SESSION TITLE: TOPICAL PRESENTATIONS

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MANAGEMENT OPTIONS FOR SHIMBA HILLS ELEPHANTS AFTER FENCING OF THE RESERVE

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ABSTRACT

The Shimba Hills National Reserve is a remnant coastal rainforest in Kenya. The forest has an estimated population of 300 elephants. By the end of 1997, the Reserve and an adjacent forest, a total area of about 250km^2, will be fully surrounded by an electric fence. Concern has been raised that the confinement of the elephant population within the Reserve will lead to radical habitat change. The fence is being installed to alleviate the severe and widespread human-elephant conflict around the Reserve. This paper investigates the options available for the management of the Shimba Hills elephants.

SUMMARY OF PRESENTATION AND DISCUSSION COMPILED FROM RAPPORTEUR NOTES

The Shimba Hills National Reserve is 35km south of Mombasa, Kenya and covers an area of 220km^2. North of the Reserve is a corridor which is accessible to elephants and links the Reserve with the adjacent Maluganji forest, increasing the area available to elephants to about 250km^2. The vegetation of the whole area comprises a mosaic of high-canopy forest, grass, deciduous forest and thicket. The Reserve is surrounded by human settlements where subsistence agriculture is practised. There is considerable conflict between humans and wild animals, with elephants, baboons and bushpigs being the main offenders.

There are between 300 to 600 elephants in the area, according to estimates derived from an aerial total count, dung sample counts, and from direct observations during which 34 family groups comprising a total of 354 elephants were identified. It is not known how the elephants utilise the area seasonally.

The Kenya Wildlife Service is installing an electric fence around the Reserve and the adjoining Maluganji forest to prevent elephants from leaving the area; it will be completed in 1997. The elephants will still be able to move between the Reserve and the forest using the corridor. Fencing is considered the ultimate solution to keeping all problem animals out of cultivated areas. However, while the fence will solve conflict problems, it may cause additional management problems.

There is concern about the impact which elephants have on the vegetation, particularly in the Maluganji forest and in the north-west of the Reserve where there appear to be more fallen than standing trees. It has been observed that in the northern area the elephants debark and knock down trees, mainly in dominance displays, rather than eating them. The area seems to be a "meeting place" for elephants. Elephants are preventing regeneration and there is concern that the rate of habitat loss will be accelerated due to the fence.

The following management options can be considered:

- A "wait and see" approach, i.e. let nature take its course.
- Translocation: the elephants could be moved, perhaps to Tsavo National Park, but the terrain and vegetation in Shimba present formidable challenges to elephant capture.

Culling: Kenya has resisted culling, even when overabundance is apparent, mainly for ethical and humane

reasons. Kenya might "mentally tiptoe" towards the idea of culling - but in this case it is not known how many elephants should be culled. Questions also arise as to what would be done with the carcasses, what equipment would be needed, etc.

In conclusion, there is no easy solution: anagement options depend on what is wanted. The (simple) choices are either to save the elephants, to save the trees or to save a bit of both.

DISCUSSION

Question: Why can't humans be translocated?

Answer: People cannot be translocated. There are political considerations.

TUSKLESSNESS AMONGST THE QUEEN ELIZABETH NATIONAL PARK ELEPHANTS, UGANDA

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ABSTRACT

Among Asian elephants *(Elephas maximus),* sexual dimorphism in tusk development is pronounced: females are tuskless or have undeveloped "tushes". Most males have some tusk development and the proportion of elephants possessing tusks varies enormously among different Asian elephant populations. With regard to the African elephant *(Loxodonta africana),* both males and females have tusks, although tusklessness occurs in approximately 10% of females and very rarely in males. From elephants shot in Uganda in the 1920s, tuskless elephants accounted for 1.6% in 1929 and 1.0% of those shot in 1930.

Selective hunting of elephants for ivory has been going on since the Pleistocene period. Intensive hunting for ivory co-existed with the slave trade, and still continues today. Single tusks weighing 1001b ((≈45.5kg) each were common and even those of up to 1751b (≈79.5kg) were not rare. In Uganda, between 1959 and 1967, the average weight of tusks was 6.4kg. Over the years there has been a reported decline in the weight of ivory coming into the markets. Recently, observers in regions where heavy poaching has occurred have commented on the high proportions of tuskless elephants. Douglas-Hamilton *et al.* (1980) noted that in the Queen Elizabeth National Park (QENP) most of the surviving matriarchs were tuskless, which is probably the reason they survived.

The level of tusklessness amongst the QENP elephants was examined in order to find out if there had been selective offtake of tusked individuals and to determine if there had been a significant increase in the level of tusklessness. It was hoped that the study would provide more information about the genetic manifestations of tusklessness but, due to the longevity of the elephant and its slow reproduction, the trends related to inheritance of tusklessness can not be determined. There has been no systematic study of tusklessness, and this report may stimulate interest in the subject.

SUMMARY OF PRESENTATION AND DISCUSSION COMPILED FROM RAPPORTEUR NOTES

The present study was initiated in 1988 due to a decline in elephant numbers in the QENP from 3,500 to 150 in 1980. The objectives of the study were numerous, with the study of tusklessness being just one of them.

Tusklessness was previously very rare in the QENP. In 1920 only one out of 2,000 elephants which were shot was tuskless and the specimen was sent to the British Museum to establish if it was diseased.

In the present study, elephant family units were identified and individuals were classed as tusked, tuskless or single-tusked. The following observations have been made:

- 10% of the females are tuskless, 9.5% of the females are single-tusked and 9.5% of the males are tuskless. Two-thirds of all the elephants over 40 years are tuskless. No young males less than 10 years old are tuskless.

- Tusked mothers produce no tuskless males but can give birth to either tusked or tuskless females. Tuskless females do not have tusked female calves, but can produce tusked males. No single-tusked female has a tuskless calf. There appears to be a strong genetic basis for tusklessness. Of the 21 families identified in the study, 42.8% are tusked, 28.6% are tuskless and 23% are mixed tusked/ tuskless.

- Old tuskless males do not appear to mate successfully but are instead chased away by younger, though large, tusked bulls.

The presence or absence of tusks may be important to survival. There is an abundant supply of water and salt in the QENP, but in less favourable or arid areas, elephants probably need their tusks to compete successfully for resources.

Future work may include biopsy analysis to find the genetic basis for tusklessness. Tusklessness may be a very localised phenomenon. It is not seen in other elephant populations in Uganda although there are many single-tusked elephants. In general there has been a trend from growing big tusks to having none at all.

DISCUSSION

Question: Why has tusklessness arisen? Is it the impact of civil unrest?

Answer: It would seem to be due to the selected offtake of elephants with big tusks. It is genetic.

Comment: In Amboseli (Kenya), tuskless elephants comprise less than 1% of the population. Tuskless females have both tusked and tuskless male and female calves. Tuskless males over 40 years are the only males left in some populations in three parts of Kenya. All have been seen in musth and are clearly the breeding males in these populations. It is suspected that the tuskless trait is passed on by the males, not by the females.

Comment: The increasing frequency of tusklessness is due to unnatural selection. The trait must be passed through both males and females unless it is carried on the mitochondrial DNA.

Question: How will biopsies help?

Answer: Biopsies from mating males and from offspring will establish which animals are reproducing.

THE ECOLOGY AND DETERRENCE OF CROP-RAIDING ELEPHANTS; RESEARCH PROGRESS

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ABSTRACT

A study is being conducted in the Sengwa Wildlife Research Area of Zimbabwe on the ecology of crop-raiding elephants. This project is examining the feeding ecology and movement patterns of bull elephants which raid crops and explores a variety of other factors which influences this behaviour. Chemical deterrents are being tested in an effort to identify compounds that may reduce elephant crop damage.

SUMMARY OF PRESENTATION AND DISCUSSION COMPILED FROM RAPPORTEUR NOTES

Initially this was intended to be a study only of elephant deterrents but it became clear that the ecology of elephants needed further investigation. The study concentrated on why elephants raid crops and whether their movements are due only to their attraction to crops, or to other factors. This objective required a comparison of vegetation within and outside the Reserve and a study of the movements, social behaviour and feeding behaviour of elephant bulls.

The study is being carried out in the Sengwa Wildlife Research Area (SWRA), which comprises 373km^2 and supports between 600 to 800 elephants (1.5-2 elephants per km^2). It is surrounded by communal lands to which there has been high human immigration. The human population density is now about 25 per km2, concentrated mainly in riverine areas.

The southern boundary of the SWRA was fenced in the 1960s, and in the past 30 to 40 elephants were shot per year on problem animal control outside the protected area. In the early 1970s, changes in vegetation due to

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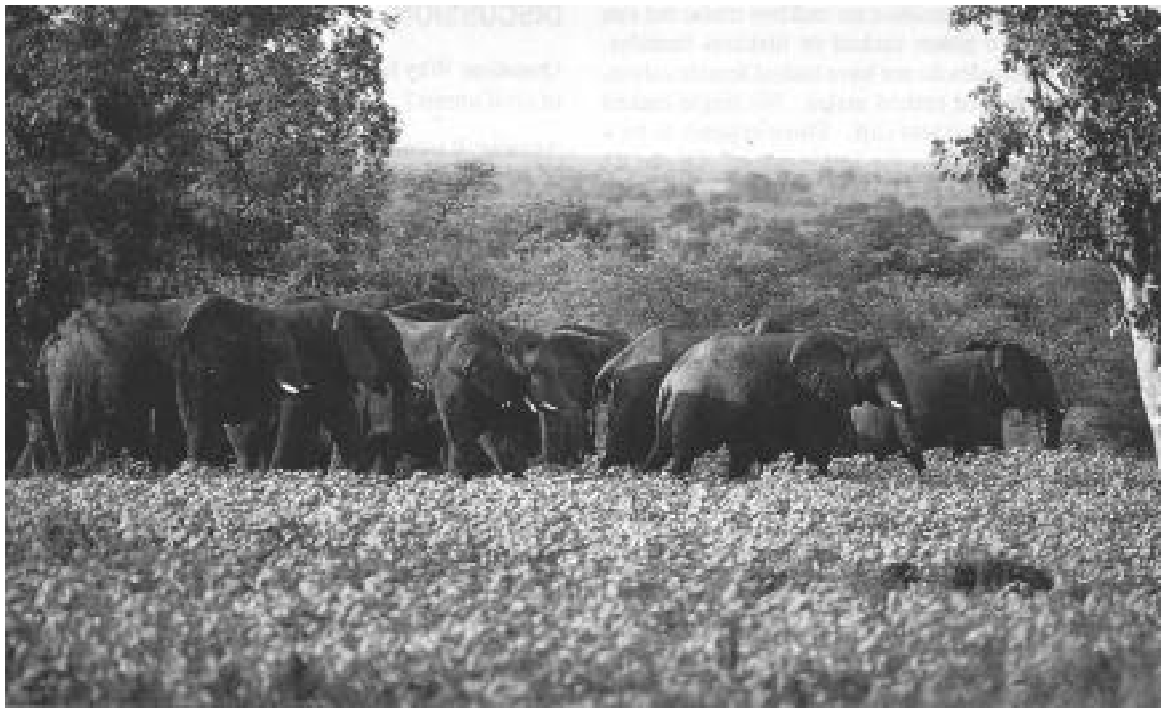

A herd of crop-raiding elephants in northern Cameroon

elephant damage and fire caused concern and culls were carried out in the 1980s to reduce their numbers. For 25 years the area outside the SWRA was not browsed by wild herbivores and there are still some areas which have not been cleared for cultivation.

The study focuses on the elephant bulls which do most of the crop-raiding. Preliminary results indicate that the movements of elephants out of the SWRA are associated with the onset of rain or the appearance of grass. Food availability seems to be a major motivating factor for the movement out of the SWRA. The predominant diet is grass in the humid, hot season January/February, and browse between June and December, the dry season. Crop-raiding decreases around June, when the elephants switch to feeding on browse. Elephants continue to break out of the SWRA even after the crops have been harvested. This is attributed to the abundance of tree species in the communal area. The preliminary conclusion, therefore, is that elephants leave the SWRA to feed on browse as well as to raid crops.

Feeding behaviour

The study includes feeding rates, plant selection, dung analysis to determine the percentage of grass and browse, and seasonal changes in food selection. Grass is abundant between May and August and limited from September to October. From December to February the dung is composed mainly of grass, but switches to browse from June to November/December. Most crop-raiding occurs in the transition period between the availability of grass and browse. The key question is whether crop-raiding is triggered by this transition or by nutritional stress. There may be another factor which motivates crop-raiding, not just desire to eat crops.

The differences in digestive rates of browse and grass are also being investigated.

Vegetation

It is necessary to compare the vegetation in the SWRA with that outside. Outside the SWRA the riverine area still has tree species which no longer occur within the Reserve. The average number of species is higher on the communal lands than within the SWRA although the total number of trees is higher in the SWRA. There are mainly *Acacia* and *Combretum* species inside the SWRA. Elephants spend two-thirds of their time browsing (at night) in the communal lands.

Control

Unless large numbers of animals are killed, shooting of the crop-raiding elephants has no (deterrent) ef

fect. Shooting in turn causes a problem in that the surrounding communities start to depend on the meat

supply, which is not sustainable. There need to be options for local people to use to combat elephant damage, rather than having to rely entirely on help from the wildlife officials.

DISCUSSION

Question: Do local people report to a central office or do you go to them to investigate incidents of crop-raiding?

Answer: People who live in the area are employed to track the elephants and to investigate whether there has been crop-raiding.

Question: What is the abundance and availability of crops i.e. does crop-raiding peak during the growing season?

Answer: The elephants seem to begin crop-raiding late in the growing season. Crops may be grown in December/January; e.g. this year (1996), because of the good rains, there were "mealies" available but there was no crop-raiding. The elephants seem to have what they need without crop-raiding at this time of the year. As the grass moisture decreases they return to the fields.

Question: Why are there more tree species outside the SWRA?

Answer: Soil types are being studied because they could be an influencing factor. Inside the SWRA there is thick bush and spiny trees. Outside the SWRA there are large canopy trees which have not been browsed by large herbivores.

Question: Do elephants prefer some crops to others?

Answer: They do not like okra.

Question: Is it possible that any of the areas being raided are historical migratory routes?

Answer: Not in this study area.