
Human Activities on Mount Kenya from an Elephant's Perspective

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INTRODUCTION

The Mt Kenya Forest Reserve covers approximately 200,000 hectares. Climate and vegetation occur in distinct altitude-related ecological belts due to the mountain's wide range in altitude (1,200-5,200 m, Figure 1). Mt Kenya has far reaching national importance as the water catchment area for two main rivers in the country, the Tana and Ewaso Ngiro rivers. Situated on the equator, it also represents a model tropical mountain system of high biodiversity (MKEP, unpubl.). The flora and vegetation of Mt Kenya have been studied since 1885. In the latest study undertaken between February 1992 and August 1994 some 882 plant species, subspecies and varieties belonging to 479 genera in 146 families were identified (Bussmann, 1995). With the exception of an elephant density estimate conducted by Reuling in 1992 (Reuling et al., unpubl.), no specific studies on the elephants of Mt Kenya have been undertaken.

In order to broaden the knowledge on elephants of Mt Kenya, a ground study on "Daily activities, habitat use and movement of elephants on Mt Kenya, Kenya" is currently being undertaken by one of the author's (Hilde Vanleenwe). In the study, recording is made of human and elephant presence in the mountain forests.

As a response to public outcry on the destruction of Kenya's indigenous forests, an aerial survey of the destruction of Mt Kenya, Imenti and Ngare Ndare Forest Reserves was conducted from February to June 1999 at the request of Kenya Wildlife Service by Bongo Woodley and Christian Lambrechts. The aerial survey was

to assess and document the extent and nature of destructive activities on Mt Kenya forests.

Based on the preliminary findings of the ongoing ground study on elephants of Mt Kenya and the data from the aerial survey of Mt Kenya forests, this note will discuss the major constraints to the use of the Mt Kenya forest area by elephants, in particular topographic features and human presence.

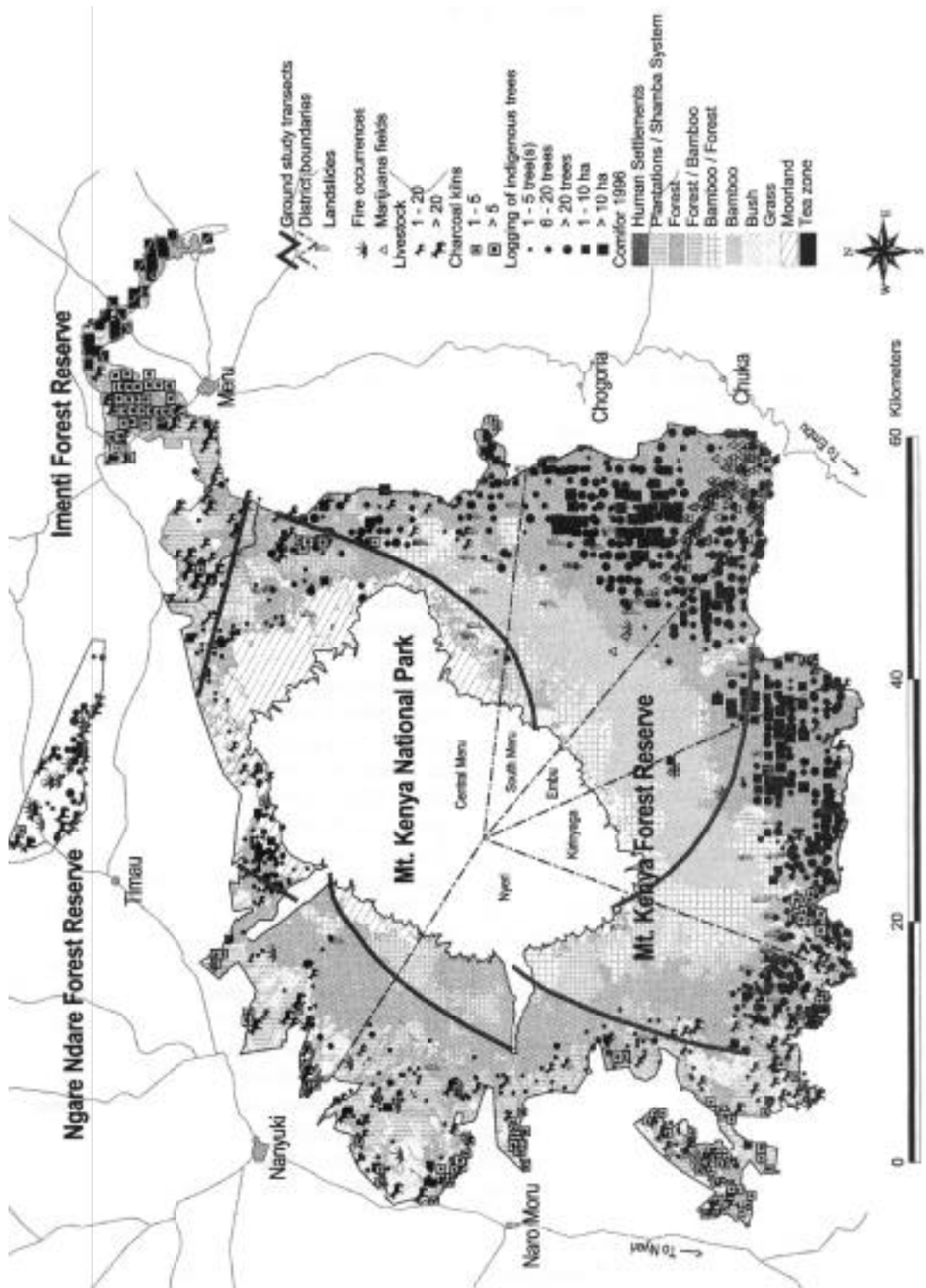
METHODS

The area for the ground study on daily activities, habitat use and movement of elephants on Mt Kenya, comprises Mt Kenya and Imenti Forest Reserves and is divided into four area blocks. For each block, one or two line-transects are walked every season. The transects are positioned to dissect all altitude clines and forest types, and their total length amounts to 263 km (see Figure 1). Along the transects, poaching evidence, logging evidence, elephant paths and dung, and direct observations of mammals are recorded. Poaching evidence includes snares, traps, pitfalls, poaching camps and carcasses of killed animals, whilst logging evidence includes logged trees, logged forest areas and logging camps. For each observation, the extent, the position alongside the transect, the surrounding vegetation type, as well as the distance from the transect are recorded. Position and distance are calculated using the Global Positioning System (GPS) and topofil.

The dung count method of Barnes (1996) and the computer program "Elephant" designed by Dekker and Dawson for dung count data analysis, were used to obtain a preliminary estimate of the elephant population of Mt Kenya.

For the aerial survey, Mt Kenya, Imenti and Ndare Ngare forests were divided into nine blocks. Aerial line transects were flown at 500 m and 1 km intervals depending upon the extent and occurrence of disturbances

Figure 1. Major threats to Mt Kenya forests.



in the surveyed area. Photographs were taken and GPS positions were recorded for each damage or threat observed, including logging of indigenous trees, charcoal production, marijuana (*Cannabis sativa*) fields and livestock grazing. Results were incorporated into a Geographical Information System using the ArcView v.3.0 software.

PRELIMINARY RESULTS AND DISCUSSION

Over time, expansion of human settlements, small scale farm holdings and tree plantations on the lower slopes of Mt Kenya have restricted elephant migration from the mountain. Elephants still migrate to the adjacent Imenti forest in the northeast, although they have to cross a rapidly growing stretch of agricultural land to get there. As such the elephants of Mt Kenya are mainly resident.

Under the non-residential cultivation scheme (known also as the shamba-system), small farmers are allowed to plant annual agricultural crops intertwined with trees within the Forest Reserve as a way to establish forest plantations. The scheme calls for the agricultural crops to be phased out by the third or fourth year of tree growth when the young trees would out-shadow the normal growth of the crops. However, the failure and abuse of the scheme has led to continued presence of small farm holdings in the areas of the Forest Reserve allocated for forest plantations. Some 7,000 ha on the western slopes of Mt Kenya

and between Mt Kenya and Imenti Forest Reserves are today covered with solely annual agricultural crops, leading to a substantial reduction of the area under tree cover.

The total area of Mt Kenya forests under tree cover should be large enough to sustain its elephants estimated at approximately 1,000 in 1992 (Reuling et al., unpubl.). However, not all that forest is used by elephants, for two main reasons:

- 1) We found that elephants avoid steep slopes (Figure 2). Natural barriers, such as the Sirimon, Kathita, Sagana, and Nithi rivers, force elephants to move to lower altitudes where geographical features are less pronounced, in order to cross those barriers and move around the mountain. This often results in conflict with farmers.
- 2) Elephants tend to avoid areas with intense human presence, such as logging sites. Today, most of the broad-leaved mixed forests of Mt Kenya are affected by logging (see Figure 1). Loggers claim that their activities are legal although no approved licences permitting logging of indigenous trees exist for the Mt Kenya forests (Kinyanjui, pers. comm., 1999).

Results of human and elephant activities were calculated as a percentage of the total number of observations per forest type, and proportional to the transect lengths walked in each forest type. Figure 3 shows that the highest presence of elephants is found in *bamboo/Podocarpus* forests (28.6%), in open spaces, such as forest clearings (26.9%) and in bushland (20.1%). Least evidence of elephants is found in the moorlands (3.3%). Evidence for poaching activities is most intense in forest plantations located within the boundaries of the

Figure 2. Slope angle and occurrence of elephant paths on Mt Kenya, March - May 1999.

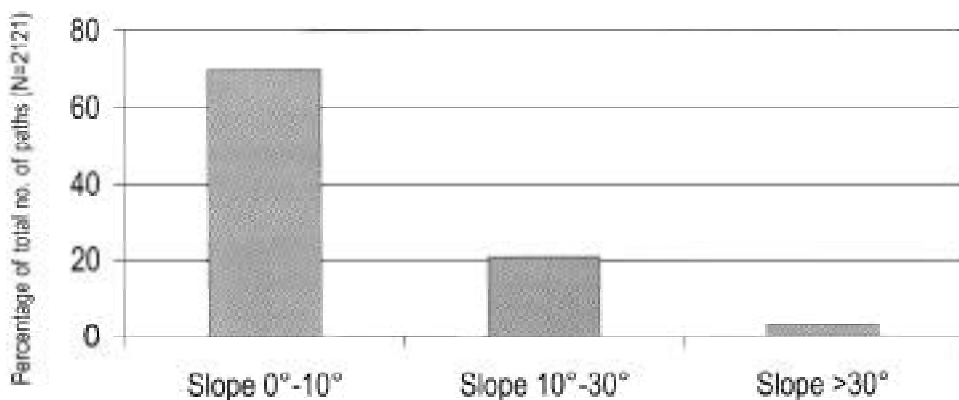
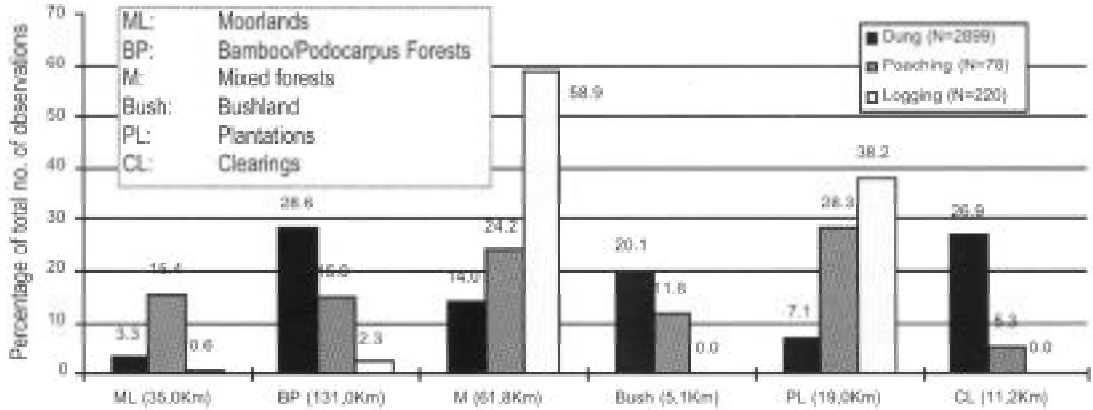


Figure 3. Human and elephant activity per forest type, Mt Kenya, December 1998 - May 1999.



Forest Reserve (28.3%) and in mixed forest (24.2%). Most evidence of logging was found in the same forest types as poaching, i.e. mixed forests (58.9% and plantations (34.2%), suggesting that the two illegal practices may go hand in hand. Due to the difficulties to access areas deep into the forest, loggers build logging houses where they can stay for several days. Snares and other traps are often found at those logging sites. Where logging and suspected poaching activities are intense, elephants are less active. The effect of logging on habitat use by elephants and other mammals may be important, in particular in daytime, because of the physical presence of humans and the of chain saws associated with logging, unlike poaching where evidence consists mainly of snares and traps.

This statement is supported by the low percentage of direct observations of mammals in for-

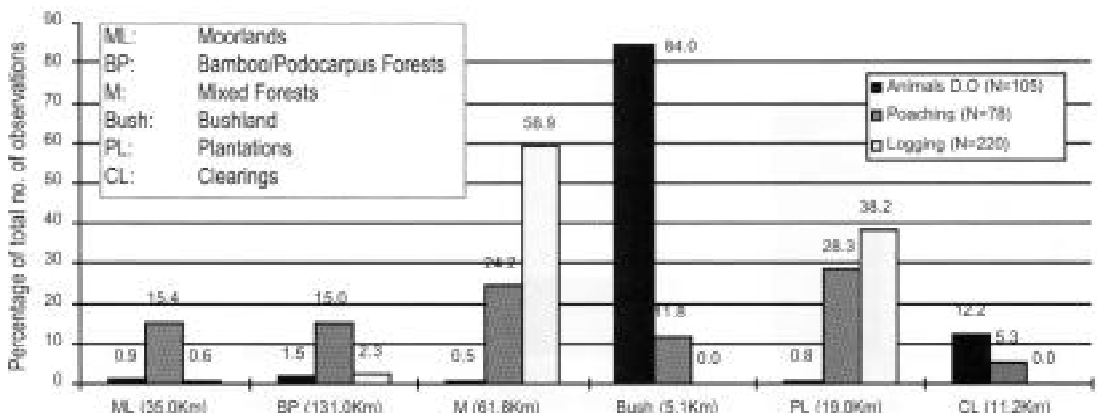
est types where logging and poaching are most intense, namely mixed forest and plantations (Figure 4). Mammals observed include buffaloes, waterbuck, bushbuck, elephants, monkeys, one hyena, one group of zebra, and two hyrax.

Figure 4 shows that hardly any animals were directly observed in mixed forests and plantations where logging and poaching are most intense.

From the above preliminary findings, it seems that human presence and the noise of chain saws may prevent animals in general from using an important part of the total forest area. This may have serious implications, especially on Mt Kenya, where almost the entire broad-leaved mixed forest area is affected by logging. Being sealed by agriculture, migration from the mountain has also become almost impossible.

Currently, the impact on vegetation by wildlife

Figure 4. Direct observations of human and mammal presence on Mt Kenya, December 1998 - May 1999.



is negligible compared to human impact. However, it is not certain that the mountain forest can sustain the needs of its wildlife in the long term, especially if they are to avoid an important part of the forest area, either due to extreme geographical features or due to the presence of loggers.

As this study continues more evidence will become available on seasonal habitat use and movement of elephants, and illegal human practices on Mt Kenya.

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