MANAGEMENT OF ELEPHANT POPULATIONS IN KENYA- WHAT HAVE WE LEARNT SO FAR?

John Waithaka

Kenya Wildlife Service, PO Box 40241, Nairobi, Kenya

INTRODUCTION

The issue of elephant-habitat interactions has stimulated debate amongst members of the IUCN/SSC African Elephant Specialist Group and other ecologists since the formation of the Group (Jachmann and Bell, 1984; Lindsay, 1984 and 1985; du Toit, 1985; Jachmann, 1987; McShane, 1989). Years later, the issues raised in the discussions have become extremely relevant to Kenya. Many aspects of elephant-habitat interactions have changed drastically. Within this period, important elephant populations in Kenya have been artificially contained within different types of barriers. Good examples include the 550 elephants confined within 250km^2 in Shimba Hills, over 6,000 in Mt. Kenya, 3,000 in Aberdares and various sub-populations living in fragmented habitats in Samburu and Laikipia. The 42km^2 Mwea Reserve will be completely fenced by mid-1998, while a fence currently under construction in Naari, Meru District, will effectively block seasonal migration of the Imenti-Isiolo elephants. Indeed, most of the remaining elephant populations in Kenya are surrounded by human settlements and have lost their traditional migratory routes and dispersal areas. The increasing confinement of these populations will have devastating effects on trees and shrubs and the general condition of their habitats. One of the major concerns of wildlife managers is whether the habitats will compensate for the overabundance of elephants.

Studies in areas with high elephant densities indicate that the habitats are already undergoing stress. Western (1990) looked at the elephant problem in Amboseli by examining aerial photographs over a period of about 40 years along fixed transects. While the theory put forward is contestable, and alternative explanations exist, Western argues that measurements of fever tree *(Acacia xanthophlea)* density showed that by 1989, following the compression of elephants into the park vicinity, the woodland had disappeared within the central basin and increased in density where elephant activity was negligible, thus creating a woodland-density gradient. A similar situation has been reported in Aberdares National Park where elephants have destroyed over 98% of trees in localized areas and converted a huge tropical mountain forest into a high shrub land (Waithaka, 1994). In Samburu, Gakami (1996) reported catastrophic destruction of riverine vegetation along the River Uaso Ngiro by huge elephant herds. Mwathe (1997) has recorded continuous destruction of forests within Shimba Hills National Reserve after a four-year study of elephant-habitat interactions. Between 1993 and 1997, 85% of the trees have been destroyed by elephants in some areas. A tree density-elephant model for Shimba Hills (Kamanga, 1997) predicted a 50% reduction in species diversity by the year 2002, assuming a 4% increase in elephant density without any management intervention. The extensive Mt. Kenya forest has experienced similar impacts from the 6,000 elephants that are confined in the area (Mwathe *et al.*, 1997). This trend has been observed in many National Parks with high elephant populations that are no longer able to move freely within their former ranges, resulting in habitat degradation characterized by low biological diversity, reduced habitat heterogeneity and weakened structural complexity.

Studies on elephant-habitat interaction in Kenya have varied tremendously in spatial and temporal scales and in duration and precision. Unfortunately, there are no clear answers deriving from the considerable amounts of research carried out in Kenya during the past 30 to 40 years. Even where detailed long-term studies have been undertaken, few of the results have been made available for valid interpretation and use in management. Many of the scientists who worked in East Africa in the 1960s and 1970s viewed the loss of woodlands as catastrophic and permanent (Buechner and Dawkins, 1961; Laws, 1969 and 1970). This is in contrast to the views expressed by Vesey-Fitzgerald (1 973), Petrides (1 974) and Caughley (1 976) who advanced the theory that vegetation change is cyclical in nature and that the woodlands and grasslands have historically alternated with each other in time and space. Others have suggested models, e.g. multiple climax vegetation model (Lamprey *et al.*, 1967), stable-limit-cycle model (Norton-Griffiths, 1979; Pellew, 1983), climate fluctuation model (Western and Van Praet, 1973), multiple stable states model

(Dublin *et al.*, 1990), as approaches for describing and understanding the dynamics of savannah ecosystems. However, these models , while useful for developing our understanding of the dynamics of heavily studied savannah ecosystems such as Amboseli, Tsavo, Serengeti and the Maasai Mara, require improved and current data on the states and processes involved, using both environmental and socioeconomic factors, to be useful.

If correct management decisions about the future of elephants are to be made, an understanding of their ecological requirements and impacts must precede the action taken. Indeed, appropriate management actions should be based on the management objectives for the area and for the nation as a whole. Furthermore, much of the policy reform, strategy and investment to ensure the long-term survival of elephants must also be based on a broadly integrated approach to conservation through the use of adaptive management.

That elephants destroy trees and alter habitat is a well known fact, but knowledge from such observations has been of limited applicability in Kenya. In many situations, management responses have not always been appropriately geared towards resolving the perceived problem. The unfolding elephant scenario in Kenya calls for decisive management actions, especially where habitat destruction by elephants at high densities is a real ecological threat, and particularly in situations where the vegetation is unable to compensate for the "over-abundance" of elephants.

LESSONS FROM TSAVO NATIONAL PARK

Tsavo National Park covers an area of some 21,00OkM^2, making it one of the largest parks in Africa. During the 1950s and 1960s the Tsavo elephant populations increased through reproduction and immigration in response to effective protection within the park and increasing poaching outside. Aerial counts in 1962 indicated approximately 1 1,000 elephants in the Park, with another 4,800 in adjoining areas (Glover, 1962). These pioneering counts were probably underestimates. At that time, however, there was already concern about vegetation destruction by elephants, which was aggravated by drought and fires. Detailed reconnaissance flights by Laws (1969) estimated a minimum population of 35,000 elephants. Recent extrapolation from carcass data suggests that the population could have been as high as 68,000 (Douglas-Hamilton and Burrill, 1991).

Most research in the Tsavo area in the 1960s was generated by and directed towards solving the "elephant problem". It was within this period that a debate erupted between the advocates of "cropping" (maintaining a stable elephant population) and "laissez faire" (letting elephant populations rise and/or fall naturally) policies on the management actions to be taken to control the elephant population in order to save some of the woody vegetation and safeguard the habitat and food supply of other herbivores. After a sample cropping for research purposes in 1966, the "laissez faire" policy was adopted following strong opposition to culling by the then Park Warden, David Sheldrick. Elephants at high densities were left to respond to natural forces, the result of which was high mortality during the drought of 1970-1971 (Corfield, 1973). However, the problem was "solved" in the late 1970s by a reduction of the elephant population of approximately 80% through starvation and poaching. This, and other experiences with elephant populations in Tsavo, are a good example of the consequences of taking no management action even when sufficient information is available.

The "laissez faire" management option for Tsavo was based on conjecture that nature, left on its own, will **find** a perfect balance. However, today's "natural environment" is an ecological island where a species can increase rapidly, exhaust its food supply, starve and suffer a rapid decline, meanwhile causing considerable **harm** to the species, and sometimes even endangering the survival of other species. More modem arguments would allow change to occur with minimal intervention, based on the goals and objectives of the protected area and/or nation.

The management options for elephant populations in Kenya points at reducing their densities in areas where they are artificially compressed. This can be done by culling or translocation. Where culling is regarded as inappropriate and translocation impeded by technical difficulties, the elephant-tree relationship must be balanced by reducing elephant densities through dispersal. Increasing space for elephants increases their ability to respond to resource depletion by moving elsewhere, a natural response that has been eliminated by blockage of their migratory routes and hostility outside parks. Restoration of migration corridors would reduce impacts associated with high elephant densities, prevent isolation of herds and improve genetic variability of the populations.

Based on the Kenya experience, the "laissez faire" management should only be considered where wildlife habitats have not been intensely altered, fragmented, reduced, manipulated or degraded. Many examples exist where the "hands off" policy failed to work, but Kenya has been unable to make appropriate elephant management decisions, preferring to court imminent ecological disaster. The decisions on elephant management are usually based on ecological, economic, social, political, ethical and practical considerations. However, the inclination towards political and ethical aspects have outweighed sound scientific and technical considerations. This position is, in my view, untenable.

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