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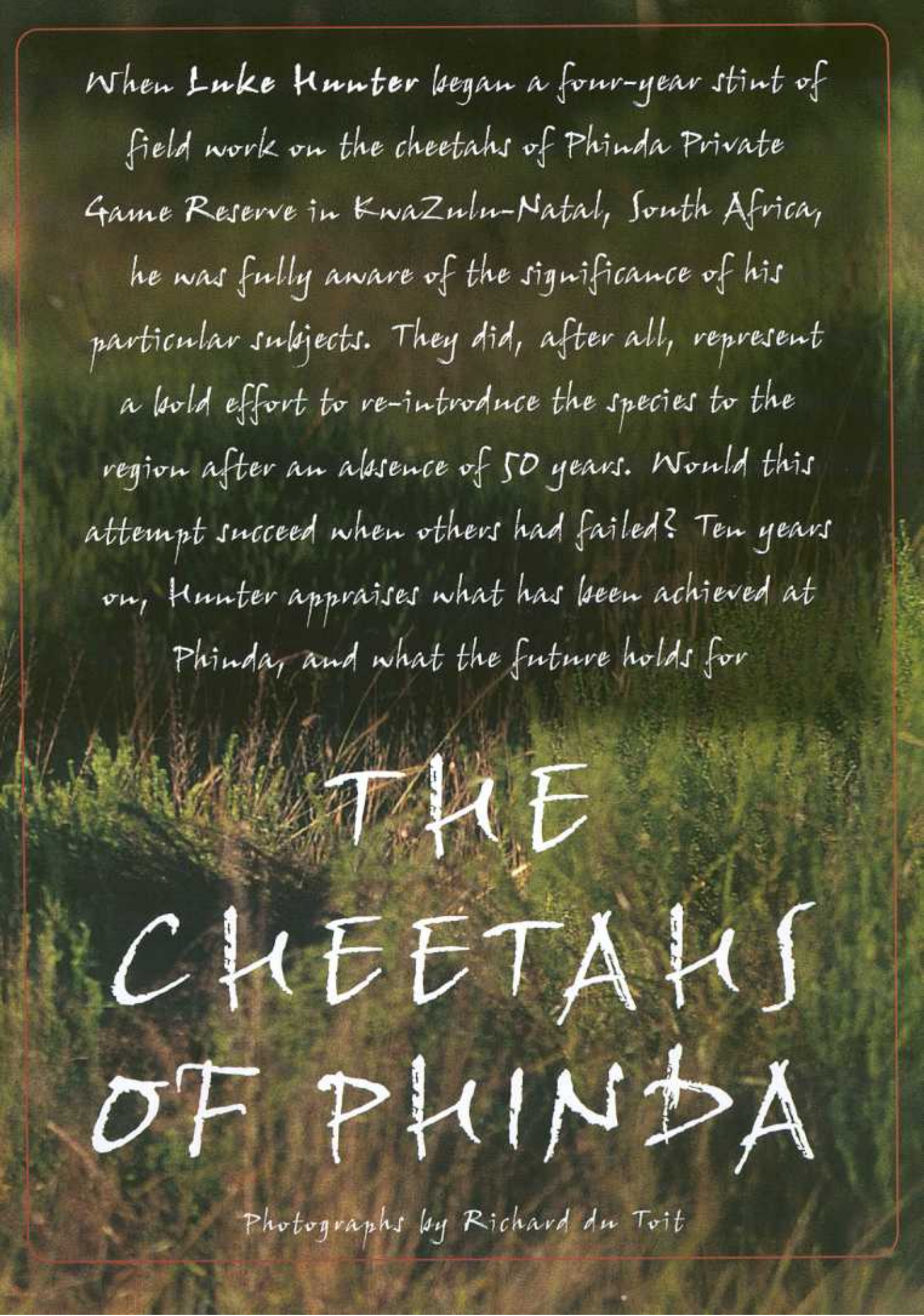
Abstract: As I watched the fluffy trio using their resting mum as a climbing frame, I realized they were the first cubs born to resident cheetahs in the region since 1940s. The mother cheetah, a female that I call Umame, was part of a concerted effort to re-introduce the species to northern KwaZulu-Natal after an absence of 50 years. Prior to 1990, Phinda had been a mixed bag of small game and livestock farms where the most common large mammal was the domestic cow. When the farms were consolidated into a 170-square-kilometre tract, Phinda's field staff removed the cattle and began replacing them with all the wild mammals known from the region before Europeans colonized it. In March 1992, six cheetahs - Umame among them - arrived from Namibia. In all, 17 cheetahs were released in Phinda between 1992 and 1994.



When Luke Hunter began a four-year stint of field work on the cheetahs of Phinda Private Game Reserve in KwaZulu-Natal, South Africa, he was fully aware of the significance of his particular subjects. They did, after all, represent a bold effort to re-introduce the species to the region after an absence of 50 years. Would this attempt succeed when others had failed? Ten years on, Hunter appraises what has been achieved at Phinda, and what the future holds for

THE CHEETAHS OF PHINDA

Photographs by Richard du Toit

LUKE HUNTER

Ten years ago I saw my first wild cheetah cubs. I'd been trailing them for weeks, chasing reports of a female's tracks leading a little convoy of miniature spoor – but that was as close as I'd come. A cheetah mother with very young cubs is notoriously shy and the slightest suggestion of danger – distant vehicle engines included – is enough to send her into cover. Th at warm morning a decade ag as though this female had d e time was right. She flopped down on a sandy road and, while her three cubs played endless games of chase around her, regarded my arrival with complete indifference.

For me, a doctoral student working on the species, the encounter wasn't exactly unexpected. I had four years of field work on cheetahs ahead of me, so I knew that sooner or later I was sure to see cubs. That did little to dampen the exhilaration of my first sighting but, personal significance aside, the moment held far greater meaning. As I watched the fluffy trio using their resting mum as a climbing frame, I realised they were the first cubs born to resident cheetahs in the region since the 1940s. The mother cheetah, a female I came to call Umame, was part of a concerted effort to re-introduce the species to northern KwaZulu-Natal after an absence of 50 years. Her cubs represented the birth of a new population.

Umame and her family lived in Phinda Private Game Reserve. Prior to 1990, Phinda had been a mixed bag of small game and livestock farms where the most common large mammal was the domestic cow. Numerous small and medium-sized indigenous herbivore species were still there, but large herbivores like buffalo, giraffe, rhino and elephant had mostly disappeared. So too had the top predators.

When the farms were consolidated into a 170-square-kilometre tract, Phinda's field staff removed the cattle and began replacing them with all the wild mammals known from the region before Europeans colonised it. In the first two years of the project, more than 1 000 wildebeest, zebra, giraffe and other ungulates were released, followed by nearly 30 white rhinos and 56 elephants. In March 1992, six cheetahs – Umame among them – arrived from Namibia. In all, 17 cheetahs (and 13 lions) were released in Phinda between 1992 and ▶

A picture of health, these third-generation Phinda-born cubs are already one generation inbred. The future of the population relies on an infusion of unrelated cats.

Cheetahs are always vulnerable to other predators bent on stealing their prey. Despite her injury, this female continued to care for her cubs.

Fast Facts: Cheetahs

SIZE
Males 29–65 kg, 74–94 cm at shoulder, 1 –224 cm nose to tail
Females 21–63 kg, 67–84 cm at shoulder, '4–236 cm nose to t

LONGEVITY
Up to 21 years in captivity robably no more than years in the wild

HABITAT
Mostly open grassland and woodland savanna. They occur at up to 1500 m in the mountains of Ethiopia and in arid areas including the Kalahari and Sahara, but are absent from the humid forests of West and Central Africa.

DIET & HUNTING BEHAVIOUR
Mostly small and medium-sized antelopes such as impala and gazelle, although male coalitions are capable of taking large animals such as adult wildebeest, gemsbok and eland. Rarely scavenges. Primarily diurnal, which may be to offset competition with nocturnal carnivores such as lions and hyaenas. Perhaps also related to high-speed chases where visibility of the terrain is important.

REPRODUCTION
Gestation 90–98 days. *Litter size* up to 9 cubs, averaging 3–4.
Breeds all year round, though birth peaks have been reported in the rainy season (November–May) in East Africa. Cubs gain independence from the mother at 12–20 months (average 18 months). Females can conceive from 24 months; males sexually mature from 12 months, but usually don't get a chance to breed until their third year.

SOCIALITY
Females solitary and do not defend a territory; may wander over very large areas, up to 1500 km² (Namibia).
Males establish territories where possible. Usually coalitions of males more successful at territorial defence. Single males more likely to be nomadic. Non-residents have much larger home ranges (averaging 777 km² in the Serengeti).

THREATS
Persecuted in much of its range by conflict with livestock farming and affected by reduction of prey species in pastoral areas. Loses high percentage of kills to other large carnivores, which are also the main source of mortality to cubs. Hunting for skins may be a threat in areas where the cheetah is not abundant, particularly northern Africa.

1994. Together with their offspring, those 17 became my study subjects. Over the next four years I would spend more than 6 000 hours documenting what happened to them and trying to establish whether such efforts at restoring big cats could succeed.

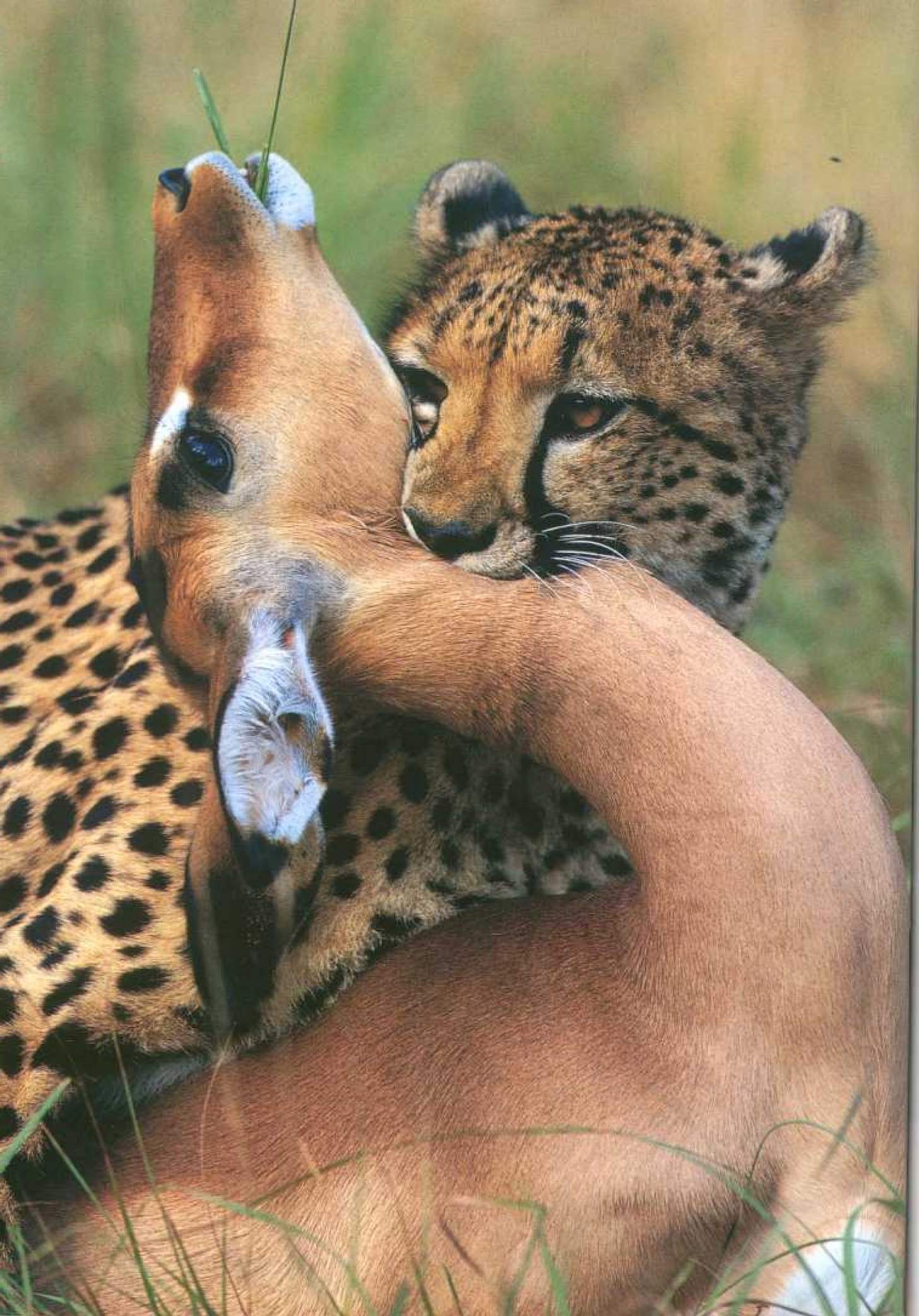
If earlier attempts were anything to go by, the prospects looked grim. Between 1966 and 1981 142 cheetahs had been released into KwaZulu-Natal's protected areas but none appeared to have established resident populations. In 1992 the collective number arising from the reintroductions was estimated at fewer than 30. Given such a damning record of failure, why imagine it was worthwhile to try again at Phinda?

Two reasons. Firstly, no one actually knew what happened to the cheetahs of previous attempts. Except for chance sightings, post-release monitoring was non-existent, so it was quite possible the cheetahs had successfully re-established populations that were merely difficult to count. And even if they had been failures, no one could say why. With radio-collars and a monitoring regime that saw every released cheetah located at least every third day, the Phinda project presented an opportunity to solve the mystery.

Secondly, we had the advantage of recent experimentation with carnivore re-introductions in the northern hemisphere. There, researchers working on species ranging from Canadian swift foxes to grizzly bears had determined the value of 'soft release' techniques. Instead of freeing translocated animals at the release site within hours of arriving – the 'hard release' method historically used with large cats in Africa – the animals were held for weeks in large outdoor enclosures in the heart of their new home. The theory is that large carnivores, as strongly territorial animals, need to not only recover from the stress of their translocation from home turf, but also become accustomed to the new stimuli of the release area. ▶

PREVIOUS SPREAD Phinda's woodlands provide refuges for the cheetahs, but they also make hunting more dangerous. Fortunately, injured cheetahs almost always recover.

OPPOSITE The *Terminalia* woodlands also furnish a multi-level playground for cubs – and superb opportunities for photographers.



We didn't know if the technique would succeed with cheetahs, but we were aware that hard-released cats rarely stayed at the release site and, in fact, usually headed for home. The record probably goes to a Namibian leopard released in Etosha National Park 600 kilometres from the farm where he had been caught. He was back there within six months. I suspect that most of the cheetahs released up until the 1980s attempted to do likewise and were killed once they moved from the parks into surrounding farms and rural communities.

Umame and her fellow captives spent about eight weeks in bomas before being released. As well as allowing the cheetahs to become accustomed to their new home, the captivity overcame some of the habits developed on their Namibian homeland. Captured on the sprawling farms of central Namibia where the species is heavily persecuted, Umame and her companions were used to running from any sign of humans, including vehicles. They were also practised fence-jumpers. Both traits were seriously undesirable at Phinda. Entirely surrounded by electrified fencing and with game farms, livestock and large Zulu communities on its boundary, Phinda couldn't afford breakouts. It also couldn't afford reclusive cats, having been established to draw the increasing international tourism traffic. By the end of their confinement the cheetahs had grown indifferent to vehicles and – after learning about electrification – suspicious of fences.

When release day came, we simply opened the boma gates. Once they had overcome their initial wariness, the cats walked out into their new home. As is the norm in cheetah society, the sexes separated almost immediately and set about exploring. Fortunately, the time in the bomas and the electrified boundary fence appeared to have suppressed any 'homing instinct' and all the cheetahs stayed within Phinda's borders. Even so, the early months were marked by large movements, presumably as they familiarised themselves with the lie of the land. This pattern was especially marked among the females.

Unusually among felids, female cheetahs are non-territorial; they wander over a home range which is never defended from other cheetahs. The ranges of females in Tanzania's Serengeti Plains average 833 square kilometres, and in the Kalahari they are about 320 square kilometres. At only 170 square kilometres, Phinda was in trouble if the released females needed to cover such large areas. It did, however, have a home-ground advantage: very high densities of resident prey. Whereas in the Serengeti and Kalahari cheetahs have to range widely to follow seasonal fluctuations in prey numbers, in Phinda this is not necessary. So while Phinda females roamed the entire reserve, they evidently didn't need more.

Interestingly, the conditions at Phinda are theoretically ideal for females to adopt territorial behaviour; with high densities of prey spread uniformly over the reserve, why not settle down to a small range and exclude other females from using its resources? In fact, even though females used areas of less than 50 square kilometres for up to a year, they were as non-confrontational as females anywhere else. Many times I saw female cheetahs ignore one another or, more often, actively go out of their way to avoid a meeting. With cubs in tow, avoidance was not always an option. Cubs seem to be irresistibly curious about other cubs and, despite their mothers' nervous yelping, they usually raced over to investigate when another family was spotted. Except for a few uncertain spits and hisses, the two families would interact peaceably, sometimes for hours. Invariably, when the mums tired of the meeting, they simply got up and left, their cubs following.

Umame and her companions were used to running from any sign of humans, including vehicles. They were also practised fence-jumpers. Both traits were seriously undesirable at Phinda

The behaviour of male cheetahs couldn't be more different. In contrast to all other cat species except lion, cheetah males form coalitions. These typically comprise brothers, but lone males will often attempt to team up with unrelated males; in the Serengeti, about a third of the coalitions ▶

Around the edges of open areas, the impala ranks as the prey species most often killed by cheetahs at Phinda. Within the woodlands, though, the much larger nyala tops the list.

Playtime. While adult cheetahs spend much of their day being vigilant for prey and competitors, young animals like these two while away the hours in play.

LUKE HUNTER

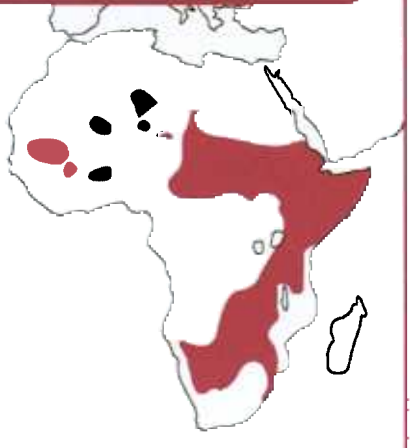
A family of cheetahs at play makes a great memory for tourists. With a sighting rate of over 95 per cent, Phinda is now one of Africa's most reliable places to see the species.

Where to see cheetahs in Africa

Phinda is now one of the finest places in Africa for virtually guaranteed cheetah sightings, but there are many other excellent places to see the species.

NXAI PAN NATIONAL PARK, BOTSWANA
The pan environment is excellent cheetah habitat. Year-round congregations of springbok at the waterhole near South Camp provide many chances to witness hunts.

MATUSADONA NATIONAL PARK, ZIMBABWE
Although the population is fairly small, the cheetahs concentrate along the rich, open habitat of Lake Kariba's shore where there are large herds of prey animals.



Distribution of the cheetah in Africa

KGALAGADI TRANSFRONTIER PARK, SOUTH AFRICA/BOTSWANA
The Auob River bed on the South African side is seasonally excellent for chances to see cheetahs hunting; March/April, when herds congregate in the riverbed after the rains, is best.

SERENGETI PLAINS–MASAI MARA ECOSYSTEM, KENYA/TANZANIA
Home to one of the largest contiguous populations in any protected area; the Aitong area in the Masai Mara probably has the consistently highest numbers. The short grass of the plains makes finding and viewing cheetahs extremely rewarding.

PARC NATIONAL PENDJARI, BENIN
Probably one of the most reliable sites in West Africa, although sightings are unpredictable because the cheetahs range over huge areas. The best spot is around the Yangouali lagoon.

RÉSERVE NATURELLE NATIONALE DE L'AÏR ET DU TÉNÉRÉ, NIGER
Only for the most intrepid cheetah watchers, this protected chunk of the Sahara offers a very slim chance of seeing the region's uniquely pale (some are near-white) desert cheetahs.

include an unrelated member. At Phinda, the period in the bomas had an unexpected consequence; unrelated males housed together consistently remained as a group once released, usually for life. And like coalitions elsewhere, they can be strictly territorial. Phinda males established territories of between 60 and 100 square kilometres and defended them vigorously from intruders. At least four males have been killed in territorial disputes, and their carcasses were sometimes consumed by the victors. Unlike the extensively overlapping ranges of amicable females, male territoriality means that Phinda's confines can never accommodate more than two or three coalitions at once.

This has long-term implications for the genetic diversity of the population, even though it doesn't limit the number of cubs in the short term. As long as there are enough females, only a single coalition (or even a single male) is required to make sure numbers remain high. Contrary to their image as a genetically-impoverished species that struggles to reproduce, wild cheetahs are prodigious breeders. In the 10 years since cheetahs have been at Phinda, at least 86 cubs have been born. Of these, almost 70 per cent have survived to independence, a stark contrast to the five per cent survival rate of cheetah cubs in the Serengeti.

The difference probably stems from the cubs' vulnerability to predation. On the short-grass plains of the Serengeti, they are conspicuous to lions and other predators at distances of up to two kilometres. Until they reach about five months of age (when they are able to out-run most other predators), young cubs don't stand much of a chance if another carnivore spots them on the plains.

At Phinda, where a patchwork of *Acacia* and *Terminalia* woodlands intersects with grassland, sand forest and palm veld, lions are less likely to see cubs. Even when they do, the cubs have places to hide. Many times I've watched lions blunder onto female cheetahs with cubs in the woodlands. While the mother cheetah diverted the lions' attention with impressively close charges aborted at the last second, the ▶

This brother and sister will only remain together until they are independent. Shortly after leaving their mother, females go their own way whereas brothers remain together for life.

ubs scattered into the surrounding ush. Eventually the lions lost interest nd the female gathered up her cubs om their hiding places as much as 500 ietres away. Although cubs must be illed by lions from time to time at hinda, clearly most are surviving.

All this suggests that the Phinda experiment has succeeded – and in many ways it has. The cheetahs have survived the re-introduction process, established enduring home ranges nd have been successfully reproducing ver since. For the past five years the opulation has remained stable at etween 20 and 30. For tourists wishing) see the species, there are few places iat can top Phinda's success rate; about 5 per cent of visitors see at least one. ut two dozen cheetahs that are easy to :e do not make much of a contribution) conserving the species. The conser- ation obstacles facing the Phinda heetahs reflect those confronting the ɔecies Africa-wide. Foremost among iem is the availability of habitat.

Loss of habitat, especially to pastor- lism, is the primary factor driving the heetah's decline. Like most large arnivores, cheetahs are rarely tolerated 'here there is livestock. Similarly, game irms – where the landowner is permit- :d to harvest the indigenous herbivores are mostly hostile to predators. In lamibia, 95 per cent of the cheetah opulation lives under such land-use 'here the number of cheetahs killed very year runs into the hundreds. On a naller scale, the same problem limits ie Phinda cheetahs, surrounded as iey are by a patchwork of cattle ɔuntry and game farms. A year after I rst came upon them, Umame and her ubs left Phinda through an entrance ate inadvertently left open. A few 'eeks later they were dead, shot by a ame farmer 40 kilometres away.

Do the Phinda cheetahs have a iture? Perhaps. But if they are to be nything more than a small isolated opulation known for its approach- ɔility, they require space. With space ɔmes larger populations and that anslates into persistence, the ability of species or population to survive.

More land will also address the roblem of genetic diversity. In small :eas where low numbers of individuals iake up the founding population, nbreeding and genetic depression emain very real threats to long-term uccess. Low levels of genetic variation iay compromise fertility, breeding uccess and resistance to disease – angers that can have devastating ffects on small populations. Phinda's heetahs already have at least one eneration of inbreeding and with the eserve now at saturation point, new lood is needed urgently. The short- erm solution entails simply removing ɔme animals and replacing them. In he long term, the only sustainable ption is to establish populations in djacent areas and remove the obstacles etween them.

Luckily, despite widespread farming in he area, Phinda is not a conservation sland. Protected areas in the immediate egion amount to nearly 500 square ilometres and negotiations to con- olidate them into a single reserve are lready well advanced. A grander vision y government agencies, private land- wners and tribal communities has armarked a total of 3 000 square ilometres for possible inclusion into ne contiguous park. That may be a ipe dream, but so too was the idea of hinda when it was first proposed.

Now the reserve is demonstrating ow wildlife, through tourism, can enerate revenue in an area where the rofit margin in farming is on a knife dge. Gradually KwaZulu-Natal's rural ommunities are regarding wildlife with new perspective – one that may put noney in the bank. I look forward to he day when the farmer who killed Jmame looks at a cheetah with differ- nt eyes. He may never enjoy the pecies as I do, but if cheetahs are what is visitors want to see, he'd be a fool to hoot them. ■

cknowledgements

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o visit Phinda and view the cheetahs there, ɔntact CC Africa at Private Bag X27, enmore 2010, South Africa; tel. (+27-11) 09 4300; fax (+27-11) 809 4400; website ww.ccafrica.com

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Taking refuge. This cub is hiding in a hicket after its family bumped into lions. As in almost all such encounters, the ɔns failed to find the cub and it survived.