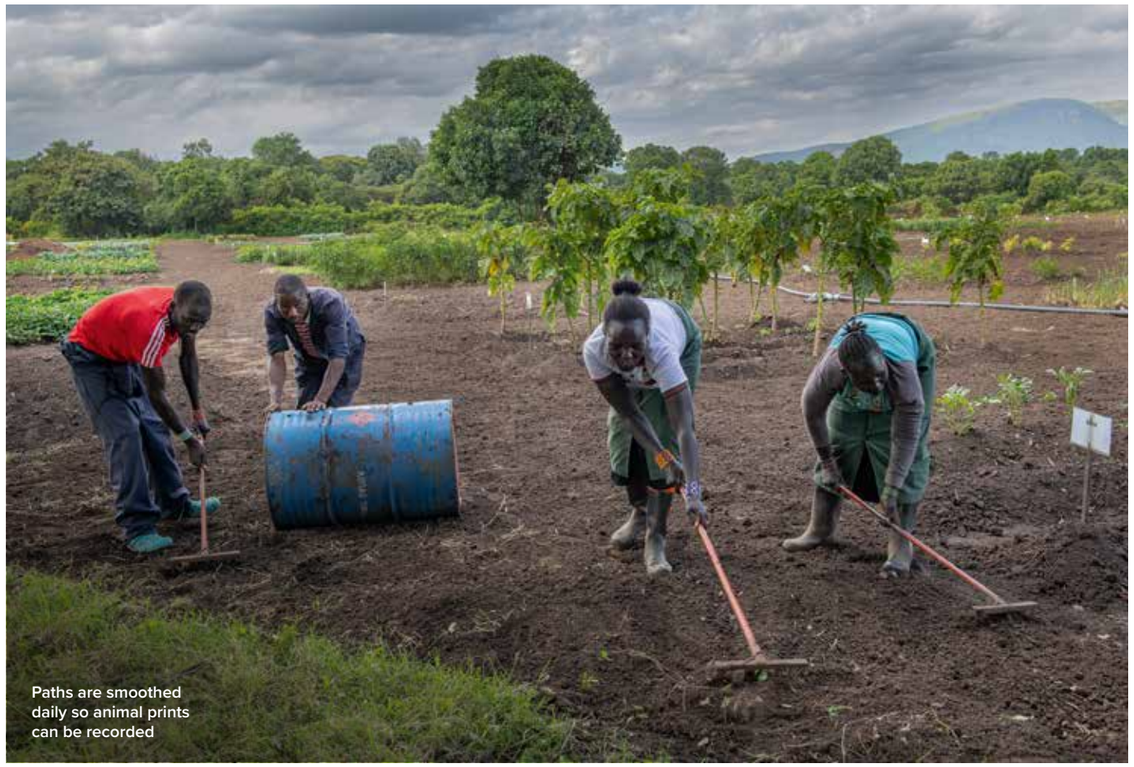
CRUNCH TIME

Conflict between farmers and African elephants is a pressing issue, but growing crops they find less appetising could be the perfect solution

Words by **ROBERTA STALEY**

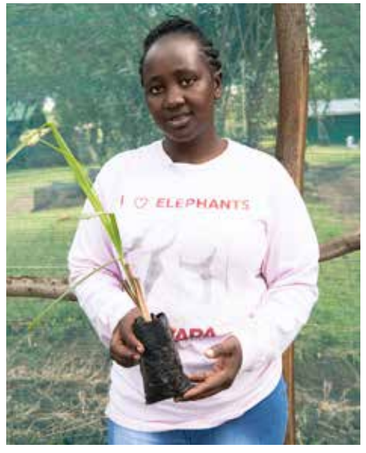
STU PORTER/ALAMY

Elephants are straying onto farmland in search of food



Paths are smoothed daily so animal prints can be recorded

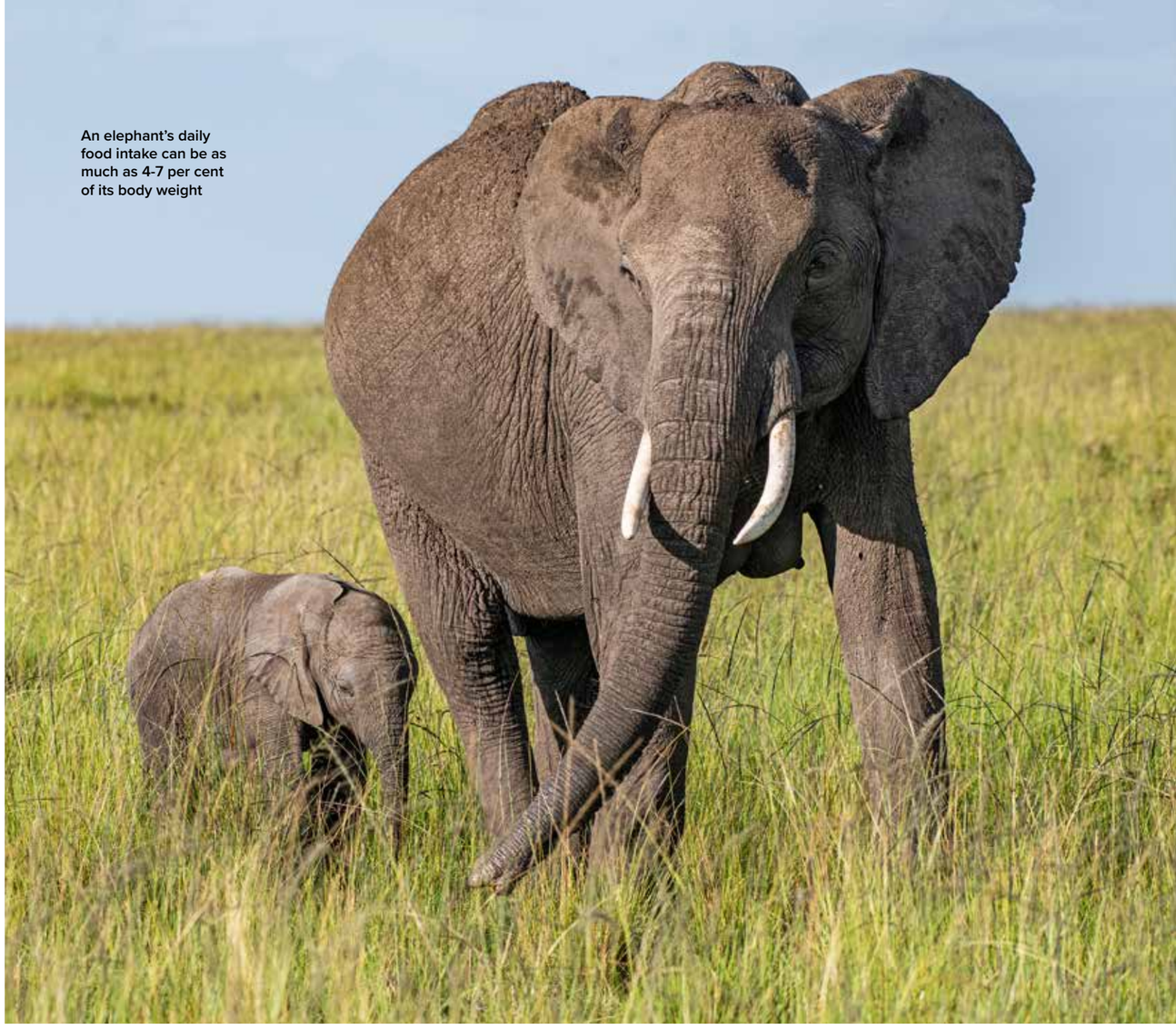
JOB INTERVIEWS SOMETIMES involve odd or awkward questions. Abigael Simaloi Pertet's interview with the Mara Elephant Project (MEP) in Kenya was no exception. "Are you okay to live in a tent?" the MEP asked Pertet. "I was a scout – I can live in a tent!" 32-year-old Pertet responded enthusiastically. She got the job.



Manager of the Mara Elephant Project's Experimental Farm, Abigael Simaloi Pertet

ABOUT THE AUTHOR

Roberta Staley is an award-winning, Vancouver-based magazine writer/editor, author and documentary film-maker. See more of her work at robertastaley.com.



An elephant's daily food intake can be as much as 4-7 per cent of its body weight

ALL IMAGES: TALULAH

It wasn't just her willingness to rough it. Pertet's honours degree in agronomic engineering from EARTH University in Costa Rica was key to securing the role as manager of MEP's Experimental Farm Project in the Transmara. The region lies to the west of Kenya's world-famous Maasai Mara National Reserve – one of the most biologically diverse areas in the world.

THE PROJECT LAUNCHED IN August 2021 and by October of the same year, Pertet was throwing herself into the job. Assisted by four farm researchers, she started preparing the five-acre plot to plant crops in neat, 5m² squares separated by wide pathways. Unlike most farms in the area, the acreage isn't fenced. Pertet wanted as many wild animals as possible – especially elephants – to peruse the farm's 32 different offerings: beans, garlic, onions, kale, cabbages, berries, ginger, peas, managu (African nightshade), wheat, butternut squashes, tomatoes, spinach, potatoes, lemongrass, coriander, tree tomatoes, chillies, watermelons, maize, sweet potatoes, cucumbers, aubergines, carrots, lavender, okra, rosemary, citriodora, tea tree, sunflowers, peppers and peppermint. The colourful smorgasbord would help her to pinpoint which crops elephants will turn their trunks up at and which will tantalise their tastebuds.

> "The colourful smorgasbord would help her pinpoint which crops elephants turn their trunks up at"

Pertet is trying to find a replacement for maize. This subsistence crop is grown to make the beloved national dish of boiled maize flour, known as ugali. All over the country, and especially in the Transmara, farmers are encroaching into elephant habitat to plant fields of maize and beans. But for elephants, a ripe maize crop is like

Neatly divided crop squares at the Experimental Farm

Discovering marketable crops will allow the local women to move away from subsistence farming

Elephants will eat bark and leaves

a corner shop giving away free sweets. They cannot resist the temptation.

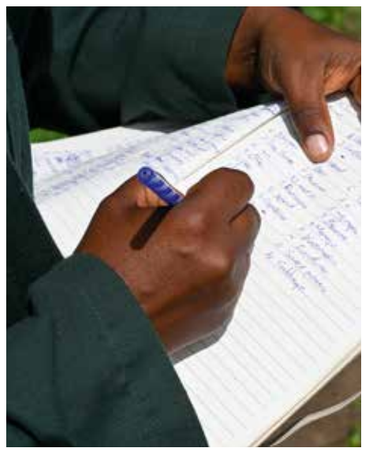
It is a deadly food addiction. Understandably outraged at waking up to a decimated crop, farmers maim or kill elephants using spears and arrows in an effort to deter future raids. Known as human-elephant conflict (HEC), crop-raiding violence has become so widespread that it now poses a greater threat to the species than ivory poaching.

It's dangerous for people too. When the maize is close to ripening, farmers camp out in their fields, light fires and beat drums to drive away potential elephant marauders, risking injury and even death.

Understanding what choices crop-raiding elephants make, therefore, is a critical component in mitigating the conflict. And with the Experimental Farm sitting at a natural conflict point, at the junction of an elephant 'corridor' (an ancient migration route) and the 1,600-strong human population of the town Emarti, there's possibly no better location for a taste test.

Once Pertet establishes the crops that elephants like and dislike, the next step is determining which of these can sustain a family or provide an income. Herbs such as lavender, for example, are in demand for their volatile aromatic oils used in aromatherapy; peas and spinach can be marketed to local safari camps; sunflowers have high value for their seeds and oil. Pertet will also determine crop viability by assessing how many nutrients they draw from the soil and how much irrigation they need.

Every new crop is sowed in several plots across the Experimenal Farm to ensure the elephants don't become habituated to eating only in certain areas, and to help



Pertet has been carefully recording the elephants' food preferences at the farm

TALLULAH (X3); ELEPHANT: YVA MOMATIUK & JOHN EASTCOTT/MINDEN/NPL

"Five motion-sensor cameras, installed on trees, capture footage of any crop raiders"

Pertet obtain a statistically accurate picture of which they prefer. Plants are watered from the nearby Mara River using a furrow irrigation system with soft hosing that can withstand the weight of an elephant. Five motion-sensor cameras, installed on trees, capture footage of any crop-raiders, and at the end of each day, farm staff rake the pathways between crops, then run a heavy drum over the dirt, smoothing the surface to record hoof and paw prints.

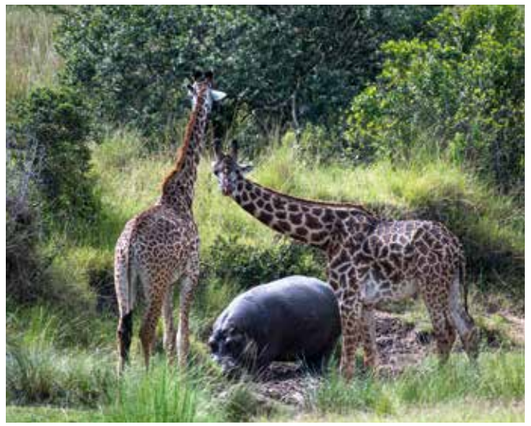
By June 2022, the Experimental Farm had produced its first crops, and preliminary data has yielded a few eye-openers.

The first is that elephants may be getting a bad rap. Pertet says that camera footage and tracks shows that hippos and black-faced vervet monkeys are so far the most voracious crop-raiders at the Experimental Farm. Birds also target the farm's sunflowers, which elephants shun. Despite sowing multiple crops, Pertet has yet to obtain a single harvest of sunflower seeds.

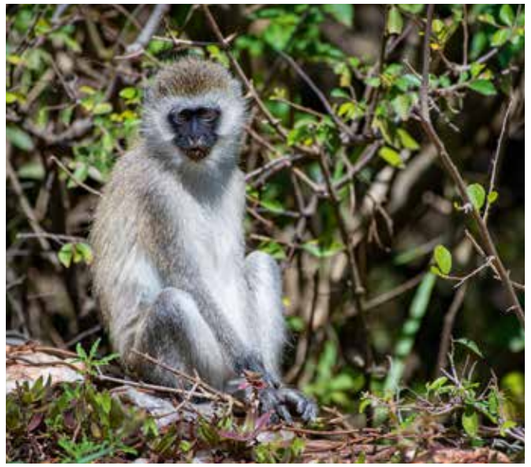
Hippos, as it turns out, are clever crop-raiding tacticians. A large bloat of hippos stays submerged all day in the Mara River about 50 metres from the farm, resembling boulders in the turgid, brown water. At nightfall, they clamber up the bank to forage. Data shows that hippos are enamoured with sweet potato vines; one night, a hippo consumed the vines on all five plots. It then moved on to an entrée of maize, before delighting in a palate-cleanser of lemongrass.

One local farmer, Noorkidemi Tukero, aged 50 and with eight children, points to a brown, wilting field of maize stalks adjacent to the Experimental Farm. "This is my husband's land; it was maize and the hippos ate it," she says. "I came out and the crop was half gone. The other half was gone the next day. It was devastating. We had to sell two cows to pay for food and school fees."

The farm, which has a US$38,000 budget for the two-year experiment, has



It's not just elephants that love maize – hippos and black-faced vervet monkeys were caught raiding the farm too



Herds comprise of females and their calves, usually led by one matriarch. Males tend to live in isolation.

"Ranger teams drive the elephants away using non-lethal deterrents such as chilli bombs and bangers"

tested possible deterrents, including digging ditches around crops. It worked, but only for elephants and hippos, says Pertet. Vervet monkeys merely scampered across the trench, happy to munch maize without any hulking competitors around.

It's clear that with so many animals mad about maize an alternative must be found. "I feel really bad as it's the farmers' source of income," says Pertet. "It's their livelihood. It's what they eat every day. But the bottom line is: we live with the wildlife, so let's look for a solution together."

Pertet is hoping to come up with long-term deterrents to crop raiding, but for now is relying upon ad-hoc solutions to keep the peace between farmers and elephants. The MEP, which has an annual US$1.5 million budget, keeps a small blue helicopter on standby at its Maasai Mara headquarters, about 10km away by air. Reacting to farmers' reports of elephant crop-raiders, CEO Marc Goss will pilot the chopper towards the pachyderms, driving them away from human habitation and into a nearby conservancy where they will be safe. Alternatively, one of MEP's eight ranger teams, located throughout the Maasai Mara region, drive the elephants away using non-lethal deterrents such as chilli bombs, bangers, bright lights or patrol vehicles. (The MEP, created in 2011 as an anti-poaching group, focuses today on encouraging local communities to embrace elephant conservation.)

Increasingly, local farm women, who are responsible for family meals, are becoming more open to the possibility of replacing maize. Pertet, a nutrition educator as well as an agriculturist, recalls how joyful one woman was when she learned that potatoes could grow in the Transmara. "We've never known that our land can give potatoes!" the surprised woman responded.

The thought of making an income from crops, rather than growing plants for sustenance, intrigues the local women.

TALLULAH (X3): HERD OF ELEPHANTS: MARGUERITE SMITS VAN OYEN/NATUREPL.COM

"Anything you don't eat directly you can use to buy a cow and buy food," says 32-year-old Sharon Nashipae, who has five children. "If we can get an income from it and we don't have to protect it from elephants, we love the idea."

Such pragmatism, however, doesn't necessarily extend to supporting elephants' need for wide open spaces and lush vegetation. Nashipae is aware that miles of fencing and new home construction intrudes upon elephants' ancient migration corridors and feeding grounds. However, "I don't feel bad," she says. "It's my land and I'm entitled to live here."

The Transmara is a highly fertile district encompassing an area of more than 1,000km² north of the Tanzanian border. It supports a rapidly growing population of subsistence farmers as well as wild animals. This includes an estimated 200 to 300 resident elephants that once ranged the Transmara, but are now

Local communities have been forced to defend themselves and their fields with weapons

IN NUMBERS

Kenya's elephants

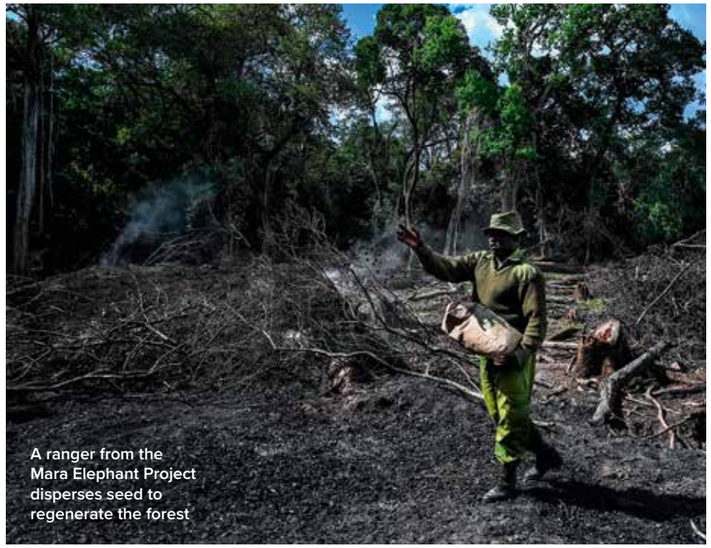
35,500 elephants were recorded by the Kenya Wildlife Service in 2022, up from 16,000 in 1989.

11 elephants were poached for their ivory in 2022.

83 incidents of human-elephant conflict were responded to by the Mara Elephant Project's ranger teams during 2021.

217kg of ivory was seized in 2021 by the Kenya Wildlife service, based on Mara Elephant Project intelligence. Poaching no longer poses a significant threat to elephants in Kenya.

400,000 elephants exist in Africa, down from three to five million a century ago. About 30,000 die annually from poaching and human-elephant conflict.



A ranger from the Mara Elephant Project disperses seed to regenerate the forest

Nyakweri Forest

Lessons to learn from the loss of this vital habitat

A HERD OF ELEPHANTS, MANY of them cows with calves, use their trunks to tear branches off trees in the Nyakweri Forest, on the western edge of the Maasai Mara National Reserve in Kenya.

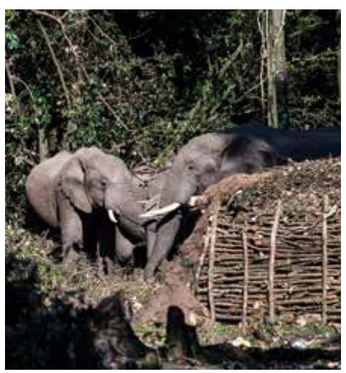
It should be bucolic, but the air is acrid from the smoke of burning charcoal kilns, while the elephants eat within metres of enormous stacks of illegally chopped trees that will be sold as timber or turned into charcoal. It is a stark reminder of the harsh competition for land between elephants and humans in Kenya.

The Nyakweri Forest, a carbon sink as well as an important watershed feeding Lake Victoria, is being degraded at breakneck speed. Here, 70 elephants are hemmed in by the rapid fragmentation of land for crops and cattle pastures, while miles of fencing cuts off their corridor into the Maasai Mara. Unlike the Maasai Mara, which has 14 conservancies where animals roam unfettered by human habitation, the Nyakweri Forest is community owned and individuals have their own plots of land.

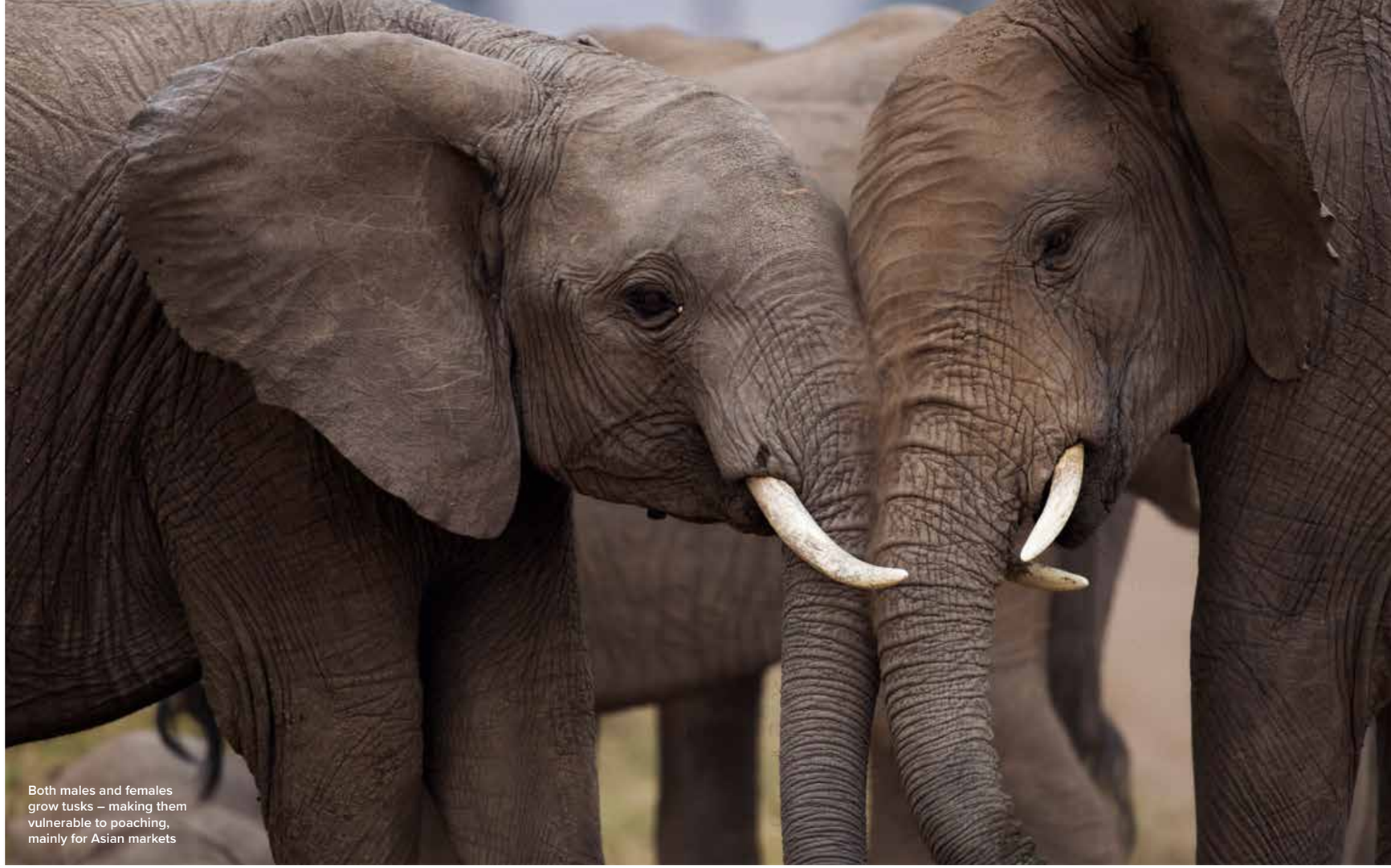
"In the past 20 years, we've lost 50 per cent of that forest," says Marc Goss, CEO of the Mara Elephant Project. The elephants, wary of humans, stay deep in the forest during the day, venturing out at night to feed. Inevitably, they end up roaming onto farms, where they raid crops, and gardens too.

There are two solutions. Pay farmers to turn their land into wildlife habitat, or move the elephants. The latter is the only likely solution – there is not enough habitat to sustain elephants long term. Moving the elephants will entail catching and tranquilizing them and trucking them into the Maasai Mara, where the Maasai are paid to keep the savannah open.

"One lesson learned is catch it while it's still early," Goss says. In future, it will be key to deliver "early childhood education about ecosystem services" to Kenyans and have government planning to ensure new settlements are compatible with key wildlife habitat, he says.



Kilns for making charcoal (*pictured*) are scattered throughout the Nyakweri Forest



Both males and females grow tusks – making them vulnerable to poaching, mainly for Asian markets

hemmed in by fences and farms. Elephants from the Maasai Mara grasslands to the east travel along corridors into the Transmara on their perennial quest for food. Such migration is key for connectivity between elephant herds and ensures genetic diversity, which is crucial as populations must adapt to increasingly extreme environments.

According to University of Kent elephant researcher Lydia Natalie Tiller, Transmara forest cover declined to 213km² in 2015, down from 348km² in 2000. Grassland decreased to 1,030km² in 2015 from 1,300km² in 2000. Crop land increased by 42.5 per cent from 2000 to 2015, covering 1,350km².

With a mushrooming agro-pastoralist population in the Transmara, the result is biodiversity loss and increasing HEC, since elephants encounter human settlements whilst travelling vast distances to obtain the 150-270kg of vegetation they consume daily. A maize crop is high-calorie, tasty and easy pickings for elephants who must spend 80 per cent of their day consuming enough grasses, roots, branches and tree bark to sustain them. (Kenya's human population in 2021 was 55 million – up from 31 million at the turn of the century.)

KILN: TALLULAH; RANGER: TONY KARUMBA/AFP/GETTY; ELEPHANTS: ANUP SHAH/NATUREPL.COM

> "Migration is key for connectivity between elephant herds and ensures genetic diversity"

A HINDRANCE TO HARMONIOUS relations with elephants is the lack of tourism in the Transmara, unlike the Maasai Mara, where luxury safari camps draw thousands of well-heeled visitors each year to watch the wildebeest migration and ogle lions, zebras, leopards, cheetahs, hyenas, baboons, buffalo, antelope and elephants. Maasai tribespeople, who own the Maasai Mara, benefit from tourism as they receive guaranteed revenue from lease fees in return for leaving the grasslands open to wildlife.

Transmara farmers don't receive tourism revenue, making it easy for them to resent elephants' gourmand proclivities. "These are people who are very angry because elephants are very destructive," says Pertet. Nor is the town of Emarti unique, she adds. "This community represents a lot of others in Kenya when we talk about HEC."

Jake Wall, MEP's director of research and conservation, says the Experimental Farm is part of a long-term, comprehensive spatial planning and management study that will identify areas where people can live, work and grow food without encroaching upon wilderness areas needed by elephants and other animals. This will involve the development of buffer and mixed-use zones to "keep wildlife and people separate," he says. A buffer zone might include grazing areas where livestock and animals co-exist.

Pertet is optimistic about the role the Experimental Farm will play in enhancing co-existence, seeing herself as an "agent of change". "This is what I want to do in life: put healthy food on the table, not only for my family but my community." A community that includes the wild animals of Kenya.