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Elephants and Bees

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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 programs 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 honeybees.

SAVE THE ELEPHANTS

Save the Elephants is a research team headed by the elephant expert Dr Iain Douglas-Hamilton, OBE. In collaboration with Kenyan 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

A farmer surveys damage to his crop caused by elephants



occupied beehives. It demonstrated that trees with hives receive some protection, especially if the hives were occupied by bees. Anyone who has seen the destruction of trees by elephants in Kenya will appreciate the importance and implications of this study.

People and wildlife used to live side by side in Africa and in my study site, 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. Due to this development, pastoralists in Kenya are being encouraged to settle down and grow crops.

This massive change in landscape use causes conflict with elephants who 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



This elephants is shaking its head in response to the presence of bees

showed that elephants avoided trees with beehives in. 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 a bee swarm the year before. Fritz played bee sounds at this elephant to see what would happen. It was obviously really frightened and ran away.

This triggered off several research questions which is what my DPhil is now based on. 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 elephants years later and 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.

Photographs supplied by Lucy King



Beekeepers use Kenyan top-bar hives which can be made from local materials and suspended from trees or wires

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 beehives. 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 forage in a hurry.

We are also not sure if elephant calves would have thick enough skins to deter bee stings. 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 lessen 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 had 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 must 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 landrover up over a sandy ridge which slowed him down a bit. I went about 300 metres before realising that I was still in 1st 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

We are 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 Disney's Wildlife Conservation Fund scientists to expand and develop our sound experiments.

We had excellent news recently that three of the beehives we constructed

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





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

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 lets hope this trend continues.

We have now built 500 m of beehive fences. My fingers are torn to shreds from the wire and my best pair of

jeans are 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 m. 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 a highly attractive proposition which complements the emerging strategy of developing farmer-based approaches to self-protection against elephant raids. If verified, this could lead to a countrywide wildlife management strategy to reduce human-elephant conflict in Kenya. ✪

REFERENCES

Current Biology, October 2007, **17**, 832–833
African Journal of Ecology, 2009, **47**,



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, who raised money in the UK to send volunteers to community projects abroad. She spent 6 years with Quest setting up Quest Africa which involved sending volunteers out to Africa to work for 6 weeks on either a community or conservation project followed by a 6 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 lead into securing funding for a full DPhil and Lucy has spent the last 3 years working on a series of elephant behaviour studies, investigating how elephants react 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.

Bee hives are suspended on wires between posts to create the elephant fence. Each hive is protected from the sun and rain by a thatch roof

