THE NICHE

DO YOU KNOW YOUR HISTORY?

HAZEL DORMOUSE

JOHN WEBLEY

A hazel dormouse *(Muscardinus avellanarius)*, a species in chronic decline with uncertain threat status, forages in a hazel tree.

Ecological Solutions and Evidence doi.org/grr5zd

Submit your amazing photos to: theniche@britishecologicalsociety.org

THE NICHE

AUTUMN 2023

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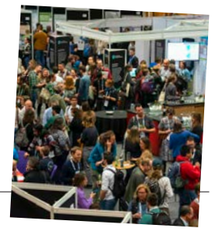
BRITISH ECOLOGICAL SOCIETY

NEWS & VIEWS

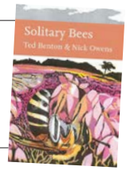
FEATURES

YOUR SOCIETY



Green Jobs for Nature

COMMUNITY



WELCOME

Do you know your history? We're talking deep history – sabre-tooth tigers and four-metre-tall giant sloths? What have these creatures that existed millions of years ago got to do with modern ecology? The answer is a lot. By learning from the past, we can prepare for the future and gain clarity on how contemporary ecosystems might respond to global changes. On p22 Jack Walker introduces us to the fascinating world of palaeoecology.

Ecology is full of passionate individuals who care about the natural world, but in academia that passion can be exploited. Mahasweta Saha and colleagues provide advice for early career researchers on navigating difficult workplace situations and call for a more compassionate research culture (p28).

Turning to the magazine itself, you may have noticed a slight change to the cover… there may be more changes coming as *The Niche* evolves. Our readership survey is still open, and we'd love to hear from you. You can find a link to the quick survey on the back cover and in the My BES section of our website. Don't forget you can also access the digital version in My BES as well as find a whole host of other member benefits.

As always, there's plenty to get stuck into this issue so I'll leave you to it.

Happy reading!

Kate

Kate Harrison, Editor
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NEWS & VIEWS

A MORE EQUITABLE GLOBAL PRACTICE OF ECOLOGY

The living world is geographically and historically connected, and ecological research and practice is a global endeavour. However, disparities and inequities persist in ecological science..

The tropical countries that hold much of the world's biological wealth are countries with far fewer economic resources. And, within those countries, there can been huge disparities between relatively privileged urban elites and the rural communities where ecology and conservation is carried out.

These economic inequities are amplified by biases built into the scientific system: how research is funded, how international partnerships are recognised, how the scientific publication model works and in how English is the dominant language.

While there are no easy solutions, there are areas where the BES – and all of us – can make a difference. A BES working group is developing a roadmap which we plan to present and discuss at the Annual Meeting in Belfast in December. Some of these actions may relate to what the BES does internally, but I believe a much more important part is identifying where the BES can have wider influence by setting clear principles of good practice, and by influencing funders and governments.

Without prejudging the outcomes of the working group, here are some of the issues we need to wrestle with and identify positive solutions for.

One set of issues revolve around the practice of international collaboration. There has been increasing criticism in recent years of 'helicopter science', where a researcher comes to a location to collect data with the help of local researchers, but leaves little legacy in terms of resources, long-term collaboration and capacity. This practice can range from major international grants to a Masters student on a summer dissertation project. Well-intentioned practices like open data can lead to equity challenges: Global South partners often collect data in challenging conditions, and may need longer to develop their analyses of data compared to well-resourced Global North postdocs with advanced R skills. The BES has an opportunity to develop a set of principles and guidelines of good practice, drawing on the experiences of its membership across multiple countries.

There is a set of challenges surrounding the scientific publication model. Many Global South institutions cannot afford access to journal subscriptions. The shift to open access has enabled the poorest countries to publish under waiver schemes but researchers in many middle income countries, like much of Latin America, simply cannot afford to pay publication fees. How can we ensure that Global South researchers are able to publish on an equal footing?

The dominance of English as the language of science is drawing much attention, and affects much of the non-English speaking Global North as well. There is substantial effort and cost to being a non-native English speaking researcher. English dominance is also bad for collective ecological knowledge: much of the non-English literature, often in excellent journals run by local Societies, is ignored by the global scientific system.

These are some of the thorny issues we are wrestling with. Although it can be daunting, I believe the BES has an opportunity to show leadership and there are concrete steps we can make.

Yadvinder Malhi
President of the British Ecological Society

THE BES JOINS 80 OTHER ORGANISATIONS FOR #NATURE2030

I ask all friends and supporters of the BES to add your voice to the open letter calling for greater ambition and commitment across the political spectrum so we hit the target to halt wildlife declines by 2030 – just seven years away.

Hazel Norman, CEO

The Nature 2030 coalition, led by Wildlife and Countryside link, outlines five measures needed to restore nature by 2030 and calls on all political parties to get behind these proposals in their 2024 election manifestos to meet the legally-binding target to halt wildlife decline by 2030.

The measures include increased protection and funding for wildlife sites, a new law guaranteeing environmental rights, doubling the wildlife-friendly farming budget, making polluters pay for nature restoration, and a large-scale green jobs creation scheme.

Professor Rick Stafford, Chair of the BES Policy Committee said:

"As an independent voice highlighting ecological evidence, the BES fully supports this campaign, and we encourage everyone to sign this open letter. The five measures outlined by Nature 2030 are closely related to much of the work the BES team has been doing over the last three years, with our reports on nature-based solutions, protected areas, and our upcoming report on regenerative agriculture."

In 2022, the UK signed an international deal to halt and reverse nature loss by 2030. In England, that promise is underpinned by a legal duty in the Environment Act 2021 to stop the decline of species abundance, and a commitment to protect 30% of the land and sea for nature.

However, as the Office for Environmental Protection concluded, 'the current pace and scale of action will not deliver the changes necessary to significantly improve the environment'. This is why the Nature 2030 coalition is urging commitments to turn environmental promises into reality.

BES BACKS NATURE 2030 CALLS

One of the key measures being called for is to provide more space for nature by 2030 through restoring protected land and seascapes. This will be vital for achieving biodiversity recovery and bringing nature to more communities. Our *Protected Areas and Nature Recovery* report found that many of the UK's protected sites are failing to deliver for nature and are in poor ecological condition. The report lays out clear criteria for how protected areas need to be managed to be included in the government's 30 x 30 goal.

Evidence collected in our *Nature-Based Solutions for Climate Change in the UK* report also gives backing to the Nature 2030 coalition's calls. The report highlights how nature restoration is imperative for biodiversity, climate adaptation, climate mitigation and people. The report also tells us how investing in nature recovery, through creating green jobs, can bring a host of economic and ecological benefits.

The right to a healthy environment is another call supported by work run by the BES. At our recent People, Policy & Planet event we heard from experts including ecologists, nurses and psychotherapists on the importance of nature to human wellbeing. Access to healthy, thriving natural environments is known to increase positive emotions and build a sense of belonging in the natural world, thereby fostering an interest in caring for it.

To support the BES and the #Nature2030 call for increased governmental ambition on environmental issues, please join us in signing the open letter. Find the letter online by searching for 'Nature 2030 open letter.'

HONEY HEIST: ONLY A FEW BEARS RESPONSIBLE FOR BEEHIVE HUMAN–WILDLIFE CONFLICTS IN POLAND

A team of researchers has figured out a way to track the DNA left by brown bears guilty of breaking into apiaries in Poland to reveal the exact culprits – an important aspect of solving conflicts between humans and wildlife.

Poland's Carpathian Forest is home to Europe's second-largest population of brown bears who are responsible for 52 incidents of damage in the region every year. 92% of these occur in apiaries, specialised facilities crucial in producing honey and provide pollination services for agriculture.

In 2014, researchers descended upon the region to investigate an incident where 15 hives had been damaged in a single apiary. The team, from the Institute of Nature Conservation at the Polish Academy of Sciences, arrived at the crime scene aiming to identify the individual bears responsible for the destruction.

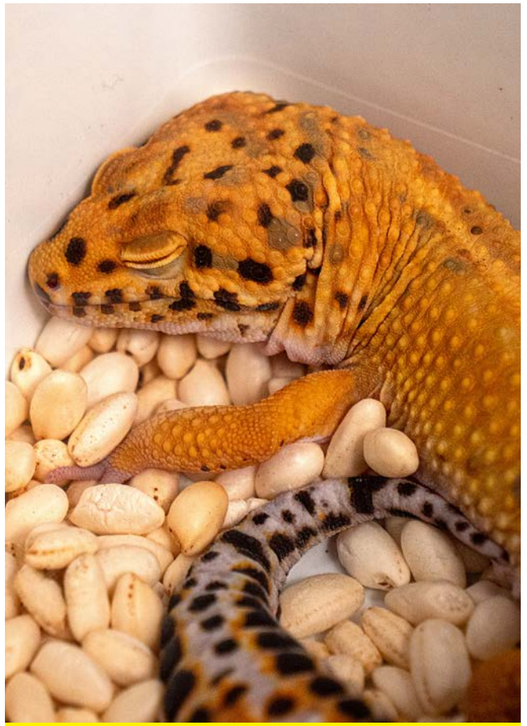
By extracting the DNA left behind from a bear, they identified a female bear with two cubs as the culprit. Three years later, she was also identified as the perpetrator of two more similar incidents.

Current beliefs suggest badly behaved bears become repeat offenders, however, this study, published in the *Journal of Applied Ecology*, implied brown bears may be the exception.

© TERESA BEREZOWSKA CNOTA

Teresa Berezowska-Cnota, lead author of the study said "Of the bears breaking into apiaries, about 33% were repeat offenders. This means that only a small fraction of the population could be classified as 'problem' individuals."

The study points out that understanding the individual aspects of conflict behaviour through population-wide studies should be a priority in applied ecology and conservation. (*Journal of Applied Ecology* doi.org/gr4xkq)



INVESTIGATING THE DARK WEB WILDLIFE TRADE

Ever wondered what wildlife is lurking on the dark web? Researchers have identified 153 different species being traded across 50 dark web marketplaces.

Lead author Dr Phill Cassey from the University of Adelaide explained "Most adverts found were for plants or fungi, used for their psychedelic effects." There were also animals being traded for drug use, such as the infamous Colorado river toad, known for secreting psychedelic toxins from its skin.

Despite trading for drug usage being high, there were also examples of animals being traded for other reasons, such as exotic pets. "This is important for understanding threats to biodiversity and biosecurity across international borders," continues Cassey.

The research team have been collecting data on Australia's wildlife trade, from over 100 websites, since 2019. Although the legality of online trade is complicated, it is clear that surveillance of marketplaces, private forums and messaging apps should be prioritised to combat the trade.
(*People and Nature* doi.org/gr696r)

LOCKDOWNS REVEALED THE BRITISH WILDLIFE MOST AT RISK OF BECOMING ROADKILL

The absence of traffic during COVID-19 lockdowns provided a unique opportunity for Cardiff University scientists to explore what traits and characteristics of animals make them more likely to be involved in road accidents.

Data from roadkill records during lockdown in March–May 2020 and December 2020–March 2021 were compared to records of the same period in 2014–2019. Lead researcher Sarah Raymond said, "During lockdown, there were fewer incidents involving nocturnal animals, those in urban environments, mammals with high brain mass and birds with longer flight initiation distances."

Common animals with those traits include foxes, badgers and pheasants, all of which are significantly more likely to be victims of road accidents and have a high mortality rate during normal traffic levels. Therefore, they all benefitted the most from the lack of traffic.

It was also discovered that across all species, wildlife–vehicle collisions reduced by 80% across the lockdown periods. The data gathered during the unusual time can help inform wildlife conservationists within our road dominated landscapes. (*Journal of Animal Ecology* doi.org/gr52xx)

CAMBRIDGE WILDFLOWER MEADOW BOOSTS BIODIVERSITY

A new wildflower meadow in the historic grounds of King's College, Cambridge has boosted biodiversity and captured the imagination of people across the city.

The study conducted by King's College, Cambridge researchers and published in *Ecological Solutions and Evidence* compared the species richness, abundance, and composition of the wildflower meadow with an adjacent lawn over a three-year period.

Despite the meadow's small size, the researchers found it supported three times the number of plant, spider, and insect species compared to the lawn, including 14 protected species in the UK. Additionally, bat activity in the meadow was three times greater than in the lawn.

The study also revealed strong public support for increased meadow planting in the Cambridge community, with only 1.4% of participants favouring entirely lawn areas. However, respondents emphasised the importance of maintaining some recreational spaces alongside meadows.

The reduced maintenance and fertilisation associated with the meadow brought an additional benefit, with an estimated saving of 1.36 tonnes of greenhouse gases per hectare per year compared to the grass lawn. The meadow also exhibited a higher tolerance for intense drought conditions.

Dr Cicely Marshall, who led the study, expressed enthusiasm for the success of the meadow: "There's no doubt that the meadow's introduction has been a phenomenal success. It has benefited the biodiversity within the College and captured the imagination of people across the city."

King's College Provost Professor Michael Proctor added "The wildflower meadow inspires us to think more about how we look after and enhance our biodiversity. We hope its presence in this iconic setting will motivate others to think about sustainability and to consider planting their own meadows elsewhere." (*Ecological Solutions and Evidence* doi.org/kkdn)

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LOUD MUSIC FESTIVALS COULD REDUCE BAT ACTIVITY BY NEARLY 50%

Music Festivals are becoming ever more ubiquitous in the UK but how do they affect our local wildlife?

Researchers at the University of the West of England present the first evidence of the negative impacts of music festivals on bat activity. Even in the absence of additional anthropogenic factors commonly associated with music festivals such as lighting and habitat disturbance, loud music playback alone was enough to disturb several bat species.

Nocturnal species are heavily reliant on sound to glean important environmental information for many aspects of their life, including navigation, finding food, mating, and avoiding predation. Changing soundscapes can therefore hinder an animal's ability to recognise and differentiate between important natural acoustic cues in their environment, disrupt social communication, and reduce the distance over which acoustic signals are perceived – reducing functional landscape connectivity and exacerbating impacts of habitat fragmentation.

Focusing on habitats mirroring the conditions of music festivals, the researchers observed declines in nightly bat activity along woodland edges of 47% in *Nyctalus/Eptesicus* species when exposed to loud music. Even the more tolerant *P. pipistrellus* species' activity decreased their activity by 32% during periods of music playback.

Most ecologists are aware of the damaging impacts habitat fragmentation has on our native landscapes, both on the ecosystems themselves and the communities that rely on them. However, research and planning policy often focuses on permanent alterations such as hedgerow removal, with more nuanced temporary disturbances requiring little to no mitigation when it comes to biodiversity protections.

Jack Hooker, lead author of the paper, said: "Music festivals in the UK are increasingly being held in places that are important for local wildlife. It is imperative that guidance relating to their planning and implementation is evidence-based and fully protects local biodiversity from any potential negative impacts if we are to share these habitats with wildlife in a sustainable manner." (*Ecological Solutions and Evidence* doi.org/kkdj)

WARMING CLIMATE COULD TURN OCEAN PLANKTON MICROBES INTO CARBON EMITTERS

A group of little-known, but highly abundant organisms known as mixotrophic microbes could have a significant impact on climate change. This is according to a recent study that suggests these microbes will shift from being carbon sinks to carbon emitters under warming conditions.

Mixotrophic microbes are organisms capable of switching between photosynthesis and consuming organic matter. They are globally abundant and are estimated to constitute the majority of marine plankton.

In a recent paper published in *Functional Ecology*, researchers at Duke University and the University of California Santa Barbara modelled how these microbes will react to warmer environments. They found that under predicted increases in global temperatures, these microbes are likely to transition from being carbon sinks to carbon emitters.

Dr Daniel Wieczynski, lead author of the research said: "Our findings reveal mixotrophic microbes are much more important players in ecosystem responses to climate change than previously thought.

"By converting microbial communities to net carbon dioxide sources in response to warming, mixotrophs could further accelerate warming by creating a positive feedback loop between the biosphere and the atmosphere."

The findings also suggested that fluctuations in the abundance of mixotrophic microbes may act as early warning signals for climate change tipping points. However, the researchers caution that these signals can be weakened by nutrient increases, such as nitrogen pollution from agricultural runoff and wastewater treatment facilities.

Dr Jean-Philippe Gibert, a co-author of the study said: "Research like this is much needed to improve our broader understanding of the biotic controls on Earth's atmospheric processes." (*Functional Ecology* doi.org/kkdq)

Paramecium bursaria, a mixatrophic microbe

© DANIEL J. WIECZYNSKI

RESEARCH

ORCA DIETS PROVIDE INSIGHT INTO CLIMATE CHANGE IMPACTS

For the first time in history, we are now able to quantify the proportion of different prey eaten by North Atlantic killer whales, thanks to the development of a new technique by McGill University researchers analysing orca blubber fatty acid patterns.

Orcas in the Pacific Northwest are already known to exploit vastly different food types, but we know much less about the feeding habits of their North Atlantic cousins.

As arctic waters warm and sea ice continues to melt, orcas are migrating further and further north. Anais Remili, the first author of the *Journal of Animal Ecology* paper, explained "Climate change is making it increasingly urgent to understand how orca diets are changing. We want to foresee the potential impacts on local food webs."

In the largest study of its kind, the researchers estimated the specific proportions of 900 prey species present within 200 killer whales' diets from Canada's eastern and northern coasts, all the way to those in northern Norway, resulting in the most detailed overview of North Atlantic orca diets to date.

The researchers discovered distinct dietary differences between orcas throughout the North Atlantic. In Canada, orcas prefer to consume other whales, such as belugas or narwhals. Compared to diets consisting predominantly of fish in the Eastern North Atlantic, and seals in Greenland.

But location isn't the only factor affecting orca dietary preferences – the team found individuals had their own preferences as well. For example, in the Eastern North Atlantic, most whales were herring eaters, but a small number of them featured other marine mammals, like porpoises, heavily in their diets.

Melissa McKinney, senior author of the paper, said "Quantifying the diets of killer whales and other top predators is crucial. It can provide insights into how these animals adapt to shifts in their prey populations and habitat conditions." (*Journal of Animal Ecology* doi.org/kkdr)

INCLUSIVE AUTHORSHIP REDUCES BARRIERS TO PARTICIPATION

The running of a global ecological research network called Nutrient Network (NutNet) has led to the establishment of an innovative framework for inclusive authorship. NutNet's approach to research has become the standard practice for scientist-driven collaboration within ecology, and the group continues to innovate with its new framework, aimed to reduce barriers to meaningful participation for underrepresented groups.

Historically, groups such as students, those from marginalised backgrounds and people with limited institutional support have been unable to access meaningful authorship on academic papers. However, the papers created through NutNet, including massively multi-authored ones with 70+ contributions, include substantial contributions from all authors, which are documented in detail.

NutNet co-founder Dr Elizabeth Borer developed the new approach based on her experience of coordinating and contributing to the publication of over 100 papers alongside her colleagues. She explained "Barriers in this process fall into a few categories: when to share with co-authors, how to balance diversity of input vs efficiency when moving to publication, and openness to feedback. Modifying the process itself can help researchers to overcome those barriers."

The approach describes a number of best practices, including assigning deadlines to increase communication, linking to shared spreadsheets with author guidelines and researchers noting in advance what they plan to contribute. All of this helps to overcome barriers to inclusive authorship for all. (*Methods in Ecology and Evolution* doi.org/gr6dw3)

PLANT COMMUNITIES: FROM LAB TO DRONES

The John L Harper award allows the BES to fund research that investigates the detailed study of plant populations and interactions. Dr Erola Fenollosa, the 2023 recipient, is investigating changes in plant metabolism as a response to disturbance.

Physical disturbances are among the most pervasive impacts of humans on biodiversity, and are now occurring with other human impacts, such as climate change and nutrient deposition. Habitat loss via land conversion for agriculture is a primary mode of physical disturbance and the leading cause of species extinction worldwide. Physical disturbance is remarkably important in grasslands, which collectively occupy 40% of the Earth's terrestrial surface and rank amongst the most biodiverse regions.

This project relies on a global network, DRAGNet, that examines the factors that modulate the resistance and recovery of plant communities to physical and chemical disturbances. After two years exploring the plant community effects in Wytham Woods (Oxford, UK), preliminary analyses have revealed drastic changes in the abundance of grassland species. However, the collected data (annual species richness and abundance) do not explicitly target which aspects of the different species contribute to their resistance or recovery potential.

Multiple multispectral indexes are summaries of variation in light reflectance that explain vegetation properties, such as 'greenness'. Those indexes can be calculated from drone images and have been recently developed to characterise plant functional traits. However, none yet exist to quantify the plant metabolome (i.e., the metabolites that underpin plant function and performance) at the community level. As such, there is a significant gap of knowledge and an opportunity to improve our mechanistic understanding of plant responses to disturbances using these techniques.

Erola plans to integrate her expertise in plant ecophysiology, her quantitative background and the drone fleet from the SalGo Team with the experimental design of the Wytham Woods DRAGNet node. This approach will allow her to test whether these plant physiological characteristics can be inferred from drone images to monitor grassland community responses to disturbances. With the help of the research team and a fieldwork assistant, Erola will obtain multispectral community-level drone images during the peak of the growing season and quantify plant metabolome community-weighted means at all experimental plots. Plant metabolomic analysis will characterise plant stress, productivity, nutrient, and light efficiency using both *in situ*, at Wytham Woods, and *ex situ* measurements, at the laboratories of the Department of Biology of the University of Oxford. This multidisciplinary approach will provide new tools to monitor ecosystem change.

SURVEYING FRESHWATER MACROINVERTEBRATES ALONG THE NIGERIA–CAMEROON BORDER

Emmanuel Akindele, a freshwater ecologist based in Nigeria was awarded a BES Small Research grant to survey macroinvertebrates in waterways along the Nigeria-Cameroon border.

Previous studies have shown that areas along the Nigerian-Cameroon boarder are biodiversity hotspots for freshwater invertebrates, although only a small number of these sites have been sampled in the past due to limited funding.

Emmanuel and his team sampled six sites which included some which were inaccessible to the public and therefore had minimal disturbance. Kick sampling and direct searching for clinging or climbing macroinvertebrates were carried out at each site.

Some notable results include the recording of two endangered damselfly species, the white-legged damselfly (*Allocnemis vicki*) and the jewel damselfly (*Africocypha centripunctata*three). Three macroinvertebrate species were also recorded for the first time in Nigeria.

This study has provided the first baseline report on the biodiversity of freshwater macroinvertebrates in the popular Cross River National Park as well as the Obudu Mountains and the Agbokim Waterfalls of the Cross River State, Nigeria. Many of the sites contained endemic species only found in this border region, highlighting the high conservation attention needed.

There are potentially more endangered and new species to be recorded, and projects such as these help to strengthen efforts to conserve these rare and threatened areas which are quickly declining due to a growing human population in the area.

Emmanuel said that "Africa is blessed with numerous biodiversity hotspots, many of which have not been investigated or reported on due to limited funding. The funding provided by the BES supports African ecologists and allows the chance to fill knowledge gaps on rare biodiversity hotspots and unreported natural sites."

NURTURED BY NATURE: A CALL FOR ACCESS TO NATURE

India Stephenson
Policy Officer

How can nature help improve and support our mental health? Three experts: an ecologist, a mental health nursing lecturer and a psychotherapist, share their insights.

There is a need to balance conservation and restoration of habitat with people's need to access nature and the wellbeing benefits it provides. There is now a large body of scientific literature supporting the positive effects of nature on wellbeing, from depression and anxiety to dementia. According to the People and Nature survey by Natural England, 84% of people agreed that being connected to nature makes them happy and during the Pandemic, 41% agreed that nature was more important than ever for their wellbeing.

> NATURE CONNECTION DOES NOT JUST MEAN NATURE CONTACT – WHAT WE DO IN NATURE MATTERS

Immersion in nature

Sarah Howes is a lecturer in mental health nursing at the University of Plymouth. Her recent study on supporting restoration from stress within mental health nursing found that immersion in nature led to a range of benefits. These included an increase in positive emotions displayed and decrease in negative emotions, an enhanced sense of belonging, and an interest in caring for the natural world.

Sarah says that investment in nature is an investment for the NHS. It is important to have access to green space as part of both staying and getting well. In fact, hospital patients recover faster when they have access or a view of green space, but green space around hospitals is disappearing.

> HOSPITAL PATIENTS RECOVER FASTER WHEN THEY HAVE A VIEW OF GREEN SPACE

As many are aware, the COVID-19 pandemic highlighted some of the benefits of contact with nature, but it also raised awareness of the inequalities of access and the value of easily accessible urban green and blue spaces. Green spaces were found to mitigate racial disparity of health, but poorer neighbourhoods generally have less access to quality green space and national parks and forests are used only by the richest third of the country. However blue space is an exception to this trend – people from all walks of life use beaches and the sea.

There are barriers that need to be overcome so that everyone can access the mental health benefits that nature provides. These include wealth – the costs of trains, access to reserves, parking and outdoor gear can be prohibitive; ethnicity – People of Colour not feeling welcome in nature and experiencing hostility; and gender – women and trans people feeling vulnerable in unpopulated spaces, for example.

Reclaiming a sense of belonging

Beth Collier is a nature-allied psychotherapist and founder of Wild in the City, a non-profit that supports People of Colour to explore their human relationships and connection with the natural world.

Beth thinks that nature connection makes sense as a form of psychotherapy, with the Earth acting like a mother that offers a sense of security and a non-judgemental relationship. Wild in the City uses natural history teaching, allowing groups to explore and learn about habitats, as a way to create a relationship with nature. It envisions a world where people feel more comfortable and safe exploring nature.

Some of the reasons for the racial disparity in access to nature include emotional and psychological barriers about who nature is and is not for, and experiencing racism and hostility in the countryside.

> DISRUPTION OF CONNECTION TO NATURE HAS LEFT BEHIND TRAUMA

There are also generational messages passed down in some communities, for example, a historical narrative that time spent in the great outdoors is a white privilege. 98.2% of People of Colour live in cities and this has created an urban identity, taking away any sense of 'rural belonging'. Disruption of that connection to nature has left behind trauma, which is why Wild in the City is working to re-establish oral histories of humans and nature, reclaiming a feeling of belonging in nature.

Connection through action

Dr Michael Pocock of the UK Centre for Ecology and Hydrology has studied the value of nature-based citizen science. Not only is volunteer-collected biodiversity data extremely valuable for environmental monitoring, it also benefits those who partake in it by promoting nature connectedness and wellbeing.

Michael explains that while it's been found that 120 minutes spent in nature each week is associated with good health and wellbeing, the quality of that time is crucial – nature connection does not just mean nature contact – what we do in nature matters.

Michael and colleagues studied the impact of citizen science on wellbeing and nature connectedness. In a randomised controlled trial, people were assigned certain activities to do for 10 minutes a day over a week: a citizen science activity, an exercise in noting down good things they noticed in nature, or both.

Both citizen science and nature noticing activities improved people's pro-nature feelings, mood and wellbeing, and the combination of citizen science and the nature noticing activity made people feel most connected to nature.

The benefits of connecting with nature are wide ranging but for many people it is still inaccessible. The BES is supporting the Nature 2030 campaign, which aims to ensure the government fulfils its 2030 commitments to nature. One of the key asks is for political parties to commit to a right to a healthy environment, which includes access to nature.

POLICY EVENTS

Sarah Howes, Beth Collier and Dr Michael Pocock were speakers at the English Policy Group's first People, Policy & Planet event, Accessing and Maximising Nature in England, which was held in London in April. These events aim to bring together academics, practitioners & policymakers to discuss important topics in environmental policy. For information about future events, join the EPG's mailing list via the policy pages on the BES website.

DID YOU KNOW?

Think you know your pollinators? Think again. The tiny *Xenohyla truncata* tree frog may become the first known amphibian pollinator after researchers in Brazil observed it wiggling into a flower for nectar, and coming out again with pollen on its back.

© CARLOS HENRIQUE DE-OLIVEIRA-NOGUEIRA

Anti-bird spikes says who?! Urban crows and magpies have been building nests using these so called deterrents. The phenomenon has been observed in several countries including the Netherlands, Belgium and Scotland.

Wales is becoming the world leader in seagrass restoration. Seagrass is up to 35 times faster at storing carbon than tropical rainforests and is a vital habitat for many species. Project Seagrass, WWF and Swansea University have developed a robot capable of planting 20,000 seeds in one trip.

China looks like it's set to exceed its green energy targets for 2030 which is great news for the climate. The country has seen huge growth in solar and wind power, hopefully other countries will follow suit.

INSPIRED BY...

MARIANNE NORTH (1830–1890)

Women in the Victorian era were expected to look after their husbands, houses and children, but biologist and botanical illustrator Marianne North had other priorities.

Following the death of her parents, North found solace in painting the flora of distant lands. At 40 years old, she travelled around the world painting landscapes and botanical art. As an unmarried and childless woman, she did most of her travelling solo. By defying societal expectations, she was free to explore the land and focus on her craft.

North's paintings defy the conventions of 1800s botanical illustrations. Instead of sticking to the typical watercolour palette of the era, she chose to use oil paints. As a result, her work is a lot brighter and more vibrant than anything else made at the time.

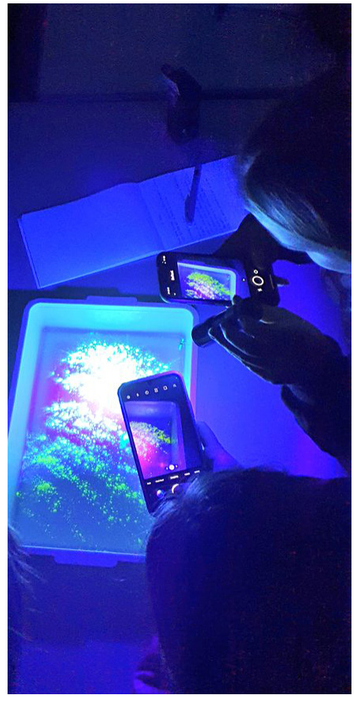
North was the first to document many species and has several named after her, like the Bornean pitcher plant *(Nepenthes northiana)*. In another departure from tradition and in a world before photography, North's botanical paintings also included people, animals and landscapes which helped to build a bigger picture of whole ecosystems.

Today over 800 of her paintings can be found in the Marianne North Gallery at Kew, London. Opened in 1882, North designed much of the unique features of the space. All paintings were fitted and framed by her creating a superb tribute to nature.

LIGHT BITES

SNAPSHOTS FROM OUR SUMMER SCHOOL!

This year students had a fun weekend in Preston Montford FSC Centre insect surveying, fungi foraging, artivism creating and much more!
Thanks to our session leaders and mentors for helping us inspire the next generation.
If you would like to get involved next year contact **education@britishecologicalsociety.org**



GUIDING PRINCIPLES FOR TRANSDISCIPLINARY SUSTAINABILITY RESEARCH AND PRACTICE

People from different walks of life need to work together if we are to understand and find fair and long-term solutions to the complex sustainability challenges the world faces today. Specifically, Indigenous Peoples and local communities have deep knowledge of their environment and local context that have been poorly recognised or neglected in sustainability research, which still leans towards a predominance of western knowledge and thinking.

To address this imbalance, Maureen Reed and Jim Robson worked with a group of international researchers, practitioners, and community collaborators from Argentina, Bolivia, Canada, Germany, Mexico, and South Africa to co-design a set of principles to guide how sustainability researchers can work better with Indigenous and local knowledge holders.

The seven principles for working together that they agreed on include: 1) honour self-determination and nationhood; 2) commit to reciprocal relationships; 3) co-create the research agenda; 4) approach research in a good way: embed relational accountability; 5) generate meaningful benefits for communities; 6) build in equity, diversity, and inclusion; and 7) emphasise critical reflection and shared learning.

By sharing these principles they hope to engender more sensitive, collaborative, and ethical sustainability research, particularly in intercultural settings (*People and Nature* doi.org/kj7r).

Who was involved in this project?

We are a team of early career and established academics and practitioners from across the Global North and South. Team members span the natural and social sciences, and humanities including agronomy, engineering, history, ecology (evolutionary ecology, forest ecology, ethnoecology), biology (ethnobiology), geography, philosophy, and water science. However, most people are working in areas that are somewhat removed from their original training and identify as interdisciplinary and even transdisciplinary sustainability scientists or practitioners. Some might even identify as undisciplined!

How did you find working with a group from different disciplines?

We have not all been steeped in the language, concepts, and ways of knowing/doing of a single discipline. Working across disciplines, geographic and cultural contexts, and work situations, we found we had to take care to avoid jargon and explain ideas carefully and fully. We often had to revisit assumptions that we took for granted, particularly when we did not share comparable words in our languages. This work was challenging, enriching, and exciting.

What have you learnt from other disciplines that you would apply to your own work?

We were privileged to work with Indigenous mentors who not only introduced important terms, but also guided us in *how* we might work together. The seven "R"s for working with Indigenous Peoples (respect, responsibility, relevance, reciprocity, relational accountability and refusal, and reconciliation) apply to any relationship – research, professional, or even personal. They encourage us to think more deeply about how we can bring our whole selves to research collaborations.

Were there any awkward moments?

Sometimes it's hard to say, "I don't understand". Asking for deeper clarification about specific words or concepts can be awkward but also extremely engaging and exciting as we start to learn more about what those ideas mean in different contexts and whether ideas that we hold dear in one context might not be relevant in another. Learning that "inclusion" might not be universally desirable is an example.

Were there any funny experiences or surprising discoveries from this research?

Not funny or surprising per se, but it was very nice to see people from different disciplinary and cultural backgrounds enjoy learning from one another and being able to share and challenge ideas in an open and respectful way.

What advice would you give to anybody embarking on an interdisciplinary project?

Listen, listen, listen. Ask. Listen some more. Work with people you enjoy working with, and also understand that working in teams like this can take more time and a big dose of humility. But it's worth it and the issues we are all concerned with, demand it. ✺

Drs Maureen Reed and Jim Robson share a UNESCO Chair in Biocultural Diversity, Sustainability, Reconciliation and Renewal at the University of Saskatchewan, Canada. They are honoured to work with academic and community collaborators around the world.

FROM WILDLIFE-RESCUERS TO CITIZEN SCIENTISTS

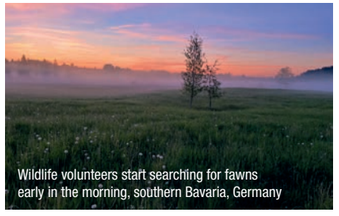
Johanna Kauffert takes us back to an early morning of a fawn rescue to demonstrate how wildlife volunteers can map roe deer birth distributions. The data can help guide farmers in their pre-mowing precautions, and also help us understand how roe deer are responding to climate change (*Ecological Solutions and Evidence* doi.org/kj7s).

It's early morning, or rather still in the middle of the night, when I get up to drive to the countryside with my colleagues. Before the first rays of sunlight brighten the day, we meet up with a group of wildlife volunteers – they have big ambitions this morning. The farmers plan to mow 35ha grassland around the village today. Who knows how many animals are currently hiding in these meadows?

In fact, many field-dwelling animals such as ground-nesting bird species, leverets of brown hare or roe deer fawns use high-standing meadows as bedding sites and are prone to fall victim to mowing machinery. Particularly for roe deer fawns, spring mowing is one of the main mortality causes (ca. 15-30 %) due to their native instinct to stay hidden and motionless in jeopardy.

Thus every spring, many wildlife volunteers group up to search the meadows for fawns before mowing.

However, due to the limited days of mowing in spring which are restricted by favourable weather conditions, not all fields can be searched simultaneously. And we currently do not know how roe deer are adapting to



Wildlife volunteers start searching for fawns early in the morning, southern Bavaria, Germany

Rescued roe deer fawns

an earlier onset spring induced by climate change. So on this particular June day, we do not even know how many fawns are still young enough to hide in the meadows.

We are arriving at the first meadow. It is still quite chilly and the dew moistens the grass – perfect conditions to search for fawns with an unmanned aerial vehicle (UAV) as the thermal difference between the animal and the meadow is at its maximum.

The wildlife volunteers are setting up the UAV and start the ascent. Quickly, they detect a fawn and direct us to go into the meadow and search for it. We approach the fawn and hold on to it with gloves and a tuft of grass. We lift the fawn into a box and leave it at the side of the field. It will now wait until the meadow is mown and will be released afterwards. In the meantime, one of the wildlife volunteers pulls out her phone, takes a picture of the fawn and enters the fawn's age specifics and coordinates to our online form.

We continue our search for a couple more hours and at the end of the morning we were able to save eight fawns. At the same time, the wildlife volunteers generated valuable data for our study concerning bed sites and breeding phenology.

Reconstructing the breeding distribution

At the end of the fieldwork season, back at our computers, we started analysing the data.

The search days of the volunteers look skewed as if they were only sampling at the end of spring. And yes, they were, because that's when the weather was good for mowing. As a result, the reconstructed birth dates of the fawns also inherit the bias of this opportunistic search.

Luckily our independent research teams sampled data during the whole span of spring which is why we were able to model the truncation introduced by this opportunistically sampled data of the volunteers.

With a simulation exercise, we were able to describe the error of data sampled under different mowing regimes and developed two algorithms to address the drawbacks.

Our results were able to show that voluntarily collected data from roe deer fawn rescue initiatives can be integral to increasing data about regional birth distributions. Knowing the exact birth distribution of fawns will help guide farmers in their pre-mowing precautions to avoid fawn deaths. The data can also help us understand how roe deer are adapting to climate change. ✺

A PARTNERSHIP TOWARDS NET ZERO AND NATURE POSITIVE

WHY ARE WE RESTORING PEATLANDS RATHER THAN PLANTING TREES?

Hazel Norman explains how the BES is beginning it's journey to becoming a nature positive organisation.

By the eastern shore of Loch Lomond lies Cashel Farm. This former hill farm of 1,250 hectares of native woodland and peatland was purchased by the Royal Scottish Forestry Society in 1996 as a restoration project for the benefit of the public. Today, with 10,000 visitors annually, Cashel Farm is managed with education, recreation, conservation and community at its core. Last December, I tried to visit Cashel with colleagues but we were thwarted by deep snow, so we still only know the site by photographs and the lines on the ordnance survey map. But Cashel Farm is very important to the BES and has helped shape our thinking and ambition around becoming a Net Zero and Nature Positive organisation.

In 2019, the BES made a commitment to reduce its carbon emissions and offset the residual. The landmark 2021 BES publication, *Nature-based Solutions for Climate Change in the UK,* (available on the BES website and through Applied Ecological Resources) was hugely influential on how to do this well. A priority solution identified in the report was the restoration of the UK's 2.6 million hectares of peatland, which hold around 3 billion tonnes of carbon. Most are in a degraded state and are no longer actively sequestering carbon, with estimates suggesting that they could be emitting 23 million tonnes of CO_2e annually. This is the equivalent to approximately half the amount released through the nation's agricultural sector.

Our Strategic Plan 2023–25 maintains the BES's commitment to reduce our environmental impact. Restoring degraded peatlands through rewetting and revegetation can reduce and eventually halt carbon emissions as well as bring benefits in terms of biodiversity conservation and flood protection. That made it a natural for the BES to focus on.

Our trustees agreed to value carbon at £252 tCO_2e, considerably higher than the traded price of carbon. £252 tCO_2e is the mid-point value the UK Government considers is the monetary value that society places on carbon. This value is different from traded carbon prices, which represent the observed price of carbon in a relevant market (such as the UK Emissions Trading Scheme).

Valuing carbon at the mid-point means we have set aside £15k in 2023 to manage our carbon emissions. A small part of this goes towards purchasing carbon credits at peatland code verified sites and the much larger remainder is used like venture capital, investing in helping new sites identify and develop their carbon sequestration potential via peatland restoration.

The key to making that work for the BES was finding a landowner who shared our values and long-term vision, and in the Cashel Forest Trust (the charity running the site) we found the ideal partner. We have been working with them since 2020, initially focusing on carbon but now expanding to encompass Nature Positive. This partnership approach is essential to delivering meaningful change on the timescales needed.

So far, BES funding has paid for the Trust to commission surveys looking at the potential to restore degraded peatland at the site and how that might be done. The report showed that restoration of 180 hectares of degraded peat at Cashel could achieve emissions savings of 16,600 tCO2e over 80 years. Continued BES funding will help the Trust realise that ambition and peatland restoration work is starting this autumn. We are funding baseline ecological survey work on the site before the works commence, so that we can assess the impact on nature in future years.

There is still much to learn about how we as the BES continue to deliver our work in a sustainable and just way. The relationship with the Cashel Forest Trust has been hugely satisfying as we work with them towards the shared goal of a thriving restored landscape. I am still hoping to visit Cashel, perhaps in 2025 during the BES Annual Meeting in Edinburgh, snow permitting, but we remain passionate about supporting positive difference and nature-based solutions despite not having set foot on these wild upland moorlands yet. ✺

PEATLANDS ACROSS THE BES

Books
Peatland Restoration and Ecosystem Services. Bonn, A., Allott, T., Evans, M., Joosten, H., & Stoneman, R. Eds. (Ecological Reviews, British Ecological Society) Cambridge University Press, 2016

Policy
Read chapter 3 of our *Nature-based Solutions for Climate Change in the UK* report which focusses on peatlands

Applied Ecology Resources
NatureScot and Natural England have published several reports on peatland management, which are freely accessible on AER. Just search for 'peatland' at appliedecologyresources.org

Peatlands Special Interest Group
Our Peatlands SIG would like to grow. Get in touch with sigs@britishecologicalsociety.org to express interest in joining the group

PALAEO ECOLOGY

© MADE NOISE

Artist impression of the Siberian Traps eruption

THE NICHE | AUTUMN 2023

UNDERSTANDING THE PAST TO PREPARE FOR THE FUTURE

We are in the middle of a sixth mass extinction. How can we learn about the possible consequences? By looking back at the previous five, says Jack Walker.

You stand looking over the coastline of an unrecognisable world. Behind you, a vast, desolate, treeless plain stretches out for as far as the eye can see. In the distance, wildfires rage, their thick black smoke trailing off into a darkening sky. It is hot, and getting hotter. The sea in front of you is seemingly devoid of life, a menagerie of sea creatures line the desiccated beach, unable to cope with the acidified, deoxygenated waters they once called home.

Coming back to reality, this may seem like a scene pulled from our planet's future – some worst-case scenario where human-caused global heating has reached its peak, laying waste to our planet's landscape.

© MADE NOISE

But this is quite the opposite, this is Earth, 252 million years ago, in the midst of the Permo-Triassic mass extinction. The Siberian traps, a huge volcanic province, have erupted, releasing vast amounts of carbon dioxide and other greenhouse gases into the atmosphere. Covered in this suffocating blanket, temperatures creep up, leading to the extinction of 90% of all species on Earth at the time.

Out of the 'Big Five' mass extinctions, the Permo-Triassic was the most severe, with the flora and fauna, and the communities they inhabited, taking millions of years to recover from its impact. Yet in the causes of this event, similarities can be seen with the current climate crisis. In the place of vast continent-spanning volcanic eruptions, we have carbon emissions derived from human activity. The greenhouse gases in both scenarios are of very dissimilar origins, yet their effects on the Earth's ecosystems are eerily similar – the organisms of the Permian were pushed to their limits, the interconnected ecosystems they resided in collapsed under the pressures of a changing world. Peering back into the annals of deep time, we can find that life on earth once faced the catastrophic consequences of change that we see affecting modern life, and more importantly, we can learn how life responded to such change.

And, to me, that is the importance of palaeoecology. A branch of palaeobiology focusing on the study of understanding ecosystems throughout our planet's past. In a time where we are battling climate and biodiversity crises and the future seems so unsure, the insights palaeoecology can give us in how the living world has previously responded to similar events is priceless.

WHAT IS PALAEOECOLOGY?

As a small child, I found myself fascinated by the animals that came before us. For centuries the same thing has grabbed the passion of individuals across the globe, culminating in the study of the fossils found in the rocks beneath our feet – palaeontology. As we have gained more knowledge of how the Earth, its systems, and the life on it, has evolved over the past 4.5 billion years, we can build a better understanding of how the organisms of the past interacted with each other and their environment.

Investigating this area of the past is called palaeoecology, a huge area of study within palaeontology. Whether scientists are working to understand the first alien-like marine communities of the Ediacaran Period, or the food webs of Late Cretaceous North America, palaeoecology is illuminating ecosystems lost to time. Essentially, palaeoecology doesn't just look at a T. Rex, it looks at what animals a T. Rex interacted with in its day to day life, and their influence on surrounding organisms – it is a web of ancient organisms in their ancient ecosystems. In the modern day, ecology is already an extremely complex subject, with our understanding constantly changing as new discoveries are made. For palaeontologists, the view of the ecosystems they study is restricted to the lens of the rock record, pieced together through the fossils of ancient plants and animals.

Yet regardless of this, it grants us an amazing level of clarity into how contemporary ecosystems might respond to a whole range of differing catastrophic events or changes.

Smilodon, a sabre-toothed cat skull

Smilodon californicus and *Canis dirus* fight over a *Mammuthus columbi* carcass in the La Brea Tar Pits. By Robert Bruce Horsfall.

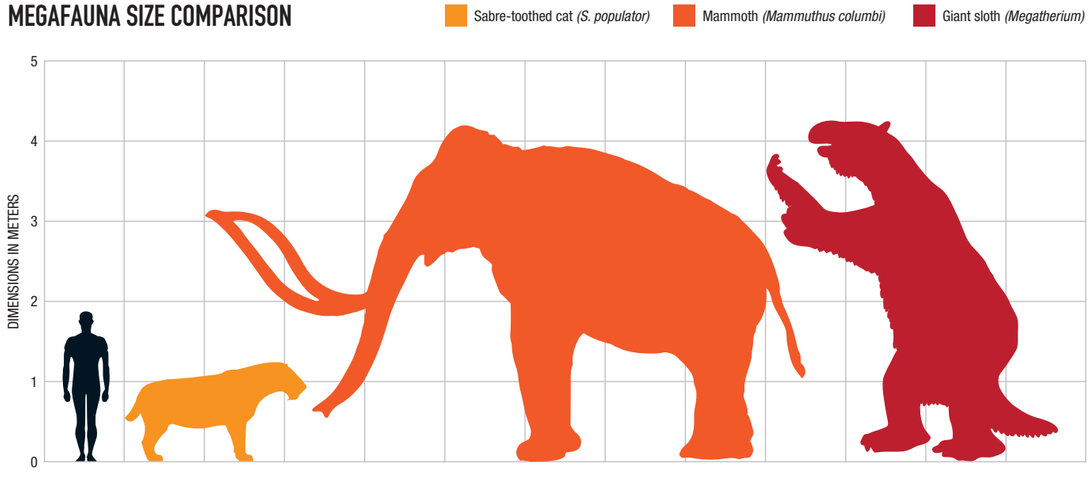
© Public Domain. William Berryman Scott, A history of land mammals in the western hemisphere, New York, MacMillan Publishing Company, 1913

BIODIVERSITY, EXTINCTION, AND GIANT SLOTHS

As a master's student in the University of Bristol's palaeobiology course, I recall the decision to choose an area of study for my thesis. Whilst my peers focused on dinosaurs, I felt the pull to dive into something that had been on my mind since visiting the Hall of Fossil Mammals in the American Museum of Natural History. Walking through that space, I found myself surrounded by a plethora of amazing creatures; giant sloths, mastodon, mammoths, sabre-toothed cats, short-faced bears, American cheetah, giant camel, dire wolves, giant armadillo, and so much more. I recall being staggered by the diversity of animals on display. Yet they all shared one key characteristic – all went extinct towards the end of the Pleistocene Epoch, only 12,000 years ago.

Megatherium, a giant ground sloth, went extinct at the end of the Pleistocene Epoch

MEGAFAUNA SIZE COMPARISON



IN THE LEAD UP TO THESE EXTINCTIONS, ANCIENT AMERICA FACED SOMETHING COMPLETELY NEW – A NOVEL SUPERPREDATOR, MODERN HUMANS

How did a continent lose such a diversity of large animals in such a short amount of time?

And so, I investigated the extinction dynamics of American megafauna in my thesis. The more I researched about the ecology of Ice Age America, the more I became enthralled in its relevance to the biodiversity crisis of the modern day. You see, in the lead up to these extinctions, the steppe, plains, parklands, and savannah of ancient America faced something completely new – a novel superpredator, modern humans.

When humans crossed the land bridge into North America, they quickly spread across the prehistoric continent, possibly reaching South America as early as 14,500 years ago. They were greeted by an ecosystem dominated by huge mammals, commonly known as megafauna. Palaeontological and archaeological discoveries have shown that these ancient peoples hunted the huge herbivores of this time for meat, hide, and even ivory. The mammoths, mastodon, giant sloths, and other giants these prehistoric Americans favoured all took a very long time to reproduce. They had long gestation periods, often calving only one individual at a time. This, coupled with extensive hunting from humans, meant these giant herbivores faded into obscurity, and then extinction. The plethora of specialist predators that had evolved to hunt these giants; such as the sabre-toothed cat *Smilodon*, lost their key prey items, and also disappeared.

The great plains of North America were reminiscent of the African Serengeti, traversed by countless species of large predator and prey. Now animals like the bison are relics of a time gone by.

But why does knowing this matter?

Understanding the megafaunal extinctions that wracked the world only 12,000 years ago opens a window into a pressing issue in the modern world – the biodiversity crisis. Seemingly countless species are at risk of extinction in the face of human activity. We find that large-bodied animals, from the Bengal tiger to the white rhinoceros, are critically vulnerable. Just like the mammals of the Late Pleistocene, humans threaten these animals and reflecting on the outcomes of the megafaunal extinctions can provide a lesson from the past on what might become of the ecosystems these large mammals inhabit if they disappear in our hands.

Cave painting of people hunting

Late Pleistocene megafaunal extinction has always been contentious in the field of palaeobiology, with the research around the driving forces behind this extinction shifting between a focus on human hunting or the effects of a changing climate at the time. However one thing remains true – we are still learning about the cascade of effects caused by the disappearance of the Pleistocene megafauna. And it is clear now, more than ever, that we know it had a devastating effect on ice age ecosystems. The past highlights the importance of these creatures, driving home the importance of preserving the integrity of modern-day natural systems. The past has shown how delicate they truly are.

FROM ROCK TO REALITY

Deep, geological time spans provide countless extinction events and ecological turnovers that can be applied to all areas of a changing modern world. The Permo-Triassic mass extinction, and the megafaunal extinctions of the Late Pleistocene are just two examples out of a long list that can relate to the climate crisis and biodiversity crisis looming over us today. They provide a framework of understanding what we can expect for our own future, and how to prepare for the outcomes of such crises.

After all, we're finding ourselves in the midst of a sixth mass extinction. Where better to seek an idea of the outcome of such an event than rolling back the clock and investigating the other five?

But is it all doom and gloom? If anything, the history of life on Earth displays its resilience in all its glory. After every extinction, every ecological collapse, and even an impact from an asteroid the size of Manhattan Island, plants, animals, and other organisms have always bounced back. We scientists have the privilege of looking back at the ups and downs of life on Earth, and can communicate what has happened to it in times of catastrophe. It is up to humans to reflect on this, educate ourselves on the consequences of our own influence on the natural world and change accordingly. ✺

Jack Walker is a Marine Science & Policy Officer with a passion for palaeobiology. His love for the subject was realised through the completion of a degree in Geology & Palaeontology at the University of Leicester and a master's degree in Palaeobiology at the University of Bristol. He believes in the importance of communicating the relevance of prehistoric life to contemporary biological issues, running the TikTok account 'dinosaurlimbs' dedicated to revealing surprising details about the natural history of our planet.

EXPECTATION VERSUS REALITY

THE EARLY CAREER RESEARCHER'S GUIDE TO SURVIVING ACADEMIA

Mahasweta Saha, Plymouth Marine Laboratory | **Pierre Mariotte**, Agroscope
Katrina Davis, University of Oxford | **Roberto Salguero-Gómez**, University of Oxford

Academia can be an immensely rewarding profession, especially for those of us who love challenge, hard work, and the thrill of new discoveries. However, it can also be a bruising experience for some early career researchers as they navigate toxic workplace cultures.

If you are a PhD student or fresh from your post graduate degree and ready for new adventures, the chances are that you will be leaving behind the familiar in search of a new position at a new place. This may even take you to a foreign country, far from friends and family. For many, these experiences are entirely positive, living up to the promises made at interview. However, for some early career researchers (ECRs), they can find themselves struggling in a hostile working environment, working alongside academics with a 'rock-star' mentality.

We can do better than this. Academic culture needs to raise its sights, with employee wellbeing promoted as the norm. Scientists worldwide need to break the cycle of abused becoming abuser and together focus on making, not breaking, the next academic generation. There is no doubt that progress has been made in the last few decades, but we still have a way to go to achieve an equitable workplace environment for everyone.

Here, we look at four common negative behaviours, with tips to overcome them.

EXCLUSIVITY IN RESEARCH

Exclusivity occurs when a manager limits the work of an early career researcher. This can take the form of stopping researchers from working on grant applications on the same research topic, or not inviting junior scientists to be co-PI in the PI's grant applications. This behaviour may be masked as concern for the junior staff. For example, one may not be invited to contribute to a proposal because of concerns about one's workload. However, by withholding these experiences, PIs can be accidentally limiting their mentee's career development.

MENTORING

The time involved in mentoring students and ECRs in skills like teaching and grant writing can be relatively high for the PI initially. Yet, mentoring does not have to fall on the PIs themselves. There are many mentoring opportunities available. The BES has a mentoring network where mentees can get support in areas like career change, work-life balance and career development. Another route is ensuring mentoring is explicit in the PI's job description with management receiving frequent feedback from students and postdocs.

BULLYING

Bullying is a persistent problem in academia. Common behaviours include unjustified verbal/written accusations, persistent criticism, rumour spreading, smears, pressure to work beyond contractual obligations, or preventing junior colleagues from carrying-out their research. Academic groups exist where a culture of bullying is so standard that it has become entrenched. How can we collectively tackle systemic academic bullying?

ASSESS THE WORK ETHICS OF THE LABORATORY PRIOR TO ACCEPTING YOUR POSITION

When choosing placements, assess potential employers not only on the quality of their publications, but also on the reputation of their laboratory – chatting with current and past lab members can be insightful. You can also check the institution's track record in dealing with bullying.

INFORMAL RESOLUTION

A frank but cordial conversion can help. Perhaps ask a friend or colleague who knows you to be present and make sure you create a paper trail of written evidence. After the meeting, write a summary of what was discussed and email it to the person to sign off, cc'ing your witness. This is a good initial course of action, but it may not be successful, and further steps may be necessary.

FORMAL COMPLAINT CHANNELS

If the behaviours persist, take a more formal stand. Most academics, including PIs, have a line manager, and departments often have dedicated staff who are available to begin these proceedings, normally at the HR office. Some institutions already have explicit policies against bullying and are known to take legal action against them. Inform yourself of the channels and discuss potential pathways with anti-bullying champions in your department.

INSTITUTIONAL POLICY

An institutional position against bullying must be unequivocal and clear cut, and policy documents – often a code of conduct – should be openly available. All staff should be aware of the institutional position and understand what behaviours are expected.

INSTITUTIONAL ASSESSMENTS

The threat of losing funding is an effective tool in encouraging cultural change. More progress in this area could be achieved if broader assessments of productivity, including lab mental health, played into the ranking and future funding allotted to institutions. The UK's Wellcome Trust, has already taken action in this direction, including "un-funding" PIs due to clear evidence of bullying. Similarly, the Leverhulme Trust has withdrawn a research grant from a prominent scientist who breached anti-harassment rules.

BOYCOTT

Well-known scientists are often invited to give keynote speeches or join editorial boards. This selection is often based primarily on their publications, grants, awards, etc. We advocate that selection is also based on workplace behaviours, so bullying is not rewarded with positions of power and influence.

DISCRIMINATION

A common expression of discrimination is providing career opportunities to some while denying others – irrespective of the individual's achievements or potential. We have experienced group leaders who, likely unconsciously, supported the career development of ECRs from their own country/culture over those from other backgrounds.

Ending discrimination in academia, and in society, requires a mindful commitment, so what steps can we take?

RAISE YOUR VOICE

If you feel you are a victim of discrimination, speak out. This is not easy, but the support of friends and colleagues will help – make sure you have this in place.

FIND YOUR COMMUNITY

There are many networks that provide support to marginalised groups, such as BlackAFinSTEM, 500 Women Scientists, Pride in STEM, and academic society groups including the BES's Racial & Ethnic Equality & Diversity (REED) Ecological Network.

DO NOT BE COMPLICIT

If you witness discrimination, speak up and become an ally.

COLLABORATION, NOT COMPETITION

There are enormous advantages to combining the expertise, experience and knowledge of different and diverse minds. The concept of academic merit should be reframed to embrace the importance of wellbeing as well as good practices and integrity in the sciences.

EXPLOITATION

The constant pressure to be novel and innovative in academia can lead to the theft of ideas and results; students and ECRs are particularly vulnerable to group leaders appropriating ideas that were originally co-engineered with ECRs. Unfortunately, research groups exist where students and ECRs are only given credit when publishing, but little mentoring occurs towards their overall development as well-rounded scientists.

KEEP WRITTEN RECORDS

Always circulate written records after meetings, either as an aide memoire, or as formal minutes. If you brought specific ideas to a meeting, make sure that this is clear in the record. Likewise, acknowledge the ideas of others. These records can also be a great way to advance your career development.

RETHINK ACADEMIC ACHIEVEMENT

The value of collaboration can be better supported by academic institutions. New indicators of success based on collaboration, as well as involvement of students in research and mentorship, would be a good step forward.

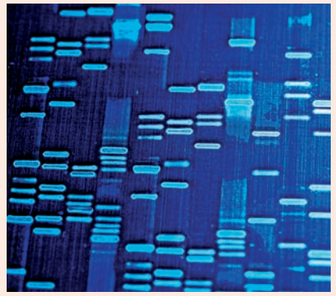
BUILD AN EQUITABLE PARTNERSHIP

In the current system of hiring graduate students and ECRs, thesis research and project work is often prescribed and approved for funding before the appropriate person is hired for the task. This leaves little room for the incumbent to inject their own ideas into projects. Creating opportunities for junior members to participate in the design and planning of research will develop and support the next generation.

While academia continues to attract, these four examples are signs of a system that could raise its game. Here's to a research culture of humility over egotism, integrity over nepotism, and compassion over competition. It starts with each of us simply playing our part. ✺

YOUR SOCIETY

EVENTS



ECOLOGICAL GENETICS MEETING #EGG2023

♦ 5–7 SEPTEMBER 2023

⚲ DEPARTMENT OF STATISTICS, UNIVERSITY OF OXFORD

The Annual Meeting of the Ecological Genetics Group, the longest running Special Interest Group that has been meeting since 1957, will provide a forum for all scientists working at the nexus of ecology, evolution, and population genetics.

AQUATIC ECOLOGY MEETING 2023

♦ 18–19 SEPTEMBER 2023

⚲ LANCASTER UNIVERSITY + ONLINE

This year the Aquatic Ecology SIG will be getting together in Lancaster for their annual meeting. Aquatic ecologists from across the board are invited to join, with both in-person and virtual tickets available.

AER LIVE: AUTUMN SERIES

♦ SEPTEMBER–NOVEMBER

⚲ ONLINE

Join us for another series of AER Live – our free, interactive, online workshops for applied ecologists and practitioners. Workshops take place once a month on Zoom and details will be announced a month before the workshop.

Our first workshop is on 27 September and is led by Elizabeth Bach who will provide an insight into long-term ecosystem restoration as a scientist at Nachusa Grasslands for The Nature Conservancy. Visit the website to find out more: bit.ly/AER-Live

BIOLOGY WEEK

♦ 16–20 OCTOBER 2023

Celebrate the biosciences with Biology Week 2023. There'll be a full programme of online and in-person events across the UK. Follow #BiologyWeek for all the action.

BES ANNUAL MEETING

♦ 12–15 DECEMBER 2023

⚲ BELFAST, UK + ONLINE

Our Annual Meeting is Europe's largest conference dedicated to ecology. More than 1,500 delegates from over 50 countries across six continents attended our 2022 meeting in person or online.

In-person and online tickets are available. Full details on our website.

britishecologicalsociety.org/bes-annual-meeting-2023

GET THEM IN THE DIARY NOW…

BES ANNUAL MEETING 2024

♦ 10–13 DECEMBER 2024

⚲ LIVERPOOL, UK

BES ANNUAL MEETING 2025

♦ 15–18 DECEMBER 2025

⚲ EDINBURGH, UK

INVASION SCIENCE

IMPROVING THE CONTRIBUTION OF INVASION SCIENCE TO POLICY AND MANAGEMENT

LLANDUDNO, WALES

Report by **Steph Bradbeer and Guillaume Latombe**

In June, we held our annual in-person meeting in North Wales, entitled **'Improving the contribution of invasion science to policy and management'**, supported by the Wales Ecological Resilience Network (WaREN) and APEM. This was the first SIG event since 2018 and whilst it was a little while coming, it was certainly worth the wait. Over 55 delegates attended the event, including representatives from academic, government, local action groups, private industry, practitioners and much more.

SCIENCE–POLICY DIALOGUE NEEDS APPROPRIATE COMMUNICATION CHANNELS

Our two keynote speakers, Dr Emily Smith and Prof. David Aldridge highlighted the need for engagement between sectors throughout the process of research and discussing mechanisms for informing and translating scientific findings into appropriate formats for policy and practitioners. The message from these keynotes were complemented by a series of nine lightning talks and eight posters, which excellently outlined work and demonstrated the echoing calls from the meeting for cross-sector understanding and for translation of research into ways that can be better understood by policy and management.

INVASION SCIENCE CAREER GOES BEYOND ACADEMIA

An early career panel session brought together five panellists from different sectors and provided insights on the array of diverse career routes within invasion science beyond academia. This session highlighted that whilst career routes may appear different, collaborative working and cross-sector knowledge is of clear importance for a career in invasion science.

HOW TO BETTER MANAGE INVASIVE SPECIES?

We held an Evidence Strategic Plan Workshop, to capture suggestions from delegates about how the different sectors of invasion science can interact to enhance efforts to manage invasive non-native species (INNS) and address research gaps. This workshop emphasised the need for increasing and measuring impact of research, understanding who is working on what where and the benefit of regular meetings.

The Invasion Science SIG focuses on bridging gaps between sectors of invasion science and enabling early career researchers in this field. We hope everyone who attended took something away from the event, be it a new contact, research idea, resource link or inspiration from all the amazing work being done in invasion science.

> **Invasion science is a critical field that requires collective efforts and interdisciplinary collaboration. To address the challenges posed by INNS, it is essential for researchers, practitioners, policymakers, and industry representatives to work together, share knowledge, and translate research into practical solutions.**

Whether you are an early career researcher, a seasoned professional, or an organisation involved in invasion science, now is the time to get involved. Seek opportunities to collaborate, engage with different sectors, and contribute to the management of invasive species. By working together, we can make a significant impact on mitigating the ecological and economic consequences of INNS and protect our natural environments. We will continue to build upon the momentum generated by this event and further cement the central role that invasion science plays in policy, management, and conservation efforts.

MACROECOLOGY GROUP

A FORMALLY INFORMAL HYBRID CONFERENCE ON MACROECOLOGY AND MACROEVOLUTION

UNIVERSITY OF BIRMINGHAM + ONLINE

#2023BESMacroBrum

On 12–13 July, 92 people gathered at the University of Birmingham and online for two fun-filled days of talks, posters, workshops, and social events as part of the BES Macro SIG annual meeting.

We were lucky enough to feature three fantastic plenary speakers at the conference. To open the conference, we had a talk by Dr Shan Huang, from the University of Birmingham, UK, discussing changes in the body size of mammals over time using fossil records. Later that day we welcomed our Student Plenary (thanks to *Journal of Applied Ecology* for their sponsorship), Biswa Bhusana Mahapatra, a PhD student at Ashoka Trust for Research in Ecology and the Environment, India. Biswa tested whether invasive vertebrate species conserved their climate niches, and therefore whether species distribution models were a suitable modelling approach. Finally, to close the conference, our International Plenary speaker Dr Cang Hui, from Stellenbosch University, South Africa, talked us through the zeta-diversity metric, its usefulness, and how it compares and complements other diversity metrics.

Throughout the two days we also hosted 31 (!!) short and long talks. Topics included island biogeography, diversification rates, biodiversity economics, crowd-sourcing data, and even Beyoncé! We were also able to include a poster session (thanks to *Methods in Ecology and Evolution* for sponsoring the session), which provided a great opportunity for networking and (even more) informal discussion.

Our conference also featured two workshops. The first, "Coding SOS: Reproducible workflows, GitHub, and R Open Mic", run by Dr Ceres Barros, aimed to provide the tools and guidelines developing reproducible projects. Whilst the second, "Who cares? Maximising the policy impact of ecological research", presented by the BES Policy Team, guided us in thinking about how to approach different end-users and stakeholders of our research in order to maximise policy outputs and impact.

And what would a conference be without some social events?! To ensure a warm welcome to all the participants, we held a small social event at a local pub on the eve of the conference. After the first full day, we then headed to a nearby brewery, who kindly allowed us to use their large outside area for further discussion (and board games!).

> **Our hybrid format also facilitated participation from all over the world, with talk views via the magic of YouTube and enthusiastic Slack-based discussions. A low-cost online option increased accessibility and lowered our overall carbon footprint, and we hope to expand our hybrid options for future events.**

Overall, the conference was a huge success! We would like to thank the Local Organisers at University of Birmingham, and all MacroSIG committee members, for the time and effort they put into the event. Planning for BES Macro 2024 at the University of Cardiff is already underway! Keep an eye out in early 2024 for more details.

To keep up with all the MacroSIG news, follow us on twitter @BESMacroecol
or join the mailing list, email macro@britishecologicalsociety.org
or visit https://tinyurl.com/BESMacroMailingList.

JOIN US IN BELFAST

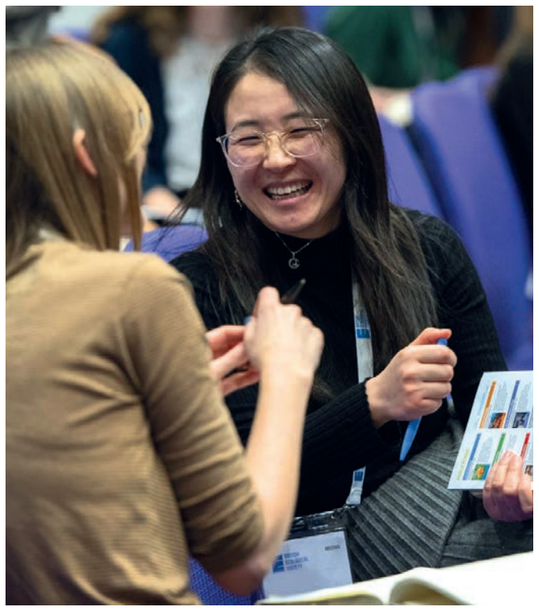
The Annual Meeting is our biggest event of the year, bringing together hundreds of ecologists from around the world.

It provides a forum for the discovery of the latest research, and for the exploration of particularly timely, innovative, and important questions in ecology. It is a chance for ecologists to meet face-to-face and delve deeper into topics, make long-lasting connections and to drive the conversation forward.

This year, the Annual Meeting will be taking place in Belfast in Northern Ireland, 12–15 December and ticket sales are open, with an early bird ticket price ending on 26 October.

SCIENTIFIC PROGRAMME

With around 800 speakers presenting on a broad range of topics, delegates are spoiled for choice when it comes to hearing about the latest research and projects. Speakers are selected from an abstract submission process (ends 6 September) and represents areas including macroecology, agricultural science and policy, invasive species, community ecology and conservation science and policy. There will be 17 topic areas covered at the event.



THEMATIC SESSIONS

These sessions are complementary to the scientific programme and a chance to hear the latest thinking on a range of newsworthy topics. Some of the confirmed topics are:

Regenerative agriculture – a win-win approach for food security and environmental sustainability

This session provides an overview of the key elements of regenerative agriculture and summarises the available evidence on benefits and challenges for different kinds of farms and farming systems. Regenerative agriculture will be explored from different perspectives including socio-economic sciences, agricultural policy and experience on the ground.

Living laboratories – the nexus between research and practice

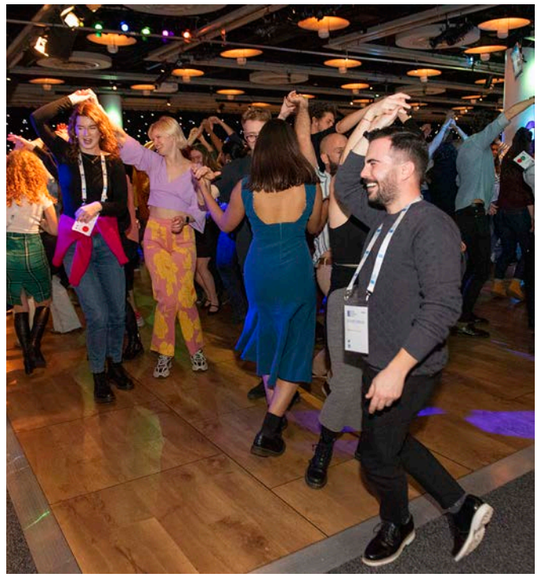
Speakers from government bodies, NGOs, academics, and consultants will discuss projects in marine, terrestrial and freshwater environments and provide lessons learned. The session will investigate the importance of simultaneously considering the different components that form social-ecological systems when mobilising the living lab approach for ecological research.

Hot topics in the Anthropocene – emerging research in fire ecology

The recovery of biodiversity and ecosystem function from human-driven declines is a timely issue in this UN Decade of Restoration. In many places, such restoration hinges on the ability to reinstate natural fire regimes. Our session will cover approaches and new ways of thinking about fire management across different biomes.

Equity in international ecological research

Led by BES President Yadvinder Malhi, this session brings together the voices of international scientists, those who publish, those who fund and those who have made individual changes to discuss and seek practical steps to tackle the challenges in building an equitable international community of ecologists.



WORKSHOPS

The lunchtime workshops are a chance to break from the traditional scientific presentations and to broaden your knowledge and skills in a range of areas. Many of these will be interactive and give you a chance to try something new.

There are also half-day workshops, taking place on 12 December. These have a small fee and are a great way to start your BES2023 experience.

VIRTUAL DELEGATES

If you are unable to attend in person, you can purchase a virtual delegate ticket to view a separate, on-demand scientific programme as well as watch live streams of the plenary speakers and thematic sessions through our Annual Meeting online platform. Discover more on our website. ✺

FURTHER INFORMATION

You can find out more details and book your place at www.britishecologicalsociety.org/events/bes-annual-meeting-2023/

Early bird tickets end 26 October

The scientific programme will be available to view in November

The BES Annual Meeting takes place at ICC Belfast on 12-15 December 2023

PLENARY SPEAKERS

At the core of the event are four plenary speakers who will be inspiring delegates with their insight and alternative perspectives.

Jane Stout
12 Months in Ecology

Isabella Tree
The BES Lecture

Stuart Davies
The Georgina Mace Lecture

Yadvinder Malhi
Presidential Address

SHOULD I JOIN A COMMITTEE?

Have you ever wondered what our committee members do?
Perhaps you've been interested in joining a committee yourself.
We sat down with postgraduate researcher **Katie Powell** (@katiepowell51),
a member of Policy Committee, to find out more.

TELL US ABOUT YOUR RESEARCH AND CAREER

My research focuses on long-term trends in insect abundance and biomass from standardised monitoring schemes and citizen science data and using trait-based approaches to predict change in the functional diversity of insect communities. I am also very interested in how land use change, especially agricultural intensification, impacts insect communities and their trait combinations over time.

SO, HOW DID YOU MAKE IT ONTO POLICY COMMITTEE? WHAT LED YOU TO JOIN?

During my PhD I became very interested in the science-policy interface, and the impact that research can have beyond the scientific community. This led me to look for opportunities in policy. I joined the English Policy Group in Autumn 2021 when the group was in its synthesis, after seeing it advertised in the BES newsletter and a year later I joined the wider Policy Committee.

WHAT DO YOU ENJOY MOST ABOUT THE ROLE?

I love that I get to contribute directly to the important policy work that the committee does. I also enjoy the opportunity to inspire others to participate in Policy Committee activities, so that they can learn more about how their research can have impact in policy and the real world beyond the scientific community. Meeting the other members has also been amazing, to expand my network and learn from others!

WHAT EXACTLY DO YOU DO ON POLICY COMMITTEE?

At its core the policy committee is about working with members and ecologists to contribute towards important policy reports, like the BES's recent *Protected Areas* report, and mobilise responses to consultations on environmental policy. The committee also runs workshops at the BES annual meeting, and the devolved policy groups (the English, Scottish, Welsh and Northern Irish Policy Groups) organise their own events to engage with, and bring together, policymakers and scientists.

To join a BES committee, keep an eye out on our online membership page and newsletters, where we regularly post open calls for committee members throughout the year.

SOUNDS LIKE THE COMMITTEE KEEPS YOU BUSY! WOULD YOU SAY IT TAKES UP A LOT OF YOUR TIME?

It takes up as much as you want to give, I would say. As committee members, we meet once every few months to catch up on all the activities we are involved in. I enjoy giving extra time beyond what's necessary. The bare minimum would be a meeting every few months – which is not much time at all!

HAVE YOU LEARNT ANYTHING FROM YOUR COMMITTEE WORK THAT YOU WOULDN'T HAVE LEARNT OTHERWISE?

I have learned a lot by joining a committee; the nature of the Policy Committee means I have been given opportunities I would otherwise never have been given, including to learn from others who have been engrained in the science-policy landscape for many years. I have a better understanding of the different ways that research can be integrated into policymaking decisions, for example.

WHO SHOULD JOIN A COMMITTEE?

Anybody! I would recommend joining a committee to anyone who wants to explore how they can have impact beyond their immediate research activities, and anyone who wants to expand their network and connect with likeminded – and sometimes maybe not-so-likeminded people. This is the best way to learn and develop as a scientist I think, and give something back to the ecological community! ✺

GREEN JOBS FOR NATURE TAKES OFF

Our new Green Jobs for Nature website greenjobsfornature.org showcases the wealth of job opportunities available in the ecology and environmental management sector. Although created and managed by CIEEM, it is deliberately unbranded and promoted as a partnership platform where partners can provide job profiles, career advice and information about education and training routes.

We have been delighted by the feedback and encouragement we have received. But it is also part of a much bigger drive to tackle an ongoing issue within our sector – the lack of diversity and inclusivity within the ecology and environmental professions.

CIEEM, like the BES, is involved in collaborative initiatives to tackle some of the well-evidenced systemic barriers to inclusion within the environmental sector. Initiatives are starting to make an impact in terms of training organisations to improve their recruitment and employment practices. But two of the key evidenced barriers to improving workforce diversity has been a) the lack of awareness of the wide range of job roles available and b) poor perceptions of environmental jobs as worthwhile and progressive careers.

So, that is where our new initiative under the Green Jobs for Nature banner comes in. Thanks to additional funding from the Esmée Fairbairn Foundation and corporate partners we have embarked on a two year initiative to 'market' nature-focused jobs to currently under-represented groups: young people of colour, those who are differently-abled or identify as disabled and those from lower socio-economic households. We are working with a communications agency, Electric Peach, and a number of engagement partners such as All The Elements, Aspire2Be, UK Youth Nature Network, Groundwork and others to deliver an exciting and innovative social media and outreach campaign. We are also working with national careers services and agencies to help them confidently advocate for nature-focused careers.

This work is at an early stage and will, of course, need to take a lot longer than two years to see the scale of change we need. But it is a start, and we are seeking to build momentum with other key stakeholders to ensure that not only will we have enough people choosing nature-focused careers to meet our environmental ambitions but that young people and potential career changers from all sectors can find an opportunity in an industry that welcomes and values them.

Green Jobs for Nature

Of course, there is another important part of this challenge that we have not yet talked about. How to get these jobs. We need to make routes into the profession much more accessible with less acceptance of expectations around the need to take unpaid volunteering or work experience. We need to help universities develop degree programmes and pathways that reflect the needs of employers. We need to map current apprenticeships and other vocational training opportunities to the jobs that are available or will be needed. We need to invest time to help make relevant and emerging secondary school subjects and qualifications as engaging and inspiring as we know they can be.

MODERNISING THE PROFESSION CONFERENCE

Transforming routes into ecology and environmental management is all part of modernising the profession, which is also the theme of our two-day Autumn Conference this year which will be held at the Hilton City Centre, Liverpool on 22-23 November 2023. Topics will include emerging technologies (including potential artificial intelligence (AI) applications), skills development, effective data management and new ways of working.

NATURE IN A NUTSHELL PODCAST

If you have not yet done so, do check out our new *Nature In A Nutshell* podcast. Every month, our Policy and Marketing team sit down to discuss the latest ecology and environmental management news in the UK and Ireland.

Sally Hayns CEcol MCIEEM, Chief Executive Officer
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cieem.net

LANDSCAPE-SCALE LONG-TERM ECOLOGICAL EXPERIMENTS

ECT's national register of 36 currently-active long-term ecological field experiments (LTEs) includes relatively few studies that were designed as landscape-scale experiments from their outset. Of these, two stand out from the crowd and both are located in the Cambrian Mountains of mid-Wales – Plynlimon Research Catchments (running for 56 years) and Llyn Brianne Stream Observatory (running for 42 years). But now the world is changing as landscape-scale ecological transformation takes centre stage, whether through rewilding, nature-friendly farming or Biodiversity Net Gain (BNG) in urban landscapes. The challenge, however, remains the same as it has always been in applied ecology – how to pin down best practice by establishing true cause-and-effect that has reproducible application in a wide range of habitats and soils. Enter from 'stage-left' a new ECT initiative in partnership with the BES.

On 21 June, ECT convened an interactive workshop for around 40 of the UK's largest public and corporate landowners with interests in landscape-scale transformation, irrespective of whatever end goals may apply (for example, ecosystem restoration, carbon credits, healthier soils). Held in close partnership with the BES at its Wharf Road headquarters in London, the workshop sought to explore the need for best practice, community building and access to expertise in landscape-scale transformation. In other words, how do landowners harness ecological expertise that enables them to learn what works where, apply it reproducibly and achieve the end goals that are *appropriate to them* and not necessarily an ecologist's ideal? Practical, robust ecological science that works in context and delivers for both nature and society.

A majority of land-owning stakeholders present at the workshop expressed support and goodwill towards further activity to build a connected community in landscape-scale experiments and monitoring design; and furthermore that this ought to include some type of centralised hub for existing practices, new best practice and quality assurance processes. ECT will continue to work with BES during the remainder of 2023 to capitalise upon this exciting and important opportunity. It looks likely that a further meeting will be convened before the end of the year with an expanded group of landowner organisations aimed at bringing additional voices to the discussion table.

By way of conclusion, writ large across the day's proceedings back in June was the uneasy relationship we all have with language – more specifically, the way in which ecologists use language and what they mean by it. With representatives of the agricultural sector attending the workshop – one of the most important UK landowner stakeholders – understanding what ecologists mean by terms such as LTEs, landscape experiments, living labs, wholescapes, rewilding, restoration and BNG is key to maintaining an open and constructive dialogue around landscape-scale transformation.

Bridget Emmett
UK Centre for Ecology & Hydrology

Ben Sykes
Ecological Continuity Trust

Ben Sykes Executive Director, ECT
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COMMUNITY

MEMBER STORIES

RAJAN PRASAD PADUEL

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#diet #diversity #coexistence

I joined the BES for… networking opportunities, research collaborations and for being updated on current ecological research.

What inspires me… exploring nature to find how different birds, butterflies, mammals, and other life have evolved to survive in the harshest environments.

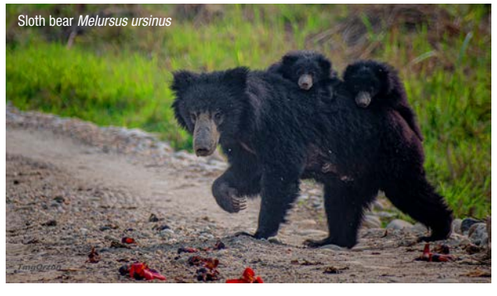
Significant experiences that have shaped my career… taking part in biodiversity assessment projects early in my career in the Himalayas have been the most significant experiences. They taught me how to lead field surveys, understand how the public perceives wildlife, and visualise ecological data.

I would tell my younger self… keep exploring…

My funniest fieldwork fail… failing with the frogs … so slippery!

When I'm not an ecologist I'm… in the kitchen making curry.

My favourite organism is… the sloth bear – they have a unique dietary niche feeding on termites, ants, and seasonal fruits which helps them live a peaceful life without the need to fight for food with tigers, rhinos and people.



Sloth bear *Melursus ursinus*

© ARJUN TAMANG

TARA DIRILGEN

University College Dublin
@taradirilgen
#terrestrial biodiversity
#above and belowground ecology
#soil-plant-pollinator interactions

I joined the BES for… many reasons, one of which was to be part of an ecological community.

Significant experiences that have shaped my career… discovering a role model and getting to know and learn from that role model. There have been one or two keynotes that have truly resonated and inspired me. Having a mentor, and their encouragement allowed me to break new ground.

I would tell my younger self… continue to do what interests you, stay curious and keep asking questions. Turns out there is a whole discipline dedicated to studying nature and a whole profession where you can be curious and ask questions for a living!

My funniest fieldwork fail… there is always some fieldwork anecdote. The funny side often not realised until after! Getting absolutely soaked walking through an oilseed rape field. Note to self: although there was no rain forecast for the day, check if it rained the night before.

When I'm not an ecologist I'm… sitting in on philosophy lectures, dancing (classical ballet, swing), pottering about the place and buying books I don't end up reading, spending time outdoors but also much time spent indoors at independent cinemas.

My favourite organism is… this changes! All organisms can be weird and wonderful in their own way.

Hoverfly on a thistle, Belmullet, Ireland

REED NETWORK GROWS TO OVER 100 MEMBERS

Dr Zabibu Kabalika (@Zkabalika)
Jordan Blanchard-Lafayette (@JordanLafayette)

The REED Network is a supportive platform from the BES for ecologists from under-represented & marginalised ethnicities. We work closely with other international collaborators to help promote equality and diversity in the field of ecological research and conservation. In this spotlight piece, we are happy to announce that our treasurer Dr. Zabibu Kabalika, has successfully defended her PhD at the University of Glasgow.

Dr Zabibu Kabalika

Dr Kabalika is a conservation biologist from Tanzania. Her PhD research focused on the application of isotopic methods to understand movement patterns and niche differentiation between migratory ungulates across the Serengeti-Mara ecosystem in Tanzania. As an early career researcher, Dr Kabalika is eager to build her research career in wildlife conservation. She is currently seeking opportunities to further her knowledge, skills and experience in wildlife conservation research as well as opportunities to form international collaborations. Dr Kabalika's ultimate goal is to build her research career in her home country, Tanzania. The REED Network congratulates Dr Kabalika for her great achievements and wishes her the best of luck in her future adventures.

REED is excited to share news of the recruitment of a new Chair and Vice Chair for the network, among other committee positions. Jordan Blanchard-Lafayette (Chair) is a PhD student at the Lancaster Environment Centre & University of Nottingham. Jordan is originally from Nottingham, and his PhD research explores the role of cultural value shifts in deforestation frontiers. Susmita Aown (Vice Chair) is a PhD student at the University of Sussex. Susmita is originally from India and her PhD research focuses on plant–insect bacterial interactions. The network is also excited to welcome new committee members, Ferozah Mahmood (Membership Officer) and Justin Isip (Partnerships Officer). We would like to take this opportunity to thank the outgoing committee members, especially Reuben Fakoya-Brooks (Founder and former Chair) and Bushra Schuitemaker (former Vice-Chair) for their outstanding leadership and service to REED.

> **WE HOPE TO HELP MEMBERS BECOME MORE CONFIDENT IN THEIR FIELD**

Continuing our exciting news, the REED network was named 'Equality and Diversity Champion' by the British Ecological Society at the BES annual meeting in December 2022. In addition to this, we were nominated for a National Diversity Award, and ran several successful events with other initiatives like the Natural History Museum's Explorers Programme, all in a year where the network grew to over 100 members. As we transition into this new period, REED is hoping to continue the growth of the network, while maintaining the strong bonds that were formed since our inception in 2020. We hope to launch a mentorship programme, organise meet ups for members to become more familiar with one another, and to bring back the popular 'lunchtime seminar' series. Through these events, we hope to help members become more confident in their field, acquire new skills, and to promote a familial safe space.

Finally, we are hoping to secure funding to upskill our members, and we are open to collaborating on future events to grow the network and our reach. If you are interested in running a session with us, or sponsoring us to enable the next generation of ecologists from marginalised backgrounds to succeed, please get in touch at reed@britishecologicalsociety.org. We look forward to hearing from you.

REED NETWORK

The Racial and Ethnic Equality and Diversity (REED) Ecological Network is a supportive platform for ecologists facing any form of racism and marginalisation within the ecological sciences and related disciplines. It is for people at all career stages and a source of inspiration for younger generations.

britishecologicalsociety.org/reednetwork

CHARLIE GULLIFORD

People and Operations Assistant

Meet Charlie Gulliford, our People and Operations assistant here at the BES. After completing a zoo biology degree, she leaped at the chance to join our HR department and has been here ever since.

So how did you end up working for the BES?

I wasn't very sure what I wanted to do straight out of school, so I worked for several years in retail, giving myself time to decide what I was passionate about. Ultimately, my love for nature and wild spaces won, and I ended up doing a zoo biology degree at a UK university. I had heard of the BES whilst I was studying (and had cited many of its journals), so when I saw the job vacancy, I knew I wanted to apply.

What was the most interesting part of your degree?

Well, I actually got stuck in South Africa for a while, as the pandemic hit whilst I was out there doing fieldwork. Luckily, I had been there for fieldwork before, and I was living on a nature reserve at the time, so it wasn't completely terrible, but it was definitely a relief when I was finally able to come home, finish my degree and start my job!

Oh wow, that must've been quite intense! Has there been any big changes in the HR field since you began back then?

Since hybrid working is here to stay, it's certainly an interesting time for people and operations teams in all industries as we find new ways of working and supporting our teams. I'm really proud of how the BES embodies its values and supports its staff, most recently by starting a 4 day working week, which I hope will be successful.

African Wild Dog *(Lycaon pictus)* photographed by Charlie on Hluhluwe-iMfolozi Park, Kwa-Zulu Natal, South Africa. The tracking collar allows the reserve's wildlife monitors to track and protect endangered species, as well as collect vital research data.

The 4 day working week concept aims to increase work life balance – what's your usual work life balance like?

For the past 9 months, the BES has been supporting me working towards a HR qualification. It's the first time I've been in full time work and studying at the same time, so life is a bit hectic at the moment, but once that's over I'm looking forward to enjoying the 4 day work week and getting back out into nature.

What do you love the most about your job?

The people. The team here are by far some of the loveliest and most interesting people I've worked with throughout my career. It's amazing getting to work alongside people who are so passionate about what they do.

I've learnt so much working alongside my colleagues here, particularly our Head of People and Operations, who has been a great role model. I've been able to push myself to try so many new things with his support.

You seem to have found the right workplace for you! You must have some top tips for other people looking for success?

Well, individual circumstances are different of course, so there's not exactly a single top tip. But reflecting on my own career path, I can see that I was scared to leave retail – a sector I felt so comfortable in – for something scary and new, even though the scary job was what I really wanted.

SO MY TOP TIP WOULD BE TO HAVE FAITH IN YOURSELF AND YOUR ABILITIES.

If I had done that, I would've moved into zoo biology a lot sooner and been face to face with some of the most beautiful landscapes in the world. ✺

HOW WE ARE IMPROVING ACCESSIBILITY, DIVERSITY AND INCLUSION IN OUR DEGREE PROGRAMMES

A CASE STUDY FROM THE UNIVERSITY OF ESSEX

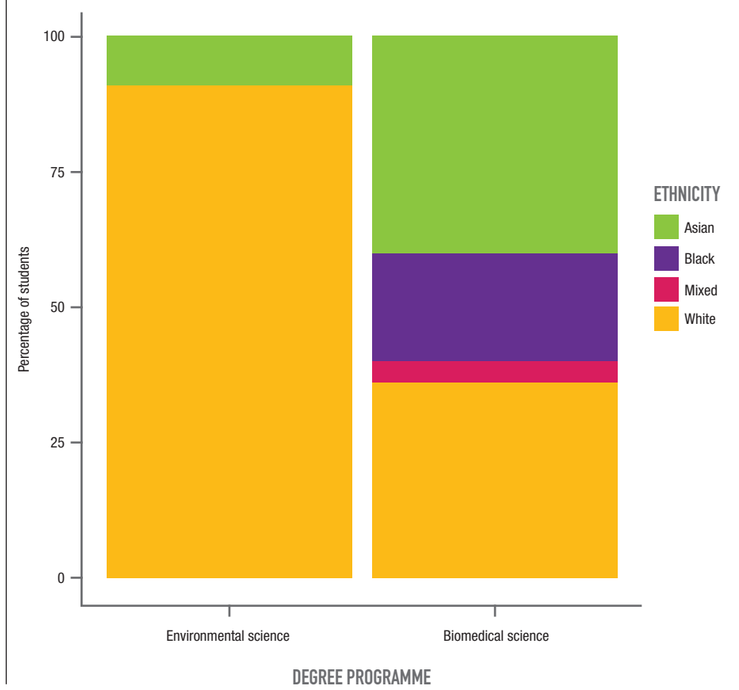
Leanne Hepburn & Alex Dumbrell, University of Essex

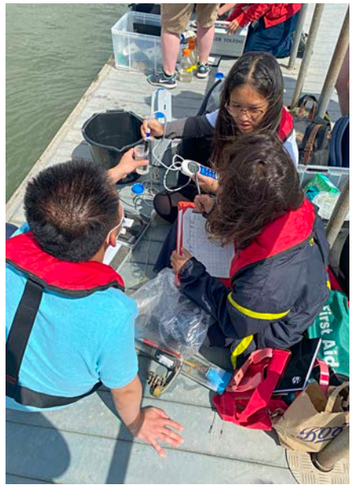
Engaging with young people before they begin undergraduate studies can foster strong and diverse communities in environmental science.

To address the key challenges the environment sector faces – the climate and biodiversity crises – we need everyone represented. The environment sector is the second least diverse sector for employment, with fewer than 1% of individuals identifying as a non-white ethnicity. So, how can we engage with underrepresented young people to support and encourage access to environmental degree programs and careers?

The School of Life Sciences at the University of Essex is home to broad ranging research and education from biomedical science to ecology. We have above average representation from Black and diverse ethnic minorities on non-environmental bioscience degrees, e.g. biomedical science (65% average entry demographics 2019/20–22/23). However, this is not matched in our environmental science degree programmes (19% average entry demographics 2019/20-22/23, Figure 1). Pleasingly, we have seen an increase in Black and ethnic minorities' entry to environmental degree programs from 13.5% in 19/20 – steadily increasing to 25.9% in 22/23.

Figure 1 Ethnicity comparison of degree programs: School of Life Sciences, University of Essex who completed our survey (n=49)





There are consistent levels of first generation enrolment and students from similar socioeconomic background regardless of ethnicity across all our degree schemes. As these factors often co-vary within higher education institutions (HEIs), Essex provides an ideal case study, with controls for school/university effects and social/financial status.

Our regional position is unique being within a one-hour commute from London but with inclusive entry tariffs (now BBB). In addition, our POLAR (participation of local area) data show an increase in quintile 1+2 (lowest participation areas) entrants and attainment.

We therefore wanted to understand inclusion practice in environmental sciences by generating empirical evidence as to why the scales of inclusivity are so different between environmental science degrees and others such as biomedical science. Our overarching goal is to increase accessibility, diversity and inclusion in environmental science degree programmes and in doing so, challenge the environmental belief paradox that it is mainly white middle-class people who are interested in understanding and protecting the environment.

We worked with In²ScienceUK, a charity working towards diversity and inclusion in STEM, to provide opportunities to underrepresented groups of 15–17 year olds to attend inspiring local environmental placements and work with researchers within our School. In²ScienceUK's 2020 impact report demonstrates impressive growth from working with 135 schools in 2018 to 391 schools (567 young people) in 2020 and 669 students in 2022.

We conducted surveys of undergraduate students at the University of Essex (n = 49), 16–18 year old In²Science UK applicants (n = 161), and placement students pre and post placement, as well as interviews (n = 16) to gain both quantitative and qualitative data on understanding opinions of environmental science placements and careers.

General trends in our surveys evidence that barriers for diverse communities to environmental degrees and careers include the importance of family views in selecting a degree, which show the influence of family to be more important for Black and ethnic minorities compared with students from white families. Family approval of environmental science as a career pathway is also a factor as more Black and ethnic minorities' parents disliked the career choice (15%, compared to 0% of white families). Reasons given for environmental science being less favourable as a career choice were the perception of low value work, along with the need for volunteering and low paid opportunities. We consider that pre-degree access to the sector is also limited and there is a lack of understanding of the breadth of career options available, which does not help with informing parents or young people of the diversity of career pathways available in environmental science.

We also ran a one-week intensive summer school in July 2022 and, in collaboration with In²ScienceUK, recruited a diverse pool of 16 young people from East and North London, 90% of whom were from non-white families. The summer school offered a range of laboratory and field practicals including coral biology, plant ecophysiology, microbiology and water quality boat surveys on the local Marine Conservation Zone.

Feedback from the summer school was excellent and 100% of students said they would be more likely to attend university and study environmental sciences, whilst 94% would consider environmental science as a career.

> **"There are lots of different jobs in this area. I've frequently been told not to go to uni and secure a good job, but talking to all the scientists made a job in biology seem much more possible."**
>
> In²ScienceUK attendee

100%

of students said they would be more likely to attend university and study environmental sciences

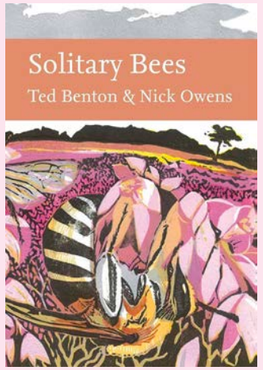
RECOMMENDATIONS TO HEIS

In order to foster strong and diverse communities in environmental science, we need interventions at pre-degree access stage. This could involve workshops and career sessions for young people and their parents/carers, even online, though in person practical experiences are more effective. Aiming engagement work at specific demographics with relevant implications are useful tools. For example, making space within the curriculum during British Science Week for targeted engagement activities by HEIs with environmental education and research.

This may help change perceptions of Black and ethnic minority families, along with offering mentoring services (and/or reverse mentoring – to close the skills/knowledge gaps on both sides).

Another tool that HEIs should consider is offering summer schools to young people at pre-degree level in order to inspire, motivate and educate around the breadth and value of environmental degrees and career pathways. This could include booklets for parents/carers, invitations to join a session, e.g. 'Meet the Scientists', online and/or in person, where a range of scientists preferably from diverse backgrounds, talk about their research and careers. In²Science provides an excellent service as an enabler to match students' interests with environmental summer schools. There is a cost involved to universities (unless funding can be sought) but the added value for underrepresented young people is evident.

Overall, there is a long way to go to ensure environmental science education and careers become more equitable, inclusive and diverse but it is hoped our survey insights and recommendations may go some way to nudging us along.



READ

SOLITARY BEES

Ted Benton & Nick Owens

Collins New Naturalist Library 2023

£35

As the authors neatly put it: 'For most of us, solitary bees inhabit an unmarked space in our mental map of the natural world'. But I had no idea quite how uncharted that space was until I picked up this splendid volume. If the value of a book is measured by how often the uninitiated (i.e. me) encounters something they didn't know, then Benton and Owens' *Solitary Bees* scores 10 out of 10. I learned something new on nearly every page – and there are a lot of pages. I didn't even know (in my defence, my limited knowledge of natural history mostly concerns things with leaves and flowers) that bees are more closely related to some kinds of wasps than those wasps are to most other wasps.

And yet, the lasting impression this book leaves is just how little we know about solitary bees. I lost count of how often something 'awaits further investigation' or 'has yet to be described'. The conclusion of the chapter on cuckoo bees (another surprise: a quarter of our solitary bee species are cuckoos) is typical: 'Much of the behaviour of cuckoo bees is still poorly understood', but there is some good news: 'but we can find out more simply by watching and waiting'. It's amazing just how much of what we do know about solitary bees was discovered simply by careful, patient observation, much of it by the authors themselves. The hundreds of excellent photos are mostly by the authors too.

Another lasting impression is just how tough life is for solitary bees. Apart from all those cuckoos, there's a huge army of parasites and predators waiting around every corner. Which raises an interesting dilemma for the bee-friendly gardener. It's easy to assume that bees need 'protecting' from such threats. But all those enemies of bees are biodiversity too, and as the authors emphasise, the presence of a diverse community of predators and parasites is itself an indicator of a thriving population of hosts. Not only that, many are themselves threatened or even extinct in the UK, for example several species of oil beetle. The lesson is an important one: don't imagine you can pick and choose between biodiversity you like and biodiversity you don't like.

A final, lengthy chapter on ecology and conservation leaves the reader in no doubt of the importance of solitary bees, for their intrinsic value, their crucial but underestimated role as pollinators (and not just for crops), and as a barometer of our attitude to the natural world. As the authors note, if solitary bees have survived so far, that survival has been largely an accident founded on neglect, and that will probably not be enough in the future. Solitary bees' needs add up to a shopping list of healthy habitats, both urban and rural. Do we, the authors ask, care enough to take the difficult decisions that are required to protect bees and biodiversity more generally? It's a good question, but you can't conserve what you don't understand, so a good first step in answering it would be to read this timely and inspiring book.

Ken Thompson

GET INVOLVED

If you have read an interesting book, from any genre, that touches on ecological research or concepts, then write us a review!

If you are promoting an event, have created a documentary or film, or know of any interesting ecological events coming up then please let us know about it.

For further details email Kate: kate@britishecologicalsociety.org

READ

THE SILKEN THREAD: FIVE INSECTS AND THEIR IMPACTS ON HUMAN HISTORY

Robert N. Weidenmann and J. Ray Fisher

Oxford 2021

£25.99

The authors are academic entomologists, not professional historians, but the central point they put across is that many historical narratives are all but impossible to relate without an appreciation of the extraordinary impact of insects. Their viewpoint is that humans inhabit an insect-dominated world and that, from time to time through history, it is the insects that open up or close down our chosen pathways. "Insects have not just influenced human history, they have driven it," they explain.

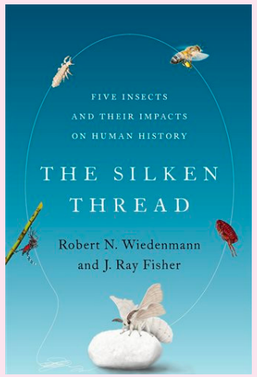
The five insects that they have selected are two domesticated good guys, the silk moth *Bombyx mori* and the honey bee *Apis mellifera*; and three bad guys, all disease vectors, the Oriental rat flea *Xenopsylla cheopis*, human lice, particularly *Pediculus humanus*, and the yellow fever mosquito *Aedes aegypti*. Between them, they have shaped key endeavours in human development.

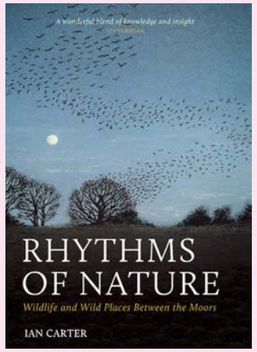
Silk is a luxury fabric worth $17 bn p.a. today. No wonder its origins were a Chinese secret for centuries and catalysed thousands of miles of Silk Roads. These routes had their parallels on the seas too, linking the spice trade to the east and the Roman and Byzantine empires in the west. Honey bees were also taken along the Silk Roads, but in the opposite direction, from the eastern Mediterranean to Central Asia and China. The book covers the bees in less depth – much has been written elsewhere about their benefits, but there are intriguing accounts of the origins of beekeeping, the use of bees in wars and the problem of "beehive rustlers" in California, where bees are needed to pollinate 6000 sq km of almond groves.

Coverage of the three disease vectors is full of fascinating information and detail. On a world scale, perhaps the impact of yellow fever reaching the Americas, how that fuelled the slave trade and all but defeated the dream of the Panama Canal is the most intriguing. The eventual control of *Aedes aegypti* in the Canal Zone led to massive growth in the North American economy and, arguably, the less happy loss of opportunity further southwards.

You might say there's little new to talk about in the subject matter, but you will think again when you open the book. A cursory skim captures the reader's attention with the depth of research into how insects of all kinds have permitted, channelled or prevented human ambition, development, culture and scientific exploration.

Mark Collins





READ

RHYTHMS OF NATURE: WILDLIFE AND WILD PLACES BETWEEN THE MOORS

Ian Carter

Pelagic Publishing 2022

£14.99

My former colleague (no bias I can assure you) has written a gentle, personal treasury of encounters with nature and wild places around his former home between Dartmoor and Exmoor. I particularly enjoyed the fact that each chapter was short enough to read over my morning cup of tea, and set me up nicely for the working day.

Thanks to Ian, I now have the image of grey and pied wagtails 'parkouring' about roofs and window ledges to add to a mnemonic that was related to me by a friend when I was a teenager. It has stuck with me. Pied wagtails ask "Is it Chiswick" as they dart hither and thither for flies. It's that art of relating personally to the nature around him that Ian excels at in this book.

This is an exploration of the physical world too. In a chapter titled 'The Turning of the Earth', we are reminded of the special draw and power, real and imagined, of the moon. We are let into a formative and mindful vision of the moon, as seen from the author's childhood bedroom window, framed by a tracery of Beech branches. I am sure many readers will have stood in awe and wonder at the night sky, trying to discern stars from planets. During the pandemic, I was thrilled to locate the comet Neowise which had a tail that was visible with the naked eye. And the sight of a meteor fireball shared with my son, whilst wild camping on Dartmoor, is literally burned on my retina. Thanks to Ian, I can now add a little nugget about how to tell whether the moon is waxing or waning, but you will have to read the book to find out!

This is a delightful collection of essays beginning indoors and drawing the reader out into the garden and the surrounding countryside.

IF YOU ARE LOOKING FOR INSPIRATION AND FRESH IDEAS FOR VENTURING OUT INTO YOUR LOCAL AREA, READ THIS BOOK.

Simon Bates

READ

TROPHY HUNTING

Nikolaj Bichel & Adam Hart

Springer 2023

£110

There can be few instances of polarisation in conservation science greater than that attached to trophy hunting. Responses against the practice verge on the visceral whilst attempts to put the matter into a wider and more nuanced focus are often lost in the media scramble. Of course, this is not the only example of heightened reactions from the wider public. In Australia, conservation responses to severe overpopulation by introduced horses are often decried in social media. The same reactions are not seen for other animals; no one is outraged by the loss of snakes! There is something anthropocentric about some species not found in others.

The killing of animals has a history going back to the Neolithic period if not earlier but it is the modern idea of sport that seems to have added to the issue. Unlike other conservation stories, trophy hunting is often reported from just one angle – that of the animal and its welfare. Rarely are the voices of the local people considered or even heard. Against this backdrop, we have this text which, hopefully, sheds not just light but nuance on the project of trophy hunting. If there is a single catalyst in this story, it must be the subject of the opening page: Cecil the lion, who was legally shot by a hunter in Zimbabwe. The ensuring furore sent social media into overdrive, the hunter into hiding, and led to trophy bans by government, but strangely ignored the plight of those for whom the trophy industry was their sole form of income. One upside we are told is that trophy hunting research has become an established research area.

The books dissects the notions of hunting and trophy, starting with an overview of the history of hunting which seems to stretch back almost as far as humans although evidence is highly variable.

In more modern times we are told of hunting in Egypt, China, Greece, Rome, and Mesoamerica but the majority of the chapter is focussed on Africa as a place example, and the last 200 years as a time frame when trophy hunting was a colonial project. Up to this time, hunting could be seen as a relatively focussed activity but in the 19th century, it broadened its focus by considering the ethics and process of hunting. We are also left in no doubt as to the colonialist and misogynist perspectives of these hunters even if conservation was a crucial element.

From a consideration of the people behind the development of modern hunting, we turn to the item being sought – the trophy itself. Just as the idea of a hunter as a specific type of person is false, so is the trophy. Originally a battlefield prize, the modern trophy might be the horns or skin of an animal. We are given a detailed history of taxidermy, it's key ideas and workers in the field. Part of the value of the trophy lies in the way it is acquired and so a section on the ethics of the hunt is an interesting and surprising addition. Likewise, the chance to "claim" a hunting record is taken very seriously and the book takes an extensive look at some of the key record keepers and their parameters as well as the pros and cons of record keeping (largely cons it seems!).

Up to this point, little has been said about what could be called the sociology of hunting. This is important because hunting, as defined here, is an intensely human occupation; no other animal hunts for trophies. It follows that if we seek to understand hunting, we need to analyse the hunter and also the anti-hunter. Who hunts, why and what motivates them is the subject of chapter four. It's a detailed look into the people side of hunting and how the practice fits into the social landscape. Even from the data, it's clear that the typical stereotype is only partially accurate – much like the rest of the topic, the nuances outweigh the certainties.

As the debate rounds out, the final chapters look away from hunting in the strict sense towards broader topics. Ethics, anthropomorphism, empathy and morality are explored. Twitter provides us with an excellent case study in antipathy and the way in which the debate is framed.

This is a genuinely unusual and fascinating text. You don't have to be a wildlife/hunting researcher to appreciate the depth of the topic – in fact, as the book makes abundantly clear, very few people *are* hunting researchers hence the paucity of debate. What could be a simple text about kill rates and hunting locations is turned into a highly nuanced debate with threads weaving through economics, politics, sociology, ecology, history, and a few others.

> **AS A STUDY IN DISCUSSING THE PARAMETERS OF AN APPLIED CONSERVATION TOPIC, THERE ARE FEW TEXTS THAT CAN MATCH IT. YOU DON'T NEED TO HAVE A VIEWPOINT ON TROPHY HUNTING TO APPRECIATE THAT.**
>
> **Paul Ganderton**

READ

BEAVERS: ECOLOGY, BEHAVIOUR, CONSERVATION, AND MANAGEMENT

Frank Rosell & Róisín Campbell-Palmer

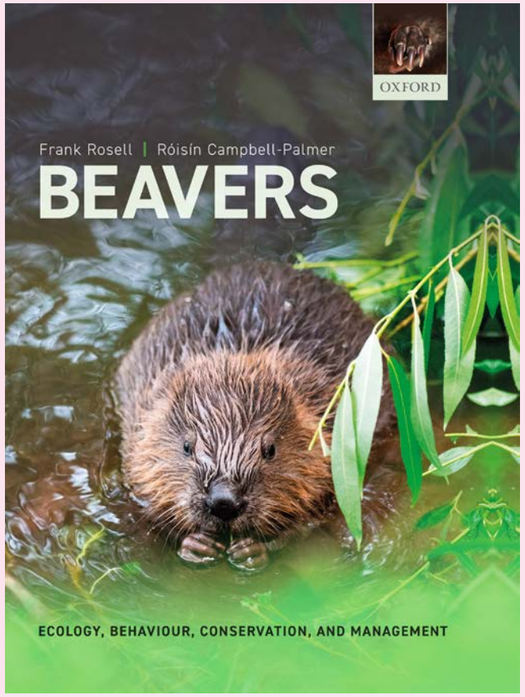
Oxford 2022

£37.99

I have long held a fascination with beavers. My field research in the boreal forest of Canada was often thwarted by their ecological engineering efforts. I remember one day a beaver dam converted the open dusty roads I was driving into an impassable wetland in which I could see a moose cooling itself, just his antlers and head visible above the water! Where you get beavers… you get life, and this is what Rosell and Campbell-Palmer celebrate in their book that explores these semi-aquatic mammals.

Information is drawn from scientific publications but also those working with beavers. The text is divided into eleven chapters that explore every aspect of beaver life. The earlier chapters provide an overview of beaver biology, moving onto beaver ecology, and then culminating in conservation and management. Each chapter stands alone, with its own reference list, and is accompanied by colour diagrams and images. The prose is accessible to the lay person, while containing everything a land manager would need to know.

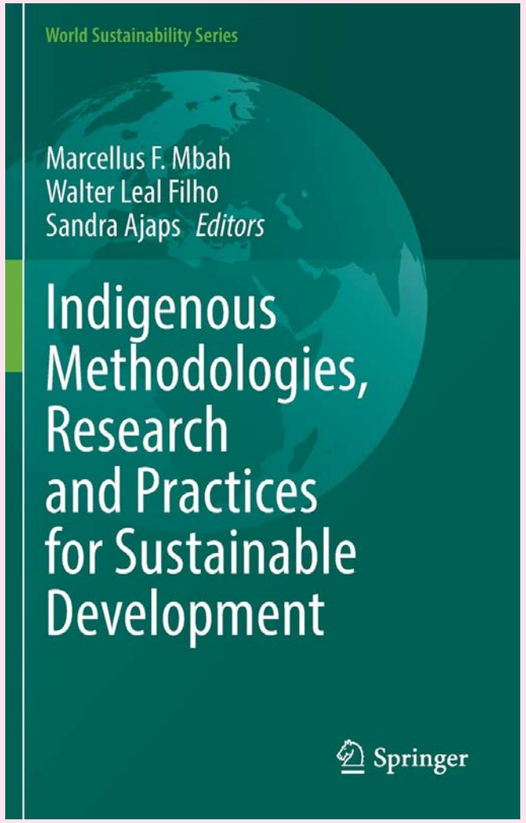
Here is a quick whirlwind tour: In chapter 1, introducing the beaver, the authors compare different attributes of living and fossil Eurasian (*Castor fiber*) and North American (*C. canadensis*) species, and examine how past genetic bottlenecks and relict populations impact their genetic diversity. Chapter 2, ultilsation and distribution of beavers, looks at the ancient relationship humans have with beavers, how we almost hunted them to extinction, and their subsequent modern recovery from genetic bottlenecks that have been accelerated by conservation efforts. Chapter 3, beaver morphology and physiology, examines the beaver's different organs and how these are physiologically adapted to keeping water out, swimming, diving, living underground, etc. Chapter 4, habitat use and constructions, examines the workings of the beaver home and its situation in the landscape. Chapter 5, the seasonal vegetation, looks at what beavers eat, and how plants respond to foraging. Chapter 6, activity patterns and life history, discusses how beavers spend their time, when young disperse, how long mated pairs stay together and how old beavers live, all backed up with scientific reports of beaver populations.



Chapter 7, territoriality, communication and populations, looks at intra-specific interactions, the role of scent, vocalisation and tail slaps. I was paddling the Peace River in Canada when a beaver silently glided up to my canoe, it only clocked me at the last minute and slapped its tail, showering me with water. At the time I thought it was to hide its direction of escape, but the authors show that the tail slap has many uses, such as expressing annoyance and as an alarm sign to warn other family members of danger.

Chapter 8, mortality and morbidity, looks at the causes of death, including human factors. Chapter 9, the ecological engineer, explains how beavers impact their environment, and it is this ability that has resulted in the proliferation of beaver trials in recent years. Table 9.3 lists beaver activities (burrowing/building, foraging, damming) and the impacts these have for ecological features, plants and animal groups. If you want to justify why you want beaver on your land, this is the go-to table. Chapter 10, animal management and population monitoring, looks at the nitty gritty of trapping, transporting and releasing beavers, including how to age and sex animals, and the different ways to remotely monitor and tag animals – their nocturnal and semi-aquatic lifestyles make this particularly challenging. Chapter 11, living with beavers: an 'adorable nuisance'?, is the books finale and considers the many conflicts that can arise and how these can be combatted, such as protecting culverts from being converted into beaver ponds… neatly returning me to where I started on my submerged forest dirt road.

> **A MUST READ FOR BEAVER ENTHUSIASTS, ACADEMICS AND LAND MANAGERS ALIKE.**
>
> **Sarah L. Taylor**



READ

INDIGENOUS METHODOLOGIES, RESEARCH AND PRACTICES FOR SUSTAINABLE DEVELOPMENT

Marcellus F. Mbah,
Walter Leal Filho
& Sandra Ajaps (Eds)

Springer 2022

£39.99

It says something about the development of the Western scientific view that cultures thousands of years in the making have had their experience and knowledge downplayed or ignored. There are examples around the world but perhaps most striking is the case of Australia where 200 years of colonial perspective has, until recently, overlooked 65,000 years of cultural practice. There is a dawning realisation that the Aboriginal cultures that survived and thrived in conditions that killed early explorers, can teach us a great deal about the issues we face today, especially in the context of this book – the Sustainable Development Goals (SDGs). It is a culture *of* place not *about* place and there is a subtle difference. The trick is to listen, not tell, and this is where this text is focussed.

The text is divided into two; broadly, theoretical and practical. An opening chapter highlights the lack of serious research into Indigenous practices. The basic idea, that Indigenous knowledge has been subject to racism, colonisation and colonialism is well made. There is also the counterpoint that such knowledge is increasingly valuable and its utility is being recognised. Of course, this could be considered as just another play by dominant cultures to appropriate more resources but that point is firmly rejected. The goal is Indigenous empowerment; using the knowledge and practices of the past to help improve an increasingly unsustainable trajectory.

Subsequent chapters cover significant theoretical ground but seem to return to some common items. The first is the need to decolonise science and research. The aim is to develop Indigenous practices and spread knowledge, not just reproduce current ways of working. The second is that Indigenous views, knowledge and practices are virtually absent from the SDGs and yet they have valid and vital ways of interacting with the environment. Thirdly, there is the need for community focus. The African concept of *Ubuntu* is a common refrain; Indigenous practices are community practices. Fourthly, there's a call for a complete rethink of research – methodology, work practices, languages used – to create a genuine participation by Indigenous groups.

Part two takes a truly global look around the many research studies into Indigenous ways of knowing and how they can be managed to create a more sustainable future. Many of these are focussed on the local and regional scene. There are no great global themes as such although the constant referral back to concepts outlined in part one does suggest a common ground for research. Cases are extremely varied but are united by a straightforward narrative so that readers are able to appreciate what that example gives to our overall understanding. Each story is underpinned by a problem that can be successfully and sustainably improved by using Indigenous knowledge.

Indigenous knowledge has a part to play if we allow those impacted to speak.

> **FOR THIS IS THE CENTRAL MESSAGE: THE NEED TO ALLOW THOSE MOST AFFECTED TO COMMUNICATE, IN THEIR OWN WAYS, THEIR LIVED EXPERIENCE.**
>
> Paul Ganderton

HORIZONS

AWAKENING

Joanna Kalemba

Awakening

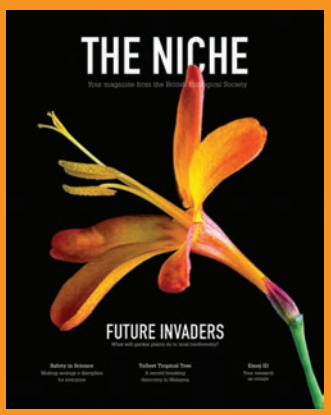
This was before the rains returned
Before they said
Look, the burial cloud is gone
Before we remembered the forest path

Within us she grew
Vast, unyielding
With the patience of spring

The days were bleak but nights
We danced to the midnight tune
Joyful and restless
Under cathedrals of moonlight
She sang to us

We did not forget the promise
Sensing
With a little discomfort
The sweetness of passing flowing through our veins

Submit a piece for Horizons to: theniche@britishecologicalsociety.org

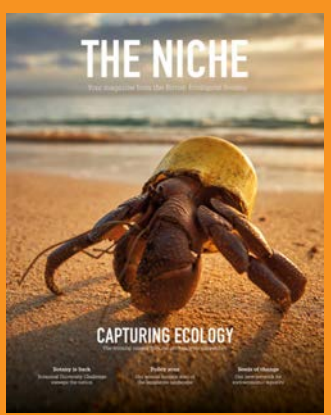


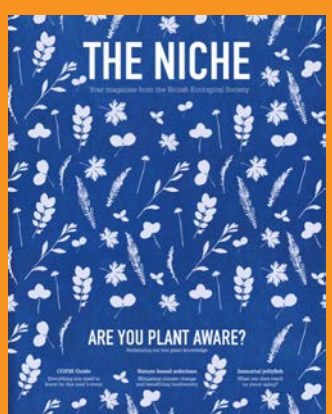
HAVE YOUR SAY

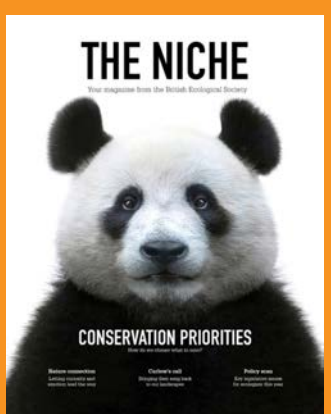
The Niche is written by and for our vibrant community – when you read it we want you to feel excited about being a BES member.

Complete our short readership survey and help us shape the future of the magazine.

www.surveymonkey.co.uk/r/niche-readership-survey







THANK YOU