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Elephants and Bees

Moroccan Beekeeping ◆ The Very Last Royal Show ◆ Bee Craft's Editors: David Ribbans

Bees help Protect Crops from Damage by Elephants in Kenya

Lucy King, MSc

A researcher in Oxford University's Animal Behaviour Research Group reports

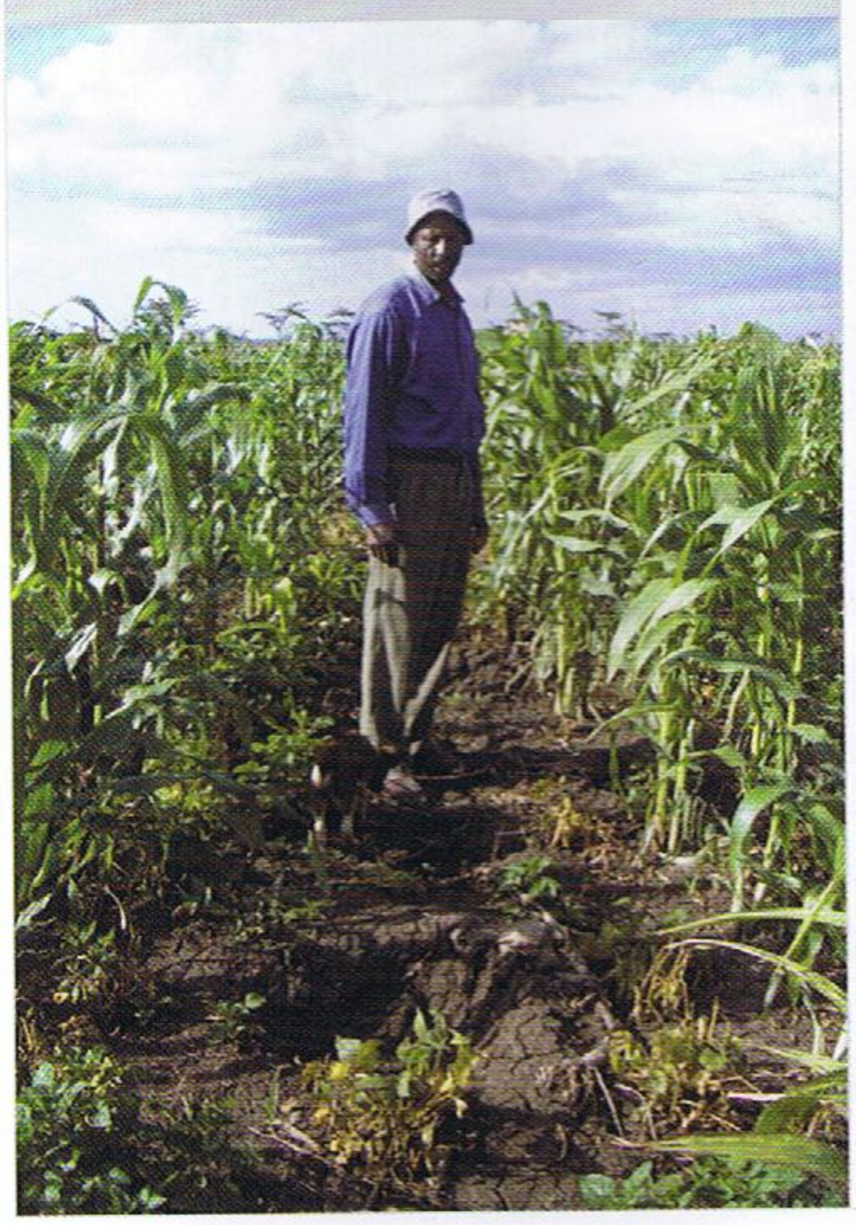
THE ELEPHANTS and Bees Research Project is one of Save the Elephants' innovative programmes designed to explore the natural world for solutions to human–elephant conflict. The project uses in-depth knowledge and observation of elephant behaviour to reduce damage from crop-raiding elephants, using African honey bees.

SAVE THE ELEPHANTS

Save the Elephants is a research team headed by the elephant expert Dr Iain Douglas-Hamilton, OBE. In collaboration with the Kenya Wildlife Service, we are investigating crop protection methods that can be financed and managed by the farmers themselves to provide long term solutions to human–elephant conflict.

Work by Save the Elephants in 2002 investigated elephant damage on acacia trees hosting empty or occupied bee nests. It demonstrated that trees with nests receive some protection. Anyone who has seen the destruction of trees by elephants in Kenya will appreciate the importance and implications of this study.

Felix the farmer surveys damage to his crops caused by elephants



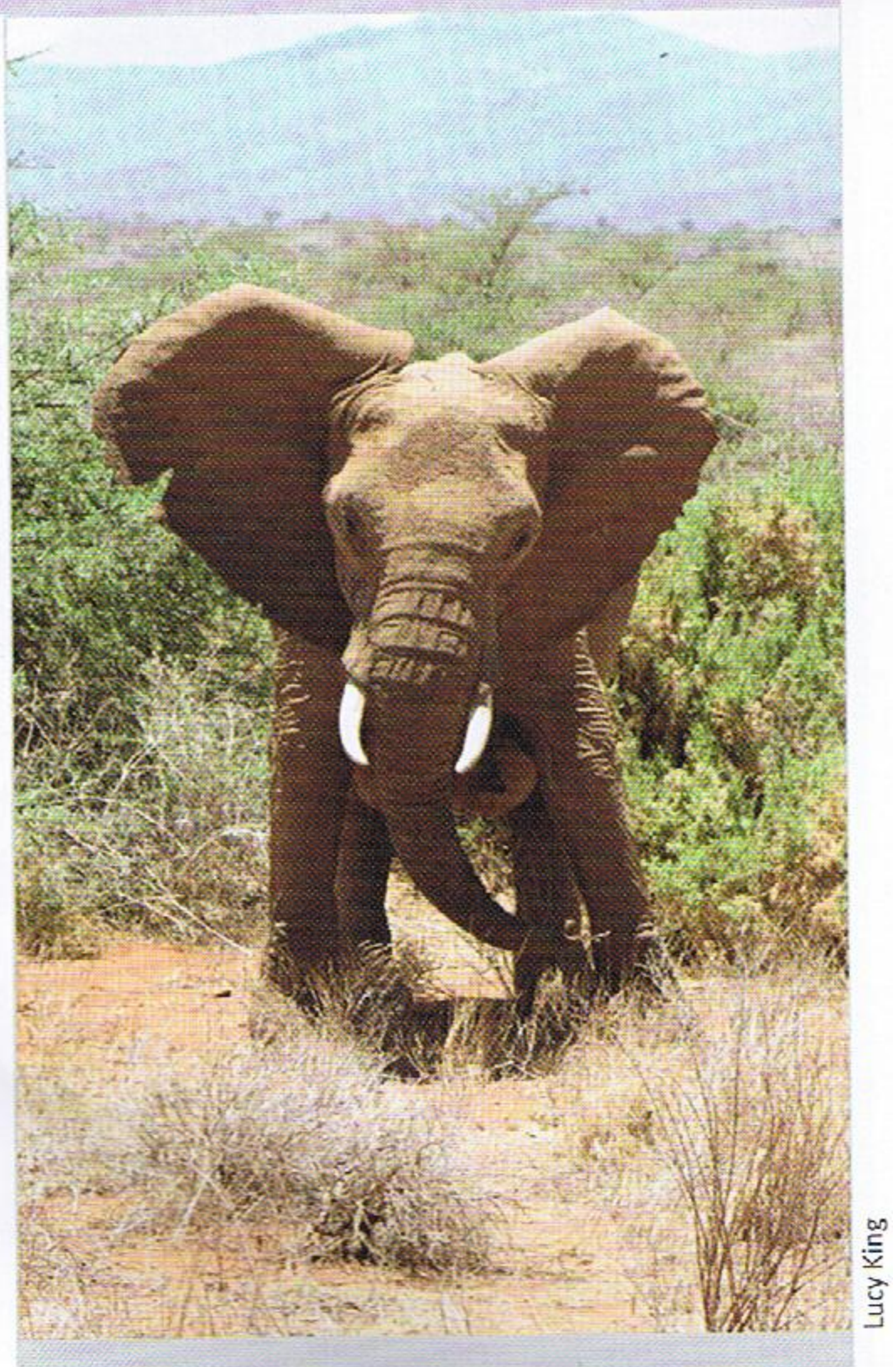
People and wildlife used to live side by side in Africa and in my study site in Kenya, there are still strong traditional and cultural bonds with elephants. However, as the human population has continued to develop and expand, elephants are being squashed into smaller and smaller home ranges, often with key migratory corridors being cut off by man-made structures such as roads, schools, farms, bore holes and factories. Because of this development, pastoralists in Kenya are being encouraged to settle down and grow crops.

This massive change in landscape use causes conflict with elephants which are still trying to utilise the full scope of their traditional home ranges. Elephants that come across farms full of ripe tomatoes, potatoes and maize won't hesitate to break in and start feeding and this is where the conflict begins. Farmers will do anything to keep their crops and families safe from damage and, unfortunately, records of shootings, spearings and poisonings of elephants are on the increase.

Our project work is trying to come up with a low-tech deterrent method that will not only keep elephants away from fields of crops but will also enhance the income of farmers through the sale of bee products.

ELEPHANTS FEAR BEES

My supervisor, Prof Fritz Vollrath, published a paper in 2002 which showed that elephants avoided trees housing bee colonies. Following this he did a rather unique pilot experiment using bee sounds. There was a semi-tame African elephant on one of the ranches in Kenya that had been badly stung by bees the year before. Fritz played bee sounds at this elephant to see what would happen. It was obviously really frightened and ran away.



Lucy King

This elephant is shaking her head in response to the sound of bees

This triggered off several research questions on which my DPhil studies are now based. The key attribute we are working with is the incredible memory that elephants have, showing that a past negative experience with bees can be remembered by them years later and this results in a retreating behaviour. I am now trying to understand this behaviour better by conducting more formal, controlled sound trials. Our initial results were published in *Current Biology* in October 2007.

Beekeepers use Kenya top-bar hives which can be made from local materials and suspended from trees or pole supports when forming a 'beehive' fence

BEES STING ELEPHANTS

Adult elephants can't be stung through their hides but bees are attracted to the moisture around their eyes which is a weak spot for stings. More importantly we know that, as elephants forage up in the branches of trees, they can disturb wild colonies. Bees can then get into and sting the inside of their sensitive trunks.

We have stories from people who have witnessed this unfortunate event and the elephant was described as going berserk, trying to get the bees out of its trunk. It must be terribly painful and not something an elephant would forget in a hurry.

We are also not sure if elephant calves would have skins thick enough to prevent bees stinging them. If not, it is understandable that mothers would be very wary about letting their young ones get too close to a wild African bee colony.

HIVES AS ELEPHANT DETERRENTS

We are working on a unique design for a 'beehive' fence which has gone through a successful pilot project stage. We are now planning a larger scale trial with more farms to see if this could be a potential solution for keeping elephants away from crops (or at least lessening the crop raiding damage). I'm also testing the idea that beehives suspended from trees offer them some protection.

CLOSE CALLS WITH ELEPHANTS

We had one female elephant charge us as we were clearing some dung away from a tree experiment we were doing. She shot around the bush faster than you can imagine with ears out and trumpeting loudly! Luckily the car was very close by and we were able to leap in and keep very still until she calmed down. Her trumpeting triggered her whole family to come out of the bush and they all started ear flapping at us in the car, circling around us and basically showing us who was boss!

Another time we were charged by a large bull in musth who was just bulging with testosterone and energy. I was in such a rush to get away from him that I had to drive my Land Rover up over a sandy ridge which slowed him down a bit. I went about 300 metres before realising that I was still in first gear and the screaming of my engine probably scared him off more than my deterrent tactics. Generally the elephants we work with are gentle and caring beasts but there is no harm in being reminded occasionally that we should be careful not to intrude into their space.

LATEST RESEARCH

With my two Kenyan field assistants, Lucas and Wilson, I am concentrating on a large-scale field trial of our beehive fence idea which will be crucial to see if the idea works in practice. I'm also collaborating with scientists from Disney's Wildlife Conservation Fund to expand and develop our sound experiments.

We had excellent news recently that

Log hives are hung in trees away from predators and thieves. Sooner or later they are occupied by swarms and the honey can be harvested

Here a crop of honey is being harvested from a Kenya top-bar hive

three of the beehives we constructed in Chumviyere have bees settled in them already, only three days after the fence was constructed. It gave us all a real boost that these new hives smell nice to the bees. We were reassured that we hadn't used any anti-bee materials by mistake. We also saw a swarm of scout bees hovering around a fourth beehive so let's hope this trend continues.

We have now built 500 metres of beehive fences. My fingers are torn to shreds from the wire and my best pair of jeans is ripped by all the thorns but I feel a great sense of satisfaction pervading my exhaustion.

The carpenters are back to work on the next 50 beehives and so we'll be back in the fields in a few weeks to construct the next 500 metres. The interesting aspect now will be monitoring the effect of the beehive fences as the elephant crop raiding season is fast approaching.

PRODUCTS OF THE HIVE

Honey is already harvested in some (but not all) parts of our study site as a low maintenance/high income crop. We are also hoping to make more use of beeswax for candles and creams.

The possibility of turning this economically beneficial activity into a crop raiding deterrent is an attractive proposition which complements the emerging strategy of self protection against elephant raids. If verified, this could lead to a countrywide wildlife management strategy to reduce human–elephant conflict in Kenya.

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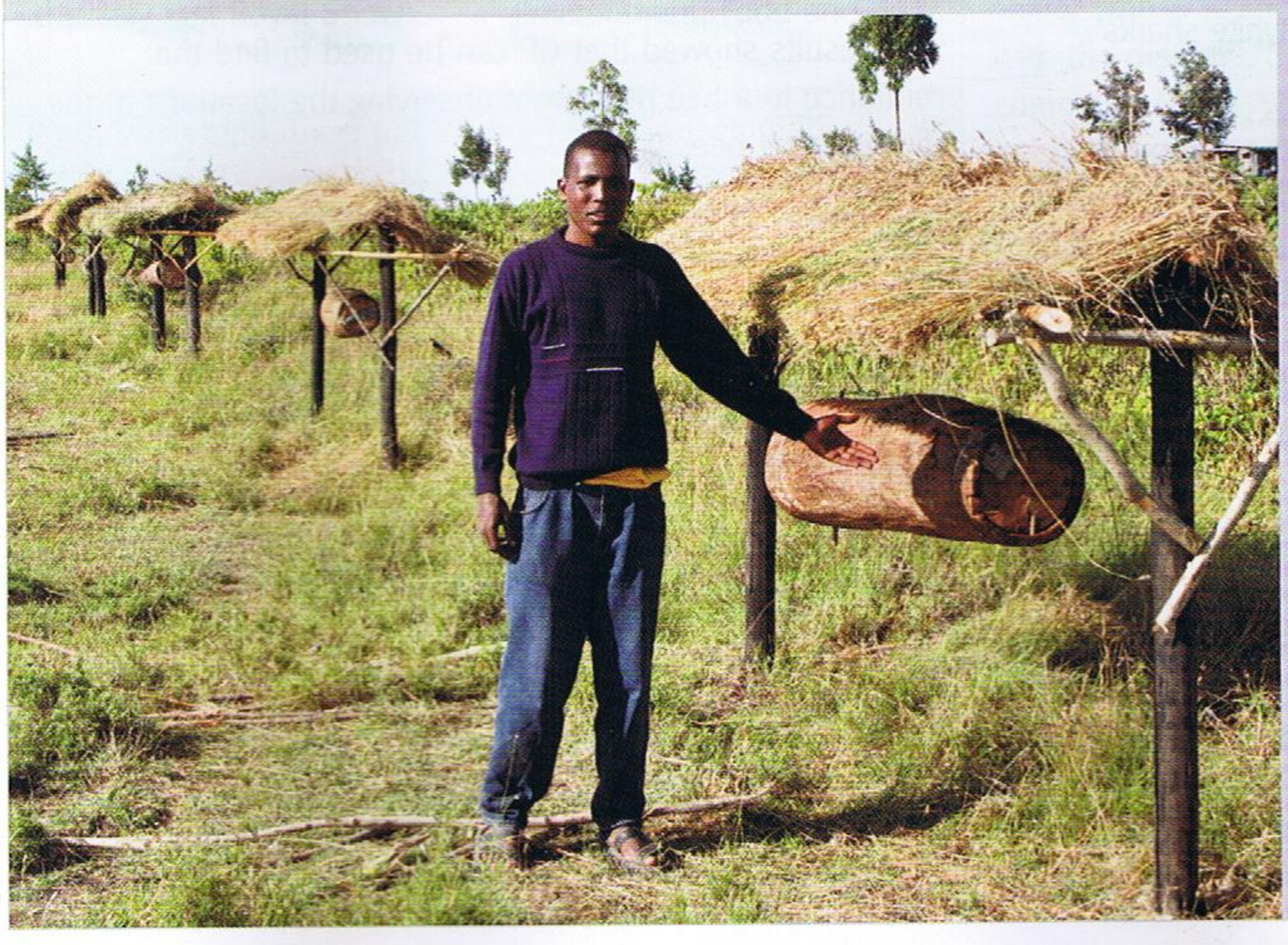
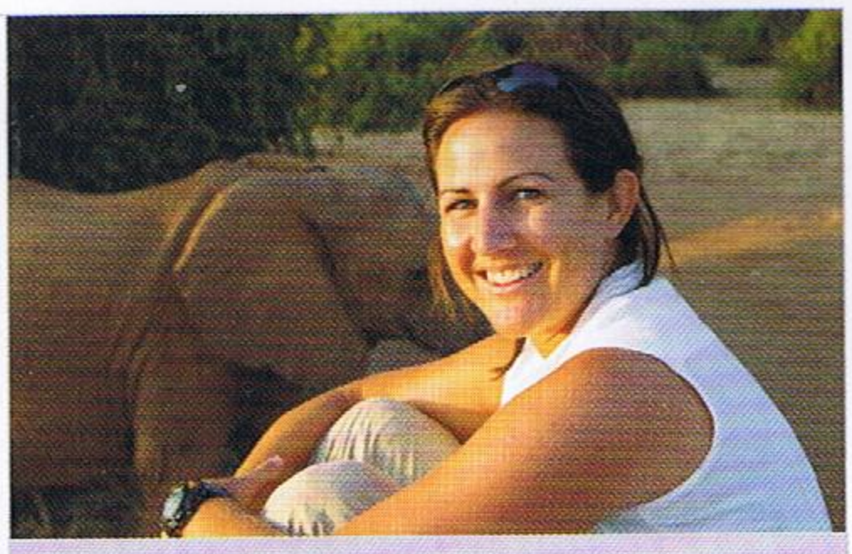
Beehives are suspended on wires between posts to create the elephant fence. Lucas demonstrates how each hive is protected from the sun and rain by a thatched roof





Lucy King was brought up in Somalia, Lesotho and Kenya. Her father worked with rural communities trying to improve agricultural practices so they frequently visited remote villages and travelled across the various southern African game reserves.

These travels inspired her to study Zoology at Bristol University where she graduated with First Class honours in 1999. She went straight into working for a small project and expedition company, Quest Overseas, which raised money in the UK to send volunteers to community projects abroad. She spent six years with Quest, setting up Quest Africa which involved sending volunteers out to Africa to work for six weeks on either a community or conservation project followed by a six-week adventure expedition across Southern Africa. They raised about £250,000 for Africa charities.

This work inspired her to return to university to study for a Masters Degree at Balliol College, Oxford. During this time she met the Chairman of Save the Elephants, Professor Fritz Vollrath, who is based at Oxford's Department of Zoology. They agreed that she could try a small pilot study looking at how elephants respond to bee sounds.

This MSc project led to securing funding for a full DPhil and Lucy has spent the last three years working on a series of elephant behaviour studies, investigating how elephants react to and communicate about bee threat.

It is very exciting and rewarding work, particularly collaborating with tribal communities who have welcomed her into their lives with amazing generosity. Lucy plans to remain in Kenya after her DPhil to keep working on this and other projects for Save the Elephants. (www.savetheelephants.org)