

**africa**<sup>®</sup>  
GEOGRAPHIC

FEBRUARY 2013

VIC FALLS FOR SISSIES  
IN THE TRACKS OF GIANTS  
MOZAMBIQUE'S DRONE WARS  
CARMINE BEE-EATERS  
DERECK & BEVERLY JOUBERT

WIN  
A SAFARI  
& DONATE A  
LIBRARY

**southern  
LIGHTS**

GIANTS & ICONS OF THE WILD

RSA R45 (including VAT)  
OTHER COUNTRIES RRP 47 (including tax)  
DIGITAL R22.50 (including VAT)

[www.africageographic.com](http://www.africageographic.com)



WILDLIFE • PEOPLE • TRAVEL



**W**e humans have many unpalatable facets to our make-up, but we are clever, inventive and highly innovative as well. And this does lift me towards an optimism that we can come up with workable solutions to issues as diverse as mitigating, and possibly even reversing, the worst threats of climate extremes or making life very hard for the people who are hell-bent on stripping Africa of its prime wildlife assets.

Technology is exciting, and without question conservation in Africa and elsewhere needs to embrace it. Already, satellite tracking plays a big role in understanding the movements of wild animals, while wildlife film-makers have been quick

to embrace whisper-quiet, unmanned small aircraft to get dramatic, high-definition imagery of animals from perspectives that were previously impossible.

It makes eminent good sense, therefore, to explore the use of such equipment to thwart criminals, hopefully before creatures such as elephants and rhinos have had their tusks and horns hacked off and been left to die agonisingly from their wounds.

Former soldier and the founder of the International Anti-Poaching Foundation Damien Mander shows us how this can work. Faced with a situation in remote Mozambique where six elephants were poached in a single week, he pondered 'Why could a drone protect me in Iraq, but these ancient creatures can't drink from a water-hole without the threat of a heavy-calibre bullet ripping through soft tissue, skull and eventually brain matter?' The answer was to use a drone in an anti-poaching context, and this is exactly what Mander set about doing – with success (see page 52).

Of course, drone technology and operation come at a price. But when you consider the understandably slow reaction times of even the best conventional anti-poaching units, the ability to spot suspicious activity in a reserve and then to guide rangers there quickly with pinpoint GPS accuracy is a great leap forward in efficiency.

Time is of the essence because once the poaching foot soldiers have wrought the savage hacking of their prize, the speed with which contraband ivory and rhino horn are moved through and out of the country of origin is impressive to say the least. With each step of the process, the illegal goods become progressively more secure within the highly sophisticated and ruthless clutches of global crime syndicates, and the chances of interception fall dramatically.

Make no mistake, illegal wildlife trafficking is very big business indeed. It is right up there with gun-running, drugs, contraband pharmaceuticals (said now to exceed cocaine and heroin in profitability), human trafficking, money laundering and the like, in a global industry that is approaching revenues of a trillion US dollars annually. And this is but a fraction of the knock-on cost to society in terms of human and wildlife misery.

Considering what we're up against then, the funds required to furnish conservation with the technology it deserves seem like small change.

*Peter Borchert*

**Illegal wildlife trafficking is very big business indeed. It is right up there with gun-running, drugs, contraband pharmaceuticals, human trafficking [and] money laundering**

Founder Peter Borchert

#### Editorial, Design & Production

Editor Sarah Borchert; Assistant editor Leni Martin; Science editor Tim Jackson; Chief sub-editor Judy Beyer; Senior designer Tamaryn Stipinovich; Designer & social media co-ordinator Cindy Armstrong; Editorial intern Catherine Sempill; Assistant to the founder Shelley Prince

#### Advertising & Marketing

General enquiries: [adsales@africageographic.com](mailto:adsales@africageographic.com)  
National sales manager Tracy Bennett, [tracy@africageographic.com](mailto:tracy@africageographic.com)  
Johannesburg Adie Ceruti, cell +27 (0)83 601 2291, [adie.ceruti@africageographic.com](mailto:adie.ceruti@africageographic.com)  
Bulk sales & distribution manager Neriza Heeger  
Advertising assistant Janine van Eeden

#### Administration & Finance

Office manager Ruegshana Ederies; Accounts supervisor Wedaad Isaacs; Accounts assistant Gadija Galant; Customer services & reception Wedaad Ariefdien; Despatch clerk Selina Pato; Admin. assistant Ismail Sitole; Office assistant Olive Nkomo

#### Subscription Enquiries

Tel. 0860 100 209; fax 0866 704 101 (SA only)  
Tel. +27 (0)21 530 3112; fax +27 (0)21 530 3143 (international)  
E-mail [subscriptions@africageographic.com](mailto:subscriptions@africageographic.com)  
Freeport CB 0209, PO Box 596, Howard Place 7450, South Africa

#### General Enquiries

E-mail [reception@africageographic.com](mailto:reception@africageographic.com)

#### Travel

General manager Christian Boix

#### Safari Interactive Travel Magazine

<http://africageographic.com/safari/>

#### Publisher

Africa Geographic is published by Africa Geographic (Pty) Ltd (Directors: Peter Borchert, Murray Jackson and Sarah Borchert) under licence from Africa Geographic Holdings (Pty) Ltd (Directors: Simon Espley, Johann van Zyl and Chris Boyes). Africa Geographic (Pty) Ltd (Reg. No. 1992/005883/07), First Floor, Devonshire Court, 20 Devonshire Road, Wynberg 7800, Cape Town, South Africa. Postal address: P O Box 44223, Claremont 7735, Cape Town, South Africa. Tel. +27 (0)21 762 2180; fax +27 (0)21 762 2246/086 541 6127 (South Africa only) [www.africageographic.com](http://www.africageographic.com)

#### Editorial Submissions

Unsolicited material will not be accepted, acknowledged or returned. However short synopses (+/- 200 words maximum) can be e-mailed to [sarah@africageographic.com](mailto:sarah@africageographic.com)

#### Copyright

Copyright © 2013. All copyright for material appearing in this magazine belongs to Africa Geographic (Pty) Ltd and/or the individual contributors. No part of this magazine may be reproduced without the written consent of the publisher.

#### Reproduction & Print

Reproduction: Resolution Colour, Cape Town  
Printing: Paarl Media, Paarl

Africa Geographic is editorially and financially independent. It enjoys the support and endorsement of several non-government organisations, but it is not affiliated in any way to these bodies or to any other publishing, environmental or political interest group. Africa Geographic strives to foster an awareness of wildlife, conservation, ecotravel, indigenous cultures and the general environment. It consistently advocates the wisest use of natural resources in a manner that involves and is of real benefit to the people of Africa. Africa Geographic is published 12 times a year.



# rise of the DRONES

In the far northern reaches of Mozambique lies one of the most remote and extraordinary places in Africa. Niassa National Reserve is a vast wilderness area and home to 13 000 elephants, which are coming under increasing attack from poachers. **Damien Mander**, a former special operations sniper from Australia and the founder of the International Anti-Poaching Foundation (IAPF), believes that it's time for conservation to benefit from innovations that have revolutionised regular combat.

TEXT BY DAMIEN MANDER



It's summer 2007. I'm hiding out with my team in an abandoned aircraft hangar in southern Iraq, having narrowly escaped two roadside bombs. Come nightfall we hear the unmistakable high-pitched motor of an unmanned drone patrolling the black sky above us, seeking out the insurgent teams that will attack us again tomorrow. Once the enemy's location has been pinpointed, a helicopter gunship neutralises the threat, the sound of heavy machine-gun fire signalling its success. Until that confirmation comes, we lie awake wondering what awaits us in the morning. It's Ramadan, and just before the call to prayer, we hear the gunfire. The drone has done its job.

### Why could a drone protect me in Iraq, but these ancient creatures can't drink from a waterhole without the threat of a heavy-calibre bullet ripping through soft tissue?

Fast-forward five years and I'm standing on top of an inselberg in Mozambique's Niassa National Reserve. My senses have been re-sharpened to the sounds and smells of the African bush. Already this week, six elephants have been killed within a small radius. Today I saw a carcass up close, the face cut away.

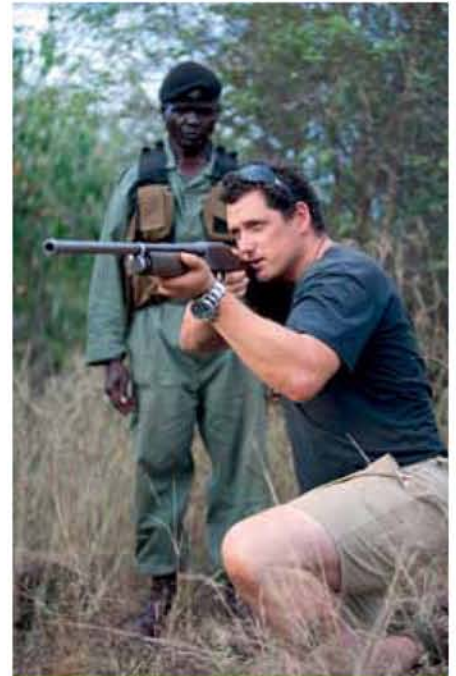
Heavily armed Tanzanian poachers cross the border illegally to take advantage of the remoteness that engulfs us. Our lack of resources makes me want to scream with

frustration and I start to wonder: why could a drone protect me in Iraq, but these ancient creatures can't drink from a waterhole without the threat of a heavy-calibre bullet ripping through soft tissue, skull and eventually brain matter?

I no longer wear a uniform, carry the gear that would give an attack on an insurgent position a better-than-average chance of success, or have access to a helicopter gunship. I'm in bare feet, my hair has grown out and there is an old Czech-made AK-47 with worn wooden grips at my side. I haven't been deployed by any army and no longer take home a wage. This is a war being fought by a select few and there are no joining papers to sign. All that exists is a deep understanding of what needs to be done. Right now that means bringing to conservation the technology that has transformed the regular battlefield.

At 42 000 square kilometres, Niassa is the third-largest reserve in Africa. It is the same size as Denmark (and about one-tenth the size of Iraq). But whereas Denmark has 73 000 kilometres of road, Niassa has just 2 000 kilometres, making most areas inaccessible by vehicle. It is often described as one of the continent's last wild places, and is certainly the most extraordinary place I have ever seen.

Ecologically diverse and laying claim to one of the largest tracts of protected miombo woodland in the world, Niassa supports fantastic wildlife populations. That it does so is thanks to the hard work of conservationists like Anabela ▶



DAVINA JOGI

### Damien's journey

Australia-born and -bred, Damien Mander served in the Royal Australian Navy as a clearance diver, then in Special Operations as a sniper. After three years in Iraq, he bade farewell to the Sandpit in 2008 and, living off his savings, headed to Africa. The 29-year-old was eager for adventure and earmarked a six-month stint with an anti-poaching unit.

'It was in Zimbabwe that the purpose of my journey through life really hit home,' says Mander. 'I came face to face with the harsh reality of rangers on the front line trying, with few resources, to defend a global treasure from a determined enemy. It was not something I could ever turn my back on.' He gritted his teeth, liquidated his assets and set up the IAPF. He has spent the past three years working with rangers – training, running operations and, above all, learning.

At the time of writing, *60 Minutes* and *Carte Blanche* had aired documentaries highlighting the use of unmanned drones in IAPF conservation operations. To watch them, or find out more about the IAPF's work, go to [www.iapf.org](http://www.iapf.org)



ARIADNE VAN ZANDBERGEN

LEFT Lugenda Wilderness Camp nestles at the base of some of Niassa National Reserve's iconic inselbergs.

OPPOSITE Cutting-edge technology meets the African bush. Mander believes that unmanned aerial vehicles (UAVs) or drones could revolutionise anti-poaching operations, just as they did for regular combat.



Rodrigues, the reserve's administrator, and Derek Littleton, the hardened Zimbabwean who has managed Lugenda Wildlife Reserve, a 4 600-square-kilometre concession, for 12 tough years. The government's new contract with the Wildlife Conservation Society also gives hope for the future.

Recently, however, contracts granted to Chinese concerns to log in forests surrounding the reserve have increased the presence of Asian nationals in the area, and Niassa's elephants – like those across East and Central Africa – have come under extreme and constant threat. In 2011, 3 332 new elephant carcasses were counted in the reserve, up 1 372 from the previous survey in 2009. Rodrigues, who has worked here for more than a decade, describes this as 'a very serious poaching trend'. According to Littleton, the reserve is currently losing 'up to six elephants a day'. It's clearly time to think outside the box.

**W**hen Simon Beart, a former Royal Navy helicopter technician, approached me in early 2012 and said he would like to build drones for the IAPF, I replied politely, as I generally do, and forgot about it. Running a not-for-profit, I have developed a simple formula that helps me to avoid disappointment: 95 per cent of people who offer to help never come through, so the faster I reply to them, the faster I can get to the five per cent who are really serious.

Two days after arriving in Niassa, I received another e-mail from Beart saying he was a week away from having two drones airborne. The cogs immediately began to turn. I focused on the logistics of getting the unmanned aerial vehicles (UAVs) to Africa, and finding the additional

capability we would need to make them properly effective. This meant a trip to Flir, thermal-imaging specialists and suppliers of the lightweight cameras we needed. A thermal-imaging camera displays an area in two dimensions, distinguishing between objects based on their heat signature. A human against the night backdrop of the African bush, for example, is the perfect illustration of white on black.

### Stalking through the bush towards the target, I wondered how long it would have taken to locate this hideout without the drone

Beart's drones are smaller than the Predator UAV that routinely patrols the skies in any region where the US has an interest, and they're lighter, easier to use and cheaper. Innovations in the civilian world, such as the mobile communication industry (see 'iPhones, drones & elephants', opposite), have given us the ability to replicate technology previously reserved for the military. Riding on the coat-tails of this revolution, the IAPF intends to make these advances available to conservation.

With the outfitted drones safely in Niassa, we could begin trials – and the unforeseen problems of operating in wild Africa became evident. Three days in, the first drone crashed and was badly damaged, its wings ripped from the fuselage and the volatile battery packs destroyed. Ninety per cent of the problems we encountered, however, were software related. With the help of online support networks, we eventually got back into the air and in the early hours of the following

morning, the drone located the embers of a poachers' campfire.

A radio call from Beart relayed the position and Littleton deployed his ground units. Stalking through the bush towards the target, I wondered how long it would have taken to locate this hideout without the drone. With our weapons raised, the team closed in silently and took the camp by surprise just after 05h00. A week earlier, a similar raid had ended in a firefight, with one ranger shot in the shoulder and a wounded poacher fleeing back to Tanzania. Of the four people in this camp, two had fishing licences. The others were Tanzanian, with no paperwork and poor excuses as to why they were in the area. They were arrested and taken to the nearest police headquarters, four hours' drive away, for further questioning.

**I**n an operational environment like Niassa, real-time information is everything. The drone provides day and night aerial surveillance and target acquisition, and monitors areas we don't have the resources to patrol. Whereas previously we walked around waiting to bump into something (a two-day-old footprint or, worse, the mutilated carcass of an animal), now we peek over the horizon.

### Who are the poachers?

**T**he four-man unit we apprehended is fairly typical of the poaching operations in Niassa. Some 35 000 people live legally within the reserve's borders, where they can fish provided they have a licence. However, numerous counterfeit fishing licences make the regulation of movement an almost impossible task. Some locals act as informants for poachers, often Tanzanians who have crossed the border illegally, and help to move weapons and tusks. Driving through villages, I see shiny new motorbikes, iPhones and designer clothes, all undoubtedly the spoils of elephant poaching. According to Derek Littleton, the manager of the Lugenda Wildlife Reserve, once-tiny villages are now bustling hotspots for ivory trading.

Further complicating matters is the fact that elephants are considered vermin by many of Niassa's residents. As the human population has grown and spread into wildlife areas, crop raids and fatalities have created a divide between the two species. In the eyes of the locals, poachers are providing a service.

Following up on intelligence is critical too. It's no good knowing where poachers are if we can't catch them. UAVs must be supported by a reaction force, which requires the integration of information using sophisticated technology and software. This takes money, training and resources, but here too, drones can have a positive impact. If a UAV can cover in a few hours the area a ground team takes a week to patrol, surely this frees up some existing rangers? They could be trained as a specialist reaction unit, one that would be on constant standby to interpret and respond to real-time intelligence.

**If we can justify spending a trillion dollars on advancing the way we talk to each other, then surely we can make this same technology available to save what humans are destroying?**

And, as effective as the two operational drones are, a longer-range UAV would be especially helpful in patrolling the reserve's vast areas – and deploying its limited resources effectively. Envisage a drone with a 20-hour endurance flying time patrolling endless grids across the bush. Live feedback is channelled through software that distinguishes between human and animal shapes and movement, and



LUKE BEART

alerts the staff to any incursions. The drone locks onto the target and guides ground teams into position while the entire incident is recorded. Now imagine this technology injected into the rhino wars raging further south...

All this will cost around US\$150,000 per drone. You could argue that the money would be better spent elsewhere, but I can't think of a more worthy place. (Then again, I'm biased.) If we can justify spending a trillion dollars on advancing the way we talk to each other, then surely we can make this same technology available to save what humans are destroying? For more than a decade drones have been put to use in defence situations, where they have revolutionised combat, and yet we're supposed to be grateful for the fact we have two to help protect elephants.

The Drone Age is here, and we must be given the capacity to embrace it for conservation. This project represents what can be done for the elephants of Niassa, but it should have a global focus. My vision is that one day, soon, wildlife everywhere will have a watchful eye flying overhead, just as our soldiers have on the battlefield.

**Acknowledgements** *The IAPF would like to thank Derek Littleton and the team at Lugenda, Conservation Guardians, Rani Resorts, Anabela Rodrigues, 60 Minutes, Wildlife Conservation Society, Carte Blanche, Eco Ranger, Rhino Revolution, Australian Geographic, Good Weekend Magazine, ABC Radio, Joy FM, Alston and all the generous donors from Australia and around the world.*

**iPhones, drones & elephants**

The single-chip microprocessor that steers a UAV has undergone an impressive transformation, thanks to the rise of smartphones and tablets – and their fast, fluid visual interfaces. These interfaces require hyper-efficient mini supercomputers that use minimum power, and there has been massive investment in their development. As it turns out, fast and efficient processors are also perfect for drones – instead of simply following a preprogrammed mission, UAVs can now start to think for themselves.

ABOVE Former Royal Navy helicopter technician Simon Beart with one of the drones he built. With eyes in the sky like this, Niassa's meagre security resources can be deployed far more efficiently.

LEFT Thanks to dedicated conservationists, Niassa's elephant population rebounded from the effects of Mozambique's protracted civil war ... only to face, yet again, the threat of poaching for the Ivory trade.



ARIADNE VAN ZANDBERGEN