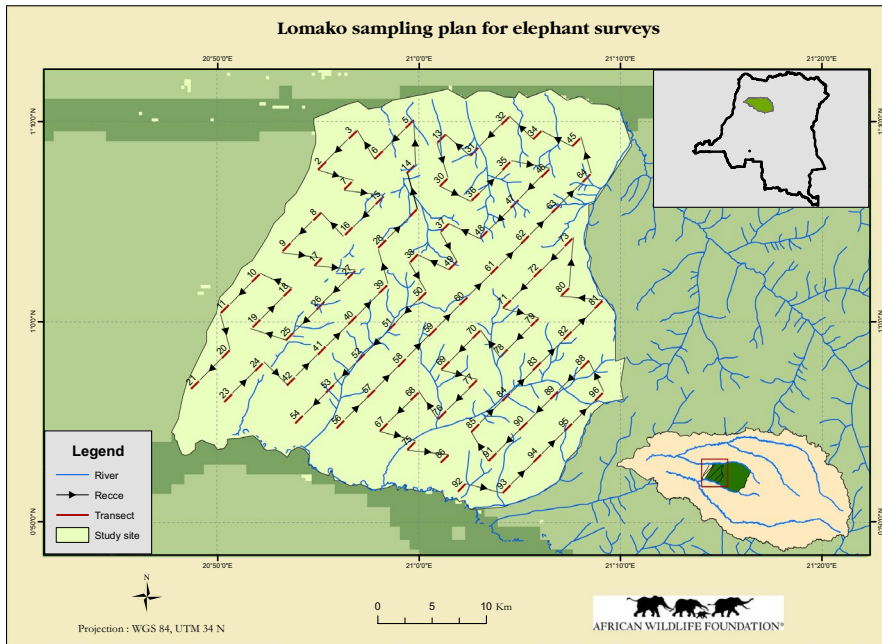


FIGURE 1 A map of the western section of the Lomako Yokokala Faunal Reserve in the Democratic Republic of Congo. Survey area and line transects ($n = 84$) are shown on the left

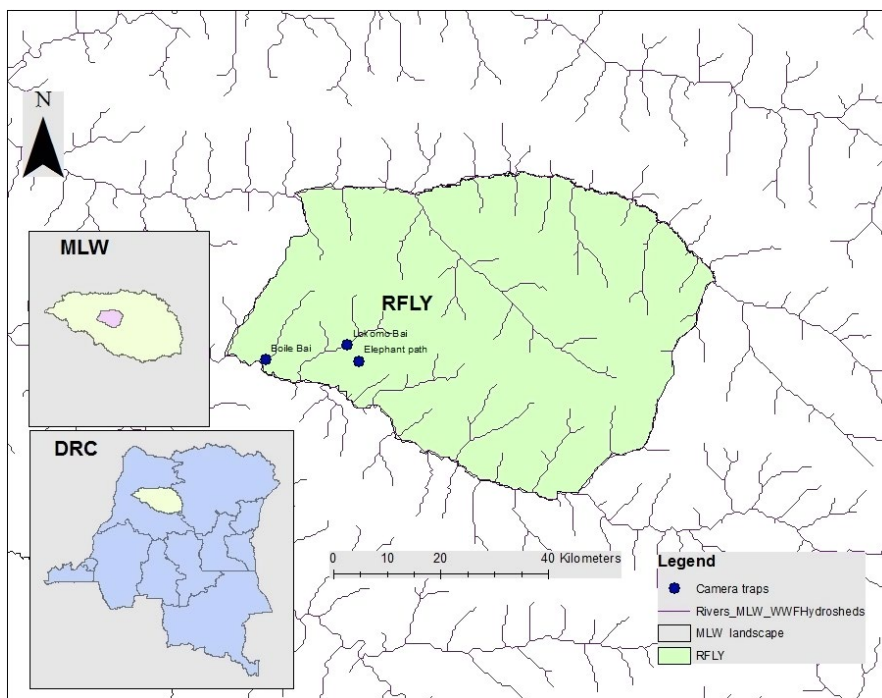


FIGURE 2 Camera trap stations to investigate forest elephant (*Loxodonta africana cyclotis*) activities in the Lomako Yokokala Faunal Reserve, Democratic Republic of Congo

were too few to allow us to estimate dung density and ultimately elephant abundances with confidence.

Camera trap deployment was for exploration purposes and not intended for an in-depth analysis of captures and effort. Camera traps yielded 9,346 images from a combined effort of 198 trap days. Trap days are defined as the sum of the number of days that each camera remained active. Of the 9,346 images, 46 were of wildlife, of which 24% or 52% were of elephants. All elephant images were captured at Boile Bai on two occasions on 4 November 2014 and 24 November 2014. On both occasions, elephant images comprised

of cows with calves. Two cows and a calf were photographed on November 4th (Figure 3), and a cow and three calves were captured on November 24th.

The detection of cows with calves signifies a breeding herd. Records of elephant activities in the western section of the reserve suggest that the bulk of the elephant territory was outside the reserve. Elephants, like most large bodied mammals, are limited by resources. Although bays are not the only areas where forest elephants access resources, it is known that bays are important to elephants because of minerals they cannot access elsewhere (Blake,



FIGURE 3 An image of forest elephants (*Loxodonta africana cyclotis*) captured using camera traps at the Lomako Yokokala Faunal Reserve, Democratic Republic of Congo

2002; Turkalo, Wrege, & Wittemyer, 2013). Within the RFLY, there are other baies, but there was no evidence to suggest that elephants visited them. Thus, the assumption here was that at the time of the study, elephants happened to visit Boile Bai. It is highly probable that other important resource locations for forest elephants were located outside the reserve. It is also possible that the south-western corner of the reserve is the extent of the herd's territory.

Camera trap images helped us identify different age classes of elephants in RFLY. These findings show that there was a breeding herd in 2014, warranting additional effort to strengthen the protected area integrity for RFLY. Further research is required to establish reasons for the limited elephant activity in the area. This would be used as a foundation to enhance efforts to protect forest elephants in RFLY and outside the reserve.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

DATA AVAILABILITY STATEMENT

Data from the study, from previous surveys, and ranger patrols are available upon request from the corresponding author.

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