WILD SCIENCE

Ben Macdonald travels to The Lodge to go behind the scenes with the RSPB's scientists – the hidden powerhouse of the organisation.

It was my first time visiting The Lodge. Like Titchwell or Leighton Moss, the name resonates with anyone involved in ornithology or conservation. The drive to the office that forms the headquarters of Europe's largest wildlife charity reveals wooded clearings ready for nightjars and woodlarks; an oasis of habitat drawing in birds from the tidy confines of the Home Counties. The building itself is impressive but not flashy, and this sets the tone for the people I am now whisked off to meet – the RSPB's quiet driving force: its conservation scientists.

The RSPB is unusual in that it is both a lobby group and a scientific research organisation. How does this work? I put this to David Gibbons, Head of the RSPB Centre for Conservation Science – a quiet, determined man nestling in a spacious attic filled with definitive books and atlases; at least one put together by himself.

Science, says David, is vital to organisations that take a particular standpoint on nature. Opposing a cull? Trying to stop a development? Your opponents will turn around and say: "well, you would say that – you're the RSPB." Science brings credibility. To influence others with honesty and integrity, the RSPB has put science first. Science informs conservation policy and practice. It is a force – a means of winning arguments and protecting species. Where others protest with hot air, the RSPB arms itself with facts.

THE FACT FINDERS

The small army providing these crucial facts consists of about 65 paid scientists, and an additional 15 to 20 PhD students, based in universities but affiliated to the RSPB. Less than half of the scientists are based at The Lodge. Others are scattered around the UK with a few overseas – not just desk-based but dotted across fabulous RSPB wildlife sites; from the Flow Country to the Harapan Rainforest in Sumatra – home to tigers and tapirs.

But with so many species in decline, and for so many different reasons, where do the RSPB's scientists start? A survey called the Breeding Birds Survey – a collaboration with the British Trust for Ornithology and UK Government – paves the way. This simple survey outlines, year by year, which species are up – and which are down. When a species, however common (like the starling) or rare (like the bittern), falls into decline, the race is on to find out why. Theories are laid down. Food, nesting sites, predation, migration – these are some key causes of decline in our birds. All are tested rigorously in the field.

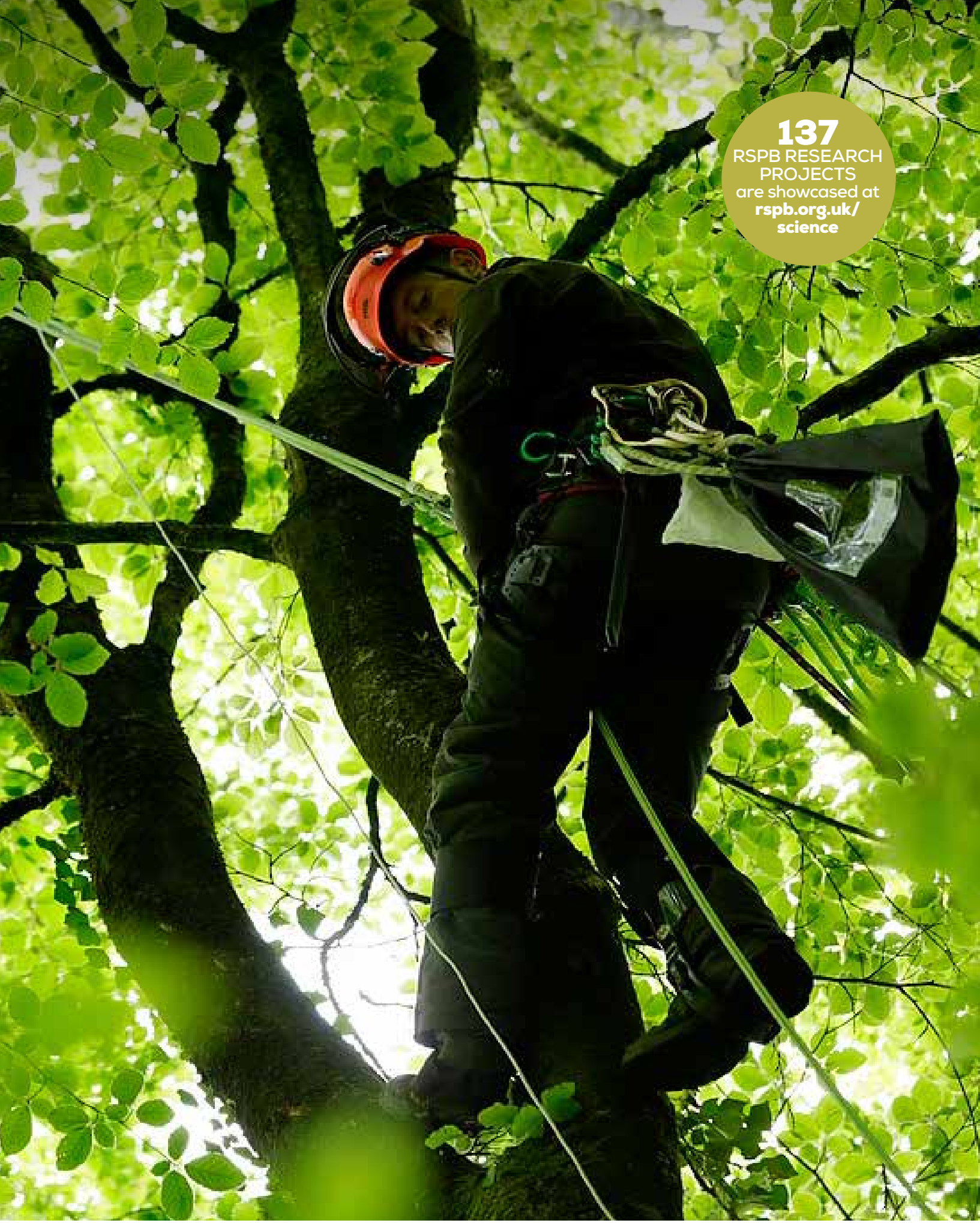
Our vanishing turtle doves, I learn from David, are carrying a disease – trichomaniasis, which sometimes kills their chicks. As an international migrant, turtle doves, and many others, like cuckoos, pose new problems for the organisation – their battle must be fought on many fronts, from the farmland of Senegal to the sandy fields of Suffolk.

NEW INNOVATIONS

Technology, says David, is coming to the fore. Tiny tagging devices, weighing less than three per cent of a bird's weight, can now be fitted to species as small as nightingales. For the first time, migratory routes are being unveiled in incredible detail. David explains to me some of the work being undertaken to narrow down the causes ▶

Photo: Andy Hay

Hawfinches nest in the canopies of ancient woodland, and monitoring them requires a *lot* of climbing.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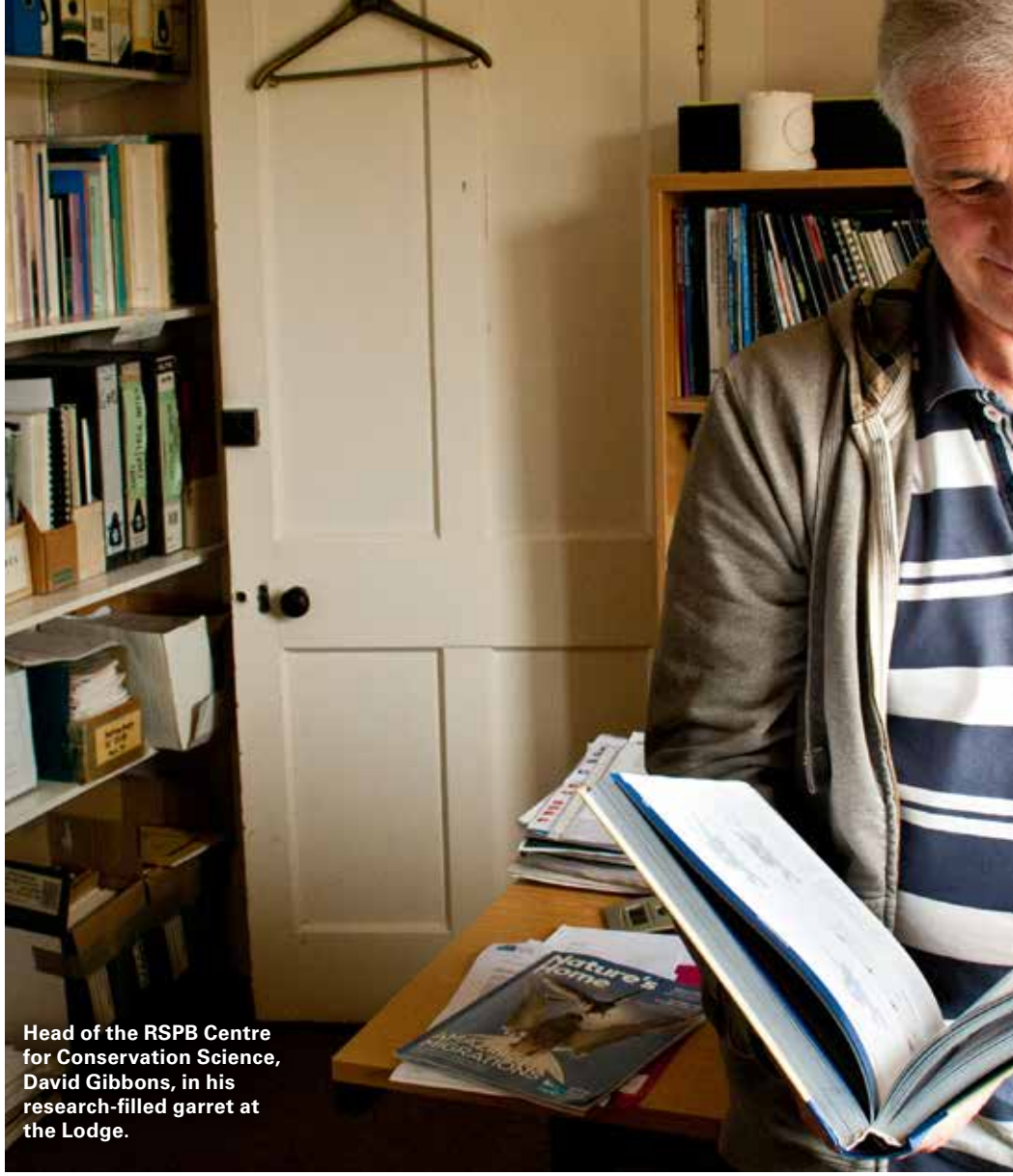
of declines in our summer migrants. But therein lies the problem – swallows or wood warblers aren't "ours" at all. Britain's migrants spend most of their lives outside of Britain – so the RSPB needs to tackle their decline on two different continents.

What's impressive, given the success of the RSPB in many areas, is David's total lack of complacency or triumphalism. The organisation has been very successful, he says, at recovering birds in particular areas: corncrakes on the machair grasslands of the Outer Hebrides, bitterns in reed-beds. The challenge of the next decades, however, is for those birds that don't conform to reserves – the birds of the wider countryside, whose fate lies in the hands of our farmers and large landowners. This is a far more difficult task.

"Agri-environmental schemes" – schemes designed to subsidise farmers to do better for wildlife – have been very successful for some species. Today these are becoming more targeted, and this brings us back to turtle doves; the UK bird facing the most imminent threat of extinction. Turtle doves need seeds – seeds for adults, seeds for chicks. The arable weeds like fumitory, which provides these seeds, were once an afterthought of the British countryside, but have vanished in the wake of intensive farming. Working with landowners, the RSPB are trying to put some of these plants back in. Who'd have thought we'd get to the stage where "weeding" meant planting weeds – not pulling them up! But as I'll learn over the course of the day, nothing is off the menu when it comes to modern conservation.

Conserving landscapes is one of the greatest challenges of the next decade. Even the RSPB has limited resources – it simply can't buy areas the size of our national parks. Even if it could, David says, it seems they are often run with multiple interests at heart, and the wildlife doesn't always come first. One day, I can't help hoping, they'll be run by people like David and his team.

Photos: Ben Macdonald; Andy Hay, Dean Bricknell, David Broadbent (all rspb-images.com)



Head of the RSPB Centre for Conservation Science, David Gibbons, in his research-filled garret at the Lodge.

A RENDEZVOUS WITH "Q"

I could pepper David with questions all day, and listen to his three decades of experience, but I'm off to meet the RSPB's "Q" – Nigel Butcher. I've already seen a picture of him dressed as a great bustard: he rocked the look. Nigel has the intense gaze of someone used to designing extremely delicate bits of kit – and adjusting tiny screws. He appears to have some colourful sheep collars on his workbench. Sheep are nature's cheapest conservationists; get the number right, and they can browse moorland to the perfect level, creating prime nesting habitat for birds like whinchats. To measure this with SAS-level precision, the RSPB is collaring sheep at its reserves in North Wales – to find out where they browse, and for how long. I'm also fascinated by Nigel's Hexacopter – a snazzy aerial drone with six propellers, fitted with a tiny thermal imaging camera to find bird nests from the air. Nigel is armed with kit that is revolutionising ornithology. His laboratory is surreal: a jumble of cameras, satellite tags, soil

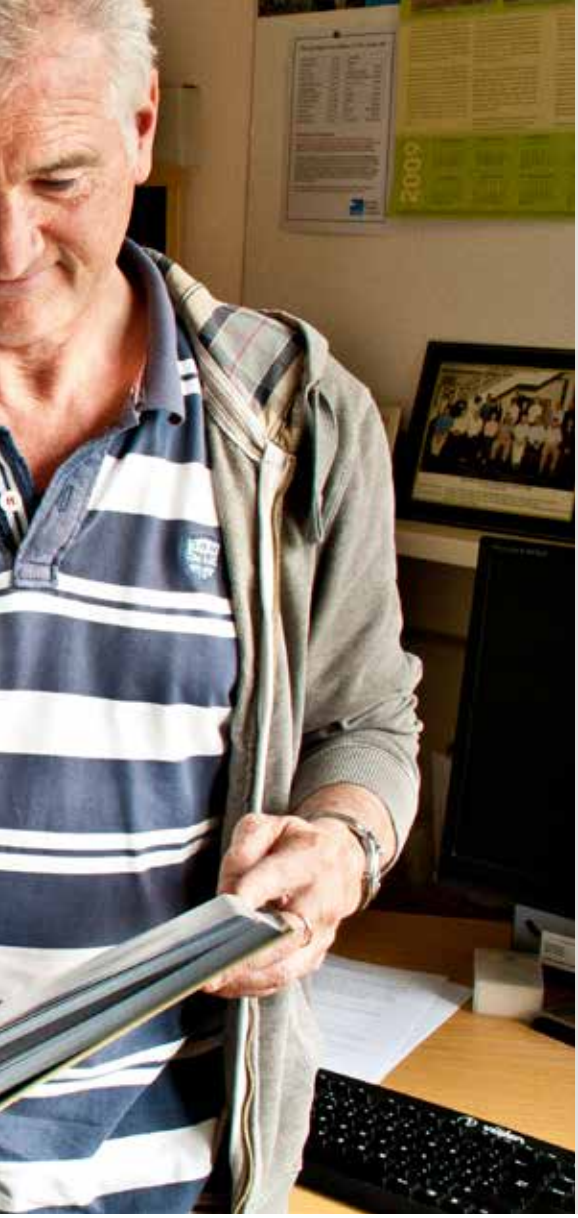
KIT LIST... Here are some of the most baffling-looking gizmos RSPB scientists use…

Eagle tracker This GPS satellite transmitter works with a pair of wing tags specially designed for eagles.

GPS tag Solar powered, can track larger birds over long distances.

Brooding sensor Placed in the nest, it monitors time birds spend on the nest.

Crane suit Scientists on the Great Crane Project disguise themselves as parent cranes to rear chicks for release.

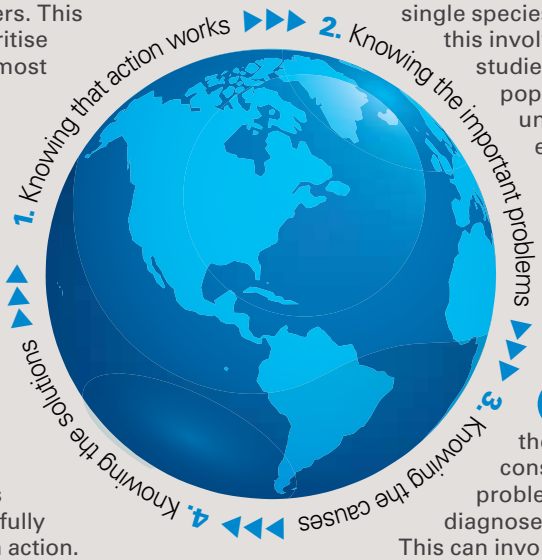


HOW WE DO IT

Over the last four decades, we've developed a model for our scientific work. Here's how it works.

1 Our work starts by identifying and prioritising the most important conservation problems to work on. We do this through monitoring and surveys, often with partners. This allows us to prioritise species that are most threatened, the most important sites to protect, and the most challenging environmental challenges.

2 Having identified the most important problems, we need to diagnose their causes. This can involve painstaking detective work and is often focused on single species. Typically, this involves field-based studies of wildlife populations, to understand their ecological requirements and external pressures they face.



3 Once we've identified the most important conservation problems, we need to diagnose their causes. This can involve a great deal of painstaking detective work and is often focused on single species in the UK or overseas. Typically, this involves field-based studies of wildlife populations, to understand their ecological requirements and external pressures they face.

4 The ultimate success for the RSPB's science is when solutions translate successfully into conservation action. Implementing or advocating conservation solutions is typically the work of land managers, advisors, policymakers or advocates. RSPB scientists advise these people, monitor effectiveness and improve interventions where necessary.

moisture probes and top-secret crime surveillance equipment, which I agree to keep just that.

After lunch I'm shown to another cosy, book-filled attic. I'm rather envious of these working conditions: it certainly beats strip-lighting and air-conditioning.

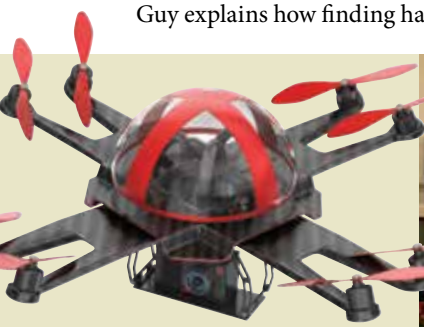
In this cosy crevice I find Guy Anderson, the RSPB's Principal Research Manager, in his natural habitat. Guy and I start chatting about hawfinches – the secretive parrot-like finches of our oldest, largest forests. Guy explains how finding hawfinch nests requires climbing; a lot of climbing. Behind each nest found is a world of preparation. Ringers with mist nets securely catch birds at feeding sites. Tiny radio transmitters are fitted. But a female hawfinch, feeding her chicks, alights for just minutes, so as the team scramble to get her signal in the woodland below, she's already flown off.

The solution? Each night, the bird must return to her nest to brood chicks. Then, the team close in on her location like a benevolent SWAT team. Nest cameras have revealed a hidden world of predators – jays, magpies, and even a goshawk dropping in for a quick aperitif.

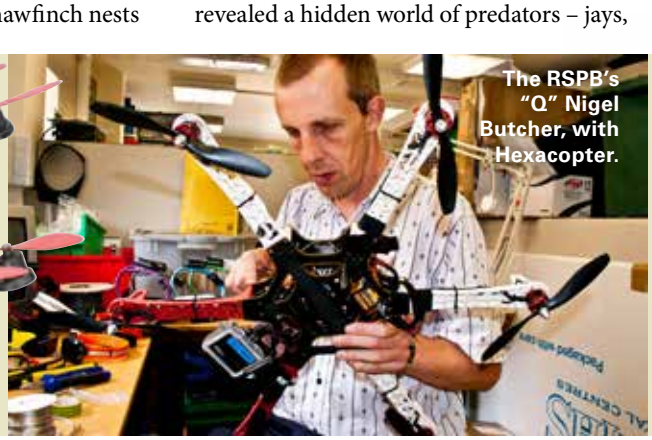
DETECTIVE WORK

After, I meet Toby Galligan. Meeting Toby exemplifies the sheer number of roles the RSPB must play in order to save birds around the world. In Toby's case, the sudden death of millions of Asia's vultures caused a crime scene investigation of epic proportions.

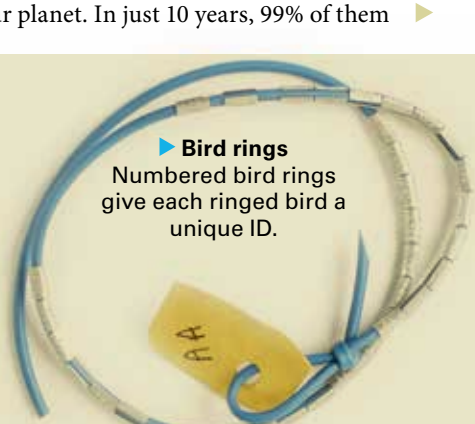
Once, India's vultures, combined, formed the greatest predatory biomass on our planet. In just 10 years, 99% of them



▲ **Hexacopter** This drone uses a thermal imaging camera to find nests.



The RSPB's "Q" Nigel Butcher, with Hexacopter.



▶ **Bird rings** Numbered bird rings give each ringed bird a unique ID.

00% OF RSPB SCIENTISTS XXXX NEED STAT HERE

A shag tagged as part of the FAME project to find out how far seabirds fly out to sea to feed.

SCIENCE IN ACTION

Conservation science involves diverse problems and skill sets, as these four RSPB scientists reveal…

Rebecca Jefferson

HEARTS OVER MINDS

As a social scientist, Rebecca's job is to research people's relationship with nature. She steps back from the figures, and keeps the heart at the centre of the science. Who'd have thought, for example, that most bird hides actually stop people connecting with nature? Newer hides, built of mud, have allowed people to close that gap. She looks at how others see issues – such as schoolchildren farmers, gamekeepers – and studies the conversations people are having, to analyse society's engagement with nature.

Pip Gullett

HOMES FOR CURLEWS

Once bubbling over the UK's moors, fields, forest clearings and heathland, curlews are now much diminished in number. Pip has been working in Scotland and northern England to put curlews back onto farms and moors. These tall birds need areas of long grass to nest and to conceal their chicks, plus wet, short fields nearby for feeding. Raising awareness by working with farmers over many a cup of tea has proven every bit as important to curlews' recovery as the science itself.

Daniel Hayhow

COUNTING EAGLES

Northern Scotland is the realm of the golden eagle – a bird that shuns anything but the remotest valleys and cliffs. In 2015, Daniel Hayhow and his team set out to count every pair, visiting all 693 known territories, many having been documented since the 1800s. The longest walk took two days straight, in the Knoydart Peninsula. The coldest was at -20°C in the barren corries of the Cairngorms. But the survey bodes well – in spite of continued persecution, this eagle seems to be doing well in Scotland, though no pairs remain in England or Wales.

John Mallord

TRACKING TITAN

In 2014, an elite ringing team visited a garden in Suffolk. They caught Titan the turtle dove on the first attempt – no others were caught all season. This was the chance John and his team had waited for. They fitted a satellite transmitter to Titan and watched as he flew to Senegal, then later another 500 miles to Mali… then north, then back to Mali again. Eventually, Titan made it back to Suffolk. With the turtle dove population halving every six years, knowing how and why they use different regions, and what challenges they face, is vital to buy them time.

Photos: Andy Hay (all rspb-images.com)

"Science is a force – a means of winning arguments and protecting species."

were wiped off the Earth, and no-one knew why. Working with the Bombay Natural History Society, the Birdlife International partner in India, and the Peregrine Fund in the US, the RSPB had to become chemical forensic detectives.

Their findings were stark – a drug used to medicate cattle was killing the vultures, which scavenged from the bodies of cows in a country where these livestock are rarely eaten.

Carcass dumps, favoured by vultures, turned from avian banquets to a deadly trap. In just a few years, the drug in question was identified (diclofenac), and the RSPB found an alternative (meloxicam) now in use by the Indian Government.

Toby's day-to-day takes him to a world as far from The Lodge as it's possible to imagine; a place where carcasses must be moved, *en masse*, so vultures don't fly into pylons as they approach to feed. It's dirty, messy but absolutely vital.

Most importantly, the lessons learned in India put the RSPB ahead of the game. If chemicals start killing vultures in Spain, or even raptors here in the UK, their scientists have developed knowledge to combat it, forged in the farthest reaches of our former colonies.

The RSPB has vast challenges ahead of it – saving migrant birds, saving landscapes, rebuilding food chains and keeping its voice relevant in a changing world. But few are better equipped to change, adapt and innovate. Conservation scientists are the building blocks of the RSPB. Their quiet excellence sows the wetlands we visit, protects the seabirds we love and tracks the migrants we can't afford to lose. They are a happy, humble, driven and formidably intelligent lot. But above all, like all the best scientists, they want to get it right – one fact at a time.

Ben Macdonald is a conservation columnist and author of *Rebuilding Wild Britain*. Follow him on Twitter @WildlifeMac.

➜ 3 WAYS TO KEEP UP TO DATE

- **BLOG: Go to rspb.org.uk/community, search for "science".**
- **TWITTER: @RSPBScience**
- **REPORTS: Download from rspb.org.uk/science**