
FOREST CLEARINGS AND THE CONSERVATION OF ELEPHANTS (*LOXODONTA AFRICANA CYCLOTIS*) NORTH-EAST CONGO REPUBLIC

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INTRODUCTION

The Odzala National Park (PNO), and north-east Congo in general, harbour dense populations of elephants (Fay and Agnagna, 1991). In PNO this seems related to the diversity of habitats, in particular in its large areas of Marantaceae forests which provide herbaceous food for elephants, and to the presence of many forest clearings which are important for social interactions and their potential role as salt licks and foraging sites. Both Marantaceae forest distribution and the location of forest clearings were found to influence considerably forest elephant movements (Vanleeuwe and Gautier-Hion, 1997). Besides being important foraging sites for elephants, forest clearings provide excellent conditions for observation of forest mammals and are consequently ideal for both tourists and hunters.

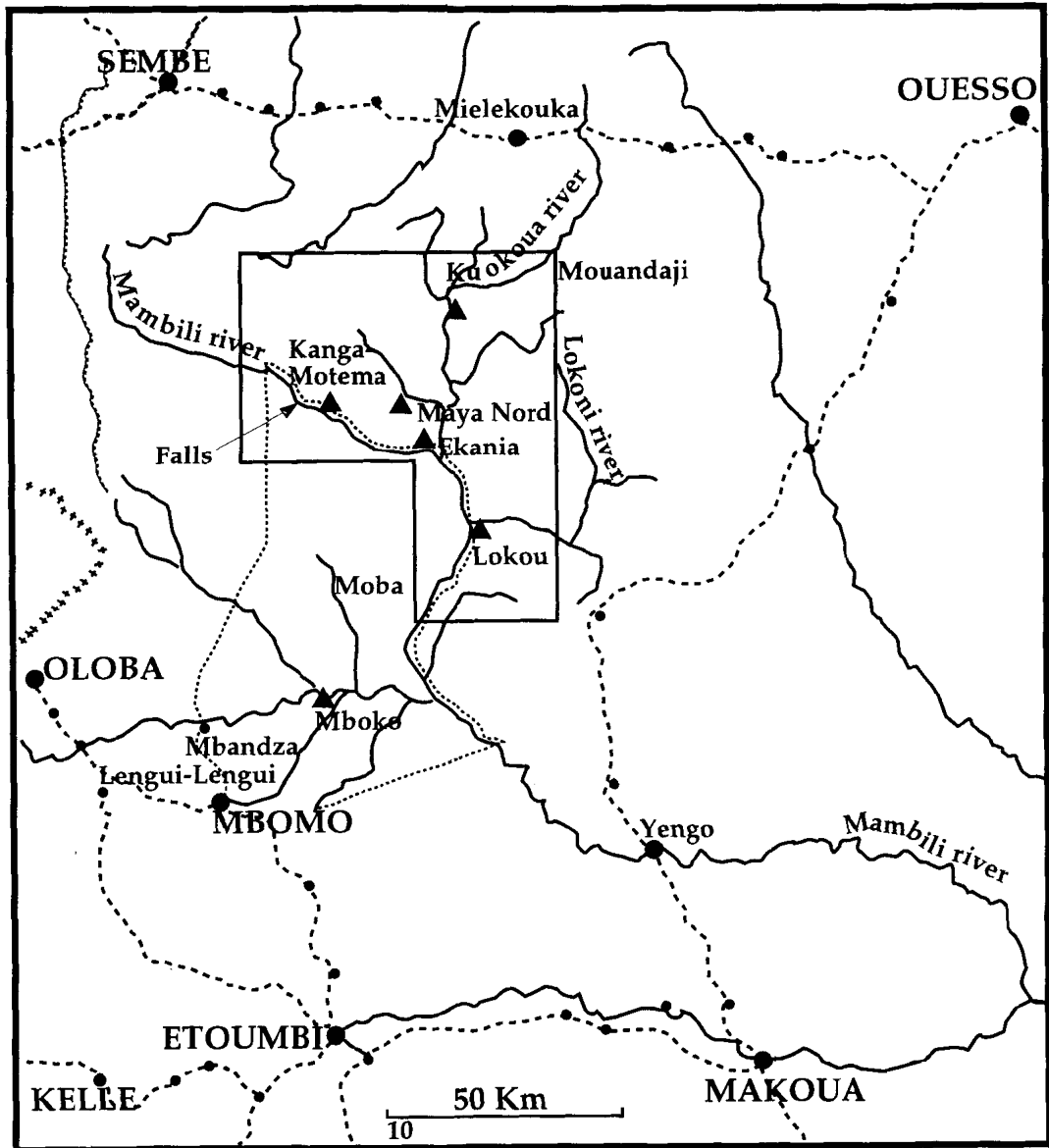
Local hunting and fishing activities are especially important at clearings near the Mambili river which has functioned, from past until present, as the only access route to the north of PNO (Figure 1) (Hecketsweiler *et al.*, 1991). These activities were altered by a decree from the "Ministère des Eaux et Forêts" in 1990, proceeded by the initiation of the EEC project ECOFAC (Utilisation rationnelle des Ecosystèmes Forestiers en Afrique Centrale) in 1992. As part of this project we examined the importance of forest clearings for elephant populations and evaluated their potential for development of eco-tourism, as well as their role in poaching.

METHODS

INTERA radar and SPOT satellite images (ECOFAC - Univ. of Gent, Belgium, 1996) show over one hundred clearings, concentrated especially in the northern areas of the Park. Thirty-siy (of these clearings were located and investigated. They were reached by motorised canoe and on foot. The distance of the clearings from rivers was recorded and their size estimated using maps. Direct observations and indirect signs (footprints and dung) of elephant activity at clearings were recorded and the presence of carcasses noted. The number of visits per clearing varied from one to 40 (Table 1). Clearings observed only once were also used in the analysis since indirect signs of elephants such as tracks or dung were so evident that they could not be over-looked. One clearing, Maya Nord, was subject to direct observations from December 1995 to December 1996 (n = 213h). The time of arrival and departure, and the size and composition of all elephant groups visiting this clearing were recorded.

RESULTS

Table 1 lists the clearings investigated. Their size ranges from 0.2ha to 42ha. The majority of the clearings (61 %) are situated less than 0.5km from the Mambili river or important tributaries. All clearings which do not border rivers have water running through them,



- | | | | |
|-------|--------------------|---------|---------------|
| | Country border | | Park Boundary |
| ——— | Escarpments | ——— | Study area |
| ● | Towns and villages | ~~~~~ | Rivers |
| ▲ | Field camps | - - - - | Roads |



The Odzala National Park and the study area

Table 1. The location, size, direct and indirect signs of elephant presence at clearings.

Regions	Clearing	Distance of rivers (m)	Surface area (ha)	No. of observer visits	Total no. of species	Number of elephants
Moba	Abandza	1100	2	5	2	++
	Avoué	50	2	1	2	+
	Louamé	150	4.2	1	1	++
	Moba	0	6.4	5	4	++
	Moba A	400	2.1	4	3	++
	Moba B	1300	1	3	2	++
	Moba Nord	150	6	1	1	++
Lokoué	Lokoué1	0	5.2	2	6	+*
	Lokoué 2	500	3.4	1		
	Lokoué 3	900	4.5	1	2	++
	Mbaya	200	0.2	2	3	++
Ekania	Hippos	150	3.8	3	3	++
	Moungali A	0	42	17	9	1
	Moungali B	500	5	4	4	++
	Moungali C	0	23.2	12	5	1-3
	OssaAsanga	100	2.1	20	7	++
	Tragos	0	0.3	7	4	++
	Maya	Maya Sud	5000	29.6	20	9
	Maya Centre	7000	25.9	20	10	1-6
	Maya Nord	12000	22	40	11	1-100+
	Obandaka	6000	4.8	5	5	1-21
Koukoua	Amberre	200	20.5	10	7	1
	Bauge M.	0	1	1	1	
	Gorilleunda	200	0.5	1	3	1
	Koukoual	300	21	1	4	++
	Koukoua 2	100	10	1	4	++
	La Capital	0	25.4	5	5	++
	Mouandji	0	35	4	7	++
	Mouangui N	50	8.8	1	1	
	Satellite	0	1.4	2	3	++
Kanga-Movma	Banane	16000	40	1	2	++
	Liboulou	150	19.5	5	7	++
	Ngonda Nord	1200	9.7	5	5	3
	Ngonda Sud	1700	8.5	2	3	++
	Odiba 600		35.1	5	8	6
	4WO 4000		5	1	2	++
Total	36			219		92%

n-n minimum and maximum number of elephants derived from direct observations

+, ++ indirect evidence of elephant activity: one (+) or several (++) individuals

92% of the 36 clearings investigated were visited by elephants. At 39% of these clearings elephants were observed, and at the others (61 %) indirect signs of elephant activity were found. The number of elephants observed at one time varied from one to more than 100 (Table 1).

Elephant carcasses were present at all but two clearings (Table 1) Their number varied from one to several

hundred. At the Mouandji clearing, several hundred carcasses were counted in November 1996, approximately 80 were the result of recent and v recent poaching (Figure 2). The two clearings with poaching indices are situated fairly far from rive Maya Nord (12km) and Obandaka (6km). They pro to be the only clearings regularly visited by elephants during daylight.

Photo Credit: Hilde Vanleeuwe



Elephant carcass at Mouanaji.

At Maya Nord, elephants were observed during 37% of daytime observation (n = 21 3h). The average number of individuals sharing the clearing was nine, and the maximum number was more than 100 (observed once). During nocturnal observations on five successive nights (n = 40h using a thermic camera) more than 100 individuals visited the clearing each night. Since most elephants went directly to the stream situated over 100m in from the edge of the clearing upon entering the clearing, it was possible during diurnal observations to collect data on group size and composition of groups. However, we cannot exclude double counting of animals re-entering the clearing. An elephant group was defined as a clustered unit of one or several individuals leaving or entering the clearing together. The composition of

271 elephant groups were analysed, with the most common group size of one individual (46%), while 15% included two individuals and 14% had three individuals (Figure 2). Groups did not exceed 14 individuals. 82% of the single unit groups were solitary males, accounting for 38% of the population observed. Male groups of two or three individuals were also seen (5% and 2% of the population respectively). Matriarchal groups were most commonly composed of two, three or four individuals (10%, 12%, and 8% respectively). Solitary females accounted for 8% of the observed population (Figure 2). Average group size was 3.7 individuals when solitary bulls were excluded, and 2.6 when solitary bulls were included.

Photo Credit: Hilde Vanleeuwe



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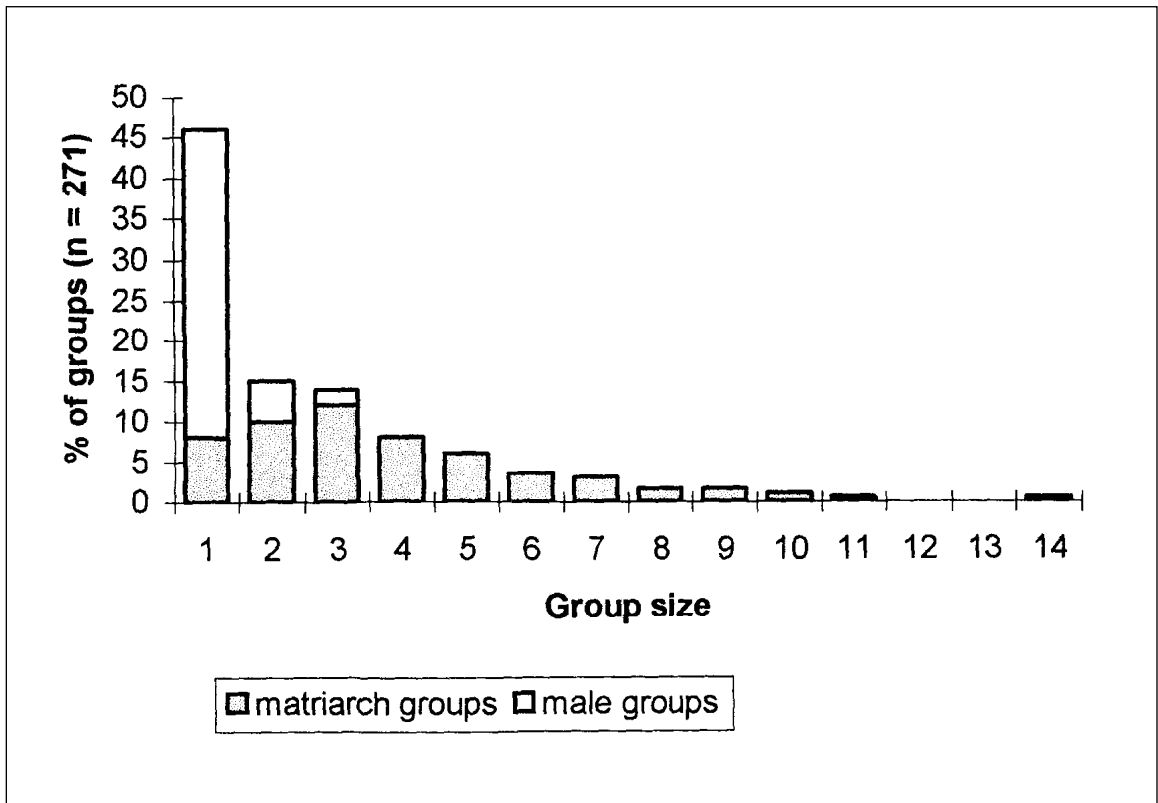


Figure 2. Group size for 271 elephant groups visiting Maya Nord in 1996

DISCUSSION

In an on-going study which began in 1990, Andrea Turkalo has identified more than 2,000 elephants visiting the Dzangha clearing in the Central African Republic (CAR) and stressed the role clearings play for feeding (on mineral salts) and social purposes (Turkalo and Fay, 1995). Additionally, the role and influence the location of clearings play in elephant movements was described (Vanleeuwe and Gautier-Hion, 1997). The present results, showing that 92% of the 36 clearings investigated were frequented by elephants, supports previous conclusions regarding the importance of forest clearings in forest elephant populations.

Our results also show that most clearings were subject to poaching. The exact number of elephants killed per clearing was difficult to determine since carcasses of wounded elephants which did not die on the spot were found in the forest up to several hundred meters from clearings. According to ex-poachers, clearings situated

farther from rivers were discovered by poachers upon following wounded elephants. This may explain why no signs of elephant poaching were found at the Maya Nord and Obandaka clearings, both situated far from the river, and why this region was the only area well frequented by elephants during the day. However, as poachers usually hunt for ivory only at night, it remains unclear why this hunting pressure has no influence on the nocturnal activity of elephants at clearings. This is the case at the Mouandji clearing, which has hundreds of old and fresh carcasses, and continues to be frequented by elephants at night. Several potential answers can be given but they remain hypothetical: one, the need for visiting clearings in order to balance or supplement their diet may be more important than the risk of being killed; two, elephants may be attracted to the elephant carcasses in the clearings; and three, elephants, unlike their reaction to human odours at Odzala, may not associate elephant carcasses with danger.

CONCLUSION

Obviously, the frequency (37%), the average (nine) and maximum number (over 100) of elephants visiting clearings such as Maya Nord during the day offer a remarkable opportunity for tourists to observe the forest dwelling giants which are otherwise difficult to view. Because these clearings attract large mammals, forest clearings may represent the most important ecological value and economically sustainable source of revenue for the PNO. Paradoxically, they are also quite vulnerable, since clearings equally constitute excellent sites for organised hunting for ivory, and ivory hunters may travel over 50km from their villages to these sites. The park is currently free from poaching, but the area north of the park boundary, including the Maya Nord, Obandaka, and Mouandji clearings, remains accessible to illegal hunters living along the Ouesso-Sembe axis (Figure 1).

The CITES participants decided in June 1997, if certain criteria are first met, to re-open trade of legally held ivory in Zimbabwe, Namibia and Botswana, with the possibility to alter the decision if poaching were to escalate as a result of legal trade. Donor governments stressed that revenues from a well managed ivory trade could support elephant conservation (WWF, 1997). Zimbabwe, Namibia, and Botswana are, however, not isolated from the portions of Africa where laws are forced, money and staff for conservation is limited,

illegal traffic is easy, and proving incidences of illegal poaching difficult. In Congo, with its impoverished economic and fractured political conditions, organised illegal hunting for ivory would be easy and the benefits potentially large. The future of elephant populations could be dangerously compromised quite rapidly. Regionally adapted protection measures are needed for forest areas such as northeast Congo, which could be included in an extension of the northern park boundary of the PNO and provide this forest area with protected area status.

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