

FIELD NOTE

Participatory survey of elephants (*Loxodonta africana*) in Kamuku National Park and its environs, northwestern Nigeria

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Introduction

Kamuku National Park (NP) in Kaduna State, northwestern Nigeria, is one of the few protected elephant ranges in the country. Despite this, no accurate estimate of the elephant population exists for the park. This article reports the first attempt at a rigorous and systematic survey of the Kamuku elephants. The survey was conducted from April 2010 to February 2011, covering both wet and dry seasons. The unique feature of the survey was the adoption of a participatory approach involving all stakeholders, including the local communities, through sensitization, planning meetings, capacity building and conservation education. Participants were informed of the need for a participatory survey of large mammals, and why endangered species must be protected. Emphasis was on using standardized methods so that survey results can be used to monitor changes over time, and analysing whether changes were positive as a result of management interventions or negative as a result of unrestrained anthropogenic and ecological factors. Two methods of elephant census were used: the line transect survey method (Barnes and Jensen 1987; Buckland et al. 2001) and the short-cut or reconnaissance ('recce') method (Barnes 1988). These methods effectively involved distance measurements and elephant dung categorization (Hedges and Lawson 2006). A third approach to collecting data was using an interview schedule to obtain information from elders, farmer groups and youths.

Elephant presence in Kamuku National Park

Kamuku NP has two ranges: Doka and Dagara. More indices of elephants occurred in the Doka range than in Dagara. Within the Doka range, where open woodland with *Isoberlinia* spp. is dominant, dung and footprints of elephants were found around Budungu stream. The decay state of the dung piles was within S5 (see Table 1). In the Dagara range, dung and footprints were found within a *fadama* ground, that is, open woodland with no specific plant species dominating. There the decay state of the dung piles was also within S5. Around villages and farmlands in Gwaska, fresh dung (S1), footprints, trails and other signs of elephant presence were found. Agricultural crops in the farms consisted of guinea corn, maize, cassava, cowpea, rice and groundnut. There were indications of browsing, uprooting and trampling of crops by elephants. The farmlands where elephant indices occurred were very close to River Kumunanu, a major river in the Gwaska area.

Footprint diameters ranged from 0.17 m to 0.49 m. The estimated elephant population for the two ranges was 13 individuals. Analysis of elephant age groups from dung and footprint diameter measurements revealed there were about four to six sub-adults and adults, and two to three young ones. Gwaska, Gorontutse, Nabango and Kuyambana junction were found to be important migration routes for the Kamuku elephants. Figure 1 shows the geo-referenced areas

Table 1. Data collected from transects and recce survey

Site	Coordinates	Elevation (m)	Observation on transect line	Observation on recce line	Dung piles decay state*	Footprint diameter (m)	Estimated no. of elephants and precise location of indices
Doka range (Goron-dutse track)	N10° 56' 32.1"; E06° 34' 03.1"	516.1	Dung and footprints around Budungu stream; open woodland with <i>Isberlinia</i> spp. dominant	Dung	S5	0.41 0.36 0.38	3 N10° 55' 58.9"; E6° 33' 37.6" N10° 54' 37.5"; E6° 32' 38.4"
Doka range (Nabango junction)	N10° 55' 28.3"; E06° 34' 58"	505.7	Nil	Nil	-	-	No data
Dagara range (Dandama track)	N10° 45' 22.8"; E06° 22' 19.8"	426.1	Dung and footprints within a fadama ground; open woodland with no specific plant species dominant	Nil	S5	0.35 0.31	2 N10° 44' 20.5"; E6° 21' 21.6"
Dagara range (Dandama track)	N10° 44' 22.7"; E06° 21' 20.7"	426.1	Nil	Nil	-	-	No data
Gwaska village and farmlands	N10° 56' 53.0"; E06° 35' 04.8"	507.0	Trails and playground were observed in the farmlands close to Sabongari	Nil	S1	-	N10° 56' 33.4"; E6° 34' 58.2"
Gwaska village and farmlands	N10° 56' 53.0"; E06° 35' 36.0"	488.0	Dung and footprints	Nil	S1	0.26 0.32 0.49 0.43 0.45	5 N10° 54' 30.3"; E6° 34' 14.2"
Gwaska village and farmlands	N10° 44' 22.7"; E06° 21' 20.7"	426.1	Dung and footprints close to River Kumunanu	Nil	S1	0.30 0.17 0.29	3 N10° 53' 20.5"; E6° 34' 10.1"

* S1 – fresh dung; S5 – fully decayed dung

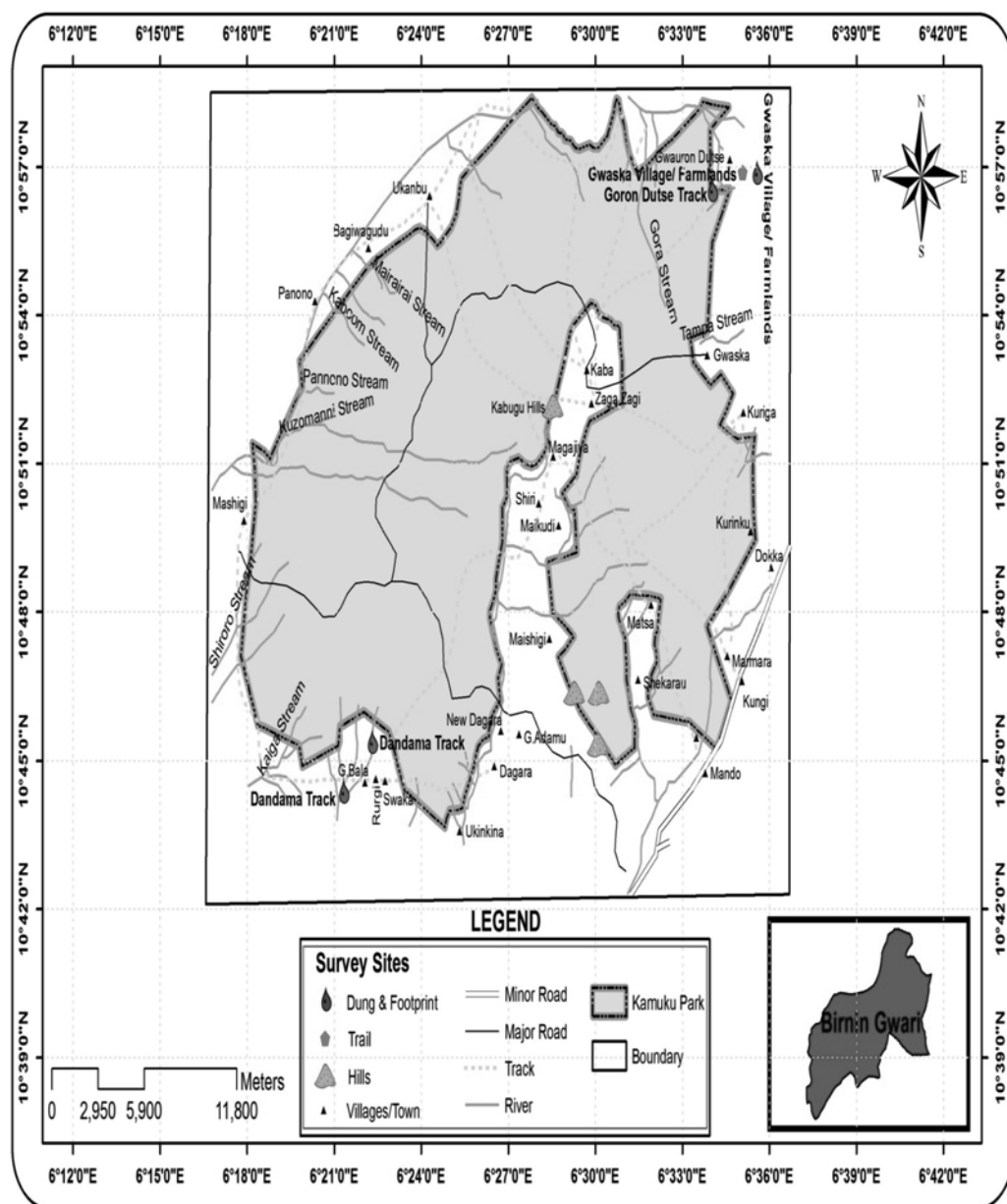


Figure 1. Areas where signs of elephants were recorded during the survey.

where signs of elephants were recorded. We found that it takes 51 days for dung to decay from S1 to S5 state.

All respondents ($n = 47$) involved in qualitative data gathering had seen elephants in and around Kamuku NP. Of these, 19 respondents (40.43%) had sighted elephants in 2009 while only 1 respondent (2.13%) had sighted them in 2010. Elephants in and around Kamuku NP were most often sighted from September through December. More respondents

reported seeing elephants in September than in any other month of the year, corresponding with the period when most crops in the area mature and are ready for harvesting. Most respondents (83.00%) believe that sighting elephants has become more frequent in the last five years. Despite the threat of elephant-induced damage on cultivated crops in the area, the unusual level of community support towards protecting the Kamuku elephants demonstrated during this project

is remarkable. This support could be attributed to the positive emotions generated for wildlife conservation among the participants through the survey approach. However, the survey also exposed the presence of threats along elephant routes and ranging and dispersal areas. The threats include slash-and-burn agriculture, pastoralism, poaching, increased settlements and habitat encroachment due to rising human population. A widespread trait common to these threats is habitat loss and fragmentation.

Recommendations

It is important to identify and understand the movement patterns of the elephants as well as their resource needs and resource availability along migration routes. The park management authorities should also identify and geo-reference migration routes and cordon them off from all forms of human activity. Because elephants often migrate through defined corridors, the routes and habitats they use must be protected. Indeed, Kamuku NP management authorities have started discussions with the relevant stakeholders on how to carry out joint patrol activities and sensitization campaigns within Kuyambana Game Reserve (GR) and its support zone communities in Zamfara State. This will ensure the Kamuku elephant population is viable. The game reserve was identified as an important haven for the elephants. Given the current state of Kuyambana GR, it will not be out of place if the Nigerian government links the reserve with Kamuku NP to develop a coherent strategy to conserve and manage the elephants.

This project established community-based elephant conservation and monitoring committees in some support zone communities of the park. This initiative is a platform for providing the park with reports on elephant sighting, movement and activities in and around the support zone communities.

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