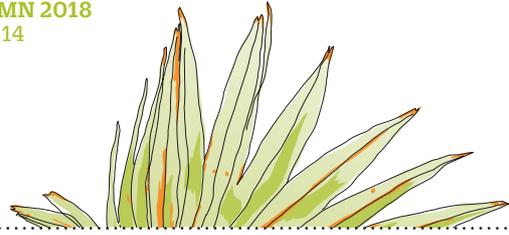


Wildlife World

AUTUMN 2018
ISSUE 14

people's
trust for
endangered
species



ISSN 2049-8268

UK

New mammal grants
Bottlenose dolphins
Lulworth skipper butterflies
Solitary bees

Relative values

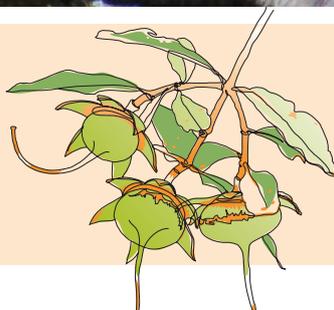
Discover the many
ways we're helping
threatened primates

Overseas

Saiga in Uzbekistan
Siamese crocodiles
Snow leopards
Indonesian elephants

Hedgehogs vs badgers?

Badgers eat hedgehogs, but are they contributing to hedgehog decline? We're investigating this highly complex relationship.



Stag do

We're proud to be beetle fans at PTES, and we're working hard to secure a future for Britain's biggest, the magnificent stag beetle.

Stable isotope analysis

It's one of the most remarkable tools in modern conservation – but what actually is it?





Bringing the wild back to life

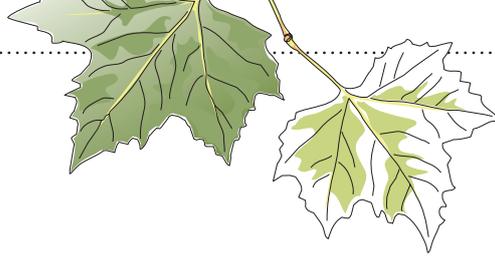
Wildlife World is published by People's Trust for Endangered Species

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](http://www.ptes.org)

HEDGEROWS

Hedgerows are vital for wildlife, offering food and security for animals at all stages of their lives. Hawthorn, seen here, is a stalwart of many hedges. It fruits profusely, but only on second year wood, so rotation cutting should happen every other year. We're managing hedges on our reserves to provide the best long-term resource for wildlife. Please help us protect these unique habitats.



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In this edition



© Jitchoo Biswas

© Victor Tyshir / Shutterstock.com



© Marie-Louise

© Peter Jones

Welcome



© Dave Willis

Times are changing, I feel it. The ecological havoc wreaked by humanity is starting to bite in ways no one can ignore. Whether we are changing fast enough is another matter – almost certainly not for the countless species whose abundance has declined drastically in my lifetime. Our window of opportunity is small, but that's no reason to be downhearted – quite the opposite in fact.

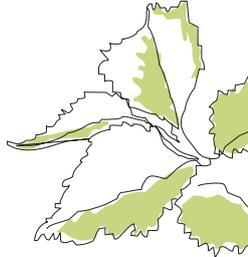
Let's act while we can. Please keep up your wonderful support for PTES, and have a think about other ways you can help struggling wildlife. Citizen science, backyard or community conservation projects, spreading the word, lobbying your MP about the kind of country you want to live in, considering the impact and environmental costs of consumer purchases. It all counts. ●

Dr Amy-Jane Beer, Editor
 ● twitter.com/AmyJaneBeer

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people's trust for endangered species



Naturalist and wildlife photographer **Ben Andrew** first approached PTES on a quest for beetles, and our relationship has turned out to be mutually beneficial.

I got in touch with PTES about five years ago to see if they could help put me in contact with a scientist working on stag beetles, a species I was keen to photograph. Not only did I get some great images of the beetles (see page 8), I was able to learn a great deal more about the species from an expert. As a thank you, I offered PTES the photos to use for their own work – an arrangement that has since extended to include a number of other species I photograph, such as water voles and harvest mice, pictures of which have appeared on the website and in the PTES calendar.

As an amateur wildlife photographer I think it's important to put a value on your work so I certainly don't give my images away for free to just anyone. But, I also think it's important to support conservation organisations and work alongside them when possible. One way to do this is by donating financial support, but fortunately I'm also in a position to help through my photography skills. If one of my images helps PTES to raise vital funds for their conservation work then I'm happy. I hope to work with PTES more in the future, maybe photographing some of the other species they're working to save or documenting some of the amazing conservation projects and researchers whose efforts they support. ●

Follow Ben on Twitter
@benandrewphotos

“
If one of my images helps PTES raise vital funds for their conservation work then I'm happy
”



OUR PLACE
Mark Cocker
RRP £8.99/£19.99

Acclaimed nature writer Mark Cocker's latest book - subtitled 'Can we save Britain's wildlife before it's too late?' is timely, daunting and inspiring in equal measure. Perhaps the most important book you'll read this year.



HEDGEHOG
Pat Morris

RRP paperback £65; hardback £65

The latest in the celebrated Collins New Naturalist series, number 137 no less, is by a leading hedgehog expert and friend of PTES - a must for hedgehog enthusiasts and book collectors alike.



TURTLES SNAKES & OTHER REPTILES/ THE A-Z OF WILDLIFE WATCHING

Amy-Jane Beer
RRP £8.99/£19.99

A busy year for *Wildlife World* Editor Amy, with two new books on offer – one for children, another for the coffee table.



Solution or part of the problem?

A debate rages in conservation circles over Nature Capital, a concept that attempts to value nature in financial terms. Will doing so help policy makers take nature more seriously, or frame it as an asset to be exploited?



In favour...

Tony Juniper CBE, Executive Director for Advocacy and Campaigns, WWF

How is it that after all the scientific reports, media coverage and decades of hand-wringing that the destruction of nature continues? The answer is in large part down to how some regard the liquidation of nature as an inevitable price of progress. While many politicians, business figures and economists see the destruction of nature as regrettable, they also believe it is necessary for economic growth, job creation and competitiveness. In this frame, looking after nature is seen as an unaffordable cost and a drag on development.

This is quite wrong of course. Healthy natural systems are vital for our health, wealth and security. Nature supplies our food and water, inspires innovations in medicine, design and engineering. Nature plays vital roles in the carbon cycle and protects us from extreme weather. If you add up the value of all that and more – the dividends we derive from intact natural assets, or natural capital – then economic arguments against protecting and restoring nature evaporate.

The benefits we derive from intact natural capital easily outvalue global GDP and, when viewed from that perspective, the conservation and restoration of nature flips from being an unaffordable luxury to a practical necessity. We can only do this by making the full value of nature more visible. The intrinsic, aesthetic and spiritual value of nature is vast, but practical reasons for conservation must be promoted too, in order to dispel the economic misconceptions which are the main problem. ●



Against...

Miles King
Environmental
policy researcher
and advocate

There's something beguiling about the notion that valuing nature in financial terms will help to save it. 'We have to talk to business and government in their own language', I am told, repeatedly. My question is – if we need people in society to develop ethical stances as to the value of nature, are accountants really the best choice?

I have nothing against accountants. But the behaviour of the 'big four' accountancy firms: tax avoidance; money-laundering and failures to audit large corporations, suggests we should look elsewhere for ethical guidance.

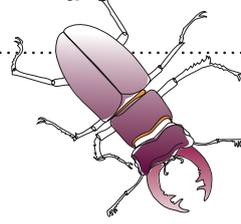
The green economist Kate Raworth suggests that there are four elements to the economy: the household, the market, the commons and the state. Very few would suggest that a global 'common' like the

Do we really want nature sold to the highest bidder?

oxygen we breathe should be given a financial value, or that love and care within households should be monetised. Why then, would we do so for nature? The risks are significant.

One is that financial value becomes price. Do we really want nature sold to the highest bidder, or the cost of its loss to become just another business expense? In ethical, emotional and spiritual terms the value of nature is literally immeasurable, and yet these reasons for protecting nature could easily be crowded out by financial ones.

It's vital that we understand why nature is precious, but the way we express this value is equally important. Financial valuation, within our current warped economic system, will reduce nature to just another tradable asset. ●



Amy-Jane Beer reviews some of the recent news stories for PTES and the wider field of conservation. A lot happens in six months, but you can also find the latest at www.ptes.org

Champions in parliament

PTES is supporting two new MPs stepping up to champion water voles and hazel dormice.



© Shutterstock.com / Etni

Two more of Britain's threatened mammals have friends in Parliament. **The Rt Hon Hilary Benn MP**, Chair of the Exiting the European Union Select Committee and **The Rt Hon Matt Hancock MP**, Secretary of State for Health and Social Care, have agreed to become species champions for water voles and hazel dormice respectively. They join **The Rt Hon Chris Grayling MP**, Secretary of State for Transport, who signed up as hedgehog species champion last year. The role of the new champions is to learn about their adopted species, champion its cause in public and in Parliament, and work to enhance its protection in their constituencies. PTES is supporting all three MPs by briefing them about developments and alerting them to opportunities where they can help. ●

Which hedgehog house?

Our Hedgehog Housing Census sheds light on garden measures that really help hedgehogs.



© Brian Aueron

Last year we invited Hedgehog Champions and members of the public to tell us their experiences of using hedgehog houses. We wanted to know how

well hedgehog houses were used, and which designs worked best. We had a fabulous response, from more than 5000 people. The data, analysed by the University of Reading, reveal that hedgehogs prefer homemade houses in back gardens. Shop bought houses are still a good alternative but, either way, local animals need time to get used to a new house before they use it. The chances of a hedgehog moving in are improved by the provision of food and bedding in a garden and, perhaps surprisingly, the presence of pets or badgers doesn't seem to deter hedgehogs from moving in.

We also found that 81% of occupied hedgehog houses were used for resting during the daytime in summer, 59% for hibernation during winter months and 28% for breeding. We're using these results to help conserve hedgehogs and give accurate advice to anyone wanting to provide shelter for them. Simple instructions on how to build two different types of hedgehog house are available at www.hedgehogstreet.org ●

Nuns to the rescue

Mexican sisters lend much needed expertise in captive rearing threatened salamander.



© Chester Zoo

In what's thought to be the first collaboration of its kind, a convent of Mexican nuns has partnered with conservation organisations, including Chester Zoo, to fight the extinction of a critically endangered amphibian. The Lake Pátzcuaro salamander *Ambystoma dumerilii* is a close relative of the similarly threatened axolotl. The nuns of the Dominican monastery convent in Pátzcuaro have been sustainably rearing the species for 150 years and using them in a traditional treatment for coughs, asthma,

and anaemia. Now they're doing so as part of an international captive breeding and reintroduction project that should see animals returned to the wild in 2020. According to Gerardo Garcia of Chester Zoo, the convent stock are valuable because they live in conditions much closer to those in the wild than those in breeding facilities elsewhere. ●

Snow leopard reserve taking shape

Following her recent success designating a special Nature Reserve for snow leopards in Mongolia, **Bayara Agvaantseren** shares even more good news.



© Shutterstock.com / AndyWorks

Bayara has persuaded the district government to provide an area suitable for an administration hub within the Reserve, a strong demonstration of local government commitment. The hub will be used to organise and focus rangers, and it's a great area for sharing resources and information about snow leopard activity.

Over the summer, Bayara trained seven local 'citizen rangers' who are now patrolling the Reserve, and will support federal rangers once official staff are hired.

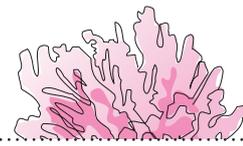
Bayara sends thanks to all our supporters, confirming that none of this would have been possible without PTES support. ●

The secret of whale shark bachelor parties

Oceanographers solve one of the many mysteries of whale shark behaviour.



© Shutterstock.com / Magnus Larsson



© iStockphoto.com / chris64

Whale sharks are not only the largest fish in the oceans, but also among the most mysterious. Tracking technology tells us that they perform some of the longest migrations of any animal and dive to phenomenal depths, but the reasons for their journeys are only beginning to be understood. A recent study of global whale shark hotspots has unpicked part of the story. **Joshua Copping**, University of Salford, and **Bryce Stewart**, University of York, compared the shape of the sea floor at whale shark hotspots and revealed they share a similar profile, with warm, shallow water close to steep dropoffs, thus offering deep water for feeding adjacent to areas where the sharks can rewarm themselves after returning from the chilly depths. Many of these sites are developing into popular ecotourism destinations. But plenty of mysteries remain – not least that the congregating animals are almost exclusively young males. The locations of breeding and pupping areas for this iconic species remain elusive – neither activity has ever been seen in the wild ●

Great results from our carnivore project

Real progress in our project tackling human-wildlife conflict in Tanzania's Ruaha landscape.



© iStockphoto.com / chris64

We're delighted to announce a new Conservation Partnership with **Amy Dickman** of the Ruaha Carnivore Project. This is the fifth such project PTES has embarked on (others are supporting vital work for Persian leopards, snow leopards, slow lorises and giant otters). These Partnerships provide longer term funding

for exceptional conservationists making a sustainable difference to the outcome for each of the endangered species concerned. The funding will allow Amy and her team to focus more time on the job of reducing conflict between humans and large carnivores like lions and wild dogs in Tanzania. ●

Crocodile revenge killing

Retaliation in Indonesia highlights the threat of human-wildlife conflict.



© Fauna & Flora International

We devote considerable resources to human-wildlife conflict in various guises. It's never simple because the fears that drive persecution are, in many cases, all too real. This was highlighted in the Indonesian province of West Papua in July, where the funeral of a local man killed by a crocodile sparked a violent retaliation. Hundreds of villagers attacked a crocodile sanctuary and killed 292 animals with knives, shovels and hammers.

The offices of the farm, which was operating on a licence to breed the reptiles for conservation, was also attacked. This unhappy series of events reinforces the need for strong local support, education and engagement in the conservation of species whose presence constitutes either a real or perceived threat to life or livelihood. Our work with Siamese crocodiles, for example (see p19), relies on deeply rooted community support. ●

DATES FOR YOUR DIARY:

Starling Murmuration and Somerset Wildlife Spectacular

November 30th and 14th December 2018
A day on the Somerset levels culminating in photographing the incredible million-strong starling roost spectacular. The levels are home to a diverse array of wildlife, including otters, bitterns, egrets and kingfishers.

Find out more www.ptes.org/get-involved

Nelson's column

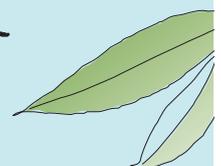
Farming for hedgehogs

I'm confident that readers of *Wildlife World* are aware of the serious decline in hedgehogs and how we've been working for some years with the British Hedgehog Preservation Society (BHPS) to find out why and put things right.

Our data show that hedgehogs are particularly scarce across arable farmland and more likely found in towns and villages, putting them at risk of local extinctions. Hedgehog presence indicates a healthy countryside, so their absence is a serious concern for agriculture. Many farmers and landowners want to help, so hopefully our new *Helping hedgehogs on your land* leaflet is just the guidance they need. It covers issues such as hedgerow management, field margins and sizes, ploughing regimes, and using scrub and other vegetation to benefit hedgehogs and other wildlife. And it links these ideas to options in environmental stewardship schemes so that farming subsidy applications can be enhanced. Hopefully a win win situation for hedgehogs and farmers.

And, in case you're wondering, recent research that we supported (with BHPS, see p16), confirms that whilst badgers have a negative impact on hedgehogs in some areas, as so often, the situation is far from black and white! ●

Jill Nelson



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



Magnificent stags

With a body up to eight centimetres long and antler-like mouthparts used for jousting and wrestling, there is no mistaking a male stag beetle, *Lucanus cervus*. And, though she lacks antlers, the female is also magnificent. These superb insects take to the wing in May and June, towards the end of their long lives, most of which are spent as grubs living underground in the softening timbers of buried dead wood. This crucial resource, which serves as both food and nursery habitat for the developing larvae, is increasingly hard to find, and that's just one of the problems the species faces. Stag beetles are already lost from some parts of England. With your support, we're working to halt this worrying decline.

© Ben Andrew



Twenty years of the Great Stag Hunt

We've now been tracking the fortunes of British stag beetles for two decades. The 1998 *Great Stag Hunt* was one of the first citizen science projects to focus on a single invertebrate species. We've since gathered data from tens of thousands of people and

recorded stag beetles across their entire national range, giving us a far better picture of their status and distribution than ever before. This is helping us protect our stag beetles for the future. We're proud of the *Great Stag Hunt* and hope you are too. ●

The State of British Stag Beetles Report

We recently published a report bringing together all that we've learned in our 20 years of stag beetle spotting. Their distribution seems to be fairly steady.

Most records come from south-east England, with a scattering from Bedfordshire, Cambridgeshire and Norfolk, and a couple from south Wales. There are

three further concentrations in Greater London, the Essex-Suffolk borders, and along the south coast between Bournemouth and Brighton. Most of the stag beetles reported to us were spotted in people's gardens.

Find out if your county is a stag beetle stronghold at ptes.org/the-state-of-britains-stag-beetles ●

European stag beetle initiative

We're also helping stag beetles beyond Britain, as it's not only here they're struggling. Stag beetles are already extinct in Denmark and Latvia, and endangered in many other parts of their European range. We're supporting the development of a standardised monitoring protocol that will enable all the European stag beetle

nations to track the status of the species and pool data for analysis in a meaningful way. The initiative is establishing a network of transects across the species' entire range.

Once again we're leading the way for stags, and are so grateful for all our supporters who enable this work to happen. Visit stagbeetlemonitoring.org ●

A big thanks

Earlier this year we were delighted by the response to our stag beetle fundraising appeal, both from existing supporters and from new people. We knew stag beetles were popular but this goes to show just how

much they are cherished. If you donated to the appeal, thank you so much. It'll really help us save our stags. If you'd like to give a gift to help stag beetles, visit ptes.org/stagbeetleappeal. Thank you. ●

Scrapbook



Safe custody

Our work with the South African Endangered Wildlife Trust is paying dividends for sungazer lizards. Following inspiring awareness raising by the team, landowners of sungazer grassland habitat are signing up as custodians of the species and proudly showing off their support by displaying these rather eye-catching road signs. And what's good for sungazers is great for lots of other grassland species too.

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



Our new tool cage

Black Hut renovations update

Our amazing volunteers have been busy once again at our Briddlesford Woods reserve: strimming, cutting, clearing and constructing a secure tool store in our rebuilt Black Hut. Special thanks to Chuck Eccleston, who definitely deserves a cuppa.

Welcome!

A special hello to all the new readers who've signed up as PTES supporters in the past few months. We're so pleased to have you on board with us and all our other wonderful donors. None of the work you've been reading about would happen without you all, so from everyone here at PTES, thank you!



Dear PTES supporters,

I am writing to express our deepest thanks for your recent support towards restoring habitat for hirola. Your continued assistance over the years has allowed us to sustain conservation on the Kenya-Somalia border, empowering one of the most vulnerable communities in the world.

The latest grant is great news for hirola and will no doubt be a big boost to everyone involved in our long-term conservation effort. It is through such support that organisations like ours actually make a difference for imperiled species.

Thank you once again,

Ali



Welcome to the world little Beina, a daughter for our Dormouse Officer Ian and his wife Diane, and a sister for Louie.



Tiny giant

And more baby news, this time from our giant anteater project in Brazil. Can you spot the pup, camouflaged well on mums back?

Twitter /PTES

Favourites from Twitter

- @ptes: Relaxation goal – be more dormouse
- #NationalRelaxationDay



@ClarePenally



As dormouse sized stethoscopes are hard to come by, our vets make do with standard kit and use the greatest of care.

© Peabody Zoo Environmental Park

Dormouse release

Returning dormice to woodlands where they've gone extinct is an important part of their conservation strategy. We're proud to lead these reintroductions. Pre-release health checks help ensure the animals do well in their new home. We're delighted to report another successful release in 2018, in Warwickshire, where Warwickshire Wildlife Trust volunteers will be regularly checking to see how the new population does.



Elders arriving at the World Hirola Day



Hirola - among the handsomest of antelope.



© AFP

f/ptes.org

Favourites from Facebook

Thank you so much to Sam, who used Facebook to make her birthday wish come true! She asked her friends to donate to help stag beetles; 'Instead of buying a drink or a card, I hope that you'll consider contributing as a way of celebrating with me. Thank you!' Sam and her friends raised over £100. From the beetles and us - thank you!



© Charlie Dobble

A day in the office with...

Emily Wilson,
Hedgehog Officer for
Hedgehog Street



I have the honour of being the Hedgehog Officer for *Hedgehog Street*, a hugely important partnership project between PTES and the British Hedgehog Preservation Society.

As part of the campaign I help coordinate research into hedgehogs and their decline, work with developers and planners to tackle habitat issues for hedgehogs in new builds, lobby parliamentarians to support hedgehog conservation, design training courses to help land managers conserve hedgehogs, as well as giving talks and interviews to the press to help spread awareness. I also spend lots of time communicating with our dedicated hedgehog champions and sharing knowledge about how we can best help hedgehogs in the garden.

Hedgehogs are wonderful - I love their gentle nature. There is still so much to learn about these night time visitors and this piques my natural curiosity. But one thing I do hear a lot is how people are seeing less of them - and this is a tragedy for us as well as the animals. I want to do whatever I can to help the plight of this very special species and *Hedgehog Street* is the perfect campaign to do that.



With hedgehog champion Chris Grayling



Radio-tracking hedgehogs

Time well spent

Ever wondered where we get all the nest boxes we use for dormouse monitoring? Well, since 2010, over 11,000 of them have come from the workshops of HM Prison Humber. Stunning work, guys! Thank you very much.



© Charlotte Doble



Thank you!

We absolutely loved this letter from one of our youngest supporters who was very worried about dormice and wanted to help. What a lovely thing to do and such an amazing picture of a dormouse - thank you!



primate update

We are family

With almost two thirds of the 700 species and subspecies in our own order of mammals seriously threatened, primates are a major conservation priority, and we're supporting many of them, as much as we can.

Scientist: Ashley Leiman
Study species: Orangutans
Project location: Borneo



Why orangutans? Without a doubt they are one of the most amazing and yet enigmatic species, truly the forest ape. And for me it all started with the forest. I knew when I first walked through the rainforests of Indonesia that these habitats had to be saved. The world knew about the loss of the Amazon forests, but not that Indonesia has the third largest area of tropical forest. And this was where orangutans came in. They are the best possible ambassadors for this extraordinary landscape. I was fortunate to go to Indonesian Borneo to study orangutans. To see them move through the forest with hands like feet, and feet like hands, completely at one with their habitat, was humbling.

Each time I'm in the field, the dedication and commitment of our Indonesian staff motivates me, as does the support of our donors who believe so wholeheartedly in the work we're doing. We're a small organisation, but I know and see the difference we make on the ground to keep the forest standing and orangutans living in the wild! ●



The mammal order 'Primates' contains what is by many measures the most phenomenally successful species on Earth (our own). But it also includes many of the most threatened animals including our closest cousins, the orangutans and bonobos. Some primates are largely solitary, others intensely social. Some are ground-dwellers, others climb, leap or swing by their arms.

Some are semi-aquatic, while others are restricted to grassland or mountains or forests.

With your support, we're focusing our efforts on several of

these varied species, which face an equally diverse array of threats.

Bale monkeys depend entirely on Ethiopian bamboo, which is being cut down to meet Chinese demand. Bornean orangutans suffer from our unquenchable appetite for palm oil, losing their forests at a catastrophic rate. In Java, slow lorises'

cuteness is their downfall, causing many to be stolen from the wild as pets and selfie props. Bonobos in the Congo Basin are hunted for bushmeat, Barbary macaques are exploited for the tourist trade in Morocco, and western hoolock gibbons are being edged out by the ever-expanding human population of Assam. It makes for disheartening reading but we're working

hard to tackle these urgent situations, as are our scientists and teams out in the field. The primate projects we fund range from grassroots work in community

We're working hard to tackle these urgent situations, as are our scientists and teams out in the field

backyards to international efforts fronted by global NGOs. The following accounts from our current primate project leaders give an insight into the varied ways they are tackling problems on the ground, with admirable passion, energy and expertise. And they are all made possible by your support.

Scientist: Addisu Mekonnen
Study species: Bale monkeys
Project location: Ethiopia



'Bale monkeys were first recorded as a species in 1902, but their elusive behaviour and the difficult mountainous terrain they live in made them a very difficult species to study. My team at the Bale Monkey and Bamboo Research and Conservation Project has risen to the challenge, and we've been working to understand the ecology, behaviour and conservation biology of this unique and unusual primate species and to conserve their preferred bamboo forest habitat since 2007.

Like giant pandas and bamboo lemurs, Bale monkeys rely heavily on a single species of highland bamboo (*Arundinaria alpina*) for food. This specialisation restricts their distribution and makes them particularly vulnerable to deforestation of their habitat. It stands to reason that Bale monkeys are less flexible at adapting to a changing



environment than a species that doesn't rely so heavily on one food source in one area. I'm happy to devote myself to saving this rare and unique specialist primate and, while the threats are serious, I'm optimistic that the long-term survival of the species is enhanced by our science-based management plans. We work with the local community, restoring forest fragments, in order to protect continuous bamboo forest habitat.' ●

© Addisu Mekonnen

Scientist: *Sian Waters*
Study species: *Barbary macaques*
Project location: *Morocco*

Barbary macaques hold an important position in European culture and their long and complex relationship with people makes them fascinating. With three quarters of the global population of Barbary macaques living in the Atlas mountains, and more in the Rif mountains, Morocco is an important stakeholder in the conservation of the species. Understanding how the monkeys are regarded by local people there is of the utmost importance to their survival.

My approach has been to collect and analyse 'cultural data' – in other words what people say about the macaques and how they behave when they encounter them. This kind of information is vital in developing an appropriate conservation strategy. Without this people-centred approach, I don't think we'd have been so successful in engaging local people as macaque protectors rather than persecutors. We're also currently working on macaque population surveys elsewhere in Morocco, involving local forest users in our research to understand what the macaques mean to them.' ●



© Lucy Radford



Scientist: *Anna Nekaris*
Study species: *Javan slow lorises*
Project location: *Java, Indonesia*

When I began the first study of Javan slow lorises in the wild back in 2011, I thought the project would last a year. These were 'underdog primates', living in the shadow of orangutans, chimpanzees and lemurs. I never anticipated the scale of their recent exploitation via social media as pets and photo props – but nor did I foresee the extent to which this mistreatment would inspire my passion to save them.

That passion, and the support of PTES and others, has allowed us to follow one important population of lorises continuously now for seven years. Every month I learn something new. Just this June, for example, I saw a slow loris kill a bat. What's more, it's only with long-term data that we've been able to unravel the amazing, complex social lives of what were previously regarded as solitary animals. Far from underdogs, they are extreme primates: social, gum-feeding, venomous, torpor-entering, long-lived and extraordinary in every way.

It can be exhausting working with an international team, coordinating projects, budgets, social media, education, outreach and scientific databases. But these varied



The support of PTES and others has allowed us to follow one important population continuously for seven years

connections mean there's always someone cheering us on, sharing a Facebook post, downloading our papers, or wanting to come to our field site to volunteer. Kind words from around the world mean so much to our team, and small victories in the field, such as a village child reporting the location of a dispersing animal and helping to keep it safe, make all the hard work worthwhile.' ●

ABOVE: Anna is a global loris expert, but even she only handles them when absolutely necessary. If you're offered a loris selfie, please refuse, as this awful trade threatens their very survival. http://www.nocturama.org/wp-content/uploads/2016/11/info_leaflet_thailand.pdf

© Little Primate Project



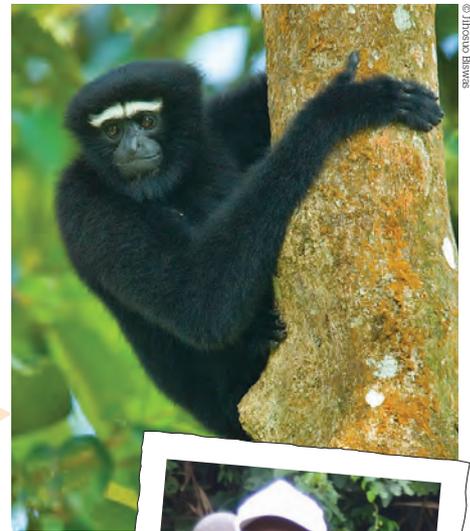
Scientist: Jithosuo Biswas

Study species: Western hoolock gibbons

Project location: India

I first encountered a gibbon back in my student days in the mid 90s. The experience fascinated me to the extent that I decided to work on the issues related to the species' conservation. Over the course of time, I began working on gibbon population, distribution and biology in the Karbi Anglong district. My field area is a transect almost 1500 km long and I've logged over a thousand contact hours with this remarkable and enigmatic species. The results are fascinating, as the district alone constitutes 65% of the state's population of western hoolock gibbons. But at the same time the threats to the population are real and visible in terms of habitat destruction. This made me realise that we need to do something concrete to protect these populations long-term, and so we created an action plan after consulting with various stakeholders. I'm now engaging with

communities in the fringe areas, using special conservation education tools. I've trained frontline forest staff in monitoring and management techniques and am working on infrastructure schemes with the forest department. I'm also planning to train and engage community volunteers in long-term population monitoring and protection in the priority areas. ●



RIGHT: Western hoolock gibbons swing through the forest using their long arms. This way of moving is called brachiation. The gibbon pictured here is a male, with black hair and a distinguished white brow. Females are copper-coloured, with brown hair on the sides of their face and chest.

— STOP PRESS! —
We're delighted to announce our decision to fund a further primate project, supporting the work of SEED Madagascar, working with southern woolly lemurs. We're really committed to helping this extraordinary group of mammals.



Scientist: Akpona Hughes

Study species: Bonobos

Project location: Democratic Republic of Congo (DRC)

Bonobos are our closest relatives, and endemic to DRC, where illegal hunting for bushmeat and the wildlife trade, and loss and fragmentation of habitat threaten their survival, even in the great Iyondji Community Bonobo Reserve (ICBR). The presence of rangers is critical to protect bonobos in their hotspots in the north of the reserve, while in southern areas higher levels of human activity, including poaching and farming, present an even more complex challenge. Just reaching these areas is an adventure, as ICCN conservationist, Akpona Hughes recalls. 'It's a four hour flight in a 14-seater from Kinshasa, and then next morning I have a 4am start for a 15 hour trip on the back of an AG 100 motorcycle with my



camping kit, riding behind my driver Kakoko. We bump and slide along marshy forest trails for 410km to ICBR.

'In the reserve, we wake at first light to the cacophony of birds, monkeys, locals going to the fields, and the eco-guards' morning exercise. The day begins with the guards on parade and their cheery songs, followed by a planning session with the conservator and his team. The highlight for me is a trip by paddle-boat into the reserve, where we spend the night. The bonobos are as curious about us as we are about them, but wary too, with good reason. I cannot help but be in awe of this forest and I wish to thank PTES for their vital support in conserving it, and its very special inhabitants.' ●

© Billy Dodds

© Jithosuo Biswas



What's happening to our rural hedgehogs?

In the debate over declining hedgehogs, the impact of badgers is much discussed. Badgers are the only native predator able to tackle a hedgehog – but new evidence suggests there's more to the situation than a simple predator-prey relationship.

As our recent *State of Britain's Hedgehogs* report makes clear, rural hedgehogs are in real trouble. The reasons for their decline are complex. The main contributing factors are a lack of good quality habitat, which in turn has an impact on the availability of invertebrate prey and nesting places. Hedgehogs rely on hedgerows and field margins, so with less of both, and with many hedges in poor condition, hedgehogs have fewer safe places to live. Badgers (competitors for the same food and the main natural predators of hedgehogs) may also be a factor in areas where hedgehogs no longer have adequate safe places to take refuge.

Together with the British Hedgehog Preservation Society, we funded Nottingham Trent University and the University of Reading to carry out the first ever National Hedgehog Survey. The survey looked at rural hedgehog presence in England and Wales, using footprint tracking tunnels.

Over two years, an impressive 261 rural sites were surveyed across England and Wales. Ben Williams, PhD student from the University of Reading, explains: 'We found

that although hedgehogs were generally widely distributed across England and Wales, they were actually present at a worryingly low number (21%) of sites. The results show that while badger sett density is negatively correlated with hedgehog presence, there was evidence of both species co-existing and hedgehogs being positively associated with built habitat (e.g. houses). More worryingly, both hedgehogs and badger setts were absent from almost a quarter of the sites surveyed, suggesting there is a much wider land management issue in our countryside affecting both species'.

Hedgehog footprints were detected at 55 of our survey sites. Almost half of these sites also had badger setts present, showing that badgers and hedgehogs can, and do, coexist, as they have for thousands of years. However, perhaps more importantly, the results suggest that a large area of rural England and Wales may now be unsuitable for both hedgehogs and badgers. Given the similarity in the two species' diets, an explanation could be that there are fewer earthworms and other larger invertebrates

to feed on; something both species need. This could be as a result of agricultural intensification and climate change.

Although this study is the largest and most detailed to date, the complete picture remains unclear. PTES is now funding further work at Nottingham Trent University to work out what habitat features enable hedgehogs and badgers to co-exist in rural areas, so we can advise farmers how to manage the land sensitively to support both species.

We couldn't have carried out this work without your support. A huge £37,400 was donated by supporters to help hedgehogs, in response to our latest appeal, plus £7,100 in gift aid. Thank you for helping. ●

▶ Our guide to hedgehog friendly land management for farmers is available at www.hedgehogstreet/farmersadvice.



TOP: A hedgehog and badger enjoying some supplementary food in a garden in Kent.

ABOVE: Hedgehog footprints are distinctive; the front feet, shown above, are wide like little hands, and the back feet are slimmer and longer.

Skin deep: how genomics is helping dolphins around the British Isles

Marie Louis is investigating how dolphins from different areas around the British Isles move and mingle. With PTES funding, she's harnessed the power of molecular biology to find out.

The extent to which dolphin groups mix has important implications for their genetic diversity and resilience to local extinction, especially given the limited nature of our current network of marine protected areas. To find out how genetically isolated the various coastal populations of bottlenose dolphins around Britain and Ireland are, we used skin samples collected during previous studies from the Shannon Estuary, the Connemara-Mayo-Donegal coasts, Wales and the east and west coasts of Scotland. We spent a month in the lab extracting DNA from the samples. The work was intense but we were rewarded with high-quality DNA, which we sent for sequencing. After an anxious wait to get the genomic data back, our days were mostly spent working in the office on the computer, applying bio-informatic tools to clean the data and then mathematical models to analyse them.

Despite the fact they share one sea, coastal bottlenose dolphin groups rarely mix

The results were clear. Despite the fact that they share one sea, the coastal bottlenose dolphin groups around Britain rarely mix with dolphins from other areas and are genetically relatively isolated. This means the individual populations might be vulnerable to local impacts on their environment and makes it all the more important that their habitats are protected. We're now discussing our results with conservation stakeholders and expect to see the practical outcomes of this important finding shortly. This is a great example of PTES-funded work discovering breakthrough information that makes conservation efforts effective. ●



LEFT: Not all conservation happens in the field. Marie's project is a great example of hi-tech lab work that can save species.

BELOW: Bottlenose dolphins live in close-knit groups around the coasts of Britain and Ireland.



© Marie Louis

Field notes: Conservation closer to home

The Nature of our Village project, launched in 2015 by local ecologist **Chloe Griffiths**, set out to increase how much we know about wildlife in Penparcau, a village of 3,000 people near Aberystwyth in West Wales.



We wanted to provide a new generation of people with the skills to recognise and record wildlife on their doorstep. Understanding nature and the threats it faces is the first step to doing something to protect it. We joined the PTES National Water Vole Monitoring Programme (NWVMP) in 2015, and discovered we were one of only five sites in Wales with positive results and the only one that wasn't already a National Key Site for the species. We realised then how much our monitoring mattered.

When we resurveyed in 2016 and 2017, we found signs of active latrines with trampled droppings (a good sign of breeding activity) and pieces of rushes neatly chopped off at an angle of 45 degrees (a sure sign of water vole feeding). This year we were lucky enough to even see an animal coming out of a burrow, although it did disappear quickly when it saw us all staring at it!

This is fantastic news, as water voles have suffered a massive national decline of around 90%. The Aberystwyth area population is one of the few that has managed to hang on. We'll continue our checking for at least three more years, and hope to provide plenty more data.

The Nature of our Village project is supported by Penparcau Community Forum, West Wales Biodiversity Information Centre and The Wildlife Trust of South and West Wales. ●



Volunteers looking for signs of water voles

© Chloe Griffiths



© Mark Redfern / Shutterstock

Another thank you – as many of you may remember, we asked for support to fund the NWVMP back in March 2015. And support we got, from thousands of people, all passionate about saving water voles. We received an incredible £36,800 from our amazing donors, plus £8,300 in gift aid. What a response – thank you everyone for making this work a reality.

Field notes: **Game of thorns**



It's hard to imagine more challenging terrain than the rotan scrub surrounding palm oil plantations in Indonesia's Leuser landscape. But these are 'corridors' through which elephants move, and if you want to know how they're used, says **Amanda Korstjens**, you must, somehow, go there.

My most recent trip to our project area was all about helping our researcher, Lucy Twitcher, set up a new site, Soraya. The area has suffered extensive illegal logging, palm oil plantations and poaching but Forum Konservasi Leuser (FKL), led by Rudi Putra, is changing things. Poaching is down by 90% since they've been working there. Now a secondary forest, the area has few large trees, but has a dense understory of skin-ripping, needle-sharp rotan leaves and trip-hazard vines. Moving off trail in this terrain is incredibly difficult, but unfortunately this is exactly what we need to do to locate where elephants travel.

Completing a one kilometre dung transect and surveying vegetation plots



Appeal update: Our supporters raised a wonderful £22,000 for this work earlier this year. Thank you!

turned out to be a whole day effort, with the entire team working together. We found no dung at all, but after six days the ten camera traps showed wild boar, deer and us. We hope to capture tiger, elephant and other wildlife on camera, and we have our fingers crossed for Lucy, who is now left to walk 22 more transects. But she is firmly up for it, and will be backed up by local field assistants and FKL staff. Hopefully, she'll be rewarded in elephant dung and more in the coming months.

The camera trap and dung data will tell us which parts of the forest elephants use most, and which plants they prefer to feed on. This information will help us plan what tree and shrub species to plant in the newly protected areas. ●

© Amanda Korstjens

Off the beaten track



We've been working in remote and inaccessible areas of Central Asia to protect one of the world's most threatened ungulates, saiga antelope.

The only viable population of saigas living in Uzbekistan is found on the island of Vozrozhdeniye which, due to the catastrophic shrinking of the Aral Sea, is no longer an island but a peninsula and so highly exposed to

poaching. Over the last two years **Elena Bykova** and her team from the Saiga Conservation Alliance (SCA) visited the region to survey the local saigas, enlisting the help of three local unemployed men to gather information from local fishermen, shepherds, villagers and border guards.

Local help is critical as it's virtually impossible to get a clear picture of the situation in a short period of time over what is a vast and very inhospitable area. Working together, the team amassed records of small, resident saiga herds and larger groups of 200 animals. But, worryingly, they also found motorbike tracks in the same area – suggesting that poachers are active, even in parts of the landscape that can't be reached by road.

The good news is that the team alerted the government to the problem and rangers are now patrolling the area to protect the saigas. The next challenge for Elena and her team is to investigate whether the Uzbekistan saiga population is connected to the larger populations in Kazakhstan and, if so, how the land used for migration between the two might be given legal protection. ●

© Vladimir Savinovsky / Shutterstock, Elena Bykova



LEFT: Looking for saiga antelope that move, in herds, over vast areas of landscape like this is painstaking, and local knowledge is essential.

Crossing borders with snow leopards

China remains a stronghold for snow leopards, with about 60% of their entire global population (estimated to be less than 10,000). Of the 11 other countries where they still live, ten share a border with China.

The sheer size of snow leopard home ranges means protected areas are seldom big enough. We've been supporting **Philip Riordan** of Wildlife Without Borders and **Shi Kun** of the Beijing Forestry University's Wildlife Institute, to work out how snow leopards move across the landscape and to identify important corridors and habitat areas. Phil and Kun are also training government wildlife teams and local communities in surveying techniques,

resulting in the first reliable population estimates for many areas. So far they've found that snow leopards are surviving outside reserves, which is good news. Young animals were spotted in most areas, so snow leopards are breeding, but we're yet to see how they fare as they mature and spread into areas where they're exposed to more human activity.

The work has led to two exciting developments – a project to extend the

Qilianshan Nature Reserve, linking neighbouring areas into a new National Park; and a transboundary collaboration with Kazakhstan and Kyrgyzstan to join protected areas and conservation effort for snow leopards across borders. ●



Crocodiles back from the brink

Freshwater Siamese crocodiles were thought extinct in the wild until their rediscovery in 2000. Fauna and Flora International (FFI) and the Cambodian government have worked hard to reduce poaching and now we're helping them with the next step.

The exciting plan is a national reintroduction of locally bred Siamese crocodiles to safe locations. The programme is going from strength to strength as the team learns more about breeding and caring for the species in captivity and improves the facilities. This year, during the long, hot summer in Phnom Penh, 65 hatchlings emerged from several clutches of eggs – a spectacular 90% success rate. With a wild population of just 250 adults, this new generation represents a dramatic increase in numbers, offering a vital lifeline for a species classified as critically endangered.

All 65 babies will be reared for up to

three years until they are a metre long, at which point they'll be able to fend for themselves and can be released into strictly protected community crocodile sanctuaries.

Further encouraging news is that this year has been the best in recent memory for records of wild nests, with five already discovered. Four of them were found downstream from one of the sites where FFI released 38 crocodiles in 2012, a great indicator that reintroductions are working. Project leader Jackson Frechette reports that 'It really feels as though we've turned a corner in our efforts to bring this species back from the brink'. ●



Captive-bred Siamese crocodiles like this one can be released into the wild at three years old.





New mammal grants

We recently awarded new funding for animals we know are especially dear to many of our supporters' hearts – UK mammals.

Every year PTES awards funds to a variety of research and conservation projects looking into new and innovative ways to conserve UK mammals. This year we're delighted to be supporting these new projects:

- ▶ **Dominic McCafferty** at the Scottish Centre for Ecology and the Natural Environment is investigating how grassland management will best help urban water voles.
- ▶ **Simone Bullion** is leading a team at Suffolk Wildlife Trust, reviewing evidence of mink control to see where water voles are benefiting most.

- ▶ **Rachel Bates** and her colleagues at the Cambridgeshire Bat Group are setting up a long-term study to see if coppicing can ensure woodland habitats are suitable for barbastelles and other bats.
- ▶ **Jo Worthy-Jones** and **Nicola Simpson** from Gloucestershire Wildlife Trust are investigating how hedgehog highways can help the nation's favourite mammal.
- ▶ At the University of Bristol, **Jo Howard-McCombe** is finding out how hybridisation is affecting wildcats and what needs to be done to stop it. ●



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Field notes: The place to be



Studying bees is challenging. They fly at up to 30 kilometres per hour, emerge early in the morning and nest underground. The trick, says PTES intern **Aaron Bhambra**, is knowing what makes a desirable bee home.

Each morning I head through an old woodland towards the edge of a lake at Sandwell Valley near Birmingham. I take out a thermometer and record the temperature of what looks like an ordinary soil bank, adjacent to a bird hide. In fact it's anything but ordinary! After a few moments, as the sun warms the soil, hundreds of tiny insects burst out to begin their day of pollinating. This modest habitat is home to over 40 different species of bee, mostly mining bees, and furrow-bees (*Lasioglossum* spp). Other holes are the workings of solitary digger wasps. PTES is funding our team to replicate the features of this favourite bee hangout and create new hotspots in other areas of the site.

One species of solitary bee and two solitary wasp species have already colonised the new nesting structures. Attracting these creatures is notoriously difficult, but once a site is adopted they will return each year until they establish a large colony, so we're delighted with the results! ●



© Aaron Bhambra

Orange-legged furrow bee

Stocking fillers with flower power

It's almost that time of year again – and if you're in need of gift inspiration, how about something that benefits nature? Hedgehog mix seed bombs are an easy, fun and effective way to give your patch some serious insect appeal – giving hedgehogs more natural prey to eat.

Each little clay ball contains the seeds of a mixture of enchanting annual, biennial and perennial native wildflowers that are great for invertebrates, including foxglove, birdsfoot trefoil, wild marjoram, red clover & viper's-bugloss, cornflower, chamomile, corn marigold and night-flowering catchfly.

To use, simply scatter the balls on top of soil in a garden bed or planter in spring or autumn, and leave the rest to nature – no green fingers required.

For these and other festive gift ideas and cards, please visit our online shop, where every purchase helps our work. ●

www.ptes.org/shop/gifts





© Fotabell



In search of Lulworth skippers

Lulworth skipper butterflies are declining across Europe. There's a population in Dorset that lies on the northern limit of their distribution. PTES intern **Fiona Bell** has been monitoring their status.

Lulworth skippers present a challenge to conservation, because they have very specific habitat requirements. Adult females lay eggs on tor-grass and previous surveys suggest they like it long. So it may be that this butterfly is suffering in areas grazed by livestock or rabbits, or managed for other butterflies such as Adonis blues, which prefer short turf.

Fiona spent last summer revisiting sites surveyed in 1978 and 1997 and searched for skippers in areas with tor-grass taller than 10cm. As well as butterflies she recorded vegetation characteristics and factors such as grazing intensity and scrub cover.

She saw Lulworth skippers at about 20% fewer sites than before – 53 in total compared with 66 in 1997 – and three large

populations seen in 1997 had reduced considerably in size. On the plus side, some smaller populations have increased. There was a strong link between Lulworth skipper abundance and the presence of taller tor-grass. Intensive grazing was shown to be a particular threat to colony survival.

So the news is mixed. Given the species' habitat requirements, it's good news that the extent of tall

tor-grass habitat hasn't decreased, and that the area currently remains climatically suitable. The role of vegetation structure over time needs further investigation, and the increasing pressures of a changing environment, particularly with respect to climate change, make it doubly important that surveys of this kind continue to monitor any changes that take place. ●

There was a strong link between Lulworth skipper abundance and taller tor-grass

And there's more! We've just agreed funding for these new worldwide projects:

Sonja Dillman (Rainforest Concern): Protecting **Andean bears** in Ecuador ●

Peter Richardson (Marine Conservation Society UK): Enforcing **green turtle** fishery regulations in the Turks and Caicos Islands ●



© Isabelle Koehn / Shutterstock.com

Jackson Frechette (Fauna and Flora International): Reintroducing **Siamese crocodiles** in Cambodia ●

Rebecca Klein (Cheetah Conservation Botswana): Deploying livestock guard dogs to protect **cheetahs** ●

Shailendra Singh (Turtle Survival Alliance): Reintroducing **northern river terrapins** in India ●

Nedko Nedyalkov (The Habitat Foundation): Building a strong conservation strategy for **Roach's mousetailed dormice** in Bulgaria ●

Washington Tapia (Galapagos Conservancy): Restoring **giant tortoise** populations in the Galapagos ●

Samya Basu (Asian Elephant Conservation Foundation): Securing migratory corridors for **Indian elephants** ●

Abdullahi Ali (National Museums Kenya): Restoring rangelands for **hirola** in Kenya ●

Jeanne Tarrant (Endangered Wildlife Trust): Averting the extinction of **Albany adders**, South Africa's most threatened snake ●

The Insider's Guide to...



Our Insider is **Katie Sainsbury** of the University of Exeter. Her doctoral research is supported by the Vincent Wildlife Trust and the Centre for Ecology and Hydrology.

Stable isotope analysis



By comparing the isotopic signature of a particular species to that of its food items, it's possible to create a broad picture, not only of what it has been eating, but when and where it ate it.

What and why?

Knowing what animals eat is fundamental to understanding their ecology and behaviour and to developing effective conservation. In the past, ecologists used a mixture of gut content, faecal analysis and observation to establish an animal's diet. Stable isotope analysis (SIA) is a more modern forensic technique based on the fact that the chemical elements from which matter is made come in different forms, called isotopes. Isotopes may be described as 'heavy' or 'light', based on the number of neutrons in their atomic nuclei, and the proportion of heavy to light isotopes of elements varies in different materials. The isotopes of carbon and nitrogen are abundant in organic material, and particularly useful for dietary studies because animals assimilate them into their own body tissues. There, they persist as a chemical record of what the animal has been feeding on. Nitrogen isotope signatures provide an indication of an animal's position in the food chain – for example if it is a herbivore, a carnivore, or a top predator. The carbon signature broadly reflects the origin of the food being consumed, for example whether it was marine or terrestrial, or which main category of plant it came from.

Different tissues grow and assimilate dietary carbon and nitrogen at different rates. Blood plasma will reflect dietary input from the last few days, whereas tissues made of keratin, such as hair, feathers and claws acquire their isotopic signatures over a much longer period. So a whisker that takes three months to grow can provide a record of diet over that time frame. Muscle tissue provides information about fairly recent diet whereas bone may provide data accumulated over a whole lifetime. SIA can even be carried out on the preserved remains of long-dead animals.

The stable isotope signatures of some elements vary naturally from place to place. Animals that travel long distances may have a record of their journeys written into the chemical structure of their tissues. Ecologists find this particularly useful in determining migratory patterns.

Step 1 – sample collection

To reconstruct the diet of an animal, researchers collect samples from the study species, and from all items that it may potentially consume. It's important to collect a good number of samples of each food type to make sure that the food group is properly represented. It's also important that samples of the study species and its



Tools of the SIA trade

food are collected at roughly the same time and place. This is because isotopic signatures vary between habitats (even within relatively close locations) and may change over time, for example as soil nutrient levels vary due to different agricultural activities.

Researchers have to choose the type of sample tissue carefully. Whiskers are useful because they provide a continuous record over a longish period of time (the time the whisker took to grow), but other tissue types may also be analysed. Some, like muscle and bone can only really be collected from dead animals, whereas others, such as hair, may be collected with minimal interference – this is especially important with species of conservation concern. All samples are labelled with species, location and date and frozen for storage, rather than being chemically preserved (for example in alcohol) as this might affect the isotopic signatures.

Step 2 – sample preparation

If samples need cleaning, distilled water is used, to prevent contamination. Fatty tissues like muscle are treated to remove lipids, which interfere with analysis. This

isn't necessary for materials like hair or feather. The materials are freeze-dried then finely chopped or powdered and divided into suitable-sized subsamples – about 0.7mg is needed for analysis. With something small like a whisker, the number of samples needed depends on how thick and long an animal's whiskers are, and it's important to know which part of the whisker each subsample comes from. Samples are sealed in tiny tin cups and placed on trays for analysis.



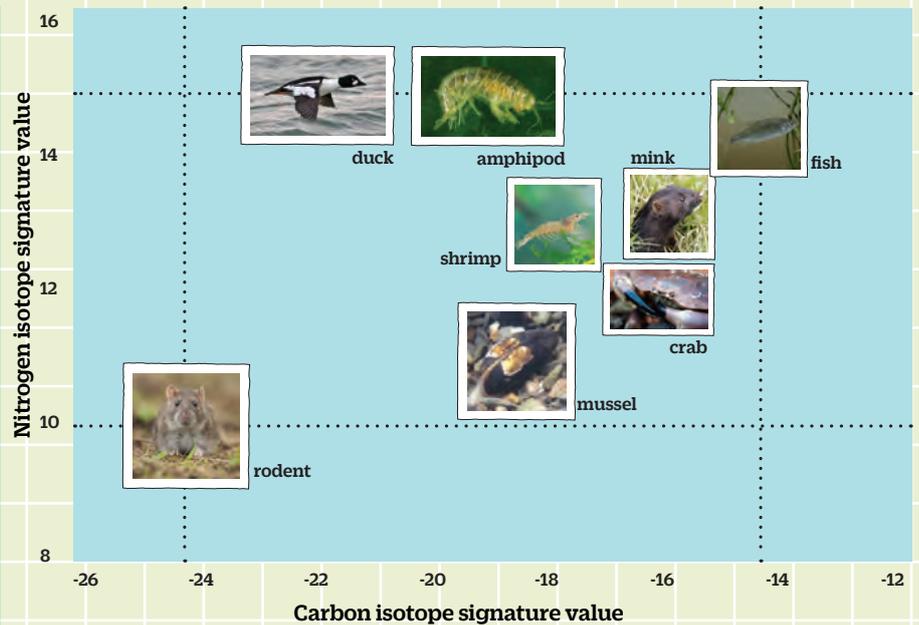
Tissue samples reveal information about diet across the period of growth, when they assimilated chemical constituents of the animal's foods.

Step 3 – through the machine

Sample trays are placed in a device called an isotope-ratio mass spectrometer (IRMS). The IRMS processes each sample individually by mixing them with gas before calculating isotope abundance. The abundance and proportions of different isotopes are calculated in relation to international standard reference materials so that studies from all over the world are comparable.

Step 4 – analysis

Analysis of isotope data is often carried out using specialist statistical software. As with all statistical analysis, it's helpful to start by plotting the data to look for patterns. Usually with analysis of biological tissues, researchers plot nitrogen signatures on the y axis and carbon on the x axis, which provides a useful visual representation of the 'isospace' of the species being studied. ●



A graphic representation of the typical 'isospaces' of various species. Their differing carbon and nitrogen isotope signatures are indicative of their varied diets. A similar plot can be created at higher resolution to compare populations or individuals within species and get an idea of what and where they have been eating.

In practice

Polecats are recovering their former range in Britain following a catastrophic decline in the nineteenth century.

One potential problem faced by the recovering population is exposure to poisons used to control rats and mice, which polecats are known to eat. I'm researching the factors affecting secondary exposure to so-called second-generation anticoagulant rodenticides or SGARs. The recent expansion of the polecat population is bringing them into areas traditionally associated with higher SGAR use. We know that dead polecats often show signs of SGAR exposure, but are they picking it up directly, or by eating poisoned rats or even by eating non-target species that have somehow picked up the poisons?

Nitrogen signatures give an indication of exposure to rodenticide, so we set out to examine the effect of diet on SGAR exposure, using stable isotope analysis. Rats are omnivorous opportunistic feeders with highly varied diets. Polecats feeding on rats might be expected to have nitrogen signatures richer in the heavy isotope than those eating mostly rabbits, which are herbivorous. If rats are the main pathway through which polecats are accidentally exposed to SGARs, you would expect this to be reflected in the nitrogen isotope signatures, and indeed, this is what we found. So we can confidently say that polecats exposed to SGARs are picking them up from the bodies of their rodent prey. What we don't yet know is what effect this exposure has, as the animals we examine have usually died from other causes, such as road traffic accidents. ●



Polecats are on the increase, but what are they eating?

© Stockphoto.com / kenrick



© David Barclay

Our last remaining wildcats are barely hanging on in the Scottish Highlands. With probably no more than 400 animals left, the most serious threat now is interbreeding with domestic and feral cats.

We're supporting work that's unravelling the genetics of wildcats, feral and domestic cats to see how many true wildcats are left in the wild so that they can be used to bolster the numbers.

Your support is vital.

Thank you



people's
trust for
endangered
species