

Wildlife World

AUTUMN 2015
ISSUE 8

people's
trust for
endangered
species



ISSN 2049-8268

Stricken saigas

How we're
helping Asia's
antelopes in
crisis

Overseas

Java's loris club

Bawean warty pigs

Beautiful water-starworts

UK

Welsh pine martens

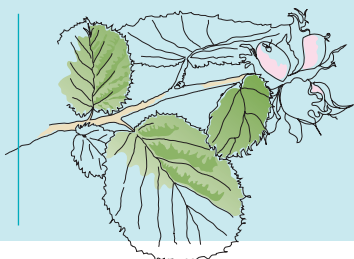
2015 interns

Orchard advice

Water vole survey

Hedgehog heroes

Discover the many ways
we're fighting to conserve
Britain's best-loved
mammal



Latest dormouse release

Continuing our clustered
approach to dormouse
reintroductions in
Nottinghamshire

NEW FEATURE

Our insider guide to the
techniques used in
conservation biology starts
with DNA analysis



Bringing the wild back to life

Wildlife World is published by People's Trust for Endangered Species

Our wildlife is disappearing. Almost two thirds of species in the UK have declined in the past 50 years. There's nothing natural or inevitable about this. It can be stopped. And everyone can play a part. That's why People's Trust for Endangered Species exists.



Find out more
www.ptes.org

HAZEL DORMICE

The range of these charming rodents declined alarmingly in Britain over the latter part of the 20th century. We are committed to returning dormice to parts of their natural range from which they've disappeared, and to the habitat restoration and monitoring that this involves. We are currently focussing on a cluster of interconnected woodland sites in Nottinghamshire.



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© Anshu Khawaja

In this edition



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© Kishan / Shutterstock.com



© Little Red Fox Project



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Welcome



© Dave Mills

When thinking up names for this magazine, I voted against 'Wildlife Matters' partly because PTES supporters don't need reminding how important nature is. I often wish the same was true in the wider world, where giving nature a voice can feel like swimming against the tide. It's encouraging when high profile personalities speak up for wildlife causes or the environment generally, and social media and e-petitioning are making it less lonely doing so. But let's not imagine that celebrity endorsement or clicking to support wildlife is enough. Nature needs every one of us to advocate, to share

information, lead by example and challenge the cultural and political fetishes that threaten to overrule science and morality. And to do that, we need evidence that will inform future responsible care for our shared home. It's great to be part of gathering that evidence with all of you, through the amazing work of PTES. ●

Dr Amy-Jane Beer, Editor

twitter.com/AmyJaneBeer

Amy

Editor: Dr Amy-Jane Beer
Editorial team: Jill Nelson, Zoe Roden, Nida Al-Fulaij
Art Editor: Zoe Roden
Illustrations: Hayley Cove
Print: 4-Print

Cover image:
Vladimir Sevrinovsky
Shutterstock.com

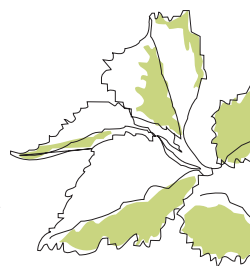
The opinions expressed in this magazine are not necessarily those of People's Trust for Endangered Species.

Contact us

PTES Wildlife World Magazine
3 Cloisters House
8 Battersea Park Road
London SW8 4BG

www.ptes.org
wildlifeworld@ptes.org
020 7498 4533

facebook.com/ptes.org
twitter.com/PTES



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★
PEOPLE



When intrepid fundraiser **Cheryl Wilde** (third from left) and her band of volunteers suggested setting up the very first PTES pop-up shop, we jumped at the chance. The astounding £24,000 they've raised since March is already supporting vital conservation work.

Animals, wildlife and conservation have been my passion since I was a child. As well as being a regular donor, I'm part of a group known affectionately as 'Four Legged Friends', which holds fundraising events for PTES and other charities.

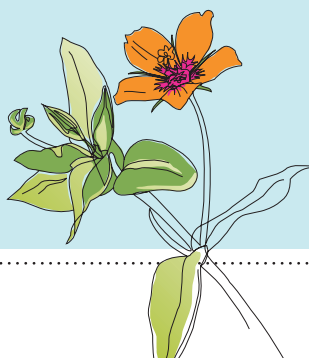
We sell a variety of second hand goods on stalls and beautify old pieces of furniture into irresistible shabby chic. Friends and family donate things for us to sell and renovate. Over time, my garage and house have become repositories for all manner of strange and wonderful items – 'Enough to open a shop', said my long-suffering husband Roger. That got me thinking...

Maidenhead High Street, like so many, has empty shop premises. I made enquires, and with the prospect of free short term rental and charity business rates, I was soon on the phone to Jill Nelson – would she entertain the idea of a PTES pop-up shop?

We opened at the end of March, following frenzied preparations. Roger painted the walls and we decorated them with pretty PTES posters. Customers duly arrived and started spending... and then donating more stock. Certainly it wouldn't all fit in my garage now! But we've raised a lot of money for a great cause and we're having a good deal of fun. If you're in the area, please pop in! ●

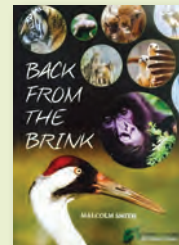
“
**We're so grateful
to Cheryl and all
the volunteers in
our pop-up shop.
It's an amazing
achievement**
”

Jill Nelson



▶ Read more community fundraising ideas
www.ptes.org/volunteer

PTES
♥
LOVES



BACK FROM THE BRINK

Malcolm Smith

£18.99

An antidote to wildlife doom and gloom, this book shows that it's possible to turn the tide of species decline. It's full of conservation success stories, valuable lessons and inspiration for the future.



THE BRITISH WILDLIFE YEAR

Dominic Couzens

£16.99

Dominic Couzens is a living, breathing encyclopedia of nature knowledge – let him be your friendly guide to a year of wildlife wonder in 2016!



FIELD GUIDE TO THE BEES OF GREAT BRITAIN AND IRELAND

Steven Falk & Richard Lewington

£35

We're delighted to see this long overdue first ever full field guide to British bees. It covers all 275 species in detail, with exquisite illustrations.



In the firing line

How many of us can honestly say we'd die for a tiger? What about a rhino? A batch of turtle eggs...? Conserving the wildlife targeted by criminals can be dangerous – deadly even. Amy-Jane Beer looks at how charities like People's Trust for Endangered Species tackle the problems.

Costa Rican environmentalist Jairo Mora Sandoval worked for WIDECAST, the Caribbean sea turtle charity with which PTES has collaborated on a number of projects. On 30th May 2013, he drove with four volunteers to Moin Beach in Limón province, to patrol an area used by nesting leatherback turtles. Turtle eggs sell on the black market for a dollar each – and left unchecked, poachers collect hundreds a night, posing a threat of local extinction. About 11.30pm, Jairo's truck encountered a tree trunk blocking the track. When he stepped out, Jairo was seized by masked men. His companion volunteers, all women, were abducted, robbed and tied up in an empty house from which they escaped and raised the alarm. Jairo's bound, naked and horrifically beaten body was found on the beach the next morning. He was 26.

The crime made headlines around the world and sparked demonstrations and government condemnation in Costa Rica, which prides itself on its green credentials. However in a lengthy trial this year, incriminating text messages and GPS data locating the phones of seven defendants to the scene went missing. The judge found the defendants not guilty, and accused the prosecution of mismanaging evidence. A retrial is likely but, meanwhile, Jairo is becoming an icon, though no-one has yet stepped up to take his place, and the turtle nests of Moin Beach remain unprotected.

Jairo was murdered for trying to protect wildlife. He's not the first – the gorilla conservationist Dian Fossey, killed in Rwanda in 1985, is perhaps the most famous case. But outside the glare of publicity, thousands of others also risk their lives daily. Over 1,000

wildlife rangers have died in the line of duty in the last 10 years – about 80% of them murdered.

Modern wildlife crime is big business, often coordinated by the same syndicates controlling drug trafficking, as in Limón province. People who rely on terror tactics to make money. The poachers are usually near the bottom of this ugly food chain, often victims of a sort themselves. Many first turn to crime as a way to get by, driven by a lack of alternative livelihoods, but rapidly become caught in a web of fear and obligation. Hundreds of them die every year as well. Things could be very different.

Conservation organisations can't ignore these issues and PTES doesn't. Many of the projects you support invest significantly in

community outreach and education and your donations might be spent on looms and weaving lessons, on school books, or festivals – in short, on people as well as wildlife. Cultures that respect and enjoy wildlife, young people who understand biodiversity, and local economies based on sustainable trades, do not turn to poaching. The criminal syndicates still lurk, but by offering hope and opportunity in frontline communities your support means these manipulative forces will find fewer vulnerable people to use as pawns when enacting their evil. Education and information is powerful in the fight against wildlife crime, be it overseas or here in the UK, and PTES is proud to be part of the process.

© Lindsey Foxall

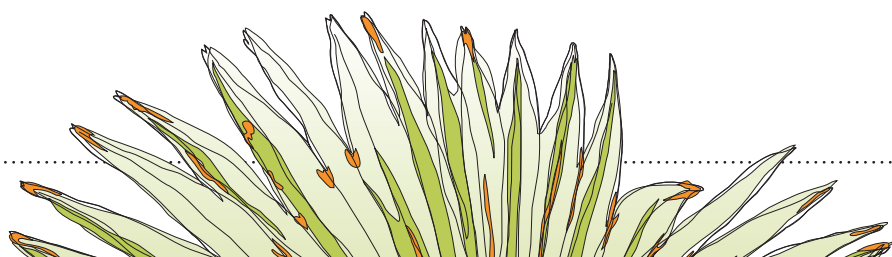


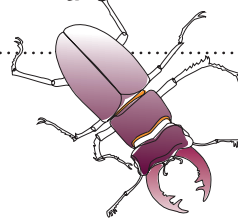
Over 1,000 rangers have died in the line of duty in the last 10 years – about 80% of them murdered

To discover more about the tough, vital work of wildlife rangers around the world, visit the websites of the Thin Green Line Foundation www.thingreenline.org.au or the International Ranger Foundation www.internationalrangers.org.



Dr Amy-Jane Beer is a biologist, natural history writer, and editor of *Wildlife World* magazine.





A lot happens in six months, but here are some of the big recent news stories for PTES. Don't forget there are also regular updates on our website at www.ptes.org

Great Stag Hunt 2015

It's been a good summer for our long-running citizen science beetle project.



© Sutton Nature Conservation Volunteers

Over the summer, thanks in part to a PR boost from the BBC's *SpringWatch* programme, we collected more than 6,000 stag beetle records – from Sudbury to Stroud; from Bexley to Bournemouth.

The first rush of sightings from people unearthing stag beetle larvae while digging in their gardens in spring was followed swiftly by numerous reports of adult beetles flying on warm summer evenings.

We've been recording stag beetles since 1998. Our fourth *Great Stag Hunt* report will be published early next year. It will explain how the data is collected, what we've found out about stag beetle habitat, highlight stag beetle hotspots, and reveal how these fascinating invertebrates are faring compared with previous years. ●

Congress hails new ideas in conservation

PTES projects are among the community-conscious schemes highlighted by a global conference.



© Ambika Khatriwada

The 27th International Congress for Conservation Biology (ICCB) took place in August in Montpellier, France. The ICCB is

a forum for sharing conservation challenges and new research, and a major networking event. The theme was *Mission Biodiversity: choosing new paths for conservation* reflecting changing approaches to conservation and, in particular, the importance of local community involvement. This point was illustrated well in the presentation given by one of our grant recipients, Ambika Khatriwada from Nepal. Ambika has been working extensively on an innovative Community Managed Livestock Insurance Scheme which has helped reduce conflict between farmers and wildlife – in particular Asiatic wild dogs or dholes. The project is an extension of a scheme set up in 2005 to help reduce persecution of snow leopards, and is a striking success. Ambika is also working on a community education scheme to reduce illegal trade in pangolins. So far this has also yielded highly promising results. Ambika explained that the next urgent step for both projects is to upscale them so that people over a wider area begin to recognise that these important species are worth more alive than dead. ●

Rare bee at Rough Hill orchard

Invertebrate experts confirm our orchard is home to a national rarity



© Steven Falk

Exciting times for our Rough Hill Orchard volunteers after recording an insect 'first' for the site – the brown-banded carder bee *Bombus humilis*. Nationally this pretty bee is in decline, but the county of Worcestershire seems to be bucking the trend, with the species first discovered there five years ago. Our volunteer warden Harry Green was

tipped off after an impromptu visit by naturalists Brett Westwood and Wendy Carter. 'Brett thought he'd seen a brown-banded carder, but all we had was a not-so-good picture and no specimen,' says Harry, who then spent a long time stalking and photographing the bees. We're delighted the identification has now been confirmed by Buglife bee expert Steven Falk. Brown-banded carders need large areas of open grassland, rich in flowers, especially clovers, knapweeds and red bartsia. ●

Hedgehogs in the limelight

Our new show gardens will inspire, delight and most importantly, help hedgehogs.

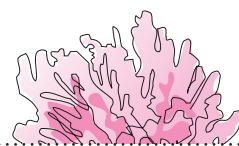


© Andy Jane Brier

Our campaign to make urban and suburban gardens hedgehog-friendly has gathered pace, with support from the Royal Horticultural Society (RHS) and the Women's Institute (WI).

In September our *Hedgehog Street* garden, created by the award-winning designer Tracy Foster, was the centre of attention at the WI Centennial Fair in Harrogate. Thousands of WI members attended the exhibition and signed up as Hedgehog Champions, promising to leave or make holes in their garden fences for hedgehogs to move through to find food and mates. We've been rewarding completed pledges with special recycled hedgehog plaques to fix over fence holes denoting them as 'hedgehog highways'.

Meanwhile, just down the road, the RHS launched an even more elaborate *Hedgehog Street* installation at their Harlow Carr show garden, open to the public all year round. Also designed by Tracy Foster, the display plot shows a series of adjoining gardens demonstrating how to be hedgehog friendly, whatever style of garden you favour. There's also information on what not to do too on interpretation boards, just to ram the point home. The new feature is ready for



Wild About Gardens week, a half-term event coordinated by the RHS and the Wildlife Trusts, which this year, with our help, focusses on hedgehogs. All of this work is co-funded by PTES and the British Hedgehog Preservation Society. ●

It's big, blue and back in British waters!

Blue whale caught on camera for the first time ever in British waters as species recovery continues.



© Russell Wynn

The deep undersea canyons of the Bay of Biscay are known as a hotspot for cetacean activity, and whale watching boats regularly ply the area to record the comings and goings of dozens of species. Parts of the area are within English waters, so when a blue whale appeared on 24th August and was photographed by Russell Wynn of the National Oceanographic Centre (NOC) in Southampton, it cruised into the record books – the first of its kind caught on camera in UK waters, ever. Blue whales have been recorded in the area before, but never photographed. ●

Unique teamwork to help harvest mice

Training gets underway for Tui, the world's first harvest mouse detection dog.



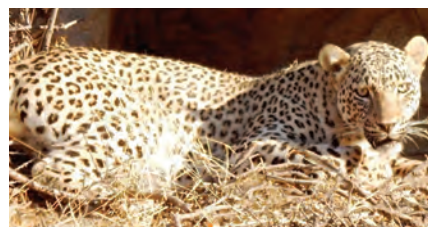
© Nick Upson

A two year-old, flat-coated retriever called Tui is providing PTES funded harvest mouse researcher Emily Howard-Williams with a completely new means of monitoring her notoriously elusive study species. After undergoing the same training protocols used for police, military and customs

detection dogs, Tui can already tell Emily whether or not a harvest mouse has entered an experimental feeding station under artificial conditions, and we're excited to see how she gets on in the field. Tui's deployment is part of a wider project at Moulton College and the University of Northamptonshire, examining the effect of landscape gaps as barriers to harvest mouse dispersal. ●

Keeping up with Kaveh

The Iranian Cheetah Society has tagged a fourth wild Persian leopard.



© ICS

Mohammad Farhadinia, from the Iranian Cheetah Society, emailed us excitedly the other day to announce that he's managed to put a radio collar on a fourth Persian leopard. PTES is supporting Mohammad's study of the ecology and feeding habitats of these leopards in the rugged northern mountain ranges of Iran. He and his team have recently collared a beautiful young male called Kaveh, which means we'll get even more vital data on their habits and where they roam. ●

DATES FOR YOUR DIARY:

24th October 2015

Dormice in Briddlesford Woods

A rare chance to see dormice and help with nest box checks in our beautiful ancient woodland on the Isle of Wight.

21st November 2015

The Day of the Hedgehog, Telford

Hear the latest insights into the decline of hedgehogs and our campaign (with the British Hedgehog Preservation Society) to save them.

27th November & 11th December 2015

Starlings and Somerset levels wildlife safari

Our photography day culminates with the sunset spectacular of thousands of starlings coming in to roost.



Find out more
www.ptes.org/events

Nelson's column

Homes wanted

It's easy to forget that when politicians call for more houses to be built, wildlife needs homes too.

Brownfield sites, on land already altered by humans, are usually considered preferable for development over so called greenbelt. But conservationists are increasingly aware that in many places brown can actually be the new green. Many brownfield sites are very rich in wildlife and support species of the highest conservation priority. And many of these species are the little guys – the invertebrates upon which so many other species, including us, depend.

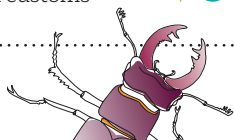
So we are campaigning for homes for wildlife. Homes for hedgehogs in your garden (see www.hedgehogstreet.org), homes for dormice (look out for an exciting new campaign soon!), homes for invertebrates in our own woodlands, orchards and wood pastures, as well as homes and living spaces for endangered species everywhere. There really is room for us all if we just plan carefully.

Thank you to everyone who did our *Living with Mammals* survey this year and took the time to record mammals seen around their own home patch. And indeed thank you to everyone who helped us with all the surveying and monitoring we do. It's vital evidence to collect and guide our work.

Thank you. ●



Jill Nelson is the Chief Executive of People's Trust for Endangered Species.



Hedgehogs



Britain's hedgehogs have declined by 37% in 10 years, and possibly as much as 95% since the 1950s. Our campaign with the British Hedgehog Preservation Society to raise awareness of the plight of the nation's favourite mammal includes substantial investment in the science that will help us understand and ultimately halt their perilous decline. Here are some of the projects that we are funding with your donations.



Roads – the great dividers?

Habitat fragmentation is a problem for hedgehogs, which need a surprising amount of space to thrive. Small, isolated populations are much more likely to be snuffed out. But are roads causing inbreeding in hedgehogs? **Phil Baker** at the University of Reading is investigating the impact of barriers to hedgehog movement in both urban and rural habitats, comparing natural and man-made obstacles, in particular major roads.

Sluggish monitoring

There is a nematode parasite that spends part of its life in slugs, but needs hedgehogs to complete its life cycle. By developing and refining a protocol for testing slugs for the parasite's DNA, **Simon Allen** at the University of Bristol and his colleagues can now confidently assess whether hedgehogs are present in an area without ever seeing one. Slugs are collected from a site, blended up and then tested using precise molecular tools that can identify the nematode. If the nematode is present then so are 'hogs.

Hedgehog-friendly parks

We've continued to roll out our unique training course for park staff, groundskeepers and green space managers. This intensive course teaches conservation professionals everything they need to know about land management with hedgehogs in mind. So far we have trained 230 people from over 50 organisations in seven different counties.

Sleeping quarters

Secure hibernation sites are a crucial component of hedgehog habitat, without which local populations are highly vulnerable. **Richard Yarnell** (Nottingham Trent University), **Lucy Clarke** (Hartbury College), and **Dawn Scott** (University of Brighton) are researching how the structure, species diversity, age and management of hedgerows in arable landscapes might influence their suitability for hibernating 'hogs. We'll use the results to advise farmers on ways they can help hedgehogs on their land.

Who goes there?

Richard Yarnell has also led our work developing footprint tunnels to reliably detect the presence of hedgehogs. The tunnels, which are baited with tempting foods, have inky pads at the entrances and paper linings on which the tracks of visiting animals are recorded. Trials indicate that if ten tunnels are deployed for five nights and do not record hedgehog tracks, then the species is almost certainly absent from the area.

Safe crossings?

Our friends at Froglife have been leading on the use of underpasses to help frogs, toads and newts cross roads. Such tunnels are also used by other wildlife, so we've asked **Silviu Petrovan** and his team to find out what factors influence the use of tunnels by different species, and in particular to ascertain the construction, locations, and habitat characteristics that make them attractive to hedgehogs.

Hedgehog-friendly farming?

Environmental stewardship schemes are designed to improve farmland habitats for wildlife – but do measures such as enhanced hedgerows, field margins, beetle banks and conservation headlands benefit hedgehogs? **Carly Pettett** of the Wildlife Conservation Research Unit at Oxford University has spent the last three years studying the movements and behaviour of hedgehogs on different types of farm. We're eagerly anticipating her results. ●

Scrapbook

We love hearing from PTES people, be they supporters or grant recipients. Pictures, reports, emails, web posts and letters give a great sense of your passion for wildlife, so please keep them coming!



Welcome Louie!

Congratulations to our Dormouse Officer **Ian White** and his wife **Diane**, who became parents on 28th March. Baby Louie weighed in at 8lb 2oz, and here he is proudly sporting his dormouse baby suit!



© Luis Eduardo Rojas

Our Colombian turtle team

Luis Eduardo Rojas, who's coordinating our project to study and conserve the rare Dahl's toad-headed turtle in Colombia, sent us this great photo recently. The team is focussing on population surveys and habitat improvement work, protecting important streambanks from trampling by cattle and restoring riparian vegetation by planting thousands of trees of more than 30 different species.

This lovely letter reminded us that the decline in dormouse populations is really very recent.



Our busy summer included a stand at BirdFair, known as the 'Wildlife Glastonbury'

Dear PTES

My siblings and I kept dormice during the war when the land-girls brought them in from the woods. I used to carry mine in the pocket of my blouse and we took them for rides in our toy farm carts. When we finally had to leave to go away to school, we left the cage door open and they came back to feed for quite some time. I've not seen one for years around here in Sussex, so I am delighted that you are working to save them and I pray your efforts will succeed.

Yours sincerely,

Frances M. Berill



© PTES

Recognition for tamarin project

We were delighted to hear from our friends at IPÊ, the Brazilian Institute for Ecological Research, that their Black Lion Tamarin Project, supported by PTES, was selected from more than 800 candidates as best NGO conservation initiative at Brazil's National Awards for Biodiversity. Congratulations IPÊ!



'Great Hedgehog Cake Off to raise funds and awareness - thanks Sue Ranger!'

/PTES

Top Tweets

[@MattCollis9](#) I've got #dormice! Three in one box and the first I've had at my new site in [@LeighWoodsNT](#). Absolutely stoked!

[@LisaShawWebb](#) I'm so excited and proud to be helping [@PTES](#) and [@BritishHedgehog](#) with their hedgehog survey, I can't wait to get started!





Size matters!

Following the wonderful success of our turtle project in convincing the government of Turks and Caicos to issue new legislation protecting young turtles, our partners at the Marine Conservation Society have been distributing these great T-shirts to local fishing communities as a reminder of the new regulations.



© PTES



© PTES

We aim to reverse dormouse decline

f/ptes.org

Facebook favourites

Carol Richardson appreciated the jaunty style of this frog wearing a leaf on its head and a petal in its mouth.



Lucky Stephen Almond has been watching this lovely fox family for the last nine months.

Meet the team

PTES is run by 16 dedicated members of staff, guided by a board of trustees. Rachel and Emily are helping us achieve our aims in different but equally important ways.

Rachel Lawrence Individual Giving Manager



From the moment I started working in the charity sector I just loved it. I really enjoy working hard for a good cause and being around people who are passionate about improving the world we live in. I joined PTES last year after working at an animal welfare charity. I now manage our fundraising appeals, trying to attract supporters so we'll continue to have the funds to carry out conservation work. I love hearing the diverse reasons donors support us and am continually impressed by the loyalty and dedication of PTES supporters – you are all wonderful!

Emily Thomas Key Species Monitoring Officer



After gaining a BSc in Zoology I worked in a couple of different sectors but soon realised how much I missed doing something I felt passion for! So I went back to university and completed an MSc in Wildlife Management and Conservation. My Masters dissertation was on hedgehogs and I've been under their spell ever since! I initially joined PTES as Hedgehog Street Intern and then became Key Species Monitoring Officer. I now coordinate the volunteers for our National Hedgehog Survey across England and Wales and have set up and coordinated the first ongoing National Water Vole Monitoring Programme, which launched earlier this year. You'll be hearing lots more about that in future (see p17)!

Gibbon school

Jihosuo Biswas, of India's Primate Research Centre, has been running training days for forest rangers to learn how to survey for threatened hoolock gibbons. The first day attracted 30 staff and was so popular that a second event was oversubscribed. We're looking forward to the results of the enhanced monitoring.



© Jihosuo Biswas

Publications

Latest publications from PTES projects

Pozz et al; Remarkable ancient divergences amongst neglected loriform primates *Zoological Journal of the Linnean Society* (2015); doi : 10.1111/zoj.12286

Bellamy & Altringham; Predicting species distributions using Record Centre data: multi-scale modelling of habitat suitability for bat roosts *PloSOne* 2015 10 (6); doi : 10.1371/journal.pone.0128440

Elisa Fuentes-Montemayor et al; Are woodland creation schemes providing suitable resources for biodiversity? Woodland moths as a case study *Biodiversity Conservation* Sept 2015; doi 10.1007/s10531-015-0997-2





Two steppes back for threatened saigas



Imagine casting your eyes to a vast horizon for a glimpse of an iconic saiga antelope. You spot one, lying on the endless plain, then another. But something is wrong. They're not moving. You realise you're looking at carcasses, as far as the eye can see. This was the shocking and tragic scene across central Kazakhstan earlier this year. **Nida Al-Fulaij** reports on our response to the unfolding crisis.

When you hear the word 'antelope' the image conjured up is usually of a tall, graceful African beast. Saigas don't conform to expectations at all. The most obvious feature of this uniquely adapted ungulate is the enlarged nose hanging down over the mouth. This strange, bulbous feature is a filter, protecting the animals' lungs from the choking dust kicked up by thousands of marching hooves as herds undertake their long summer migrations. In winter the large nostrils warm up frigid air as it is breathed in. These extraordinary noses, along with a rich chestnut-coloured coat, large black eyes and spindly legs make the saigas one of the most charming mammals I've been lucky enough to see in the wild.

Saigas are among the larger mammals found in the arid Eurasian steppe, but in the flesh they are surprisingly small, standing between 60 and 80cm tall at the shoulder. The males look larger, thanks to their distinctive horns, which they use to defend their harems of females from rivals.

Saigas are a relic of the ice-age fauna that also included mammoths and sabre-toothed tigers. They once lived as far west as the British Isles, and in the east of their range they may have crossed the ancient land bridge from Siberia into North America. Even a few hundred years ago, herds of saigas still occupied a continuous range from Ukraine to

Animals died within hours of becoming sick. We know that at least 150,000 perished in just two weeks.

China. More recently their range stretched across the plains of Kazakhstan, Uzbekistan, Russia, Mongolia and Turkmenistan. But now those vast herds are gone, reduced to just five isolated populations.

Saigas of all ages are vulnerable to predation by wolves, and calves are taken by foxes and eagles. Humans have also hunted saigas for millennia, mainly for meat and hide. However, since the decline of the Soviet Union, this pressure has escalated dramatically. As rural economies collapsed and poverty spread, poached saiga meat began to provide an income, as well as an illegal source of food. Then a new form of hunting emerged – targeting horn, for use in traditional Chinese medicine. This much larger-scale exploitation is completely unsustainable. In just 15 years, 95% of the world population was lost, threatening the entire species with extinction.



© Stefan Zahner

We've been funding work on saiga antelopes in Russia and across their range for the last 10 years. Although saigas are classified as Critically Endangered by the IUCN, they face a brighter future than many others in a similar situation, because of the dedication and close cooperation of those working to protect them. The Saiga Conservation Alliance (SCA) is a group of researchers and conservationists who have

been working together to study and protect the species for 15 years. We have worked closely in partnership with two SCA trustees, Professor E.J.

Milner-Gulland of

Imperial College, University of London, who began working with saigas whilst doing her PhD in Russia in 1990, and Anna Lushchekina, who introduced PTES to saigas back in 2005.

The SCA has a strong team established across the saigas' range, but 2015 has brought the toughest challenge yet. In May, reports began to flood in of dead and dying antelopes across central Kazakhstan. What started as hundreds of deaths in the Kostanay region rapidly escalated to thousands, then tens of thousands across a much wider area. People on the ground described how the affected animals became lethargic, lost coordination and died within a few hours of becoming sick. We now know that at least 150,000 perished in two weeks.

PTES supporters quickly provided emergency funds enabling the SCA to respond to the crisis, gathering samples in

ABOVE: The mystery disease that has killed thousands of saigas may have been triggered by a widespread environmental factor.

MAIN PICTURE: The Centre for Wild Animals (CWA) in Kalmykia, Russia, is the first and currently only captive breeding centre for the saigas, maintaining the species gene pool and carrying out critical research.

BELOW: Rangers from CWA dedicate their lives to protecting saiga antelopes in the Republic of Kalmykia, Russia.



© Nils Bamnollet

OUR WORK WITH SAIGA ANTELOPES



© Nandini Singh

LEFT: The extraordinary proboscis that gives saigas their distinctive appearance serves as a dust filter in summer and in winter it warms cold air as it is drawn into the lungs.

RIGHT: In happier times, young saigas gain strength and stamina remarkably fast. Within a week they are able to run at over 40 kph, and begin their first northward migration, travelling 80km or more each day at an ambling pace.

Kazakhstan that may help understand the causes of the mass die-off and put in place measures to ensure that it doesn't happen again – at least not to the same extent. Mass die-offs of animals do occur in nature, and have happened to saigas before. But the significance is much greater this time because many herds suffered 100% mortality, including one of 60,000 individuals. It's extraordinary and alarming and, worse still, we don't know exactly what happened.

Early reports suggest that the cause is unlikely to be an infectious agent transmitted from one animal to another. Two of the populations lost were about 300km apart and yet they succumbed simultaneously. 'Epidemiologically, directly transmitted diseases don't kill whole populations in seven days,' says Richard Kock, wildlife vet at the Royal Veterinary College in Hatfield and part of the team on the ground. A possible alternative is a polymicrobial disease involving bacterial pathogens such as *Pasteurella*. These pathogens are always present in the population but could have been triggered to run riot by a widespread environmental factor.

I visited the Republic of Kalmykia in the south-western corner of Russia last year, to attend a week-long saiga workshop. The people I met were an awe-inspiring group, dedicated to protecting saigas in a special way. Teachers, wildlife club leaders and biologists were stimulating interest and passion in their young students, ensuring that the next generation will not only reject saiga poaching but also hold the species in the highest regard. Most school children in the UK are aware of wildlife to some extent but their connection with nature is limited.

In Kalmykia, we visited a local secondary school and their knowledge of wildlife and enthusiasm for their national species was phenomenal. Colourful murals of saiga antelopes adorned the walls, one whole room had been turned into their very own natural history museum, and the children performed songs and dances for us that celebrated not just the antelopes, but also the people conserving them. Their passion and enthusiasm was heart-warming and reassuring. We could learn a lot from these communities.

After visiting the school we had the chance to explore Kalmykia's capital, Elista, where the most imposing building is a towering Buddhist temple. At the entrance, visitors are welcomed by a statue of the White Old Man – a local deity and protector of nature – standing with a saiga antelope leaning tenderly against his leg. The tradition of respecting and coexisting with nature is important here, and offers hope.

We hope that our swift response will help uncover the underlying cause of the disaster so that we can be better prepared for the future. It's unlikely that natural die-offs can be wholly prevented – but we can work on the factors that make populations highly susceptible to losses, such as poaching. Until saiga numbers are robust enough to withstand great losses, and pressures have been reduced, we are proud to support the SCA teams mobilised across the species range to protect these creatures at all costs. ●



Find out more

www.ptes.org/saiga

You can see more images from Kazakhstan by visiting this web page but please note some of the images are upsetting.



© Eugeny Polansky



© Eugeny Polansky



Fact File

SPECIES NAME

Saiga tatarica

COMMON NAME

Saiga antelope

DISTINGUISHING FEATURES

Small tan-coloured antelope, 60–80cm at shoulder, distinguished by large fleshy proboscis and large dark eyes with obvious preorbital glands. Males have gently curving ridged horns.

HABITS

Gregarious, nomadic grazers, with migratory herds numbering tens of thousands. During annual rut males fight for harems of up to 50 females.

LIFE HISTORY

Single calves or twins born in April after five month gestation, weaned at about four months; may live up to 10 years.

HABITAT & DISTRIBUTION

Steppe grasslands, with remaining populations located in Mongolia, Kazakhstan and far southwestern Russia.

CONSERVATION STATUS

Critically Endangered (IUCN); also listed on Appendix II of CITES & Appendix II of the (Bonn) Convention of Migratory Species.

Desperate times

E.J. Milner-Gulland explains how practical action is helping her cope with a tragic situation.



Professor E.J. Milner-Gulland has spent 25 years working on saiga antelopes, and helped to set up the Saiga Conservation Alliance.

The first time I saw a saiga antelope, I'd been searching for two days, driving across the vast steppe of Kazakhstan. I was running out of time and beginning to lose hope, when we nearly drove into a baby saiga sheltering in the wheel ruts of the rough track, almost invisible against the sandy soil. I was thrilled, and that feeling of elation has stayed with me over the years. There's nothing to beat standing on the steppe in a sea of waving cotton-grass as the sun goes down and the larks singing loudly, and seeing the female antelopes return to feed their offspring. The air fills with gruff mooing as each mother searches out her own youngster among the throng.

These graceful and mysterious animals have been my passion for 25 years, even though I spend most of my time at a desk in the UK. When I started to see images from Kazakhstan of dying mothers and doomed orphans crowding round the last standing female, desperate for milk, and then the endless sea of carcasses, I was heartbroken. This precious population took years of effort and conservation work to build up. My colleagues saw the tragedy unfold first hand during a monitoring trip to the saiga birthing grounds – usually a joy. For once, I was glad not to be there.

Since then, I have been trying to get the best possible conservation strategy in place and speaking to the media around the world, so that these awful events can at least act as a catalyst for future conservation of saigas. These practical actions help with the grief, as does the scientific and intellectual challenge of working out how and why the mass mortality happened, and understanding the biology of this highly unusual disease. It has been draining. But the support and understanding that we're getting from PTES and others has really helped me and my colleagues through these difficult times. ●



The team talking to farmers



Taking samples on the steppes



A newborn saiga



© All images SAC

Landmark dormouse release

Lorna Griffiths of Nottinghamshire Wildlife Trust reports on our continuing effort to restore dormice across their native British range.

Fragmentation and habitat loss play a major role in the decline of dormice and other species. PTES has been working to restore and monitor dormice across their former range in England and Wales for over 25 years. Originally the reintroductions sought to fill gaps in the species' range where dormice had gone extinct, or to boost numbers at sites where populations were showing signs of decline. Some of these earlier release sites were isolated woodlands, with very little connectivity to the wider landscape. However, after a review of the reintroduction programme commissioned by Natural England, it was concluded that future reintroductions should form clusters of woodlands connected by a network of hedgerows. It is expected that this new strategy will improve the chances for the long-term survival of the species by linking up isolated populations.

The cluster approach has initially focused on north Nottinghamshire, where PTES is seeking funding for a long-term landscape project in partnership with the Nottinghamshire Dormouse Group (NDG), Nottinghamshire Wildlife Trust (NWT) and local landowners. By restoring hedgerows and creating new wildlife corridors between areas of suitably managed woodland, the project will create a hotspot of interconnected new dormouse populations. Following two previous reintroductions in 2013 and 2014, this summer we were well practiced for the third. The new wood is within 3km of the other two sites and has good connectivity, thanks to restoration and re-planting work.

Volunteers from NDG prepared for the release by mounting 20 soft release cages and 50 nest-boxes on trees in the centre of the woodland, and in June 20 pairs of

captive-bred dormice were reintroduced. Their arrival marked the 25th dormouse reintroduction by PTES, and a number of partners were present for the release including representatives from PTES, Zoological Society of London (ZSL), Paignton Zoo, Natural England, NWT and members of NDG.

The reintroduction followed the standard 'soft release' protocol PTES has developed over the years, with pairs of dormice being introduced to the cages, where they lived for 10 days, getting used to their new surroundings. After this acclimatisation period, small hatches in the cages were opened, enabling the dormice to leave the cages of their own free will, investigate their new home and search out natural sources of food. To aid the transition from captivity to the wild, the dormice are provided with supplementary food as required, for about two months.

Some of the cages were fitted with motion detection cameras for monitoring purposes, and early footage showed that all the dormice were quick to leave the cages, with only a few returning periodically to feed. This suggested that the majority were able to find plenty of wild food from the start. Although it is still early days, signs for the future are good. We're delighted to report that babies have already been spotted at the site. It seems highly likely that one of the females released was already expecting young. Let's hope that we find more evidence of breeding next year. ●

endangered



Nida transports the precious cargo to their release cages



© All images PTES

Making martens welcome

How we helped the **Vincent Wildlife Trust** smooth the way for pine marten recovery in mid Wales.



The occasional sighting of pine martens outside their northern stronghold area gives hope that a recovery of the species across England and Wales is possible, and the thought that these sinuous and charismatic hunters could once more thrive across Britain is exciting. In Wales, a dead pine marten was found on a road in Powys in 2012 and evidence suggests small numbers exist in Gwynedd and Ceredigion. But numbers are so small that there have been no live sightings for decades and translocation is thought to offer the best chance of returning the population to a viable level.

The reason pine martens declined so severely in the past is associated with a perception that they can be problematic predators of gamebirds and domestic fowl. So in order for a recovery to happen, and certainly before reintroductions took place, it was important that informed public opinion was in favour. In mid-Wales, where large areas of suitable woodland had been identified as potential release sites, our friends at the Vincent Wildlife Trust used PTES funding to conduct a consultation and engagement project ahead of their attempt to release a population of these beautiful mammals to an important part of their rightful range. ●



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To the riverbanks!

Emily Thomas reports on the launch of our major new initiative to coordinate water vole conservation across the UK.

We have already had a fantastic response from volunteers to our new *National Water Vole Monitoring Programme*, which launched at the beginning of April. Some 286 of the sites we'd pre-selected for annual monitoring have been allocated to surveyors and almost 220 additional sites have been registered. We asked volunteers to survey their sites once during May, though this period was extended slightly this year to allow for landowners to be identified and contacted before the survey was carried out.

The deadline for submitting results this year is the end of October. We'll then collate and analyse them to find out what the current national picture is for water voles.

We owe a massive thank you to all the volunteers who have been involved in the programme so far. If you're interested in surveying a site next year then please register online and select a location now so you're all set to go next May. ●



© Jan Green www.wildword.co.uk



Find out more
www.ptes.org/watervoles
watervoles@ptes.org

Traditional orchard advice online

Our new Orchard Officer **Megan Gimber** reports on some exciting developments for our long-running traditional orchard project.

Traditional orchards are a fantastic oasis for wildlife across the country, providing shelter to an array of species, some of which would otherwise struggle to survive.

Earlier this autumn, as Apple Days were taking place around the country, we launched our virtual advice centre designed specially to support owners of traditional orchards keen to restore and maintain their sites. A wealth of information is available on ecologically beneficial and sympathetic management and restoration techniques, and we're also providing help tracking down local heritage fruit varieties, sending out practical management guides and providing grants to help get novices started.

The orchard team has been busy all year gathering, writing and filming content for the new web pages, which you can find at www.ptes.org/orchards. We're really excited to show off what orchards have to offer and help owners discover and protect these wildlife havens. ●



© PTES

There's more! We don't have room to tell you about every project, but your donations have also been supporting...

RHINO CENSUS



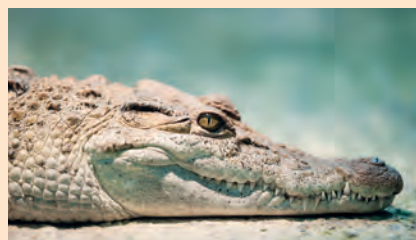
© Pranjal Bezbarua

Pranjal Bezbarua, who runs our Indian one-horned rhino project in Assam, sent us encouraging results of the 2015 census in Kaziranga National Park. The area is now home to 2,401 rhinos, up 72 on the 2013 figure and more than double the original count made in 1991. ●

SAVING WOOD PASTURE

Britain's wood pastures and parklands support specialist wildlife, but many suffer from neglect, changing land use and development. We are working with Natural England, the National Trust and others to develop a simple survey technique so that volunteers can be enlisted to help assess the real condition of these ancient sites. ●

PHILIPPINE CROCS



© Peter Wey / Shutterstock.com

Our Philippine crocodile project at Dinang Creek has now built 62 livestock pens, excavated two safe drinking water wells and planted a vegetated buffer zone alongside this stronghold area for the species. With these measures in place to protect local people and their animals, the community now supports crocodile conservation and, in April, they helped release five captive-reared juveniles in the creek to help boost the population. ●

Seeing stars



PTES grant recipient **Richard Lansdown** has been searching for one of the world's rarest water plants – the tiny, beautiful water-starwort.

Beautiful water-starwort (*Callitriche pulchra*) is a small water plant, related to plantains. Until recently it was known from only a handful of pools in limestone pavement in the Cyrenaica area of Libya, and on the tiny island of Gavdos off the southern coast of Crete. Limestone pavement is a scarce habitat in the Mediterranean, so every site is vital. Some good news came in 2014, when beautiful water-starworts were found in three small pools on Cyprus by Kyriakos Kefalas, but worryingly the species hasn't been seen in Libya since 1969. It's classed as Critically Endangered by the IUCN.

PTES provided a grant for **Ioannis Bazos**, of the University of Athens, and me to travel to Gavdos to assess the status of beautiful water-starworts there, and decide whether urgent conservation action was needed. Gavdos is the southernmost point

in Europe, and in summer its resident human population of just 80 is boosted by 10,000 tourists, attracted by the beaches and clear skies. Outside the tourist season however, it feels like one of the most remote places on Earth, and it takes three days to reach from the UK by plane, train, bus and ferry.

Ioannis and I were guided by the mayor of Gavdos, Evangelia Kallinikos, who not only knows everyone on the island, but also

understands its geography. During our visit, we recorded more than three hundred limestone pools, most of them less than a square metre

Good news came in 2014 when *Callitriche pulchra* was found in three small pools

in surface area. To our delight, over 100 of these tiny habitats contained specimens of beautiful water-starwort. Thus on Gavdos the population seems to be secure for now, but it is threatened by the spread of Calabrian pine into areas where traditional agriculture has been abandoned. ●

RIGHT: The dainty form of beautiful water-starwort – one of the world's rarest plants.

BELOW: The dry limestone landscape of Gavdos is studded with tiny pools, where *Callitriche pulchra* clings to a fragile existence.



© Richard Lansdown

Action to save the world's rarest pig



On the tiny Indonesian island of Bawean lives a species of pig so rare it was recently thought to be extinct. We are working to pull this unique animal back from oblivion.

The landscape of Bawean, off the coast of Java, is changing rapidly. Only a tenth of the forests that once cloaked the volcanic slopes remains – the rest have been converted for agricultural use, including vast plantations of teak. The native wild pigs are forced to leave their dwindling forest homes to feed, but then risk being exterminated as pests.

We are funding conservation scientist **Johanna Margono** and her team to carry out the first ever investigation to find out more about Bawean warty pigs.

The good news is that the species still seems predominant over feral European wild pigs, which increasingly compete with native species elsewhere. Camera traps at crop raiding sites are revealing

behaviour such as feeding, travelling, socialising and even fighting. The team has also spotted sows with very small piglets, suggesting they were born in March or April. This is all valuable ecological information on an otherwise little-known species.

Interviews with 50 local people are encouraging – many are happy to try and find a solution. The promotional stickers and educational materials the project gives out are also very popular with school children.

To ensure a lasting impact, the findings will be reported to local people as well as the governmental authorities as we press for species protection. Several local guides will be trained to continue the good work, providing more than a glimmer of hope for Bawean warty pigs. ●



© Irfan Iyamoto

Starting them young in Java



The Nature Club initiative educates local children about the importance of protecting the region's beautiful montane forests, home to the endangered slow loris. **Faye Vogely** of the Little Fireface Project reports.

Every Friday, children in Cipagantim join us for the free sessions at a school we helped to build with the aid of PTES. One of the rooms in the bright and inviting building is set aside for our Nature Club, and its walls are plastered with murals, drawings, maps, and posters of animals and plants.

Nature Club provides fun classes on biological and ecological topics. The lessons are light-hearted and involving. We conduct basic scientific experiments and often go outside. As long as laughter fills the air we know we're doing our job well, but we also monitor the effect of our work, see how much the children retain and how their views of the world change as they learn.

At the moment, the focus is on the importance of trees and agroforestry. The

children have built a tree nursery, and are learning to value trees for their ecological as well as economic benefits. Agriculture is changing the landscape in Cipagantim and loris habitat is disappearing. By educating the children (and, in separate efforts, the farmers) on how trees benefit both people and lorises, we hope to provide an environment where both species can live together.

Working here is incredibly rewarding. Attendance is increasing every week and when I walk through the school gates, I am welcomed by excited children: 'Miss Pey, Miss Pey! (they struggle with the 'F' in my name) Apa kabar?' It means 'How are you?' and the only answer I can give is, 'Great. Things here are absolutely great.' ●



Learning is fun at Cipagantim Nature Club!

© Faye Vogely

Meet our 2015 interns

Every year, we help launch the careers of promising young conservationists by funding short projects that allow them to train on the job and begin making a difference to threatened species right away.

Michael Smith

The last known sighting of a **bordered brown lacewing** in the UK was in Holyrood Park in Edinburgh, 20 years ago. If the species does still exist here, its uncertain status, restricted range, and lack of ecological information make it very vulnerable. With assistance from Buglife and Historic Scotland, **Michael Smith** (seen here wielding a special bug-vac) is seeking to determine the status of this rare insect. If he finds it, he will try and clarify its relationship with wood sage, a plant with which it is thought to be ecologically linked, though the nature of the association is unclear. This information may help establish a habitat management plan for the conservation of the species in the UK. ●



Gillian Birtles

Scotland's non-native coniferous plantations are often regarded as having little value for biodiversity. But recent evidence suggests that such areas may be important for several protected bat species. **Gillian Birtles** is working with the University of Stirling and the Forestry Commission Scotland to find out more about how **soprano pipistrelles** use Galloway Forest, using radio-tracking to locate maternity roosts, and mapping movement corridors and foraging patches. She'll also investigate how felling influences the species, and her results will aid the Forestry Commission with conservation planning. ●



Rory Dimond

The large scabious bee relies on pollen from scabious plants to feed its young. The species was once widespread in southern England but has declined along with its food plants, and may be nearing extinction in Cornwall. **Rory Dimond** is working with Buglife to find out whether any populations of large scabious bee are holding on near a former stronghold site. He will assess the viability of any populations he finds and encourage landowners to manage their grasslands to conserve this rare bee. ●



© Steve Falk

Alice Kent

Alice Kent of the University of Oxford Wildlife Conservation Research Unit is embarking on a study of two sexually transmitted diseases affecting badgers by screening the population in Wytham Woods for *Chlamydia* and the herpesvirus MusHV-1. This neglected area of wildlife health is important, since many species of conservation concern are known to suffer reproductive failure and infertility as a result of infections. ●



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Connor Wood

Invasive signal crayfish are now well established throughout the UK, and they're driving native white-clawed crayfish to localised extinction as well as causing bank collapses and increased sediment loading. Traditional trapping is unlikely to succeed as a means of eradicating them – since it's mostly large, male animals that are caught, leaving females and smaller males to reproduce. However the effect of sex bias in the

remaining population is not well understood, so **Connor Wood** is working at the University of Aberdeen to understand how control measures might influence sex ratios and population growth. He'll compare the results of different trapping regimes and investigate the effects of different sex ratios over the breeding period. Ultimately, this project will ascertain whether sex ratio is a significant factor in signal crayfish ecology and control. ●



Vicky Fowler

We know that artificial light can affect the behaviour of bats and other wildlife, but what about their physical wellbeing? **Vicky Fowler** is working with Amy Fensome and Professor Fiona Mathews at the University of Exeter, to investigate whether high levels of artificial night lighting in the environment might cause physiological stress in bats. Using a non-invasive approach she will conduct stress hormone tests on samples of faeces collected from lesser horseshoe and brown long-eared bat roosts across the southwest of England. She will then analyse the concentrations of these hormones and compare her results with the amount of light in the core area used by each bat population for foraging (known as the sustenance zone). ●



Deborah Wright

Deborah Wright is working with Warwickshire Wildlife Trust to investigate the distribution of harvest mice in the county, where there have been fewer than 10 harvest mouse records in the last eight years. Deborah will survey sites for nests and record any surrounding vegetation. She'll also set mammal traps and analyse owl pellets for harvest mouse remains. Her results will be shared with the local records centre, landowners and other interested parties. Deborah will also be putting her new expertise to good use by helping to train others in workshops. ●



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Find out more and how to apply for future internships
www.ptes.org/grants
grants@ptes.org

The Insider's Guide to... DNA analysis



Our Insider is research biologist **Fraser Combe**, who is currently studying dormouse genetics at Manchester Metropolitan University.



What and why?

There's more to biodiversity than the number of species in an environment. Genetic diversity within species or between populations is also important because it allows species to adapt to environmental change and avoid problems associated with inbreeding. As conservationists, we're also interested in identifying variants that might require special attention, such as rare subspecies with a limited geographic range. Another use for genetic tools is in measuring how genes are spread across a landscape – sometimes called 'gene flow'. Studies of gene flow can identify the physical landscape barriers, such as roads or built up areas, most likely to cause reproductive isolation. This knowledge can help us target conservation activities such as restoring habitat corridors or building animal bridges in areas where they'll be most effective in reconnecting vulnerable populations.

Step 1 – Collecting DNA

Genes are made of a molecule called deoxyribonucleic acid, or DNA. DNA can be gathered in many different ways. These days, we usually focus on methods that are 'non-invasive', obtaining genetic material without injury or stress to the organism. Because only a tiny amount of DNA is required, we can usually extract enough from shed hairs, feathers, faecal material or from other debris gathered from inside a used nest box. As often as not, the animal won't even be aware it has been sampled.



Dormouse nest boxes are a good source of DNA, which can be extracted from hairs and droppings. Luckily a little goes a long way!

Step 2 – Sample preparation

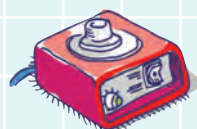
Most samples we handle will contain a wide range of biological and other compounds in addition to DNA. Extracting the DNA stored in the cell involves breaking the membranes that enclose cells and their contents, using enzymes. Adding a highly concentrated salt solution to the resulting soup causes the molecules we don't want or need (such as fats and proteins) to precipitate, that is to form solids and come out of solution. The DNA remains in solution and can be separated from the unwanted cellular debris by centrifugation (spinning at high speed so that solids collect as a pellet at the bottom of a tube). The DNA, which is still dissolved in the liquid, can be moved to a new sample tube and stored indefinitely in a freezer to use when needed.

The aim is to obtain pure DNA from just the target specimen, and the most important consideration in the preparation and handling of a sample is avoiding contamination with DNA from other sources. This could include other individuals of the same species, but also the researcher – we all shed DNA all the time and as any forensics scientist will tell you, every contact

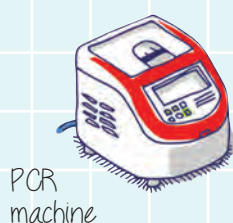
Tools of the trade...



Centrifuge for separating precipitate



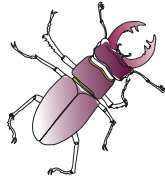
Agitator for mixing samples



PCR machine

Micropipette & sample tubes





leaves a trace. The DNA extracted from the sample may consist of hundreds or thousands of copies of the whole genome, depending on the size and nature of the original sample material.

Step 3 – PCR (Polymerase chain reaction)

To measure the variation in a particular set of genes easily, it's best to have millions of copies of the relevant sections of DNA. But the non-invasive techniques usually applied in conservation studies, mean that our samples tend to be smaller, often just a few thousand copies. Thus before doing any analysis, we have to boost the sample and increase the number of gene copies. To accomplish this we use a standard laboratory technique called polymerase chain reaction (PCR), which uses the DNA in our sample as a template to make many copies of specific sections of DNA. Using enzymes similar to those that work in all living cells to copy the nucleotides (the building blocks of DNA), we can create as many copies as we need. PCR is used in many different applications in biology, and has revolutionised the field of conservation genetics.

Step 4 – Separating DNA fragments

A relatively simple way to observe genetic differences is by measuring the length of different versions of a particular gene, found at a specific location in the genome of different individuals. These different versions are called alleles. Once we know a particular gene has a variety of alleles, we can identify them by length, using a process called gel electrophoresis. This is the process of physically pushing the gene copies we made with PCR through a solid gel using an electrical charge. Larger alleles move more slowly through the gel and thus become separated from smaller



Fraser loads the gene copies he made using the PCR technique into the gel cast. Here the DNA fragments will be separated and different alleles can be seen.

alleles in much the same way as pigments separate as they seep through a piece of blotting paper in traditional chromatography. Because DNA is invisible, we combine it with a molecule that reflects a specific wavelength of light, which we project over the gel using a laser, and visualise using special sensors.

In practice

How is DNA analysis helping dormice?

My research aims to use genetic tools to aid the long-term conservation of hazel dormice in the UK in two ways. Firstly, I'm comparing the genetic variability of dormouse populations across the UK with that of populations in continental Europe. This is critical in recognising potentially unique regional genetic variants so that they can be incorporated into a conservation plan. I'm also interested in finding out whether dormice in the UK are distinct from their continental cousins and, if so, by how much. This sort of information is used to influence specific conservation priorities for UK dormice. To achieve all this, I'm collecting dormouse DNA samples from across the species' UK range, using sequencing to measure genetic differences, and making statistical comparisons with the diversity we find in samples from other areas. My preliminary findings suggest that there are five distinct genetic variants of dormice within the UK, and that they are all genetically distinct from dormice found in continental Europe. Using this data, I have estimated that dormice first reached the UK between 8,000 and 10,000 years ago, shortly after the last Ice Age.

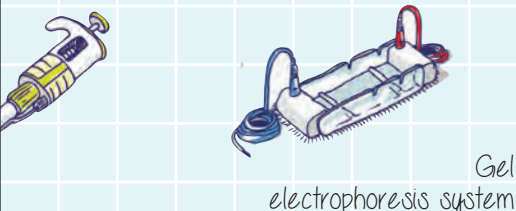
I'm also investigating gene flow to see how dormice move through their habitat and between populations, and specifically how particular landscape features help or inhibit these movements. For example, it seems likely that roads restrict gene flow, but we don't really know by how much. I'm also using the same techniques to see what effect the creation of corridors like hedgerows or wildlife bridges has in real dormouse populations.

Step 5 – Sequence analysis

Another way to measure genetic biodiversity is to compare longer DNA sequences between individuals and populations. This is the same procedure as used in the Human Genome Project, which has the aim of identifying differences in particular DNA regions. In a conservation setting this kind of information is used to identify distinct genetic variants. Once identified, such populations or species can be protected to conserve their uniqueness. We might also use this information to understand historical dispersal and geological movements which can affect species' distributions.



Survey work - even geneticists like to get outdoors!



© iStockphoto.com / aurielaki



Many people have no idea that red squirrels were once common across England and Wales, before grey squirrels ousted them from all but a few islands and isolated areas. Severe shrinkage of natural habitat and the devastating squirrelpox virus carried by the greys have greatly accelerated their decline.

Protecting the red squirrels left in Scotland is an absolute priority. We are helping the Saving Scotland's Red Squirrels project to do just that.

Your support is vital.

Thank you.



people's
trust for
endangered
species