
TRANSLOCATION OF ELEPHANTS: THE KENYAN EXPERIENCE

Steve Njumbi, John Waithaka, Salome Gachago, Jim Sakwa, Kennedy Mwathe, Paul Mungai, Martin Mulama, Hamisi Mutinda, Patrick Omondi and Moses Litoroh
Elephant Programme, Kenya Wildlife Service, P.O. Box 40241, Nairobi, Kenya

ABSTRACT

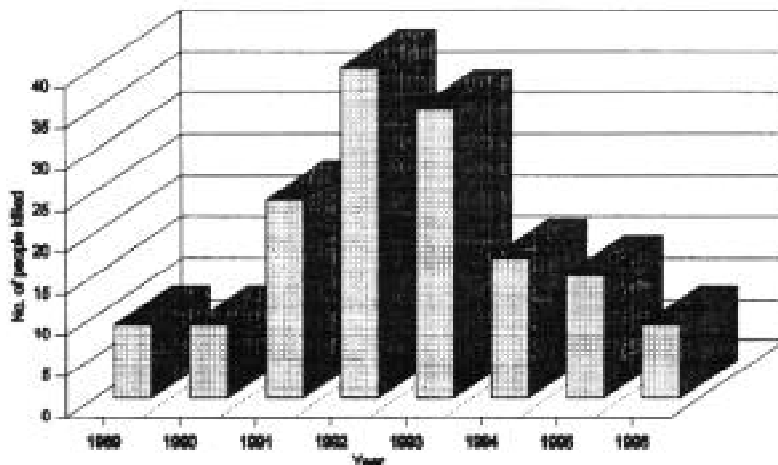
Human-elephant conflict problems in Kenya have attained severe proportions, and with them, new ideas and techniques for conflict mitigation are emerging. Towards the goal of mitigation, the Kenya Wildlife Service (KWS), through the Elephant Programme (EP), initiated a series of trials on elephant translocations during the last quarter of 1995. The plan was to transport 26 elephants from Mwea National Reserve in central Kenya, which is completely surrounded by farms and human settlements, to Tsavo East National Park in south-eastern Kenya, some 500km away. Sixteen elephants were successfully translocated in five operations between September 1995 and June 1996. Another five elephants died, three of them in a recumbent state after darting and the remaining two a few days later, due to changes in physiological conditions during the third operation. Hence a total of 21 elephants were removed from the Mwea population. Details of the operational techniques, the successes, challenges and problems, as well as some general conclusions and recommendations about the Kenyan experience, are discussed in this paper.

INTRODUCTION

Human-elephant conflict

Human-elephant conflict in Kenya has attained severe proportions and requires urgent solutions. Since the formation of KWS in 1989, poaching, which reduced Kenya's elephant population by 85% in the past two decades, has been effectively curbed. However, strong protection of elephant populations has increased their numbers and reduced their fear of people. Relative to the pre-1989 era, elephant deaths have fallen to an all-time low while human deaths and destruction to crops by elephants have steeply increased, as illustrated in the figure below. With the implementation of management intervention measures, including fencing and shooting of rogue elephants, these incidents have, on a national level, declined. However, in certain local areas, the problem has continued to escalate.

In and around the Mwea National Reserve, one person was killed in 1994 and two more in the next year. The Reserve is small (42km²) and completely sur-



Number of human deaths caused by elephants between 1989 and 1995

rounded by farms and human settlements which prevent elephants from migrating naturally. Before the translocation exercise there were 48 elephants, which, in addition to being a threat to nearby farmers and their crops, were damaging the environment. On the other hand, Tsavo National Park (East and West), located in southeastern Kenya, is large, covering an area of 21,000 km². Currently Tsavo has an elephant population of approximately 8,000 individuals, five times less than it supported in the early 1970s before rampant poaching depleted its population. In September 1995, the EP embarked on its first elephant translocation operation, from Mwea to Tsavo, a distance of 500km. The objective of the operation was to reduce the density of elephants in the Mwea National Reserve from one elephant/km² to 0.5 elephants/km² by translocating 26 individuals to Tsavo East National Park. The following is a summary of the experience.

METHODS

Pre-translocation

Surveys to establish social structure

Elephants live in a complex social world comprised of a network of relationships, radiating out from the family unit to bond groups and clans (Moss & Poole, 1983; Moss, 1988). This implies that the first requirement for successful translocation should be minimum disruption of this complex social structure and, ideally, the basic unit for translocation should be the family.

Five aerial surveys were conducted of the Mwea National Reserve prior to the translocation exercise. The objectives of the survey were (i) to establish the distribution and the population estimate of the Mwea elephants (ii) to determine the population structure and (iii) to identify and recommend, based on the survey data, the elephant groups to be translocated (Njumbi *et al.*, 1995; Sakwa & Waithaka, 1995).

Based on the results of these surveys, a family herd of 22 elephants (led by "Big tears"), and another of four elephants (led by "Left fangs") were identified for translocation.

Studies of the vegetation, soils, topography and roads

The above parameters were studied because they are important for the successful planning of logistics and pre-operation procedures. In particular, it was important to determine the state of the existing road net-

work, the access points to the Reserve and their suitability for the translocation trucks.

These studies revealed that 90% of the Reserve was covered by thick bushland or woodland, dominated by *Commiphora* species. It was recommended that certain bridges, culverts, drifts, luggas" (depressions) and narrow bends that were to be used in and around Mwea be repaired or modified prior to the translocation exercise (Mungai & Mwathe, 1995).

Survey of Tsavo East National Park

A survey was carried out in Tsavo East National Park to determine the best release site (Hamisi & Waithaka, 1995). Accessibility to the site, food and water availability and security from poachers were the main criteria for selection of the release site. The Thambangunji area, situated at the northern half of Tsavo East, beyond the Galana river, was eventually selected.

Translocation

Capture and handling of target animals

The procedure for capturing and subsequent handling of the elephants involved three steps:

Immobilising

Because of the thick vegetation at Mwea, the elephants were darted from a helicopter. The darts contained three drugs, etorphine (immobiliser; 7-15mg depending on body size), hylase (tranquiliser; 1500-3000 i.u.), and azaperon (sedative; 60-100mg). It took between 7-15 minutes for the drugs to take effect.

Maintaining recumbency

Once an elephant was immobilised, veterinary doctors continuously monitored the depth of anaesthesia, mainly by measuring the animals' temperature, respiration and pulse rate. If an animal was becoming "light" (showing signs of waking up), a small dose of etorphine (usually 2mg) was administered, while if it became "deep" (showing signs of becoming comatosed), then nalorphine, a weak reversal, was proscribed. During this stage, water was poured over the elephant's body to cool it down as animals are generally unable to thermo-regulate when under the influence of the drugs.

Reviving

After being rolled into a specially built crate (see next section), an immobilised elephant was given a com-



A recumbent elephant

plete reversal (diprenorphine (revivon)) during the last stage of lifting the crate. However, it was found necessary to keep those elephants that were to be transported in the container slightly sedated, otherwise they would become extremely aggressive.

Loading, transportation and release of elephants

Loading of adults

The loading, transporting and transfer of adult elephants was facilitated by a custom-made translocation truck, "Hannibal". The truck, a Volvo NLI0 6x6 rigid truck, built with a special container box with power winches, was designed to lift and load immobilised adult elephants of up to seven tons on to other lorries or on to itself. The truck was built at a cost of US\$140,000.

For the purpose of post-translocation monitoring, each adult elephant was fitted with a radio-collar (Telonics model).

Loading of calves and juveniles

Calves and juveniles were rolled, using ropes, onto a conveyor belt and then dragged into a container. The container was then winched on to transportation trucks.

Description of the capture operations

Five capture operations were carried out at the Mwea National Reserve between September 1 1995 and June 1 1996. Twenty-five elephants were darted during the operations; 16 were translocated to Tsavo, five died and the remaining four were revived and released at

the capture sites in Mwea. The table below lists the elephants which were translocated.

During the first operation, a target family of four elephants was spotted in a herd of ten inside thick *Commiphora* thickets. Efforts to drive the elephants to more open ground using the helicopter proved futile as the animals would reach the edges of the thickets, run along the thicket boundaries and double back into the thickets. Difficulties were also encountered during attempts to isolate the four target elephants from the rest of the herd because the individuals scattered in different directions, contrary to the belief that they would split into their respective family units when disturbed by the helicopter. However, after much work, the four elephants were darted. The recumbent matriarch could not be reached by the loading truck "Hannibal" because she fell on to a steep incline. The truck cannot operate on steep slopes - it would tip over while loading the elephant. The matriarch was therefore revived and released. The two calves and a juvenile which had been darted were also revived as their chances of survival at a new site without their mother was considered slim.

Alone, bull elephant was thereafter identified, darted, loaded and transported to Tsavo. The loading, being the first trial, witnessed a considerable lack of coordinated activities, and the exercise dragged on for



The translocation truck, "Hannibal".

over 10 hours and the subsequent journey for 17 hours. The entire crew was thoroughly exhausted at the end of the operation. A moment of danger was experienced at the release site in Tsavo when the bull, upon being released from the crate, charged at a column of media personnel which had lined up behind the crate to capture this moment of history.

The translocated elephants.

Operation	No. of elephants	Old adults (>15 yrs)	Young adults, juveniles & calves (< 15 yrs)	Number of radio-collars fitted
1	1	1 (>35 years)	none	1
2	5	1 (>35 years)	4	1
4	5	2 (>30, 25-30 years)	3	2
5	5	2 (>30, 20-25 years)	3	1



Photo credit: Steve Njumbi

Loading an elephant on to the truck.

During the second operation, co-ordination among the capture crew was improved, and a family of five elephants was successfully captured, loaded, transported and released at Tsavo. A tractor with a sledge that was used to clear a path towards the recumbent elephants developed two punctures during the operation. The tyres could not be repaired at the site and instead had to be ferried by helicopter to the nearby town of Embu, 60km away, to be mended. This considerably slowed down the operation time to 12 hours of loading. Hence fatigue and exhaustion were evident among the capture personnel. The tractor was replaced by a bulldozer during the next operation.

The third translocation was abandoned after three of the six darted elephants died. It was later established that the elephants died of acidosis - a physiological condition that is brought about by abnormally high levels of potassium in the body, leading to heart failure. The condition is precipitated by a change in diet which occurs after animals engorge on fresh, green forage that sprouts with the arrival of rainfall after a long dry spell. It so happened that this operation was carried out after the onset of rains in Mwea. In such circumstances, the animals are especially vulnerable to any physiological stress that may affect their acid-base balances - such as being darted with immobilising drugs. After the death of the first three recumbent elephants, a decision was taken to revive the remaining three. However, two of them died a few days later.

The last two operations, carried out in June 1996, were the most successful in terms of time, handling and improvements to capture techniques. Prior to the actual operations, a "mock" translocation was done, enabling last-minute adjustments to technique and equipment to be incorporated. The fourth operation saw five elephants tranquilised, loaded and ready for transit to Tsavo in under five hours! The only bottleneck in the operation was the slow transfer of animals from "Hannibal" to the transportation containers/trucks and the long journeying time of 19 hours. However, even better organisation during the fifth operation saw the next five elephants darted and loaded within four hours and transportation time reduced to 15 hours.

CONCLUSIONS AND RECOMMENDATIONS

The primary objective of the translocation project was to reduce Mwea's elephant population by half. A total of 21 elephants were removed from the population, 16 by translocation and 5 by dying during and after the third operation, representing a 44% reduction in population size.

The terrain of Mwea, comprising thick *Commiphora* bush and relatively steep slopes, presented major difficulties for darting and/or isolating the animals as well as for the manoeuvrability of the heavy trucks. Although the operations improved with experience, "Hannibal" and the transportation trucks are obviously suited for open savanna-type vegetation and not for thick bushland/forested areas. It is recommended that translocation be confined to the latter regions and that alternative management interventions be sought for bushlands and forests.

Unpredictable behaviour of the family herds when confronted by the helicopter posed a number of challenges. Scattering of individual family members, failure to drive them to more open ground, or inaccessibility of an individual (such as the matriarch) often tempted organisers to dart any elephant or transport only those that were accessible. It has been shown that elephant calves under two years and those between two and five have a zero to 30% chance of survival without their mother (Lee, 1987). Hence at the very least, translocated juveniles and calves must be accompanied by an adult female. Death of elephants at the release site, within a two-year period, would defeat the purpose of a translocation.

Finally, it was demonstrated that team co-ordination, efficiency and morale are the basis of a successful translocation operation. If the capture crew is using new equipment or equipment which has not been in operation for some time, a "mock" test should be a standard undertaking as part of project preparations.

ACKNOWLEDGEMENTS

This is a report of the Elephant Programme and the credit goes to all the participants. Special thanks go

to the following staff of KWS; Dr. J. Wambua, Mr. Kanyingi, Mr. S. Ngethe, Mr. D.K. Njoroge, Ms. M. Thiongo, Dr. R. Kock, Capt. P. Matthews, Mr. J. Mramba, Dr. J. Mwanzia, Mr. Mutero, Mr. Mugo, Capt. E. Anyonyi, Mr. G. Combes and the Capture Unit. Clem Coetsee, of Zimbabwe, gave professional advice on capture techniques. The KWS Director, Dr David Western, was instrumental to the success of the operations. He gave his personal input, ideas and support to the project. Many other individuals contributed in different ways. It is not possible to name them all but we whole-heartedly say - "Asante sana"! The EP is funded by a grant from the European Union. The majority of the funds to procure the vehicle was donated by the Born Free Foundation based in Surrey, England, while KWS met the remainder of the costs.

REFERENCES

- Hamisi, M & Waithaka, J. (1995) Suitability of Tsavo as a release site for translocated elephants. Report to the Kenya Wildlife Service.
- Lee, P.C (1987) Allomothering among African elephants. *Anim. Behav.* 35, 287-291.
- Moss, C.J. (1988) *Elephant Memories*. William Morrow and Co. New York.
- Moss, C.J & Poole, J.H. (1983) Relationships and social structure in African elephants. In: *Primate Social Relationships: An Integrated Approach*. (Ed. R.A. Hinde.) Blackwell, Oxford.
- Mungai, P. & Mwathe, K. (1995) Vegetation, soils, topography and infrastructure of Mwea National Reserve. Report to the Kenya Wildlife Service.
- Njumbi, J.S., Gachago, S.W. & J. Waithaka, J. (1995) Population dynamics of the Mwea National Reserve elephants. Report to the Kenya Wildlife Service.
- Sakwa, J.S & Waithaka, J. (1995) Mwea elephant population; principles and history of translocation. Report to the Kenya Wildlife Service.