



**Pictured:** Fred is one of the elephants notorious for crop raiding who has been collared by the Mara Elephant Project.




# The economics of saving Kenya's elephants

As Africa's grey giants clash with a growing population in southern Kenya, the Mara Elephant Project goes high-tech

**By Roberta Staley • Photographs by Tallulah**



**ABOVE** Mara Elephant Project rangers try to spot a crop-raiding elephant on their drone flight controller.

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It's closing in on the end of a long day of elephant collaring in the Nyakweri Forest in southern Kenya's Maasai Mara region. But for Dr. Jake Wall, back in his office at Mara Elephant Project (MEP) headquarters, work concerns are far from over. He peers closely at 21 tiny elephant icons on an enormous, 65-inch wall-mounted Sony television screen displaying colourful forest-green and savannah-brown topography. The icons bear slightly whimsical names: Ivy, Fred, Hugo, Kegol and, now, Fitz — the young bull elephant collared a few hours ago by two teams of MEP rangers, Wall and a Kenya Wildlife Service (KWS) veterinarian, who darted the pachyderm with a tranquilizer and later administered the antidote to rouse him.

"There's Ivy," says Wall, who became MEP's director of research and conservation early this year. He points to one icon with a long, meandering digital trail. The thread indicates the 35-year-old elephant's movements, which are being recorded thanks to an inventive software platform called EarthRanger, which Wall helped develop while undertaking a PhD in

elephant spatial behaviour at the University of British Columbia in Vancouver. Since then, EarthRanger has gone on to become the gold standard for protected-area management initiatives throughout Africa.

"Delta Team is waiting," Wall says. "They'll wait until they get a geo-fence break from Ivy. That might happen at 10 pm, it might happen at 2 am. The elephants are more active at night because of people."

In simple language, a "geo-fence break" means that Ivy is, once again, leading her herd into temptation — crop raiding. Her heavy Kevlar collar — with its lithium batteries, GPS software, very high frequency (VHF) beacon and Iridium satellite transmitter that connects data straight to EarthRanger for real-time, 24/7 tracking — gives her away. The software is equipped with analyzers that, when a new data point is registered — such as Ivy moving to within a kilometre of a village — an algorithm is triggered and sends an alert to MEP staff. Unbeknownst to Ivy, that's lucky, as one of MEP's six ranger teams, such as "Delta," consisting of four to eight rangers, will receive the exact coordinates of Ivy's nefarious activities on their phones via short message service (SMS). Because they live not only on MEP headquarters but in temporary camps scattered about the vast range MEP monitors, the rangers can

react quickly to an alert, jumping in a Land Rover cruiser and motoring over rough, dirt roads to where the crop-raiders are. The rangers will then frighten the elephants away with non-lethal deterrents like chili bombs, which launch pepper spray at the animals, or fly drones over their heads. The high-pitched whining and diving sends pachyderms scurrying, possibly because the noise reminds them of bees.

The rangers, who are trained in conflict mitigation, will record every detail of the marauding: where the event was, what type of crops were damaged, were there preventions such as electric fences, what time did the event occur, how long did it take to shoo the animals away? "We're hoping that data collection will help inform our conservation practices," says Wall. These include determining patterns, such as the most likely time of night and time of year elephants raid crops. "One of the things we do is build up a picture. We want to move from conflict to coexistence."

Easier said than done, with a cascade of social, economic, cultural, climate-change and deforestation factors at play, including a mushrooming human population that is putting enormous pressure on elephants' range. Pachyderms traverse vast distances, up to 65 kilometres a day, through forest and over grasslands in order to consume the huge amounts of



**ABOVE** Mara Elephant Project's CEO, Marc Goss, lands his helicopter on the edge of the Nyakweri Forest, accompanied by an armed member of the Kenya Wildlife Service; Maitai Jackson, MEP's assistant warden, demonstrates how to fling a chili bomb using a slingshot; a close-up of a chili bomb.

food they need — as much as 270 kilograms a day for a bigger animal. Increasing populations has meant more land is being fenced off, while forests that provide rich and varied food for elephants are being decimated by people clandestinely clear-cutting trees — even in protected areas — and burning them to make charcoal, which is then sold locally and to other African countries.

#### Elephants decimated

The world has changed dramatically for elephants since the turn of the 20th century. Kenya's population has grown to 53 million from 2.8 million, and that number is projected to rise to 67 million by 2030. On the continent, the elephant population is now deemed "vulnerable," plunging to just 415,000 today from 10 million in 1930, the World Wildlife Fund states. The population nosedived with the popularity of big-game and ivory hunting. More recently, from 2011 to 2015, African elephant poaching skyrocketed when the price of ivory tripled in China; 100 pachyderms a day met a violent end, according to World Elephant Day.

In the Maasai Mara, there are 2,400 elephants, their status as a keystone species making every single one of them invaluable. They are Africa's gardeners, boosting plant biodiversity

and spreading nutrients thanks to their seed-laden dung. Dung beetles also carry elephants' plant-heavy manure underground, a sublime form of carbon sequestration, says Wall. Elephants uproot bushes, push over small trees

**Each pachyderm brings from US\$1.4 million to US\$1.6 million in tourism dollars into Kenya in its lifetime**

and dig up soil. Such behaviour, rather than being destructive, is architectural, controlling bush overgrowth and keeping grasslands open and healthy for other animals like gazelles, antelopes, zebras and wildebeests.

A 2019 report by *Nature Communications* indicates that poaching has declined in the past few years, thanks to China's ban on ivory in 2017. However, raw ivory is still in high demand in other Asian countries. In the Maasai

Mara, poaching has diminished due largely to MEP's intelligence operations, which the organization focused heavily on during its first full year of operations, in 2012, when 96 elephants were killed, says MEP CEO Marc Goss, a tall, Swahili-speaking, Errol Flynn type with a boisterous laugh. Goss flies MEP's helicopter, which had been lent to the organization by the Karen Blixen Camp Trust, operated by a nearby eco-tourism safari facility of the same name. In those early years, says Goss, MEP's intel unit set up sting operations with armed KWS officers to bust ivory dealers and confiscate their illicit caches of tusks. "It used to be very exciting," Goss recalls. "Death threats, hiding in the bushes, jumping out."

#### Human-elephant conflict

Last year, poaching fatalities fell to four. The big worry today is what Wall calls human-elephant conflict, which killed 12 elephants in 2018. Wall points to another icon on the TV screen. "This is Fred," he says. "He's crossed the river. He's on the other side." Fred likes to tag-team with co-conspirator Kegol, another collared elephant, when he has mischief on his mind. "The two of them might be lining up to go crop raiding," Wall says. It's going to be a busy night for the MEP rangers.



**ABOVE** An elephant mother and her calf near the Mara River are among the pachyderms monitored by Mara Elephant Project's six ranger teams.

Wall compares elephant crop raiding to human consumption of alcohol. There are the binge drinkers, the occasional tipplers and the teetotalers. Ivy — first collared by MEP in late 2011 — is a binger. Distinctive for having only one left tusk, Ivy has successfully raised two babies and is a much-admired as well as notorious elephant. Wall is a big fan. “She’s super smart. She’s an important elephant to be tracking. She keeps crop raiding, so we’re using her as a beacon for other elephants, as she’s not on her own; she’s with other elephants.”

Despite being attacked in the past with arrows, and in spite of MEP’s ranger teams regularly chasing her away from farmers’ maize and sorghum crops, Ivy continues plundering. It makes for uneasy relations with local Maasai villagers, although the creation of conservancies in regions like the Maasai Mara have made elephant raiding more tolerable to native Kenyans. There are 14 privately managed conservancies in the Maasai Mara region that are run for the benefit of tourists, wildlife and local Maasai tribespeople, who receive guaranteed

revenue generated from lease fees in return for leaving their land open to wildlife. MEP’s headquarters, with its permanent housing for rangers, as well as brand-new accommodations and mess hall for visiting researchers, is located in the Lemek Conservancy. MEP operates across all 14 conservancies, which cover just 1,500 square kilometres of the vast area it monitors, including the unprotected areas where human-elephant conflict most commonly occurs.

But even in those areas where Maasai are receiving regular lease payments, human-elephant conflict inevitably arises, while villagers’ patience dwindles. This year, Goss, in order to save a young bull elephant who was running for his life from villagers who had peppered him with 24 arrows, landed the helicopter in between the attackers and the elephant to protect the terrified pachyderm. Goss then flew the helicopter to pick up the veterinarian. They managed to track down the still-fleeing elephant, even though he wasn’t collared. Goss, the vet and MEP rangers tranquilized the animal, pulled arrows out of both sides and treated

the deadly wounds, any of which could have become infected, leading to septic shock and organ failure.

Ivy is now on her fourth collar (it costs MEP \$26,000 to collar an elephant, which covers the hardware, helicopter and veterinary time, drugs and ongoing digital and field monitoring). Despite her roguish ways, Ivy is one of the elephants enriching the Maasai Mara and the tribal Maasai who inhabit the area, grazing their cattle and growing crops. That’s because elephants are a huge tourist draw. In the Maasai Mara, 600,000 people every year — mainly well-heeled Westerners — come to see the wildlife and especially the elephants. (Tourists also come to the area to see the famous Great Migration of more than two million zebras, wildebeests and gazelles that travel north 800 kilometres from the Serengeti plains in Tanzania into the Maasai Mara, starting each May.)

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# Mara Elephant Project

## 2018 highlights

The Mara Elephant Project (MEP) has 57 rangers, who monitor the Maasai Mara, and an intelligence arm, which works with the Kenya Wildlife Service to nab poachers. Highlights from 2018 include:

- 46 total arrests
- 356 kilograms of ivory seized
- 324 snares removed
- 203 human-elephant conflicts attended to
- 17,640 kilometres patrolled on foot
- 141,729 kilometres patrolled by vehicle

42 years has been rescuing baby elephants, orphaned by poachers, and rehabilitating them back into the wild. This huge figure compares to the comparatively paltry sum of \$21,000 that organized traffickers receive — the poacher receives far less — for a set of tusks on the black market in Asia.

### Ivy goes raiding

Early the next day, Delta Team reports that its rangers have indeed spent the night chasing Ivy and an additional nine elephants from her herd out of a crop field. Several hours later, at 7 am, Delta Team responded to a call from a village just one kilometre away from their temporary camp. A big bull elephant was inside a maize, sorghum and bean field. Residents had tried to protect their village from elephants by installing an electric fence. The animal, however, crashed through the gate, the only portion that wasn't electrified. He then panicked and couldn't find his way out. The electricity had to be turned off, allowing him to run through the wire to safety. Sairowua takes out the MEP drone and does a flyover to see how far the rogue animal has fled. He is long gone. Says villager Johnson Moseti, "We love the elephants, but they are causing destruction all the time."

Back at headquarters, Wall is apprised of the situation and says with a sigh that the big male will likely have to be collared. Sometimes, Wall admits, he'd love to return to pure research and start digging into the massive amount of



**ABOVE** After drinking in the Mara River, an elephant will take a dust bath to protect its hide from the sun.

data he's accumulated, rather than reacting to such day-to-day concerns as protecting maize-munching elephants. Analyzing the data from EarthRanger will give answers to the big questions related to elephants' future safety and welfare. Where are the important elephant migration corridors? How much rangeland do they

need? What crop alternatives can villagers grow that elephants will find unpalatable, thus lessening human-elephant conflict? Driving all of this is Wall's concern and deep respect for elephants like Ivy, who walk the earth with such dignity and intelligence. "The world is better with her in it," he says. 🐘