

THE PROBLEM ELEPHANTS OF KAELE: A CHALLENGE FOR ELEPHANT CONSERVATION IN NORTHERN CAMEROON

Martin N. Tchamba

Centre for Environmental Science and Development in Cameroon, P0 Box 410, Maroua, Cameroon

INTRODUCTION

On a continental scale the population of the African elephant dropped from about 1.3 million in the late 1970s to approximately 600,000 a decade later (Douglas-Hamilton et al., 1992). However, some small populations have apparently become locally overabundant and are creating intense conflict problems (Thouless & Tchamba, 1992; Damiba & Ables, 1993; Taylor, 1993). Conservationists are faced with the dilemma of managing a species in urgent need of protection over most of its range, yet which occurs in such large numbers in certain limited areas that the need to cull must be considered.

Elephants are a major source of conflict between wildlife and people in the Kaélé region of northern Cameroon, largely on account of damage to crops and property and injury or death to humans. Conflict is limited to the wet season when more than 300 elephants invade the region. Although the exact origin of these elephants is not known, it is likely that at least part of the herd originates from Waza National Park located more than 120km away. Local strategies for deterring elephants are ineffective and often lead to fatal accidents. The government strategy for reducing conflict is limited to shooting a few elephants and providing food relief to the affected farmers.

This paper describes human-elephant conflict in the region and discusses possibilities for reducing conflict. The implications for long-term conservation of elephants are examined.

THE STUDY AREA

The Kaélé region or Mayo-Kani Division is defined here as the area comprising the sub-divisions of Kaélé, Moutourwa, Guidiguis, Mindif, and Moulvoudaye (Figure 1). It covers an area of approximately 5,033km² and is bordered in the west and north by the Diamaré Division, in the south-west by the Mayo-

Louti Division, in the east by the Mayo-Danai Division, and in the south by the Republic of Chad. The Kaélé region has a population of some 267,000 people with a mean density of about 53 inhabitants/km² (MINAGRI, 1993). The annual population growth rate is estimated at 1.3% and is lower than the national average of 2.9% (MINEF, 1993). The active population, for which agriculture is the main occupation, represents 34% of the total population.

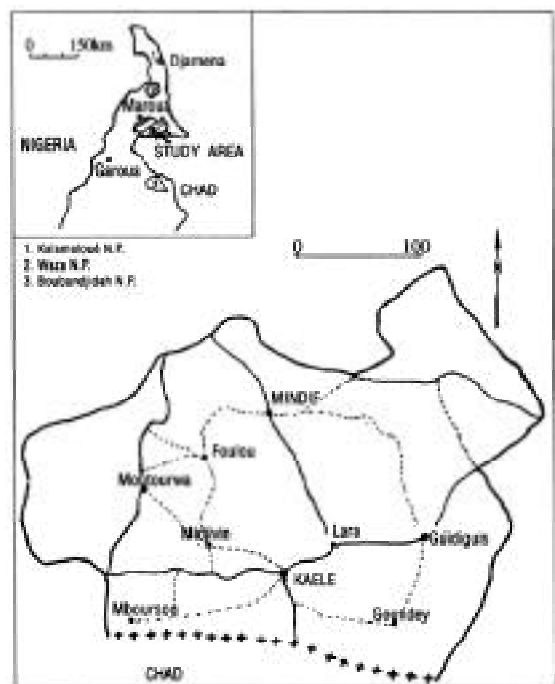


Figure 1. Sketch-map of the Kaélé region

The farming system is based on “slash and burn shifting cultivation” methods, using rudimentary equipment. The major food crops are millet, sorghum, and corn. The frequent invasion of birds like *Quelia quelia* is a serious threat to cereal cultivation. Cotton is the principal cash crop. Livestock holdings are confined mostly to goats and cattle, and do not provide substantial revenues

because of their rudimentary nature. In recent years, millet has been replacing cotton as the major source of revenue because of the difficulties faced by cotton sellers on the international market.

The climate is soudano-sahelien with seasonal rainfall varying between 700 and 800mm per year, falling between May and October. Temperatures are high with the maximum in excess of 45 and minimum rarely falling below 19. The natural vegetation is a woodland savanna dominated by *Acacia seyal*, *Balanites aegyptiaca*, *Piliostigma reticulatum*, and *Combretum* spp. This natural vegetation is threatened by bush fires, "slash and burn" cultivation, and excessive cutting to satisfy the firewood needs of Maroua, the provincial headquarter.

Wildlife is very rare except in the wet season when the region is invaded by crop-raiding elephants, *Loxodonta africana africana*.

The region is a mosaic of small-scale farms and woodland which offers good cover and food for the elephants. Water is a serious problem in terms of quality and quantity. With the drying up of streams in the dry season and the reduction of the water table, the water supply cannot meet the needs of the people, domestic animals and wildlife. Infrastructure in the region is relatively good. Schools and health centres are found in nearly all villages. There are 130km of tarmac roads and 800km of dirt roads, which are hardly accessible in the wet season.

History of the conflict

Human-elephant conflict in Kaélé began in 1980 when a herd of more than 30 elephants from Waza National Park roamed the Mindif area throughout the rainy season. Two elephants were killed and elephant crop damages were estimated at 10ha (DDA, 1981). Elephants were noted in Lara, Kolara and Gaban in 1982 (DDA, 1983). In subsequent years, the number of elephants leaving Waza at the onset of the rains for the Mindif area increased and their home range enlarged (SPTEN, 1986). The number of elephants visiting the area and the extent of crop damage was not documented.

The conflict escalated in 1991 when a herd of about 50 elephants invaded the immediate vicinity of Kaélé. A total of some 260ha was destroyed and 600 50kg sacks of rice were donated by the central government as food relief (Thouless & Tchamba, 1992). In early

July 1992, elephants reappeared in the region and it appears that the herds may have built up over the next few months. They left the area in November/December when all the pools and seasonal streams dried up, and crops had been harvested. Even more elephants arrived in June 1993, causing further damage and human deaths.

Origin of the elephants

There are three known elephant populations within an area of 150km, and it is possible that the Kaélé elephants originate from one or more locations. A population of approximately 1,100 elephants (Tchamba, 1993) spends the dry season in the Waza Logone floodplain (about 120km north of Kaélé) which includes the Waza and Kalamaloué National Parks. During the rains they disperse widely into the far north of Cameroon (Tchamba, 1993). Since 1980 there have been about 30 Waza elephants roaming in the Mindif area (about 25km from the core area of the Kaélé elephants' activity) in the wet season. In 1992 and 1993 there were no reports of unusually large numbers of elephants passing through Mindif to Kaélé. However, it is possible that some Waza elephants moved to Kaélé in small herds very early in the wet season. They did not attract much attention because crops had not matured and consequently there was little or no damage.

According to Daboulaye and Thomassey (1990) there are no more than 100 elephants in the whole area west of the Chari River. However, they indicated that the Binder-Léré Reserve and the Beinamar and Larmanaye regions in Chad were still unexplored. According to Chadian authorities, the Mayo-Kébi region of Chad, just across the border from Kaélé, suffered substantial elephant crop damage in 1992 and 1993. It was thought that these elephants were moving from the Binder-Léré Reserve or the Beinamar and Larmanaye regions (Daboulaye Ban-Imary, Director of Wildlife, Chad, pers. comm.). Local informants south of Kaélé were certain that there were still resident elephant populations just across the border in Chad. There is a need for more investigation within Chad, but it would be surprising if such a large population of apparently unpoached elephants should still be surviving there.

There is a belt of elephant range extending across the sudanian-savanna region about 140km south of Kaélé, which includes the Boubandjidad National Park on the border with Chad. There is little information on

the current status of elephants in Boubandjidah. Although not based on accurate counts, the population is estimated at about 660 individuals. The insecurity in Chad has spilt over into Boubandjidah; it is not known how much poaching is taking place. It is believed that there may be wet season dispersal into the Mayo-Kébi floodplains in Chad, and if so it is possible that this dispersal may have extended as far as Kaélé.

Recent observations indicate that a relict population of about 100 elephants on the Chadian side of Lake Chad has moved to Cameroon as a result of disturbances in Chad. The elephants have actually settled in the Blangoua area but it is expected that they will emigrate towards Kalamaloué and Waza National Parks.

There is a small resident population of not more than 20 individuals spending the dry season around Goundey in the Guidiguis sub-division, about 8km from the Chad border. These elephants drink in the few small pools designed for domestic animals. They draw no attention from villagers because of the very limited damage they do on the dry season millet, locally called "mouskwari".

METHODS

Field work was conducted in the wet season of 1992 and 1993. In September 1992 an aerial survey was carried out to estimate elephant numbers and to assess the damage caused by crop-raiding elephants. Ground truthing and observations of elephant herds were conducted in 1992 and 1993. Determination of the age structure of the elephant population followed the technique of Laws (1966).

Interviews were conducted in Midjivin and Foulou, the two main centres of elephant activity. Persons from randomly selected households were interviewed using a questionnaire, which was divided into three sections. The first was designed to provide background information on age, sex and major occupation of the interviewee, and size of household. The second section asked questions about elephant damage, such as history and period of damage in the farm, size of farm, type of damage, size of farmland damaged, and traditional methods used to deter elephants. The third section sought to determine the local perceptions about elephant conservation. The questionnaire contained 22 questions, of which 12 were of fixed

format and 10 were open-ended (Parry & Campbell, 1992). In addition, focused interviews (Bailey, 1982) were conducted in each of the two villages and allowed respondents to comment on potential strategies for reducing elephant impact in the region.

A Problem Animal Reporting (PAR) System (Hoare, 1990) was set up in Midjivin and Foulou, so that elephant movements and damages could be reported to the local enumerators. Enumerators were instructed on how to quantify elephant damage, spatially and temporarily.

RESULTS AND DISCUSSION

Behaviour of the elephant population

From observations made, the Kaélé elephants showed no signs of having been subjected to severe poaching pressure. When they smelt human beings they were just momentarily alarmed and returned to feeding immediately. The sound of humans caused more concern, but they returned to feeding after moving about 500m, and were not frightened by vehicles passing within 100m (Thouless & Tchamba, 1992). During the day time the elephants were usually concentrated in two or three herds of more than 100 individuals. They moved together in these large groups and started feeding on crops two hours before sunset. These aspects of behaviour differed considerably from crop-raiding elephants observed in East Africa, where crop-raiders tend to be in small groups of no more than 20 animals, only coming into the fields several hours after dark (Hoare, 1990; Ngunjiri, 1992).

The fact that the elephants remained tightly grouped may be an indication of heavy stress due to permanent harassment from local people and the crop damage control operation.

Size, age and sex structure of the population

The elephant population was estimated at about 320 individuals in 1992 (Thouless & Tchamba, 1992). In 1993 about 400 elephants visited the Kaélé region. Figure 2 shows the age structure of the Kaélé elephants in 1993. It indicates that the Kaélé elephant population consists mostly of sub-adults and adults (71% of the total population). Compared to the age structure of the elephant population of Waza (Tchamba, in prep.) it

appears that there is a marked scarcity of babies and juveniles in Kaélé (10% and 19% respectively compared to 14% and 25% respectively in Waza). This difference may indicate that the elephants of Waza and the elephants of Kaélé are two separate populations or that mostly mature elephants leave Waza National Park to roam in the Kaélé area. The sex ratio for immature elephants (<15 years old) was 1:0.9, whereas in mature elephants it was 1:1.2, not a significant departure from observations made in Waza (Tchamba, in prep.⁸); 1:0.8 and 1:1.4 for immature and mature elephants respectively.

The age and sex structure seemed to be typical of a very lightly poached population, with some large-bodied adult bulls which had heavy tusks by Cameroonian standards. The proportion of calves to adults was relatively low (22%).

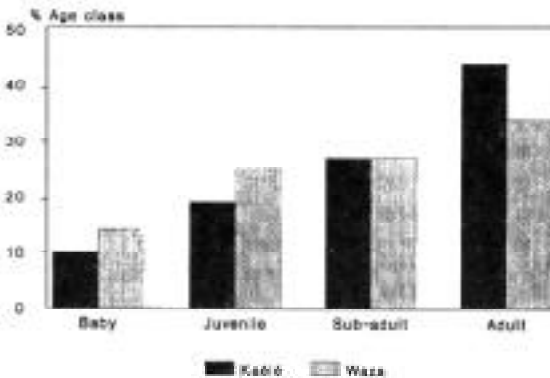


Figure 2. Age structure of the Kaélé elephants in 1993

Elephant impact in the villages

Ninety-seven questionnaires were administered with the help of two local people.

Rainy season sorghum (53%) and dry season millet (37%) were the most frequently damaged crops. Cotton (5%) and corn (5%) were also affected. Most damage (54%) was caused by browsing elephants. Damage from trampling (35%) was observed when elephants were chased away from the field by farmers. Uprooting occurred only in 11% of observed cases of crop damage.

In Midjivin, elephant crop damage affected 22% and 42% of cultivated land in 1992 and 1993 respectively, while the corresponding rates in Foulou were 25% and 39%.

It is very difficult to get a true assessment of the cost of crop damage by elephants throughout the Kaélé region. This is because there is a tendency for local authorities and farmers to inflate estimates of crop damage in anticipation of compensation by cash, food assistance or meat from elephants which are shot for damage control. Using local production figures and typical market prices, the direct loss was estimated at US\$ 38,740 and US\$ 75,180 in 1992 and 1993 respectively in Midjivin, and at US\$ 14,460 and US\$ 22,170 in Foulou.

In the Kaélé region one and four persons were killed by elephants in 1992 and 1993 respectively. The dead included a military colonel leading an army battalion deployed to shoot crop-raiding elephants. It is difficult to attach a financial value to human life since no compensation can fully cover the loss.

In addition to the direct costs incurred by loss of crops which would otherwise be eaten or sold, or by the death of human beings, there are indirect environmental and social costs. Soils, for example, are affected by elephant trampling. Disruption of social activities occurs when people have to spend the whole day or night guarding their farms. School children lose many school days assisting their parents to guard farms or chase away elephants. Some people have even abandoned their cultivated land due to fear of crop-raiding elephants.

Local strategies for reducing elephant impact

The most common strategy is beating drums or empty barrels to scare elephants with noise, but this only has the effect of moving the problem to other areas. Stones and wooden sticks are thrown at elephants, but this exercise sometimes leads to fatal accidents. Farmers also light wood stocks around their crops or simply sleep outside with a flashlight to guard their fields from elephants. They also pray collectively to request the assistance of God and consult witches for magical practices to move elephants far from their villages. In September 1993, local people blocked the highway between Garoua and Maroua (the two largest cities of northern Cameroon) for eight hours, to demonstrate against the lack of government assistance with the "elephant problem".

Government action to reduce elephant Impact

There is no official strategy for solving the human-elephant conflict in the Kaélé region. Wildlife authorities' actions are currently limited to shooting a few elephants to provide a cheap source of meat as compensation for crop damage. Two and seven elephants were killed in 1992 and 1993 respectively. The government recently indicated that US\$ 1.8 million would be distributed to farmers in northern Cameroon to compensate them for losses incurred through drought, locusts, birds and elephants. The assistance has yet to materialise and is awaited with doubt and suspicion that it will be "lost" somewhere on its way to the villages.

Opinions, concerns and expectations of local people

All the 97 respondents expressed a common concern: what will happen to their farms with an increased elephant population in the Kaélé region? They look on the wildlife authorities primarily as a law-enforcement agency not willing to assist people and they expect the local administration to help them cope with elephants more effectively. Thirty-four percent of respondents were concerned that they might be asked to emigrate in order to make space for elephants. Most of the respondents (98%) indicated that they did not benefit from crop damage control in terms of game-meat. A large part of the meat, they said, was shared among administrative, military and political authorities. Fifty five percent of respondents did not believe in the possibility of government compensation.

Forty-one percent hoped that wildlife authorities would move the elephants and fence them elsewhere. Some respondents (18%) suggested that all the elephants should be shot while others (15%) thought that only the animals responsible for damage should be killed. Four percent suggested that the elephants could be scared away by gunshots. Nearly one-quarter of those asked (22%) had no idea what should be done.

CONCLUSIONS AND RECOMMENDATIONS

The conflict in Kaélé illustrates a situation which might escalate in the future given the notable increase of elephant numbers in northern Cameroon. Any solution to be chosen will have to take into account

both the interests of the local people and the goals of sustainable elephant conservation. Kaélé tests the capacity of the government and its international partners to face and manage this type of challenge.

Five broad strategies can be considered to reduce human-elephant conflict. They are: (i) raising the tolerance threshold, (ii) deterrence of animals, (iii) culling, (iv) ecological infrastructure, and (v) physical barriers. These strategies have been applied to elephant management in different circumstances in southern and eastern Africa, with variable success (DHV, 1992).

Raising the tolerance threshold

One of the traditional ways of increasing the tolerance level of rural communities towards elephants has been to pay compensation to affected farmers. The compensation experiment in the Omay Communal Land, Zimbabwe, was abandoned in 1989, as was the official countrywide compensation scheme in Kenya (DHV, 1992). In Malawi, compensation appeared to have no beneficial effect on alleviating crop damage. A short-term solution for the Kaélé region may be to compensate farmers, whose crops have been damaged by elephants, by supplying them with millet or rice equivalent to the loss in yield. The drawback of such a scheme would be its administration -which would be open to abuse and corruption - and the difficulty of assessing damage. Therefore it appears that in this period of economic hardship, compensation is not a sustainable solution.

The distance separating Kaélé and the nearest national park (Waza, more than 120km away), along with legislation, complicate the sharing of revenues from wildlife-related activities by the Kaélé residents. Because tourist and hunting periods are limited to the dry season when elephants are not found in the Kaélé region, the linkage between costs and benefits of wildlife would be difficult to demonstrate to the local residents. Also, the implementation of a common property resource management scheme such as CAMPFIRE in Zimbabwe (Taylor, 1993) would hardly be compatible with present day realities in Kaélé.

One possible solution to reducing both the conflict and the number of elephants in Kaélé is to offer wet season safari hunting in the region. This could give residents the opportunity to earn some revenue from hunting activities. However, because of the potential abuse of

the system, guidelines should be established to ensure a sustainable harvest of elephants at the height of the crop-raiding season, with adequate distribution of financial returns to the local community.

Deterrence of animals

Deterrence may take the form of shooting, fire, noise, use of light or chemical applications. Most such methods fail in the long run (Bell & Mcshane-Caluzi, 1984; La Grange, 1989; Deodatus & Lipiya, 1991; Ngiure, 1992; Whyte, 1993). Once elephants are established in an area, they rapidly become habituated to any types of deterrence, accepting them as the price to pay for the bonus of feeding on tasty and easily harvestable human crops.

When the exact origins of the Kaélé elephants are known it will be important to establish a solid "front line" of well-defended farms to try and avoid the penetration of animals further into the region. This will probably require a full-time team of technicians and local informants with adequate transport and ammunition to follow the animals.

Culling

Culling, or selective removal of animals from a population, may be accomplished by killing or by translocation - the live capture and subsequent transportation of animals elsewhere (Jewell & Holt, 1981). Translocation is not applicable to the Kaélé elephants as they are not residents and move to the area only in the wet season.

In general, control shooting has failed to reduce damage rates to crops and in a few cases the value of destroyed animals has exceeded the value of damage inflicted (Bell & Mcshane-Caluzi, 1984; La Grange, 1989; DHV, 1992). Control shooting of elephants in the Kaélé region could be seen primarily as a palliative to local people who in turn, benefit from the indirect compensation of the meat.

Ecological infrastructure

The poor state of knowledge concerning the ecology of elephants in northern Cameroon hampers the development of a sound ecological infrastructure to reduce human-elephant conflict in the region. It is not clear, for example, how much the development of a buffer zone around Waza National Park, or the

improvement of elephant habitat in Waza, or the setting up of elephant corridors and stepping stones, would modify the behaviour of elephants.

Physical barriers

The construction of physical barriers attempts to find a semi-permanent or permanent solution to a conflict problem. Moats, ditches and trenches have been dug in various parts of east and southern Africa. However, they have achieved very limited success (DHV, 1992). In the Kaélé region of Cameroon conventional and electric fencing are clearly impractical, because of the large area involved, and the manner in which small fields are interspersed with uncultivated land. Waza elephants could be semi-confined by limiting their southward wet season migration with electric fences. However, this would increase elephant pressure within the natural habitat of Waza, which is already suffering from increased elephant density (Tchamba, in prep.). Successful use of fencing would require a clear understanding of elephant movements, with trained technicians employed to implement and maintain the fences (Hoare, 1992).

Finally, sustainable solutions for reducing conflict between humans and elephants need to tackle the problem at its source. Elephant conservation and management outside protected areas will largely depend on the perception of local communities towards elephants.

ACKNOWLEDGEMENTS

The assistance of Hamadou Paul and Tiawoun Sylvan with the collection of field data and the compilation of records is gratefully acknowledged. I express my sincere gratitude to the Netherlands Ministry of Foreign Affairs (Directorate General for International Cooperation) and the United States Fish and Wildlife Service for funding this research. My special thanks go to Hanson Njiforti for valuable comments on the paper.

REFERENCES

- Bailey, K.D. (1982) *Methods of social research*, 2nd edn. The Free Press, New York, NY, 540pp.
- Bell, R.H.V. & Mcshane-Caluzi, E. (1984) The man-animal interface: an assessment of crop damage and

- wildlife control. In: *Conservation & Wildlife Management in Africa*. Bell & Mcshane-Caluzi (Eds) US Peace Corps, Malawi. pp. 387-416.
- Daboulaye B.I. & Thomassey J.P. (1990) La problématique des populations d'éléphants et de leur habitat au Tchad. *Nature et Faune*, 6, 31-38.
- Damiba, T.E. & Ables, E.D. (1993) Promising future for an elephant population-a case study in Burkina Faso, West Africa. *Oryx* 27, 97-103.
- DDA (1981) Rapport annuel d'activités. Délégation Départementale de l'Agriculture du Diamaré, Maroua, Cameroun. 119pp.
- DDA (1983) Rapport annuel d'activités. Délégation Départementale de l'Agriculture de Kaélé, Kaélé, Cameroun.
- Deodatus, F.D. & Lipiya A.K. (1991) Public relations and crop protection electric fencing, Kasungu National Park, 1990. FAQ Field Document No.19, Department of National Parks & Wildlife, Malawi. 19pp.
- DHV (1992) Environmental impact of the proposed fencing programme in Kenya. Elephant & Community Programme, Phase 1. DHV Consulting/Price Waterhouse Harare. 103pp.
- Douglas-Hamilton, I. Michelmores, F. & Inamdar A. (1992) *African elephant database*. UNEP. 176pp.
- Hoare, R.E. (1990) Observations of elephant crop raiding behaviour and evaluation of electric fence designs in Laikipia District. Unpublished report to Kenya Wildlife Service. Typescript. 7pp.
- Hoare, R.E. (1992) Wildlife fencing as a management tool for protected areas in Africa. *IUCN Parks*, 3, 35-39.
- Jewell, P.A. & Holt, S. (1981) *Problems in management of locally abundant wild mammals*. (eds) P.A. Jewell, S. Holt & D. Hart. Academic Press, New York. 360pp.
- La Grange, M. (1989) Problem animal control. Game Management in Africa, P.O.Box St 32, Southerton, Harare, Zimbabwe. 81pp.
- Laws, R.M. (1966) Age criteria for the African elephants. *E.Afr. Wildl. J.* 4, 1-37.
- MINAGRI (1993) Rapport d'évaluation des dégâts causés par les éléphants dans le Mayo Kani au cours de la campagne agricole 1992-1993. Ministère de l'Agriculture, Système National d'Alerte Rapide, Yaoundé, Cameroun. 14pp.
- MINEF (1993) Gestion de l'espace et utilisation des ressources dans la région Soudano-Sahélienne. Projet PNUD/UNSO n°. CMR/89/X02. Ministère de l'Environnement et des Forêts, Yaoundé, Cameroun. 126pp.
- Ngure N. (1992) Human-elephant interactions: seeking remedies for conflicts. *Swara* 15, 25-27.
- Parry, D. & Campbell, B. (1992) Attitudes of rural communities to animal wildlife and its utilization in Chobe Enclave and Madabe Depression, Botswana. *Environmental Conservation*, 19, 245-252.
- SPTEN (1986) Rapport annuel d'activités. Service Provincial du Tourisme pour l'Extrême-Nord. Secrétariat d'Etat au Tourisme, Maroua, Cameroun. 67pp.
- Taylor, R.D. (1993) Elephant management in Nyaminyami District, Zimbabwe: Turning a liability into an asset. *Pachyderm*, 17, 19-29.
- Tchamba, M.N. (1993) Number and migration patterns of elephants in Northern Cameroon. *Pachyderm*, 16, 66-71.
- Thouless, C., & Tchamba, M.N. (1992) Emergency evaluation of crop raiding elephants in Northern Cameroon. Report to U.S. Fish & Wildlife Service. Washington. 13pp.
- Whyte, I. (1993) The movement patterns of elephant in the Kruger National Park in response to culling and environmental stimuli. *Pachyderm*, 16, 72-80.