

THE BULLETIN



BRITISH
ECOLOGICAL
SOCIETY

InFOCUS

A Smooth Giant Clam (*Tridacna gigas*) in the waters off Lizard Island on the Great Barrier Reef in Australia. *Tridacna gigas* have been studied at Lizard Island for more than 25 years, both in terms of reproductive ecology and population dynamics. The population density in some places (e.g. Watson's Bay, ~200 clams/ha) is amongst the highest recorded anywhere in the world.



CONTENTS

APRIL 2017

OFFICERS AND COUNCIL FOR THE YEAR 2016-17

President: Sue Hartley
President Elect: Richard Bardgett
Vice-President: Rosie Hails
Vice-President: Andrew Pullin
Honorary Treasurer: Tom Ezard
Council Secretary: Adam Vanbergen
Honorary Chairpersons:
Zoe Davies (Meetings)
Alan Gray (Publications)
Will Gosling (Education, Training and Careers)
Juliet Vickery (Public and Policy)
Rosie Hails (Grants)

ORDINARY MEMBERS OF COUNCIL

	Retiring
Diana Gilbert, Jane Hill, Iain Stott	2017
Dawn Scott, Markus Eichhorn, Lindsay Turnbull	2018
Peter Brotherton, Yvonne Buckley, Nina Hautekeete	2019
Cristina Banks-Leite, Helen Roy, Peter Thomas	2020

Bulletin Editor: Alan Crowden
48 Thornton Close, Girton, Cambridge CB3 0NG
Email: bulletin@britishecologicalsociety.org

Associate Editor: Lauren Ratcliffe
Email: bulletin@britishecologicalsociety.org

Book Reviews Editor:
Books to be considered for review should be sent direct to the Bulletin Editor at the address above

PUBLISHING IN THE BES BULLETIN

The *Bulletin* is published four times a year in March, June, August and December. Contributions of all types are welcomed, but if you are planning to write we recommend you contact one of the editorial team in advance to discuss your plans (Bulletin@BritishEcologicalSociety.org).

Material should be sent to the editor by email or on a disk in Word or rtf format. Pictures should be sent as jpeg or TIFF (*tif) files suitable for printing at 300dpi.

Design: madenoise.com
Print Management:
H2 Associates (Cambridge) Ltd.

Cover photograph: David J Bird, winner of the BES photocompetition 2016. For more information see p28.

REGULARS

Welcome Alan Crowden.....	4
President's Piece: Speak Truth to Power Sue Hartley.....	5
Fighting sexism with soapboxes Nathalie Pettorelli and Seirian Sumner.....	7
Combating the invisible enemy: implicit bias, data collection and the Teaching Excellence Framework Elva Robinson.....	9
What is the future of peer review in ecology? Alice Plane.....	11
BES Journals Survey.....	13

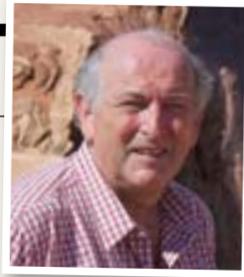
BES Annual Meeting 2016: All the news from Liverpool including Award winners, Press roundup and Minutes of the AGM.....	16
BES Photographic Competition 2016 Amy Everard.....	28
Remembering Ecology in your Will – Take the 1% challenge Paul Bower.....	37
Policy update: tackling the challenges and opportunities of Brexit Ben Connor.....	38
Supporting ecology in Africa Markus Eichhorn and Paul Bower.....	40
Engaging with the BES Joanne Griffin.....	42
RainDrop has landed! Jessica Bays.....	43
Special Interest Group News.....	44
Of Interest to Members.....	52
Chartered Institute of Ecology and Environmental Management Sally Hayns.....	90
Publications News.....	92
Book Reviews.....	95

FEATURES

Importance of field stations for ecological education and research Dominic J. McCafferty.....	54
Do we argue enough in ecology? Roger Cousens.....	58
Exploring citizen science in Chile Helen Roy, Audrey Grez, Tania Zaviezo, Peter Brown.....	62
What are the forthcoming legislative issues of interest to ecologists and conservationists in 2017? William J. Sutherland et al.....	66
Thoughts of a Southern Mediterranean Ecologist Tarek Mukassabi.....	76
Support for a BES food policy Ben Phalan.....	78
Palmer Newbould 1929 – 2016 Dicky Clymo.....	80
A Sense of Place John Wiens.....	82
From Our Southern Correspondent Richard Hobbs.....	86
Exhibition and Sponsorship Opportunities at BES Meetings.....	100

WELCOME

WHETHER THE NEWS IS REAL OR FAKE, LIFE GOES ON



Alan Crowden | Editor | bulletin@britishecologicalsociety.org

This bumper issue contains so much comment about Brexit, President Trump, and the current vogue for distaining the advice of experts that I'm not even going to highlight where these topics arise; I fear indignation and disbelief will be a regular feature of *Bulletin* articles for the foreseeable future.

In an issue which is definitely not fake news, we begin with an uplifting article from Nathalie Pettorelli and Seirian Sumner on the background to their award-winning work on Soapbox Science (p7), followed immediately by Elva Robinson on some of the subtle ways in which gender bias affects career progression (p9). The search for impartiality, fairness and balance is a key task for our publications team, and on p11 Alice Plane reports on a workshop on the future of peer review, held during the last annual meeting (an article followed on p13 by some encouraging results from a survey on users' opinions of the BES journals).

The BES Annual Meeting is the cornerstone of the Society year, and pp16-27 are devoted to a whole range of articles on the 2016 meeting in Liverpool, with pictures of people and events, news of our award winners, a roundup of media coverage, and – try not to burst with excitement – the minutes of the Annual General Meeting.

Last year the Society appointed Paul Bower as Fundraising and Development Manager and Paul outlines ways in which members can help in a couple of articles in this issue. Members are reminded that it is possible to remember the BES in your will (p37) and, more immediately, we are encouraging members to consider donations to swell the funds we have available for the *Ecologists in Africa*

programme, which provides small grants to ecologists who might otherwise struggle to fund some very exciting and innovative projects (p40).

Moving on to the excellent feature articles in this issue, Dominic McCafferty sings the praises of biological field stations on p54. Roger Cousens lists some of the drawbacks of scientific meetings on p58 – we'll all recognise some of the drawbacks he describes, but to offset the moaning Roger offers one solution he's found to make meetings more interactive, enjoyable and productive. The comprehensive annual legislative scan from Bill Sutherland and colleagues is on p66.

If ever you arrive at a BES meeting and are tempted to complain about having had a difficult journey, I refer you to the article on p76. Libyan ecologist Tarek Mukassabi is a regular attendee at the annual meeting, and aided and abetted by Peter Thomas, we managed to persuade Tarek to write an eye-opening account of life as an ecologist in a war-torn country.

Sadly we lost Palmer Newbould last year; Dicky Clymo's tribute to an influential ecologist appears on p80. One of Palmer's many contributions to the life of the BES was to suggest the creation of a regular newsletter to keep members up to date with the work of the Society. I hope you enjoy *The Bulletin*.

The British Ecological Society is the oldest ecological society in the world, having been established in 1913. Since 1980 it has been a Registered Charity limited by guarantee. Membership is open to all who are genuinely interested in ecology, whether in the British Isles or abroad, and membership currently stands at about 5000, about half of whom are based outside the UK.

The Society holds a variety of meetings each year. The Annual Meeting attracts a wide range of papers, often by research students, and includes a series of informal specialist group discussions; whereas the Annual Symposium and many other smaller meetings are usually more specialised and include invited speakers from around the world.

Proceedings of some of these meetings are published by the Society in its Ecological Reviews book series. The Society distributes free to all members, four times a year, the *Bulletin* which contains news and views, meeting announcements, a comprehensive diary and many other features. In addition the Society produces five scientific journals. The *Journal of Ecology*, *Journal of Animal Ecology*, *Journal of Applied Ecology* and *Functional Ecology* are sold at a discounted rate to members. *Methods in Ecology and Evolution* is free to BES members. The Society also supports research and ecological education with grant aid. Further details about the Society and membership can be obtained from the Executive Director (address inside back cover).

The *Bulletin* circulates exclusively to members of the British Ecological Society. It carries information on meetings and other activities, comment and other topical items. Unsigned commentaries are the responsibility of the Editor and do not necessarily represent the views of the Society.

A limited company, registered in England No. 1522897 and a Registered Charity No. 2812134. Registered Office: Charles Darwin House, 12 Roger Street, London WC1N 2JU

PRESIDENT'S PIECE

SPEAK TRUTH TO POWER



Sue Hartley | sue.hartley@york.ac.uk

RELIABLE DATA AND THE ACCURATE PRESENTATION AND INTERPRETATION OF SCIENTIFIC EVIDENCE ARE THE LIFEBLOOD OF ECOLOGY, BUT AT THE MOMENT THERE ARE SERIOUS CHALLENGES TO THE VERY IDEA OF OBJECTIVE FACTS.

I'm writing this just after a self-avowed climate change denier has been inaugurated as President of USA. Donald Trump has tweeted that "the concept of global warming was created by and for the Chinese in order to make US manufacturing non-competitive" (and that's rather more polite than most of his tweets on the subject!). The previous incumbent of the White House is on record as stating "reason and science matter"; a marked contrast in approach to scientific evidence and its communication, leaving aside even more obvious contrasts in politics!

I'll leave the politics there. Instead I want to focus on how we communicate amongst ourselves and with others about ecological science and its application. How should we approach that task when there are increasingly urgent issues we need to speak out about (climate change and biodiversity loss amongst many others), but when we live in times where experts are mistrusted, or, potentially even worse, everyone armed with a smartphone and access to Google feels they can be an expert? So this month's i-word is **information** – how do we make sure our voice as ecologists is heard, and, more importantly, recognised as authentic, in the cacophony of opinions, soundbites and tweets?

Communication is our business as scientists – as my old boss when I was working at the Centre of Ecology and Hydrology used to say "if you haven't communicated the results, you haven't done the experiment". Speaking at meetings and conferences, writing papers, reports and policy-briefs (and blogs these days!) and discussing our ideas and experimental findings with our peers is what we do. We are lucky to be working in institutions and organisations, and with colleagues, who value such discussions and who recognise that it's through such debate and challenge that hypotheses are rigorously tested and reliable truth emerges. The scientific method is clear and we (usually!) argue nicely.

But increasingly public discourse it not following that approach. Maybe it never did – after all it was in 1943 that the novelist George Orwell described the propaganda around the Spanish civil war by saying "the very concept of objective truth is fading out of the world". But at a time when the Oxford English Dictionary names "post-truth" as the word of the year and Donald Trump's spokesperson has recently introduced us to the bizarre idea of "alternative facts", these do seem to be unusually tough times for facts, truth and evidence-based analysis. Do we, as a recent article in a UK newspaper

suggested, live in a culture "where it's pitched as a triumph of democracy that everyone can claim authority and anyone who claims that actually there is an objective truth is condemned"?

If this is indeed the case, I believe as ecologists we need to speak out against it. Ignorance is not a virtue, expertise is not dead, we cannot all have our own facts, nor is everyone's opinion of equal value. That's not being arrogant or part of the "liberal elite", but it is suggesting that people who have years of research training might be better placed to interpret complex scientific evidence than someone who has not. Professor Brian Cox summed this argument up very well in a recent interview: "Being an expert does not mean that you are someone with a vested interest in something; it means you spend your life studying something. You're not necessarily right – but you're more likely to be right than someone who's not spent their life studying it". So it's time to be proud of our training and expertise, and call out lies, which is what alternative facts actually are of course, when and where we see them.

But just checking facts and challenging lies may not be enough – it's a little bit dry and dull for this soundbite age! We need to get much more effective

at spreading the truth by using some of the passion and emotional appeal that works so well for those who want to spread lies. This was the subject of Professor Mike Begon's lecture at the BES annual meeting in Liverpool last December. It's a difficult issue – how do we communicate our message to people who have their head turned by campaigning slogans like “take back control” and “make America great again”? Maybe we need to get smarter with our vocabulary to challenge these superficially attractive, but grossly oversimplified messages, more effectively. But we also need to challenge the very idea that complex issues can be reduced to a simple choice between yes and no, and to keep pointing out that effective solutions to issues like climate change are unlikely to be simple, quick or popular.

But why is any of this the business of ecologists – why don't we leave it to others, perhaps those more comfortable with media engagement or public discourse to take the lead? Well, for a start, accurate information is what we spend our time and energy trying to obtain – rigorous collection and analysis of data critical to the science of ecology, so there can be no compromise here and we cannot stay quiet when people misuse our findings or try and undermine the truth about issues as important as climate change. But this shouldn't make us aggressive or rude – we simply “stick to the facts and civil dialogue”, as the founder of Wikipedia, Jimmy Wales, wrote recently in a piece about the best ways to challenge so-called fake news. In the words of a recent newspaper editorial on the same subject, we should “be civil, but unrelenting”. We won't back down and we won't fall silent.

But however nicely we argue, speaking out will bring a reaction – just ask the climate scientists from the Tyndall Centre at the University of East Anglia, or those working at the Environmental Protection Agency in the USA, or any of the scientists working on genetic modification when that was the centre of media attention. We can expect to be in the firing line! So we have a responsibility to make sure we build trust in us as a community – part of the anti-expert sentiment abroad at the moment derives from a lack of trust. We need

to be confident in our integrity and one way to help this is to be sure that our publications and associated peer review system are as unbiased and effective as possible, and that our interpretation of the data we present is accurate and appropriate. The Society's journals have a well-deserved reputation for integrity which give us a head start. Our system of peer review is central to that integrity of course – I'm sure I'm not alone in finding it difficult to fit in reviewing papers, but it's more important than ever that we try and support each other in this way. I'm going to try harder!

Social media and the lightning fast way information spreads across the internet are often held responsible for the problems I've been discussing. In 1976, the then British Prime Minister James Callaghan said that “a lie can be half way round the world before the truth has got its boots on” – that's truer than ever in this online era, but we can use the same means to help the truth catch up. We need to be ready with our rebuttals and get them out there fast! One way we can do this is to speak out in blogs and on twitter, but we need to turn our outrage into effective action not just lonely rants – speaking out together will be more effective than single voices.

That's where learned societies like the BES can help. We can support you in speaking out through the work of our policy team: you can be the expert who explains the facts to UK politicians at Select Committees. If you are reading this you are likely to be a member already, but encourage people to join the BES – we need to speak out together, including joining our voice with that of with other like-minded societies and organisations. When the BES met the Minister for Exiting the EU before Christmas, we were joined by the Zoological Society of London, the Campaign for Science and Engineering, the Royal Society of Biology, the Royal Society for the Protection of Birds and the Wildlife and Countryside Link (See also p37-8). This made our message much more convincing and powerful. We also recently joined with Institution of Environmental Sciences, the Landscape Institute and the Chartered Institute of Ecology and Environmental Management to write to the Rt Hon

Andreas Leadsom MP, Secretary of State for the Environment, Food and Rural Affairs, emphasizing the importance of the recommendations of the Environmental Audit Committee regarding the environmental implications of Brexit. We said in our letter that we represented 17,000 members – how nice if it had been many many more. There is strength in numbers but much more so if they are large ones! Learned societies have a vital role in standing for objective facts and the value of evidence, so please join up now and help us do that.

In the eighteenth century, the Society of Friends, often known as Quakers, charged themselves with an undertaking: “Speak Truth to Power”. I think that's an excellent summary of what we are called to do as a response to these unusual times. As ecologists concerned for our planet and the species we share it with, we are called to challenge those with the power to implement more sustainable approaches. As scientists committed to the search for knowledge and to evidence-based interpretation of facts, we are certainly called to speak the truth. We face significant challenges in terms of the scale of current environmental problems, as well as in terms of how those are being presented to the public at the moment. To respond effectively we need to be the sort of people who speak out clearly and with confidence.

I'll end where I began – with Donald Trump's inauguration as US President. He said during his inauguration speech “Now arrives the hour of action”. That's one thing he got right! So let's speak truth to power, loudly and together, and let's do it now.

AIN'T THAT THE TRUTH



AWARDS

FIGHTING SEXISM WITH SOAPBOXES



Nathalie Pettorelli & Seirian Sumner

We have launched a new annual award, Equality and Diversity Champion, which recognises an individual or group who have campaigned to highlight the importance of equality and diversity and worked to make a difference or served as an inspiration to others.

The first recipients of the award are Seirian Sumner and Nathalie Pettorelli: here's why they launched Soapbox Science.

Seven years ago, we co-founded Soapbox Science, a public outreach platform for promoting women scientists and the science that they do. Why did we do so? Our motivation was driven by a series of personal experiences and realisations acquired over our years as PhD students and early career researchers, namely: (1) there are fewer and fewer female role models available in science as you progress up the career ladder; (2) sexism in science is alive and kicking, if you allow yourself to notice it; (3) science stories are mostly told by males; (4) celebrated science heroes are mostly males.

Our personal experiences reflect the state of play: in both the United States and European Union men and women tend to be equally represented in many undergraduate and graduate science programmes, with men generally being underrepresented in biology. However, as you climb the academic ladder within Science, Technology, Engineering and Mathematics (STEM) subjects the proportion of women plummets,

with less than 20% of STEM professors in UK academic institutions being women.

What are the reasons for this 'leaky pipe'? One of the most cited reasons for women 'leaking' out of the science career ladder is that these crucial years often coincide with the preferred time for starting a family. This can make short-term postdoctoral positions abroad, long hours in the lab, time away from home for fieldwork, and intensive networking at conferences unattractive to women in particular. But this is only part of the issue: stereotype threats, lack of female role models and implicit bias are also factors. The problem lies both with the public's opinion of what a scientist looks like and with unconscious biases within the academic system. For example, a 2015 L'Oreal for Women in Science/UNESCO public survey revealed that the majority of Europeans between the ages of 18-55 still describe a scientist as a man. Recent research moreover shows how academics (both male and female) are guilty of unconscious or implicit gender bias: female applicants for academic positions are assessed as weaker candidates than their male counterparts, even though CVs and



Chantal Nobs, nuclear physicist

qualifications are identical. And that's not all: denial of the contribution of woman scientists in research has been well-documented, while female scientists have been shown to earn less, to be less likely to be listed as either first or last author on a paper, to be less likely to review and write comments on papers published by prestigious journals; and to be less likely to be asked to join editorial boards.

Admittedly, the roots of the problems can actually be traced to the wider society itself. After all, we live in a society where parents are disproportionately encouraging their sons over their daughters to pursue a career as an engineer or a scientist, and where kids are mostly drawing

scientists as men. The career cost of parenthood is still disproportionately carried by women around the world, with, for example, few working men opting for shared parental leave in the UK despite the recent legislative changes. Sexism is also not just found in science: it's in sport, in the entertainment industry, in business, on social media: it's literally everywhere.

In the face of all this, we wanted Soapbox Science to achieve something we felt was needed: to inject positivism over doom; to promote inspiration over difficulties and hurdles. Despite national initiatives, such as the Athena SWAN Charter which aims to improve gender equality in science within the academic arena, the heart of the battle indeed lies in changing cultural perceptions of who a scientist is. The paucity of female role models at the top of the food chain in the scientific workforce, and the lack of diversity in the science media only further reinforces the stereotype that STEM subjects are for men. With Soapbox Science, we wanted to show society (and possibly reassure ourselves!), that it is possible for a woman to have a successful career in science; that many of these talented scientists do some really cool research and live not far from your home; that there is more than one path to success for women in science.

Our idea was simple: challenge the perception of who scientists are by putting female scientists on soapboxes on busy urban streets to chat about their science with passers-by, while promoting the visibility of female scientists and equality in science careers. Soapbox Science is sustainable, cheap, highly reproducible, flexible, and with a simple aim: inspire people who never normally get exposed to science. So far, over 350 inspirational women in science have taken to their Soapboxes since 2011 and that number is set to pass 500 this year. 2017 is indeed an exciting year for us, with 21 events scheduled across 6 countries. This success could not be possible without the hard work of the local organising teams in each location, who work tirelessly to establish and sustain a Soapbox Science event in their city. Two large public engagement grants



Dr Veronica Fowler, virologist

from the Science Technology Facilities Council (STFC) have allowed us to expand our initiative since 2014 and employ an event coordinator to support any local teams interested in bringing Soapbox to their part of the UK or internationally. This year, this grant has also allowed us to start the new "Soapbox: Art & Science" initiative which will see Scientists collaborate with artists to bring their work to UK arts festivals.

What incentives could be driving the hundreds of women who are willing to give up their precious time to be a Soapbox speaker or local organiser? Surely, their career would be better served by spending the time writing an ERC grant (whilst they can!), or tweaking the perfect text for that first author submission to *Nature*? The number of women who volunteer to take part speaks in volumes: Soapbox Science brings together that part of the STEM community, which is full of people relentlessly pushing for change and developing ingenious transferable solutions to advance the gender equality agenda. This feeds us with optimism about the years to come, for the expansion of the Soapbox community globally, and the future level of diversity that could be found in the STEM community.

Every year, Soapbox moreover brings us stories of how the public reacted to our events, which never fail to touch us deeply: in Newcastle, for

example, one parent told us that the best part for her had been the reaction of her daughter, who saw a female scientist in person for the first time; in London, a school pupil at a told us it had led him "to believe that women can also excel and attain success in such a complex field". Because getting involved with gender equality initiatives is so rewarding, we would encourage any person who is passionate about diversity and its importance in society to get engaged and set up new ones. The more initiatives we have that open dialogue on gender equality, the better: don't think that your efforts would be too small.

And so our Soapbox 'baby', has fled the nest: it has grown beyond our wildest dreams in 6 years. We are blown away by the enthusiasm and support that we, our speakers, and local organisers have received over the years: the momentum is incredible and the appetite for Soapbox in the STEM community never ceases to amaze and delight us. We were overjoyed therefore, to gain the recognition of the BES as recipients of their first Equality and Diversity Award. This recognition and support will help Soapbox go from strength to strength as it expands across the globe in 2017. Thank you BES! And we look forward to seeing lots of BES members at Soapbox events around the country this summer!

EDUCATION

COMBATING THE INVISIBLE ENEMY: IMPLICIT BIAS, DATA COLLECTION AND THE TEACHING EXCELLENCE FRAMEWORK

Elva Robinson | University of York, UK | @Elva_Robinson



Our daily lives are full of judgements and decisions, many trivial, some weighty. We collect information from many sources to inform our actions, and inevitably, much of this information comes from our prior experience and personal thought-patterns and assumptions. Implicit or unconscious bias arises when we are unaware that these personal, and often irrational, interpretations are influencing our judgements and decisions¹. We are all subject to some degree of implicit bias², and certain biases, such as associations between maleness and scientific ability, can lead to practices promoting inequality and unfairness³.

Implicit biases manifest themselves from early childhood onwards – this is not a problem restricted to traditionally influential decision-makers. Undergraduate students demonstrate implicit bias against female lecturers when they evaluate teaching quality. Studies from both France and the US⁴ have shown that student evaluation scores are significantly influenced by gender – for example online instructors believed to be female received lower scores than instructors believed to be male. Even on something as apparently objective as the speed of return of student work, US students rated male instructors as more punctual – when work was in fact returned equally promptly. The bias was so strong, that in some cases female teachers producing better learning gain were rated lower than less effective male teachers⁴.

If we are all subject to implicit bias, then why the focus here on bias in undergraduates? Student evaluations of teaching quality are to form a major part of the new Teaching Excellence Framework currently being rolled out in the UK⁵. Eventually, the TEF aims to include subject-level assessments of the teaching at all universities, and these assessments will affect how much universities are allowed to charge students for their courses. The TEF will take a range of measures into account, including 'teaching environment', which could encompass equality and diversity activities – but it is clear that student evaluations are to play a significant role. Student evaluation scores already contribute to staff promotion applications; when the evaluations have financial implications for the whole institution, it is likely they will be taken even more seriously. Potentially, this could lead to hiring and progression policies that favour staff who generate the best student evaluation scores – even if those scores are biased against female lecturers (and potentially other underrepresented groups)⁶.

Do student evaluation data suggest such bias is a genuine concern in the UK? As part of the Athena SWAN initiative⁷, equality and diversity data are collected by universities on a range of activities, including student evaluations of teaching and whether they differ between male and female lecturing staff. Equal student evaluation scores across the genders seem at first glance to be an indication

that everything is going well, and TEF-gender-related concerns are misplaced. But should we take such data at face value? As I see it, if we start with the assumption that male and female lecturers are, on average, equally good at teaching, then we can interpret equal student evaluation scores across the genders in (at least) three ways:

- 1 The students don't have implicit bias. This would be great news, but is highly unlikely².
- 2 The students have implicit bias, but don't let it affect their teaching evaluation scores. This would also be great – and is also highly unlikely⁴.
- 3 The students have and express implicit bias in favour of male staff, but the scores come out as even, because lecturers tune the effort they put into student experience. Remember – feedback scores are mostly about subjective experience, not learning gain⁴.

The third interpretation above does not require conscious deliberate action by lecturers – most lecturers are aware of where their student evaluation scores sit with respect to those of other members of staff, and most lecturers are also aware that putting extra effort into providing detailed feedback to students, additional resources and support increases student evaluation scores. So if student evaluations are actually expressing some interaction between student expectation (implicit bias) and

* While the primary focus of this article is gender, most of these points apply at least as much to other protected characteristics such as ethnicity and disability, and indeed to other judgements we may make unconsciously about appearance, accent etc.



student experience (which doesn't correlate well with effectiveness of teaching^{4,8}) then it is not unreasonable to suppose that female lecturers could find themselves putting more effort into the student experience, to compensate for the disadvantageous implicit bias.

There is no straightforward way to distinguish between these three differing possible interpretations, or to test our initial assumption of equal competence. Hypothesis testing here is tricky – we can't blind test for gender effects if our teaching is face to face, and teaching is so variable and unique that assessing effort and comparing between staff would be almost impossible. So, while we do need to support data collection, we must also avoid complacency about what it might mean.

Is anyone free of implicit bias? I'm certainly not: for example, when I took one of the Harvard University Implicit Association Tests⁹, I was disappointed to find out I had a moderately strong bias towards associating men and science (versus females and humanities). On reflection, this is hardly surprising – while I am now in a relatively diverse work environment, my composite experience of scientific environments has been one of male prevalence – indeed, arguably more so than for my colleagues: for example, when I worked in a Computer Science department, I was usually the only female in the room. Everyone else there was seeing a better gender balance than I was. I've also been experiencing gender-biased cultural

references for my whole life, as insidious as they are ubiquitous – such as a “charming”¹⁰ children's book 'The Little Red Engine and the Rocket', which though published in the 1950s, is still in print and widely available in public libraries telling our children that “A scientist is a man who finds things out about the world”.

While the effects of life-long conditioning may be unsurprising, we don't need to be fatalistic about their impact. There are things we can all do, to reduce the impact of the invisible enemy, implicit bias:

- 1 Be cautious:** We should take student evaluation scores as a measure of the student in question's subjective experience. Student experience is important - but doesn't necessarily measure teaching effectiveness. So we should exercise caution in our interpretation and usage of such scores – and indeed of any evaluation process that is not blind to gender or other protected characteristics.
- 2 Be informed:** Awareness of bias can decrease its effects¹². BES now offers unconscious bias training to all BES staff, committee chairs, editors and SIG secretaries, and we can all access the Royal Society's resources¹ and take the Harvard Implicit Association Tests⁹.
- 3 Be vigilant:** While most *Bulletin* readers are past the stage of filling in the National Student Survey, we do give feedback on talks, whether that is in the formal sense of judging student presentation prizes or

marking oral presentations – or less formally, when we think back through the good talks we've seen to find ideas for keynote or invited speakers. When evaluating talks, posters, CVs, when interviewing candidates, when writing references or peer feedback, when giving advice and in many other contexts... we can all benefit from critically assessing our own decision-making and (tactfully) that of those around us.

Progress is made when we recognise that implicit bias affects us all. Take a few minutes to have a look at the Harvard Implicit Association Tests – the results might surprise you, and might help you look again at some feedback or evaluation scores and question what they are really telling us.

REFERENCES

- 1 Frith, U. *Understanding unconscious bias*. 2015 The Royal Society; <https://royalsociety.org/topics-policy/publications/2015/unconscious-bias/>.
- 2 Raymond, J., *Sexist attitudes: Most of us are biased*. Nature, 2013. **495**(7439): p. 33-34.
- 3 Moss-Racusin, C.A., et al., *Science faculty's subtle gender biases favor male students*. Proceedings of the National Academy of Sciences, 2012. **109**(41): p. 16474-16479.
- 4 Boring, A., K. Ottoboni, and P.B. Stark, *Student evaluations of teaching (mostly) do not measure teaching effectiveness*. ScienceOpen Research, 2016.
- 5 Department-for-Education, *Teaching Excellence Framework: year two specification*. 2016.
- 6 Holroyd, J. and J. Saul. *Will the Teaching Excellence Framework be sexist?* 2016 The Guardian; <https://www.theguardian.com/higher-education-network/2016/apr/04/will-the-teaching-excellence-framework-be-sexist>.
- 7 Equality-Challenge-Unit. *Athena SWAN Charter*. [cited 2016; <http://www.ecu.ac.uk/equality-charters/athena-swan/>].
- 8 Johnston, A.N., B.H. Massa, and T.H.J. Burne, *Digital lecture recording: A cautionary tale*. Nurse Education in Practice, 2013. **13**: p. 40-47.
- 9 *Project Implicit*. <https://implicit.harvard.edu/implicit/takeatest.html>.
- 10 Amazon. *Product Description for 'The Little Red Engine and the Rocket'*. 2016 Nov 2016; www.amazon.co.uk.
- 11 Johnston, A.N.B., H. Massa, and T.H.J. Burne, *Digital lecture recording: A cautionary tale*. Nurse Education in Practice, 2013. **13**(1): p. 40-47.
- 12 Lindsey, A.P., *Explaining for Whom, How, When, and Why Diversity Training Works*. Psychology Department, George Mason University, 2016. PhD.

PUBLICATIONS

WHAT IS THE FUTURE OF PEER REVIEW IN ECOLOGY?



Alice Plane | Assistant Editor, British Ecological Society | alice@britishecologicalsociety.org

Peer review is critical to the research process, but has also been the subject of much ongoing criticism and debate (Smith 2006). How the process of peer review is changing with new advances in technology, how we ensure quality, fairness and impartiality in peer review (Lee 2013), how we reach the next generation of reviewers and how we acknowledge or reward review effort (Warne 2016) are topics widely discussed by the scientific community. Many peer review models and experiments have emerged across scientific disciplines with the aim of improving the review process, but they often lead to more questions than answers.

At our Annual Meeting in December, our Publications Team held a workshop in the form of a panel debate to discuss some of these issues. It was a lively debate between a panel of experts, chaired by Jane Hill (Chair of our Publications Committee), and an audience who had lots of great questions in unexpected topic areas.

The workshop provided an opportunity to seek the views of our community on peer review, as well as gathering suggestions for how we could improve or make changes. The audience were engaged participants in the peer review process. Many were currently serving on editorial boards of journals, while others were early career researchers, wanting to find out more about peer review.

A DIVERSE RANGE OF OPENING PERSPECTIVES WAS PROVIDED BY THE PANELLISTS

Allen Moore, Editor in Chief of *Ecology and Evolution* explained how he set up the journal to provide an 'author-friendly' review and publication process. Allen questioned whether a paper that has already been through the peer review process at one journal really needs to start at the beginning for another journal.

Patricia Morse, Managing Editor of *American Naturalist*, a journal which recently changed from single-blind to double-blind review, gave an overview of her experience with this model.

Nate Sanders, Senior Editor of *Journal of Animal Ecology*, talked about the importance of all ecologists being involved in making sure that the best science, wherever it may come from, is published and the review process should ensure that this happens.

Andy Robinson, Senior Vice President and Managing Director, Society Services at Wiley emphasised the significance of peer review in making published literature different from freely available web content, highlighting the importance of the integrity of peer review. He also recognised the need for a more efficient process where millions of hours per year are spent on peer review.

Elizabeth Moylan, Senior Editor, Research Integrity at BioMed Central discussed increasing transparency in peer review and how it can be made more open and accountable. Elizabeth



was keen to see more experiments to improve peer review and most importantly, the availability of the data behind these experiments.

THE MAIN DISCUSSION COVERED A HUGE RANGE OF THEMES

Key themes discussed included: How do we integrate pre-registration into current publishing practices? Should data be available to reviewers? When and how should we make reviews available to readers? How do we make the best use of a researcher's time given that most are already overstretched? Finally, how do we best provide support and training and harness the enthusiasm of the next generation of reviewers?

Allen made the case for giving more credibility to the review process through pre-registration, where the hypothesis and experimental design for a piece of research are submitted before the research is carried out. If, for example, an unexpected result is then discovered, this could be addressed and explained in the paper, leading to an honest and transparent account of the scientific process. However, there were concerns, in particular about the pre-registration process giving busy ecologists more work.

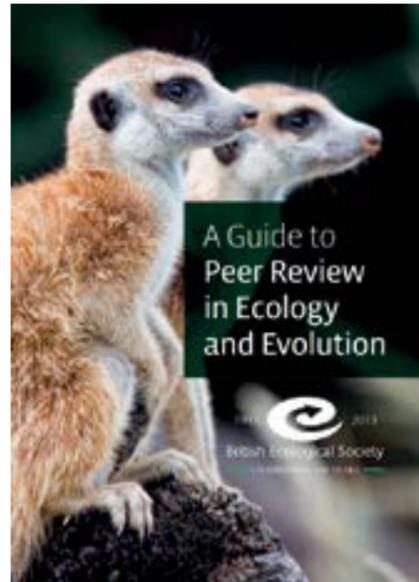
Nate discussed the great interactions between reviewers and authors that can happen when reviewers really engage with the data behind a paper. He felt that there are missed opportunities for readers when the conversations between reviewers and authors that take place during peer review never emerge after publication.

Elizabeth suggested that peer review of the 'living article' online could be the next step (Shanahan 2015). Open peer review, where reviewer reports are published online, allows readers to see the conversation between authors and reviewers, as well as encouraging transparency of the system and high quality and constructive reviews.

On the topic of encouraging new and early career researchers, Andy raised the need for everyone in all parts of the review process to be involved in training the next generation of reviewers. There is more work to be done to engage younger reviewers and reviewers from all over the world. Andy gave the example that there are twice as many papers published by Chinese authors as the number of Chinese reviewers (Warne 2016). We need to continue to find new ways to engage with this emerging network and support it.

Patricia highlighted the importance of mentoring new reviewers and

how guides such as the BES Guide to Peer Review are fantastic resources for early career researchers. All participants agreed that it is important for senior researchers to encourage their students to review, putting them forward for reviews if they decline and holding group review sessions, which we also strongly encourage.



STAY INVOLVED AND LEARN MORE

There was a lot more discussed by the panel on the day and a video of the whole session is now available on our website.

It is clear that although there are already a lot of initiatives, experiments and resources in place to improve the peer review process, we still have a long way to go to further engage with different groups and to make the peer review system more efficient. Please let us know your thoughts and suggestions by continuing the debate on Twitter using #BESPeerReview.

REFERENCES

Lee, C. J., Sugimoto, C. R., Zhang, G. and Cronin, B. (2013), Bias in peer review. *J. Am. Soc. Inf. Sci.*, **64**: 2–17.

Shanahan, D. (2015) A living document: reincarnating the research article. *Trials*, **16**:151

Smith, R. (2006). Peer review: a flawed process at the heart of science and journals. *Journal of the Royal Society of Medicine*, **99**: 178–182.

Warne, V. (2016) Rewarding reviewers – sense or sensibility? A Wiley study explained. *Learned Publishing*, **29**: 41–50.



© Stephen Plaster

BES JOURNALS SURVEY

This summary was put together for our Annual Meeting in December. A full report of the survey results will be available later in the year. Thank you to all our Reviewers and Editors. The success of our journals would not be possible without the hard work of all of our authors, reviewers and Editors.

Journal of Ecology

Journal of Applied Ecology

Methods in Ecology and Evolution

Functional Ecology

Journal of Animal Ecology

Proud to partner with Ecology and Evolution

Our Journals team aim to offer a professional, ethical and high-quality peer review service by soliciting constructive reviews and delivering fast turnaround times.

In September 2016, we surveyed our authors and reviewers to find out how they rate our service.



15,000 people invited who either reviewed or submitted a paper for one of the five BES-owned journals in the last 3 years.

2,000+ responses

SATISFACTION

We are pleased to find that overall satisfaction with the submission, publication and review process is high and 79% of respondents are likely to submit to us again.

Areas for improvement:

- Additional options to help authors to communicate their work
- Further reduce time taken to review

SUBMISSION

Clarity of communication in the submission system

91% SATISFIED

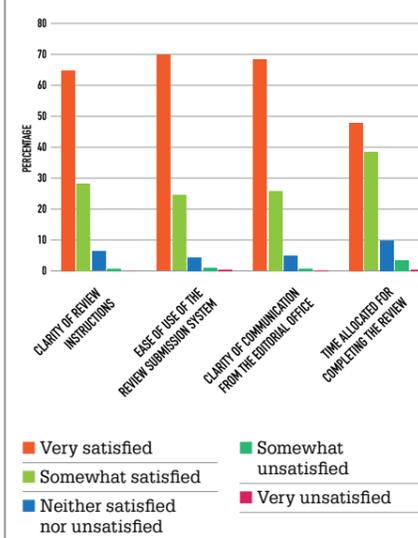
Clarity of guidelines on the Journal website

91% SATISFIED

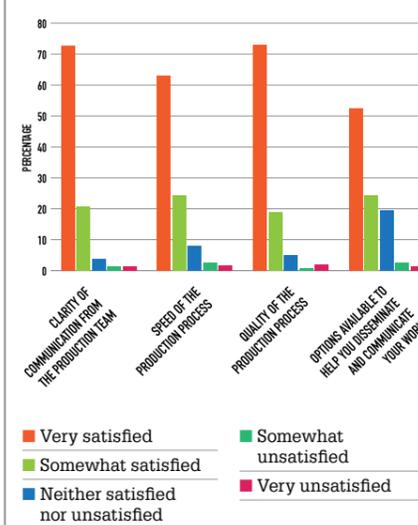
Ease of use of the submission system

88% SATISFIED

REVIEW



PRODUCTION



Choosing where to submit a paper

The most important reasons are:

- The reputation of the Journal
- The relevance of Journal content
- The quality of peer review
- The Journal's audience
- The impact factor of the Journal

PEER REVIEW

- Most prefer in-depth review (for novelty, importance and scientific soundness) (over 80% prefer)
- More people prefer double-blind over single-blind review (62% vs. 42%)
- Peer review only for scientific soundness (74%) is ranked highly and shows similar results to 'option to transfer reviews' (64%), possibly indicating authors' positive experiences with *Ecology and Evolution*
- Open (33%) and post publication (20%) review models are not popular

REVIEWER REWARDS

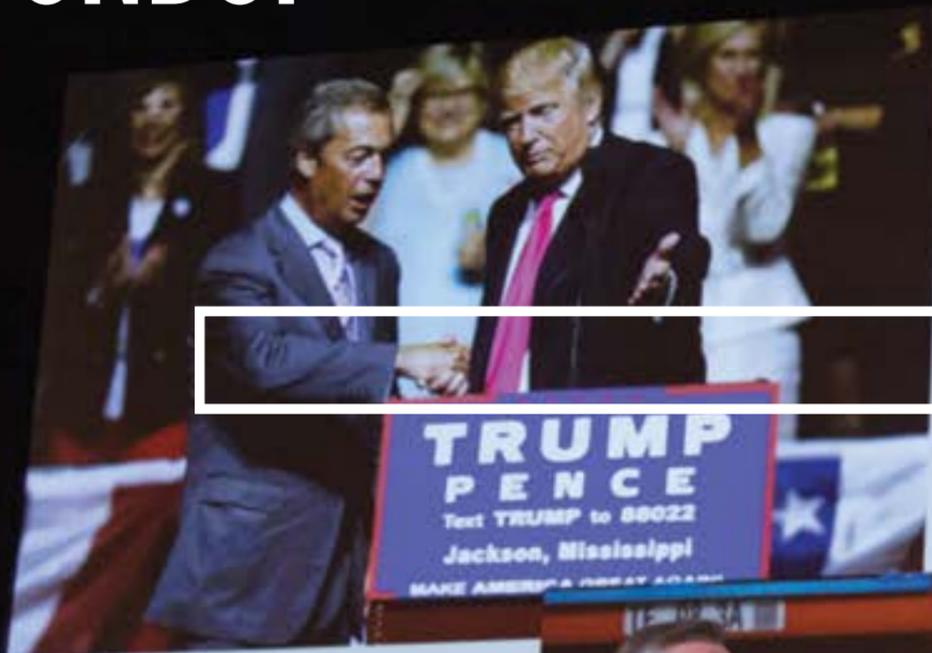
Top choice:

Information on the final decision on the paper (95% prefer).

Other popular rewards:

- Access to other reviews of the paper
- Feedback on usefulness/quality of their review
- Discount on Open Access for a future submission to the Journal
- Acknowledgement on the Journal website

ANNUAL MEETING 2016 ROUNDUP



BRITISH
ECOLOGICAL
SOCIETY

ANNUAL MEETING

THE BRITISH ECOLOGICAL SOCIETY ANNUAL MEETING 2016



Alan Crowden | Editor | bulletin@britishecologicalsociety.org

By the time this *Bulletin* lands on the desks of our members it might be a bright and cheerful springtime in the UK. (Apologies for seasonal inappropriateness to our members in tropical, Southern hemisphere and polar regions). The Tweeters, bloggers, emailers and gossips have all long ago had their say on the 2016 BES Annual Meeting. The BES Meetings Committee has met to discuss both delegate and staff feedback from the meeting, looking at ways to make 2017 event even better. So as the poet wrote *'The Moving Finger writes: and, having writ, moves on.....'* Thus it only remain for me to show a few images from the meeting.



Someone spent ages arranging these cakes and you lot just came along and wolfed them down. The 150 pattern marks the anniversary of the coining of the term ecology. (There was also a baked item marking Hazel Norman's 21 years at the BES; but there are only so many cake images I can handle without a foray to break my diet. Again.)



Note to self: when commissioned by Richard English to take photos of the new BES branding, best not to enrage him by cutting the Society off the British Ecological tablecloth.



A friendly seasonal welcome in the conference venue.



Networking, posters and exhibits.



Games and bean bags strategically placed around the exhibit hall added to the relaxed atmosphere.



The Barn Owl pulled them in again this year.



Kirsten Parris provided the entertainment at the conference dinner by reprising her Science Slam winning role as Russell the Growling grass frog. It's all right, she's back in Australia now.



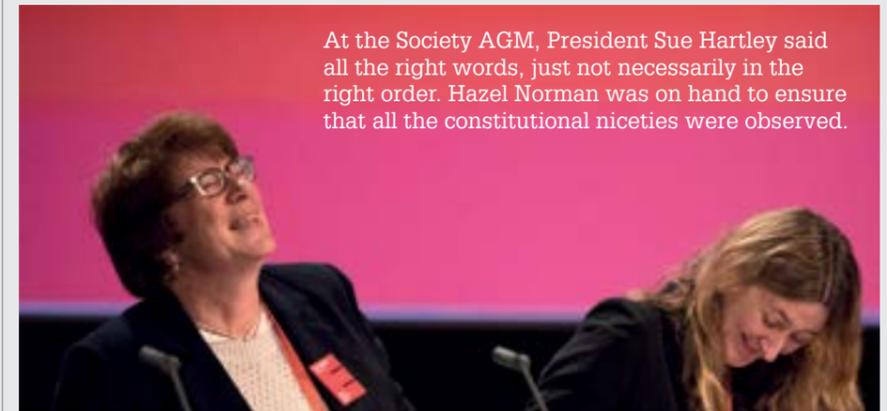
Amelia Simpson took the last day Christmas jumper theme very seriously. We are going to miss Amelia, who has moved on to a new job and who will be greatly missed by all of us who have attended the excellent events she has managed professionally, but with a sense of fun.



Mike Begon got the conference off to a lively start with his introductory remarks.



Anne Chao delivered a thought-provoking BES Lecture.



At the Society AGM, President Sue Hartley said all the right words, just not necessarily in the right order. Hazel Norman was on hand to ensure that all the constitutional niceties were observed.



Alison Hester delivered the 12 months in Ecology lecture, providing a fascinating and entertaining insight on the year gone by.



The Nature Conservancy's newly appointed Chief Scientist Hugh Possingham delivered the closing lecture on the last afternoon. It provided a lesson on how to hold an audience spellbound without resorting to visual aids. Great job.

AND OUR AWARD WINNERS WERE...

Congratulations also to award winners not featured here; Yadvinder Malhi (Marsh Award for Climate change Research), Ali Burkett, Nick Loughlin and Victoria Burton, joint winners of the Public engagement award, and Elton Prize winner for 2015, Jonathan Pruitt.



Diana Wall and Charles Godfray were awarded Honorary Membership of the BES, the highest honour that the Society gives



Bridget Emmett, winner of the Marsh Award for Climate Change



The Marsh Award for Ecology was given to Lynne Boddy for her exceptional contributions to the study of fungal ecology



Jordi Bascompte and Pedro Jordano received the Marsh Book of the Year Award



Keith Kirby received the BES Award for exceptional service to the Society



Julia Blanchard was the winner of the Founders' Prize



Nathalie Pettorelli received the new Equality and Diversity champion prize, which she received jointly with Seiran Sumner for their inspirational Soapbox Science



Emily Nicholson was highly commended in the Equality and Diversity Champion category. Emily is the proud mother of three young boys as well as being a senior lecturer in quantitative ecology at Deakin University in Australia. She is actively involved in developing the IUCN Red List of Ecosystems and writes inspirational blogs with tips on dealing with career interruptions, parental leave, and more



Yuuya Tachiki received the Harper Prize for the best paper by an early career researcher in Journal of Ecology



The Journal of Applied Ecology named Dustin Ranglack winner of the Southwood Prize 2015



Brian Steidinger received the Haldane Prize 2015 for his paper in Functional Ecology



Kim Calders was given the Robert May Prize 2015 for his paper in Methods in Ecology and Evolution

ANNUAL MEETING

STUDENT PRIZE WINNERS 2016

Each year we call on a diverse group of judges to select winners for our Anne Keymer Prize for Best Student Talk and Best Student Poster Prize. With 150 entries for both talks and posters, the judges had their work cut out!

To enter, applicants must be a current student presenting work on their research project, or recently have completed their studies and be presenting work that was completed when they were still a student. If presenting a poster, entrants must be the first author and have undertaken the majority of the work of the project.

Both talks and posters are scored on categories including; visual style, scientific content, originality of research, response to questions, and effectiveness of communication.

Winners receive an honorarium of £250 and runners up receive £100. Due to the high standard of presentations we have also selected a number of highly commended individuals.

Our judges were incredibly impressed with the exceptional standard of presentations across the board and we are pleased to announce the following winners. Congratulations to all this year's winners and thank you to our judges whose time and effort makes this possible!

THE ANNE KEYMER PRIZE FOR BEST STUDENT TALK

This prize is named in memory of Anne Keymer, who was one of the first winners of this previously unnamed prize in 1981. She went on to a career of great distinction, before passing away from cancer in 1992 at the age of 36. Anne was a member of the Editorial Board of the *Journal of Animal Ecology* and more generally was an exemplary scholar, teacher, and citizen of her discipline. In naming this prize after Anne, we recognise an ecologist early in their career who embodies, to a remarkable degree, the qualities and values we stand for.



BRITISH ECOLOGICAL SOCIETY

WINNER



Svenja Kroeger
University of Aberdeen

Cumulative reproductive costs on current reproduction in wild yellow-bellied marmots

With Julien Martin (University of Aberdeen), Jane Reid (University of Aberdeen), Daniel Blumstein (University of California), Kenneth Armitage (The University of Kansas)

Reproduction is costly, thus successful reproduction in one year may reduce reproductive success the subsequent year. However, reproductive costs may also accumulate over the reproductive lifespan of individuals. I investigated whether reproductive frequency and litter sizes across all previous years affected female yellow-bellied marmot reproductive probability and litter size in the current year. Whilst there was no evidence for reproductive costs from one year to the next, I found that females which had both reproduced frequently and weaned large litters in previous years were less likely to reproduce again. Female long-term reproductive history thus affected their current reproductive success.

RUNNERS UP



Charlie Outhwaite
Centre for Ecology & Hydrology (CEH)

The other taxa behind the State of Nature 2016 report: Exploring the results from biological records

With Gary Powney (CEH), Tom August (CEH), Nick Isaac (CEH)



Ashley Lyons
Edge Hill University

Spider community responses to contrasting grazing management in upland calcareous grasslands

With Paul Ashton (Edge Hill University), Ian Powell (Edge Hill University), Anne Oxbrough (Edge Hill University)

HIGHLY COMMENDED



Alessandra Kortz
University of St Andrews

Habitat structure mediates the impact of an invasive species in a biodiversity hotspot

With Anne Magurran (University of St Andrews)



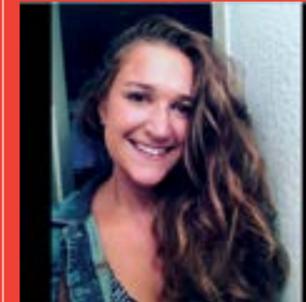
Marianna Chimienti
University of Aberdeen

Taking movement data to new depths: inferring prey availability and patch profitability from predator foraging behaviour

With Thomas Cornulier (University of Aberdeen), Ellie Owen (RSPB), Mark Bolton (RSPB), Ian Davies (Marine Scotland Science), Justin Travis (University of Aberdeen), Beth Scott (University of Aberdeen)

BEST STUDENT POSTER PRIZE

WINNER



Catherine McNicol
University of Exeter

The Effects of Pine Marten Reintroduction on Grey Squirrel Populations in Wales

With Stuart Bearhop (University of Exeter), Jenny Macpherson (Vincent Wildlife Trust), Robin Gill (Forest Research), Robbie McDonald (University of Exeter)

Is biological control of invasive grey squirrel (*Sciurus carolinensis*) populations possible by pine martens (*Martes martes*)? Recent studies in Ireland suggest martens negatively impact grey squirrel populations. Here, we investigate this interaction, exploring potential mechanisms behind this relationship. Translocated pine martens and resident grey squirrels were tracked using GPS loggers and telemetry to examine habitat preference, home ranges and any spatial interactions. Thus far it appears squirrel home ranges are contracting where pine martens are present. Further analysis is ongoing into the survival and site residency of grey squirrels as well as further behavioural and dietary observations.

RUNNER UP



Sarah Nelms
Plymouth Marine Laboratory, University of Exeter

Investigating microplastic trophic transfer in a marine top predator

With Tamara Galloway (University of Exeter), Brendan Godley (University of Exeter), Dan Jarvis (Cornish Seal Sanctuary), Penelope Lindeque (Plymouth Marine Laboratory)

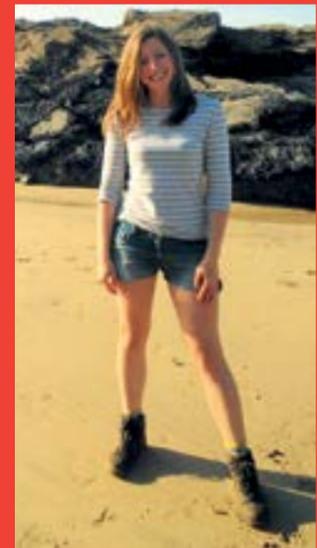
HIGHLY COMMENDED



Martin Jung
University of Sussex

Lasting influences of past land-surface conditions on species assemblages

With Pedram Rowhani (University of Sussex), Jörn Scharlemann (University of Sussex)



Sara Mynott
University of Exeter

Does climate change alter anti-predator defences?

With Stephen Widdicombe (Plymouth Marine Laboratory), Martin Stevens (University of Exeter)



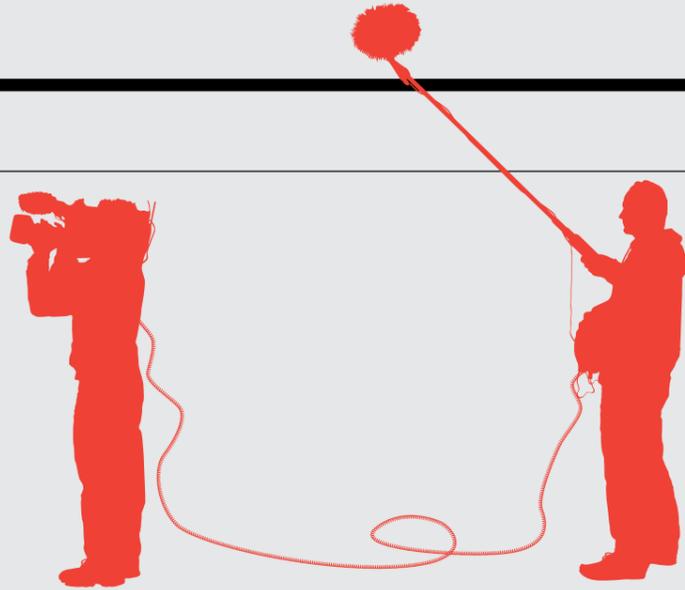
Johanna van Paassen
University of Aberdeen

Potential role of phosphorus in carbon sequestration in upland ecosystems?

With Sarah Woodin (University of Aberdeen), Andrea Britton (James Hutton Institute), Lorna Street (University of Edinburgh), David Johnson (University of Aberdeen), Andrew Coupar (Scottish Natural Heritage).

ANNUAL MEETING

PRESS ROUNDUP



Becky Allen

With the impending arrival of a new Press Officer at the BES, Becky Allen presents her last report on media coverage of the science presented at the 2016 Annual Meeting.

From shrinking reindeer to squid and chips and from *Time* magazine to the *Times of India*, our press work for the BES annual meeting got acres of great media coverage in December 2016.

We had a bumper crop of papers to work from, in the end picking the latest results from Professor Steve Albon's monitoring of reindeer in Svalbard, Dr John Pinnegar's work on a warming North Sea and what that might mean for our fish suppers, as well as a paper by Dr Penelope Whitehorn on neonicotinoids and their impact on bumblebees' buzz pollination, and the Natural History Museum's Dr Louise Ashton on what the global tower crane network is telling us about the last biotic frontier – the forest canopy.

We also served up stories on Dr Mark Goddard's carbon capture gardens on urban brownfield sites and Dr Pete Ianetta's pioneering work turning peas into beer.

The stories were picked up by radio, TV, newspapers and online media across the world. Few journalists can resist a reindeer story in the run up to Christmas, so as the meeting kicked off on Monday morning our press coverage got off to a great start with Steve's work covered in almost every

national newspaper in the UK – from *The Sun* to the *Daily Telegraph*. It ran in the BBC's news bulletins on Radio 4, FiveLive and the World Service, and was syndicated across the US – from the *Sacramento Bee* to the *Wichita Eagle*.

The same day, John's research featured across the BBC – from BBC Breakfast to Farming Today, as well on ITV and in *The Sun*, *The Guardian*, *Daily Telegraph*, *The Indie*, *Daily Mail* and *Daily Mirror*.

On Tuesday and Wednesday, Louise, Mark and Pietro took up the baton. We had several reporters at the meeting – the BBC's science correspondent Vic Gill came to find out more about tower cranes, *New Scientist* interviewed lots of BES members, and Volker Mrasek of German Public Radio – who was resident in our press room throughout the meeting – seemed particularly keen to record a beer story.

Pete helpfully arrived in the press office with a six pack of his Tundra ale and despite having forgotten to pack a bottle opener, the pair successfully popped the top off several samples – all in the name of recording some 'atmos' for the radio package.

It was a joy to help bring so much ecology to a wider – and worldwide – audience: we got coverage in Europe, Asia and Australasia; more than 300 items in all; reaching a readership of millions in publications with an ad value worth thousands.

So I am leaving the BES press office on a high note. Over the past 15 years we've established a great reputation with science media across the globe, and it's this firm foundation that a new full-time press officer will build on, guided by a new strategy that Karen will tell you about below.

It's been a pleasure helping so many BES members communicate their ecology to a wider audience. And while a few of them have grumbled at having to turn up at Sky TV at 6am, almost without exception they've enjoyed working with the media and found value in doing so.

The public is fascinated by science and it funds science. The media still helps shape public opinion and can change our behaviour. So I hope that – through the BES press office – ecologists will continue to tell their stories and make their voices heard.

IMPLEMENTING A NEW PRESS STRATEGY

All being well by the time the *Bulletin* lands on your desk, our new full time Press Officer will be in post or, at least, very nearly in post. Becky has done great things for the BES and in appointing a full-time Press Officer we are in effect doubling the capacity we have for press related activity.

Our Press Officer will work across the full range of our journals and other activities to raise the profile of ecology and ecological science. The growing role of the Press Officer reflects the expansion of our journals, policy and public engagement work, not to mention the growing size of our annual meeting, symposia and special interest groups.

Our future press work will

- Increase the number of press releases issued by the BES for papers published in our journals
- Increase support for authors of papers and liaise with press officers in other institutions to communicate the great research that's happening
- Increase the support and resource we have for promoting meetings, symposia and the science presented through these events.
- Provide more media training and build a community of spokespeople from the membership who are able to synthesise, comment on and engage the media with ecological science. With this in mind, please do get in touch with us if you would like to join the expertise database or you are interested in media training
- Identify those areas of underrepresented policy-relevant ecology topics and develop proactive projects that seek to highlight the importance of these areas
- Work more closely with the Science Media Centre on those areas of science that are controversial or more likely to be "wilfully misinterpreted"
- Communicate ecology and its relevance at local, national and international levels

Everyone is welcome to get more involved and further details will be made available online as we go through the year.

Karen Devine, External Affairs Manager

ANNUAL MEETING

36TH ANNUAL GENERAL MEETING MINUTES

The minutes of the AGM held at 10:00 on Tuesday 13th December 2016 in Hall 1, Area and Convention Centre Liverpool, Monarchs Quay, Liverpool, Merseyside L3 4FP.

1 MINUTES OF THE 35TH BES AGM

The minutes of the 35th AGM held on Tuesday 15th December 2015 in the Pentland Suite, Edinburgh International Convention Centre, The Exchange, Edinburgh, EH3 8EE, as published in the *Bulletin* Vol 47:1 pp30 – 31, were presented to the meeting.

The motion to approve the minutes was proposed by M. Eichhorn, seconded by R. Marrs and carried by a majority with no votes against.

2 THE ACCOUNTS FOR THE YEAR ENDED 31 DECEMBER 2015

The Accounts for the year ended 31 December 2015, as published in the *Bulletin* Vol 47:3 pp 59-84, and summarised in the Annual Review were presented to the meeting.

The motion to approve the accounts was proposed by E. Sayer, seconded by O. Lewis and carried by a majority with no votes against.

3 THE REPORTS OF THE TREASURER AND THE AUDITORS

The Honorary Secretary presented the accounts on behalf of the Treasurer.

After 6 years as treasurer, it was with much sadness that Dr Purves was moving aside to be replaced by Dr Ezard. Dr Purves used the opportunity to thank Dr Ezard publicly for the enthusiasm he had shown in taking on this new role, attending multiple meetings over the last 6 months or so to get up to speed. Based on what we have seen so far, Dr Ezard will have no trouble keeping up with the role, and will soon be introducing his own ideas and approaches, to the great benefit of the BES and ecology more broadly.

Dr Purves reminded the AGM about the overall shape of the BES finances, which will be familiar to some. It was fair to describe this overall picture as one of sustained growth. The Society carries out several different kinds of activities, all of which we consider very important in their own right. There are activities on which we simply spend money. The main ones are our research grants, as well as our work in education and policy. Then, we have activities on which we spend some money, but which also provide some income, with the balance between income and expenditure depending on the activity. Activities in this category include the Annual Meeting, our symposia, and special interest groups. Similarly, our membership section produces the *Bulletin*, but also receives subscription fees, and makes a small profit overall. Finally, we have our work in publications, where we spend a large amount, but gain back a lot more. The net result of all of this, is that we are able to run, each year, at a surplus,

which is placed in the long term endowment fund that will one day put the BES finances on a completely secure footing.

Although this overall picture has not changed since Dr Purves became treasurer, in fact the Society has increased greatly in scope, and been through many changes during that time. When he first visited BES HQ, it was a small, crowded building in Putney. Today, we are part owners of two large buildings near Kings Cross, with fantastic conference facilities in house. We have substantially increased the amount we spend on every one of our activities, in some cases hugely. For example, we have increased spending on special interest groups from £18,000 per year in 2010, to £145,000 pounds per year now. We have added a highly successful new journal to our stock – *Methods in Ecology and Evolution* – and taken a leading role in still another – *Ecology and Evolution*. We now use long-term financial planning, routinely making financial projections out to 2020. Similarly, we are currently part way through a 5-year strategic plan, which seen every part of our operations reinvigorated. This long-term approach has been aided by the fact that our publishing is now based around 5-year contracts with a guaranteed minimum income.

Dr Purves thanked the BES staff, led by Hazel Norman, who he thought were really unusual in their ability to run things professionally day to day, whilst always being enthusiastic about change.

4 THE REPORT OF THE COUNCIL SECRETARY

The Council Secretary, Dr Vanbergen, presented his report to the AGM.

He noted that the Society had been very active in the last 12 months, delivering much towards the 2015-2019 Strategic Plan. The Society continued to have a world-leading publishing portfolio supported by a well-respected editorial team. As well as ensuring that excellent research continued to be published in the Society's Journals, the team had run a number of initiatives including debates on data archiving. The Society continued to have impact on ecological research in Africa through its grants schemes supporting African ecologists. The Scottish Policy Group continued to be active and keep strong connections between policy makers and ecologists in Scotland.

The BES had also been active in many outreach events during the year. We obtained a Silver Medal at the RHS Chelsea Show for our stand on pollinator ecology and we also ran a successful programme of activities at Glastonbury music festival. Our outreach work in schools continued and the Summer School this year included A Level students from low socio-economic backgrounds to promote diversity. The BES has developed a wide range of career support and training programmes, including the Summer School, to help ecologists establish themselves and develop a successful career. We hope to expand that work, and work in other areas, through fundraising for more activity and to that end we appointed our first Fundraising and Development Manager in 2016. Supporting the next generation of ecologists, helping ecologists through difficult career stages and increasing funding for Africa will be fundraising priorities.

Dr Vanbergen thanked BES staff, Trustees, Committee members, SIGs and members for all their contributions to the work of the BES. He encouraged all members to get involved with the Society and participate in our work.

5 TO ELECT OFFICERS OF COUNCIL OF THE SOCIETY

The Council nominees for four Officer posts were as follows:

Present Officers	Retiring Date	Council Nominees
President	S. Hartley	2017
Past President	W. Sutherland	2016
President Elect		R. Bardgett
Vice President	R. Hails	2017
Vice President	A. Pullin	2017
Council Secretary	A. Vanbergen	2018
Honorary Treasurer	D. Purves	2016
		T. Ezard
Honorary Chairpersons of Committees	Retiring Date	Council Nominees
Meetings	Z. Davies	2018
Policy	J. Vickery	2016
		J. Vickery
Publications	A. Gray	2016
		J. Hill
Education, Training and Careers	W. Gosling	2017

The motion to accept these changes to the Officers of the Society was proposed by C. Thomas, seconded by L. Turnbull and carried by a majority with no votes against.

6 TO ELECT ORDINARY MEMBERS OF COUNCIL

Three Council members were retiring at the end of their term of office and there was an election to choose three from the five nominations. A ballot was held and tellers were appointed. The following people were elected as Ordinary Members of Council: Dr C. Banks-Leite, Dr H. Roy and Dr P. Thomas.

7 THE APPOINTMENT OF THE AUDITORS FOR 2016 AND THE AUDITOR'S REMUNERATION

The AGM agreed to delegate authority to BES Council for the appointment of the auditors and their remuneration. The motion to approve this was proposed by R. Marrs, seconded by P. Brotherton and carried by a majority with no votes against. Professor Hartley, BES President, noted that Council had appointed new auditors, Haysmacintyre, through a competitive tender process.

8 ANY OTHER BUSINESS

Professor Sue Hartley, thanked the members of Council who were retiring; Professor Sutherland, Dr Gray, Dr Purves, Dr Lewis, Dr Sayer and Dr O'Callaghan.

Professor Hartley also noted that in 2017 there would be a planned refresh of the Strategic Plan and there would be an opportunity for the membership to contribute their views.

There was no further business and the meeting was closed.

ANNUAL MEETING

UP GOER FIVE AT OUR ANNUAL MEETING



At this year's Annual Meeting, we decided to add a new element to our poster presentations. Using the incredibly successful *Up Goer Five* initiative, we invited presenters to summarise their research using just 250 of the thousand most common English words!

[Editor's note: For any readers who, like me, live in deep ignorance of the modern world, the *Up Goer Five* initiative was stimulated by an online magazine *xkcd* which attempted to describe the blueprints of the Saturn V moon rocket using only a list of the thousand most commonly used English words. Apologies for the interruption if I am the only BES member who did not know this]

A number of presenters rose to the challenge and delegates were asked to vote on their favourite description. We are pleased to announce Tuomas Aivelo from the University of Zurich, is our first *Up Goer Five* winner.

TROUBLE MAKERS CAN CHANGE THE CROWDS WITHIN SMALL ANIMALS

Animals have many much smaller living things inside them, and these can be good or trouble for the animal. We do not know well how these smaller things live together, whether they help or fight each other. In any case, they form crowds in which single things act with each other.

We studied free animals living in trees in a far away place surrounded by water. These small animals are close to us in our family tree. We followed the same animals for two years. We figured out the living small things inside animals, crowds they make up and the relationships between each other. The living things were recognized in a new way: by looking at the letters within their cells and seeing if they match between each other. The relationships between the small things were studied with several different ways, some of which were new.

We found that the small trouble makers within animals like different crowds. In fact, even though they can be almost same, they still live with different crowds. The animals explained less than we expected on which small things or crowds are

present inside them. We are sure that the way we did this, can help people doing same things in coming years. The problem is that we can't say for sure if this finding is caused by the acts between the small things or if it is because some other reason we haven't looked at.

WE ASKED THOMAS HOW HE FOUND THE CHALLENGE...

I found writing *Up Goer Five* description surprisingly easy. Whilst it took a while to get started, with a lot of trial-and-error as the vocabulary is rather limited, when I found the right mindset, the text flowed easily onto paper. I am learning German at the moment and there are a lot of similarities in doing *Up Goer Five* and learning a new language: I need to make myself understood with a very limited vocabulary! It was a useful exercise to think of new ways to present my work and it does help you to focus on the key results.

I am quite proud with the end result, as it actually describes my research quite well. There are a number of expressions which might not be quite so clear; Madagascar is 'a far away place surrounded by water', mouse lemurs are 'close to us in our family tree' and DNA sequences 'the letters within cells'! But then again, 'the small trouble makers within animals' is definitely right!

The inspiration for this new initiative has come from xkcd, Theo Sanderson and Chris Rowan & Anne Jefferson.



Tuomas Aivelo
Our first *Up Goer Five* winner

ANNUAL MEETING

THE BES SCIENCE SLAM 2016



Jessica Bays, Engagement Officer and Kirsten Parris
jessica@britishecologicalsociety.org

In December we hosted the BES Science Slam as a fringe event at the Annual Meeting. Throughout the night, we saw five brave ecologists take to the stage to entertain an audience in Liverpool's premier comedy venue. Compered by the hilarious Sam Avery, the evening featured everything from Barry White and a dancing antelope, to audience participation and internet dating. Go online to view the footage now (www.britishecologicalsociety.org/besslam)

After a tense clap-off, between Rosie Woodroffe and Kirsten Parris, Kirsten (aka Russell the growling grass frog) was crowned the winner, read more about Kirsten's experience below:

There I was, in a cold and rather dingy space behind a red velvet curtain, in the basement of an old warehouse in Liverpool, dressed as a rotund frog, bouncing around to keep warm (and calm) while I did some vocal warmups. I was waiting to take to the stage as part of the BES Science Slam 2016. Why had I ever thought that this was a good idea? Was it too late to change my mind? Would I remember the words to my songs? Would anyone think I was funny? Just like Harry Potter before he faced a Hungarian Horntail in the first task of the Triwizard Tournament, the waiting part was definitely the hardest part of the #BESSLAM experience.

When I had applied to participate in

this event, I provided the following short (max 80 words) explanation of my motivation for entering: "I am passionate about science communication and love finding new ways to tell ecological stories that resonate with people everywhere. I also like to dress up, sing, share poetry and imitate frog calls in public. The Science Slam will provide a fabulous opportunity to do all of these things in just eight minutes!" And it did.

Participating in the BES Science Slam was one of the most terrifying yet ultimately enjoyable experiences I've ever had at a conference; it was certainly the most memorable! My fellow participants – Mahasweta Saha, Moya Burns, Rosie Woodroffe and Zac Baynham-Herd – did a wonderful job of communicating their science through the medium of comedy, ably encouraged by our host Sam Avery and the enthusiastic and appreciative crowd. A special thanks to Jessica Bays and the BES Roadies team for organising this event. Without them, Russell the growling grass frog would have remained as a vague idea on the outskirts of my imagination – and now he's alive on YouTube.

If you have a great idea for a Science Slam entry, or an alter-ego you want to channel, get in touch with Jessica to find out more about plans for our Science Slam in Ghent.

Russell the Growling grass frog (aka Kirsten Parris) won the BES Science Slam and triumphantly reprised the performance during the Gala dinner the following night.



FEATURE

BES PHOTOGRAPHIC COMPETITION 2016

Each year we welcome members to enter our ever-popular Photographic Competition. This year we had over 250 images submitted, covering all aspects of ecology. We also introduced an exciting new category, Up Close and Personal, celebrating the intricacy of nature using close up or macro photography.

Our judges had a difficult task, but we were pleased to exhibit the following winners at our Annual Meeting in Liverpool. Congratulations to all our winners and many thanks to our judges!

OVERALL WINNER

David J. Bird
University of the West of England

Cuban Emerald humming bird

The Cuban Emerald humming bird (*Chlorostilbon ricordii*) is found only in Cuba and the Bahamas. This species feeds on many native and cultivated plants that rely on these birds for pollination. They fly so fast that of hundreds of images taken over several weeks, this was the only sharp image!

About Photography...

I remember that my parents were mortified when I spent all my savings on a second-hand Nikon F when I was about 15, but I have been taking photographs ever since. Photography, combined with my interest in natural history developed into a career in teaching and research in animal physiology, ecology and conservation. Now I have retired, I have more time to enjoy photography and I have just achieved my ARPS (Associate of the Royal Photographic Society) for a panel of natural history images taken in Cuba.

About the Image...

I have run field trips to the Isle of Youth, off the coast of Cuba for many years to enable undergraduates to study tropical ecology. The picture of a Cuban Emerald (*Chlorostilbon ricordii*) was taken on the last trip. I noticed that the humming bird would visit the same bush outside

the field station every hour or so, but it was extremely difficult to focus on the bird before it flew off to the next flower. Even when I managed to take a photograph, the bird was usually facing the wrong way (I have many pictures of humming bird bottoms). Out of hundreds of shots, this was the only one where everything came together. It was taken with a Nikon D800 with a 300mm f2.8 lens handheld at 1/1000sec, f8, ISO 360

About my research...

I completed my PhD on lampreys in Western Australia and postdocs at Bath University on fish endocrinology. I recently retired from the University of the West of England, Bristol, where I was involved in fish ecology and the effects of pollution in the Severn Estuary. I have also spent time in Indonesia surveying freshwater fish and I am presently analysing data, collected in Cuba, on the ecophysiology of *Anolis* lizards.





OVERALL RUNNER-UP

David Costantini
Leibniz Institute for Zoo
and Wildlife Research

Chatting

Arctic terns (*Sterna paradisaea*) mate for life. They breed on the ground and both sexes share incubation duties. This photo taken in Svalbard shows that vocal communication between mates is very important to coordinate parental efforts in order to achieve a successful reproduction.

OVERALL STUDENT WINNER

Leejiah Dorward
University of Oxford

You are old, Father William

A *Gynanisa minettii* caterpillar stands out from the thorny bushes it is feeding on in village land around Ruaha National Park, Tanzania. Its bright, pale skin and reflective white spots make it unmissable under torchlight at night.



CATEGORY 1: ECOSYSTEMS AND COMMUNITIES

WINNER

Roberto García Roa
Museo Nacional de Ciencias
Naturales, CSIC

Three-for-one

Trophic cascades form the skeleton of diverse ecosystems. The interactions that shape this ecological balance occur in all type of organisms. This picture illustrates an example of this, in which a mouse hunted by a common barn-owl attracted the attention of multiple wasps.



STUDENT WINNER

Ciara Stafford
University of Manchester

The End

A caterpillar's back has erupted with parasitoid pupae. Meanwhile, it is being systematically punctured by a wasp- around 40 minutes after this was taken, all that was left was a shrunken skin. You can see a drop of haemolymph accumulating on the caterpillar's head. Taken in San José de Payamino, Orellana, Ecuador.

CATEGORY 2: WHOLE ORGANISMS AND POPULATIONS

WINNER

David J. Bird
University of the West of England

Buffy flower bat

A Buffy flower bat (*Erophylla sezekorni*) emerging from a cave in Cuba. Every individual photographed had their tongue sticking out, perhaps to direct their echolocation calls? In other species this function is performed using a nose leaf. To capture the bats in flight required an infrared trigger and multiple flashguns.



STUDENT WINNER

Sandra Angers-Blondin
University of Edinburgh
& Université Laval

In the green shade

This grey heron (*Ardea cinerea*) has found a peaceful green oasis perched in a weeping willow in the Royal Botanic Garden in Edinburgh.





CATEGORY 3: ECOLOGY AND SOCIETY

WINNER

Peter Steward
University of Leeds

Death by a thousand cuts

Lilongwe's rapidly growing population creates a huge demand for fuel wood which has created unsustainable pressure on Dzalanyama Forest, a haven for biodiversity. The forest is also the catchment for Lilongwe's water supply and solutions are urgently needed to address conflicting uses of this natural resource before it is lost.

STUDENT WINNER

Leejiah Dorward
University of Oxford

Collateral Damage

Livestock remains are often poisoned in retaliation for carnivore attacks on livestock around Ruaha National Park in Tanzania. It causes widespread ecological damage by indiscriminately killing a variety of non-target species. Here carcasses of a bateleur eagle and two white-backed vultures await autopsies to discover the type of poison used.



CATEGORY 4: ECOLOGY IN ACTION

WINNER

Dom Cram
University of Cambridge

Anti-poaching in action

Anti-poaching rangers inserted an identifying tag into the horn of his young white rhinoceros bull (*Ceratotherium simum*). Vets and rangers also recorded data about the enormous animal's health and growth. The data collected will help ecologists understand white rhino populations, and how best to combat the threat of poaching.

STUDENT WINNER

Patrick Wright
Vincent Wildlife Trust &
University of Exeter

Bechstein's bat conservation in action

This Bechstein's bat (*Myotis bechsteini*), one of Britain's most elusive mammals, is about to take flight after being caught in a harp trap and receiving a ring on its forearm as part of a PhD project with the Vincent Wildlife Trust and the University of Exeter.





**CATEGORY 5:
UP CLOSE AND PERSONAL**

WINNER

David J. Bird
University of the West of England

Spider and morning dew

The spider, *Agelena labyrinthica*, is commonly found on low vegetation, but it can be difficult to see because it is very sensitive to vibration and quickly withdraws to its tubular retreat when disturbed. This individual was observed early one morning when its platform web was covered with morning dew.

STUDENT WINNER

Ciara Stafford
University of Manchester

Efficiency

A colony of caterpillars methodically makes its way through the most palatable parts of a leaf in the Ecuadorian Amazon. San José de Payamino, Orellana, Ecuador



ENTERING THE COMPETITION

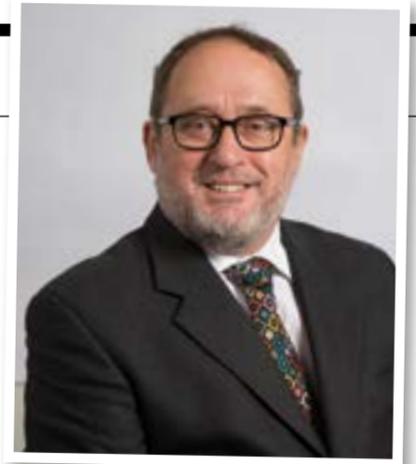
The competition is open for all members to apply and is great way to promote both your photography and the research you are involved in.

The Overall winner wins £750, the overall runner-up wins £250, and the student winner wins £100. We would also like to thank the Oxford University Press and Cambridge University Press for kindly sponsoring £40 worth of book vouchers to category winners and student category winners, respectively.

The next round will open later this year, so watch this space! Further details can be found on the BES website: www.BritishEcologicalSociety.org/Photocomp

FUNDRAISING

**REMEMBER ECOLOGY IN
YOUR WILL – TAKE THE
1% CHALLENGE**



Paul Bower | Fundraising and Development Manager | paul@britishecologicalsociety.org

In the last issue of the Bulletin I promised that we would build on the success and impact of the Parkyn and Jackson legacies by putting in place measures to make it easy for our members to remember ecology in their Will.

You can now start the process and investigate whether leaving part of your estate to the BES is the right option for you by visiting the Membership section of our website and going to the Remember Ecology in Your Will page: www.britishecologicalsociety.org/membership-community/remember-ecology-will/

Here you can learn about the impact that legacies have already made to the lives and careers of ecologists, sometimes with the gift of a relatively small amount of money.

I COULD NOT HAVE ATTENDED INTECOL WITHOUT THE HELP OF THE PARKYN TRAVEL BURSARY WHICH ENABLED ME TO PRESENT MY FIRST PAPER AT AN INTERNATIONAL MEETING AS AN EARLY PHD STUDENT. IT HELPED ME MAKE NEW CONNECTIONS, ACCESS OTHER FUNDING AND NETWORK WITH SOME BRILLIANT PEOPLE. THE BURSARY MADE A TREMENDOUS IMPACT ON MY RESEARCH AND HAD A TRANSFORMATIVE IMPACT ON MY SCIENTIFIC CAREER. THANK YOU TO BES AND OF COURSE THANK YOU TO DR PARKYN.

Dr. Priyadarshini Chakrabarti
University of Calcutta, Kolkata, India

The new section of the website also gives background information on the four main types of bequests that are typically left to charities including a **residuary bequest**. This is a gift of a percentage of your estate following the distribution of specific gifts to your family and payment of any debts or expenses.

We do not offer legal advice or recommend legal practices. The only advice that we do offer is that you should take the advice of a full qualified legal professional when making a Will. With that in mind, we have included links to the Find a Solicitor services of the United Kingdom's three law societies on the website.

We have also created two short forms:

- A template codicil in case you have already made a Will and wish add a gift to BES;
- An entirely non-binding confidential expression of intentions form which will help us keep a record of your wishes and how you would prefer your gift to be spent.

If you decide to make the BES a beneficiary of your Will, we will ensure that you are in control of every aspect of the process. With that in mind, we have created our Legacy Promise and a 12 Point Code of Conduct which includes these three key commitments:

- We will never intrude on your privacy by telephoning you, unless you explicitly ask us to do so and we will never ask you about the size or type of legacy, unless you volunteer that information;
- We will always keep your intentions private, we will keep your personal data safe and we will never pass it on to another organisation or individual;
- We understand that circumstances change and there may be a time where you need to take the BES out of your Will. If you do decide to take us out of your Will you are under no obligation to inform us.

At a time when natural systems are under increasing pressure and the value of evidence is being questioned, it is more important than ever to support ecology and the important work that we do.

That is why we are asking members, and indeed anyone who is passionate about ecology and the importance of scientific research, to consider making a residuary gift of 1% of their estate to help secure the future of our discipline.

For more information talk to:
Paul Bower
Tel. +44 (0)207 685 2537
paul@britishecologicalsociety.org

POLICY

POLICY UPDATE: TACKLING THE CHALLENGES AND OPPORTUNITIES OF BREXIT

Ben Connor | Policy Manager, British Ecological Society
ben@britishecologicalsociety.org



As I write, the Government has just released a simple, two clause Bill that will shape the political and policy landscape in the UK for the rest of this year and many to come.

The European Union (Notification of Withdrawal) Bill empowers the Prime Minister to trigger Article 50 of the Treaty on European Union, and formally start the process of leaving the EU. With the passage of the Bill looking secure, the two-year window for negotiating a new relationship between the UK and the EU could have opened by the time you read this article.

Without doubt, Brexit will dominate our policy work in 2017. The UK's decision to leave the European Union brings about the possibility of the most substantial changes to our environmental policy framework in a generation, whilst also placing British science in a state of profound uncertainty. There are major risks, but also opportunities in this period of change, and it is important that the ecological community makes itself heard by engaging proactively with the debate.

OUR ENGAGEMENT WITH BREXIT IN 2016

We have identified three overarching priorities that have shaped our engagement with Brexit since the referendum: that existing levels of environmental protection are retained or improved; that any legislative changes are informed by the best



People, Politics and the Planet

ecological evidence and that UK science is protected from the potential adverse effects – in terms of funding, collaboration and movement of people – of leaving the EU. Underpinning these priorities is the recognition that global ecological issues demand a collaborative, international response, and that we are, and will remain an inclusive, international society open to all – as demonstrated by our *Ecology Across Borders* joint Annual Meeting this coming December.

Over the last few months we have been working, often in collaboration with others, to promote these messages to decision-makers. Back in July, with the Sibthorp Trust and the Royal Geographical Society (with IBG), we hosted *People, Politics and the Planet: Any Questions*, offering an audience of over 400 people the first post-referendum opportunity to question leading politicians, including Defra Minister George Eustice, on the future of UK environmental

policy post-Brexit. In September, in partnership with the Zoological Society of London, Wildlife and Countryside Link, the Royal Society of Biology and the Campaign for Science and Engineering, we welcomed over 200 attendees, including key policymakers, to hear speakers from BES President Sue Hartley to Sir John Beddington address the challenge of *Making Brexit work for Ecology and Conservation*.

In November, we presented our priorities and concerns directly to Government in a meeting with Robin Walker, Minister for Exiting the European Union within the newly created DExEU, who stated that he was “determined that the UK will maintain our proud record on environmental science and conservation after leaving the EU”. Finally, we submitted extensive evidence to the influential House of Commons Environmental Audit Committee’s inquiry into the future of the natural environment following the referendum, and were called to give oral evidence to the Committee, with Sue Hartley answering MP’s questions on topics ranging from rewilding to land use policy. The Committee’s report, released in January, made extensive use of our evidence and called for a new Environmental Protection Act to maintain current standards.

PLANS FOR 2017

Brexit was never far from people’s lips at our 2016 Annual Meeting, and we held a packed workshop on Monday lunchtime to give members an opportunity to share their views and identify key priorities, challenges and opportunities for the year ahead. Key discussion topics included the chance to develop a better replacement for the Common Agricultural Policy; the need to maintain levels of protection for species and habitats, tackling invasive non-native species and how the UK could establish itself as a world-leader in marine policy. Cross-cutting themes included emphasising opportunities for improved policies, the importance of working collaboratively with other stakeholders, the problems of continued policy uncertainty, and the need to find narratives that speak to people’s values. You can read the

workshop report on our website at www.britishecologicalsociety.org/brexit-workshop.

The results of the workshop will help to inform the work of our new Brexit Policy Working Group, made up of both Policy Committee representatives and other members. The Group will give extra support to the External Affairs Team as we tackle the challenges and opportunities of Brexit, and will be developing a work plan during early 2017, including the production of a series of briefing papers on key issues. There will be a number of opportunities for members to get involved in this work, so please get in touch with any ideas – we are always keen to hear from you, and it is vital that we represent the views and expertise of our diverse range of members as effectively as possible.

We will also continue to build relationships with other organisations to amplify our messages, and will be working on joint projects with other environmental learned societies and professional bodies, including the Chartered Institute of Ecology and Environmental Management, the Institution of Environmental Sciences

and the Landscape Institute, as well as pan-science organisations such as the Campaign for Science and Engineering.

AN UNCERTAIN YEAR AHEAD?

As the process of leaving the European Union starts to unfold, a huge number of questions for the environment and science remain unanswered. Will the Government’s “Great Repeal Bill” effectively transfer European environmental legislation into UK law? How can we achieve the Prime Minister’s aspiration of continued collaboration with European partners on major science initiatives outside the single market? What will the replacement for the Common Agricultural Policy look like? Addressing all of these questions requires the input of ecologists and ecological science. In these times of change, it is vital that we seize the opportunity to inform the debate, and I look forward to working with members in 2017 to do just that.

To keep up to date with our work on Brexit during 2017, visit www.britishecologicalsociety.org/brexit and follow us on Twitter @BESPolicy.



Representatives from the BES and other science and environment organizations meet Minister Robin Walker at the Zoological Society of London

GRANTS

SUPPORTING ECOLOGY IN AFRICA



Meeting local stakeholders to discuss utilisation and conservation of trees

Markus Eichhorn | University of Nottingham, UK

Paul Bower | Fundraising and Development Manager, British Ecological Society

paul@britishecologicalsociety.org

Most ecologists can trace the beginning of our careers to a small grant that allowed us to make the first steps towards independent research. It's easy to forget, when you're praying to the grant fairy for funds to expand your group, that the most important grant you ever received was probably only a few thousand pounds. Perhaps, like me, it was from the BES. Perhaps, like me, you also spent it on travelling overseas to work with colleagues from another country. Those of us from the UK, or other developed countries, will know that there are plenty of small pots of funding around for those who just need a plane ticket and a few pieces of equipment.

Such opportunities are not as readily available to ecologists in the developing world. Ecologists there have already overcome a large number of hurdles: access to higher education and research infrastructure, lack of equipment, political and social contexts that are often hostile to ecological agendas (or even the syllabus), and the challenge of finding a scholarship or paid position. Cash for collecting data, buying equipment, paying research assistants or travelling to remote field sites is hard to find. Ironically, for a young researcher in Maputo or Mombasa, the field can effectively be further away than it is for a colleague in a First World university. African ecologists continue to be grossly under-represented, even in the research published from their own continent.

For this reason, the net benefit of investing in an early-career researcher in the developing world – what economists would call the marginal gain – is much greater than elsewhere. That first step towards an independent research project, a publication, and recognition for your skills and experience, is harder to obtain.

The BES has run the *Ecologists in Africa* programme since 1998 to provide this first step for our colleagues in developing African countries. We choose to concentrate on Africa because, by doing so, we can focus our resources more effectively. Every year the Society invests £63,000 in grants to African ecologists, but even with this geographical restriction, we are overwhelmed by demand from passionate, talented African ecologists. The number of applications has almost doubled in three years. In the last funding cycle we received over 100 applications but were only able to fund 6% of them, while 20% scored over 80% in their reviewer assessment, and were likely to be fundable.

Applicants must be a scientist and citizen of an African country that is categorised as either a low or lower-middle income economy by the World Bank. They must have at least a Masters-level qualification, and be working for a university or research institution in Africa. Applicants can request up to £8000 for research within Africa, plus a further £2000 for travel to make wider connections and use facilities. Successful applicants also receive two years of free membership.

We welcome donations from members to this well-established programme, which are guaranteed to make a difference to the careers of fellow ecologists in Africa. You could consider making a donation or leaving a gift in your Will to the BES and designate it to our work in Africa. We hope to introduce the ability to make recurring donations as part of our membership, but for now our current donations page allows you to donate up to £500 or as little as £5 to this or any of our four major funding streams: www.britishecologicalsociety.org/membership-community/donate-now

If you have contacts with a trust, foundation or corporate body who are committed to building capacity in Africa and might like to partner with us, then please get in touch. This would help us help us make more grants available to those African ecologists who submit high quality proposals but with current limitations on funding would not quite make the cut. To discuss legacies or external links please contact:

Paul Bower
paul@britishecologicalsociety.org
+ 44(0)20 7685 2500

We are working towards a world inspired, informed and influenced by ecology. Help us to make that possible in Africa, and to leave a legacy of independent African ecologists – and colleagues.

MEASURING THE VALUE OF AQUATIC ECOSYSTEMS IN NIGERIA

The grant provided me with the opportunity to carry out my own ecological studies, and in addition I was able to support my under-graduate student in his final year on the project. I also received travel funds enabling me to network and develop valuable skills with peers in the USA, which would not have been possible without support from the BES.

Prince Emeka Ndimele

Nigeria is a rapidly-developing country, with major growth over recent decades in both the population and economy. This is leading to ever-increasing pressures on aquatic ecosystems in the Niger delta, a region of high biodiversity, as well as one that is rich in mineral resources. Local people depend heavily on aquatic habitats for their livelihoods, but poor regulation has often led to their contamination with crude oil and heavy metals.

This project collated information on the distribution of flora and fauna in three localities within the delta region, along with their uses and economic values. Pollution levels were monitored monthly for a year. Combined with mapping, this allowed for quantification of the economic impacts of oil spills, and therefore the appropriate compensation that local communities should receive when their livelihoods are impacted by the activities of multinational companies. The end result was a management tool, enabling stakeholders and decision-makers to balance economic development with conservation and sustainable use of aquatic resources. This was the first attempt to map the value of such ecosystem services in this region.

In the process, there was a flow of information from researchers to the local communities. For example, recognition of the values of mangrove ecosystems led to a reduction in their harvesting for wood fuel. Awareness of the impacts of pollution, and the costs that local communities bear, incentivised them to report and document pollution incidents.



SUSTAINABLE TIMBER USE IN LIMPOPO

Given the field based nature of ecological studies, much of the expense is in excursions. This grant enabled me to carry out my field work by catering for almost all my travel needs. The grant also enabled me to procure equipment, collaborate with spatial ecologists who deal with geographic data, and to hold meetings with local stakeholders.

Dowo Gregory (edited from original)

A grant in 2015 to Dowo Gregory, a PhD student at the University of Zimbabwe, supported a project examining resource utilisation in the Great Limpopo Transfrontier Conservation Area. Transfrontier conservation areas present particular challenges for management due to the many agents involved and their conflicting interests. Discussions can often exclude the people who live within them, depend on them for their livelihoods, and have the greatest role to play in their protection and maintenance.

Mopane woodlands in this region contain a high diversity of trees, providing a range of non-timber forest products including fruits, fibre, firewood and traditional medicines. The most pressing concern at present, however, is a shortage of timber for construction. Communities at the edges of national parks often find their harvesting rights have been curtailed, leading to illegal extraction and interference with conservation objectives. Finding a sustainable solution to this problem requires integration of the needs of locals with the goals of government agencies. Doing so would strengthen cooperation between all stakeholders and thereby the viability of the park as a whole.

This project examined use of hardwoods for firewood and construction poles, creating an agent-based model of the socio-ecological system. From local people, the project collated records of personal experience of the woodlands, their many values, and how they had changed in the recent past. Through quantifying rates of wood extraction and current biomass, the project projected harvesting rates and their impacts for communities surrounding the national park.

The research combined participatory methods, including local communities at all stages, with sophisticated modelling tools. This type of interdisciplinary study lies at the forefront of modern conservation research, utilising best scientific practice whilst ensuring local ownership of the process and findings. The impacts will be felt not only through academic publication, but in the influence on Zimbabwe's new forestry policy, and in the information provided directly to local residents and stakeholders.

ENGAGEMENT AND OUTREACH

ENGAGING WITH THE BES



Karen Bacon uses Pollinator Top Trumps to engage Year 13 students with ecological ideas

Joanne Griffin | PhD student | University of Liverpool, UK

Having assembled from various locations around the UK, warming up with hot drinks in a pokey central London Starbucks, we play our favourite game: 'Who's Poo?' We busk a little differently to most people. When you check out the next BES Annual Meeting (you know you want to), be sure to keep your eyes peeled for it. It will change your life.

As a BES Roadie, I've received public engagement training, helped develop busking activities and had the opportunity to attend music festivals and science festivals across the country. The goal being to better my science communication skills and inform people outside the world of science on diverse matters such as ecology, and the research I conduct for my PhD.

These activities are great for engaging people and spreading the word of ecology, however, there are communities that we are still struggling to reach. As stated in the British Ecological Society report 'Making Ecology for All', members of BAME (Black, Asian and Minority Ethnic) community are significantly less likely to be in a STEM profession when compared to White counterparts. In 2010/11, BAME individuals made up 16.7% of all biological science students. This is an underrepresentation when compared to both the total for all STEM subjects, 20.1%, and for all subjects, 18.4%. There are no excuses for this gap; in the 21st century I am appalled that recent figures published by the Higher Education Statistics Agency reveal that no British University is employing a Black academic in a senior management role. This must change.



Joanne Griffin and Arron Watson playing 'Whose Poo?' in a Starbucks (other coffee shops are available)

Now back to our London 'Poo Game' trip. The Windsor Fellowship has collaborated with the Royal Society to provide a mentoring scheme for Year 13 Black students living or studying in Greater London, who are studying STEM subjects. This is where we, the BES Roadies, come into the picture. We were given a one hour slot to communicate ecology to the students. Jessica opened the session with a brief introduction to the BES and the importance of science communication. We then split the cohort into four groups and took one group each to demonstrate our busking activities. Karen got to play 'Pollinator Top Trumps', Arron had 'Who's Poo?' Jessica was on the 'Mushroom Game' and I demonstrated the use of taxonomic keys using the 'Festival Animals' busk that we took to Wychwood festival back in June. The students rotated around the different activities before reconvening in the seminar room where I then gave a short talk on my research.

I am used to communicating my work to academics back in my University department and at conferences. Entertaining a room of A-level students, however, was a pretty terrifying prospect. When I asked if anyone had heard of the term 'symbiosis' some students nodded their head with a vague look of recollection whilst others shook their heads. Using examples such as corals, the bobtail squid, nitrogen-fixing bacteria in plant roots and deep sea tube worms, I got the students on board with the concept. Explaining the use of fruit flies and their symbiont to study host-shifts was a little trickier, I was nervous that this was where I might lose them. To my surprise, I was bombarded with questions. From the development and maintenance of symbioses and coevolution to the nitty gritty techniques I used to achieve my work and collect data, these students were the most inquisitive and enthusiastic audience I have ever had. It was an enormous pleasure to spend time with them. If I haven't persuaded them that parasites and mutualists are just about the coolest things to study, then at least they will have left the session with a broader understanding of the term ecology. I hope that we will continue to engage with a diverse range of communities in the BES and look forward to reuniting with the Roadies for more science communication.

If you would like to become involved with the BES Roadies, please see upcoming public engagement and training events on our website: www.britishecologicalsociety.org/engagement

ECOLOGICAL CONTINUITY TRUST

RAINDROP HAS LANDED!



Jessica Bays | BES Engagement Officer | jessica@britishecologicalsociety.org

We are thrilled to have established a new long-term experiment (LTE), at Wytham, Oxfordshire. RainDrop a new RAINfall and DROught Platform, successfully completed its first field season in 2016 and has been established in partnership with Oxford University (Andy Hector), the Open University (David Gowing), the Patsy Wood Trust and the British Ecological Society.

The development of a new LTE, capable of investigating multiple drivers of change simultaneously, has been on the agenda of the ECT for some time, and it is fantastic to see this objective realised. Using state-of-the-art equipment and cutting edge knowledge the platform will investigate grassland resilience to drought.

Through the installation of rainshelters measuring 5m x 5m RainDrop imposes treatments of +50% and -50% rainfall over the growing season. These treatments are complemented by procedural controls (with rainshelters that allow unimpeded rainfall) and unroofed ambient controls. These are each replicated five times across the platform and the design currently has

capacity to support additional and future experimental use.

RainDrop adheres to the Drought Net experimental protocol, thus contributing to a global network of sites assessing terrestrial ecosystem sensitivity to drought. Adjacent to the site is an Environmental Change Network monitoring site, which has been collecting meteorological data since 1992.

Having now completed its first field season we are now inviting researchers and institutions to consider how they might use the site to progress their scientific studies. Please get in touch to discuss potential projects and opportunities for collaboration.

The Ecological Continuity Trust is a registered charity formed in 2008 by esteemed members of the British Ecological Society.

We work to secure long-term field experiments for the use of future generations. Visit our website to find out more: EcologicalContinuityTrust.org, or contact Jessica our Engagement Officer (jessica@britishecologicalsociety.org).

ECT COMPETITION: CAN YOU THINK LONG-TERM?

We want to see more researchers using the UK's long-term experiments (LTE). To encourage the next generation of scientists to think about how they might use these resources in their own work, we are hosting a PhD student and early career researcher competition.

Sponsored by *Global Change Biology*, entries are welcome from any country in the world. Your entry will be judged by a panel of esteemed ecologists, with the winners in each category to win £100 cash.

To enter the competition, you need to submit a short research proposal which incorporates the use of a long-term experiment (6 years or longer). The experiment in the proposal may be an existing LTE, or one that you would like to see established.

One of the new rainshelters at the long-term experiment site at Wytham, Oxfordshire



SPECIAL INTEREST GROUP NEWS



MOVEMENT ECOLOGY GROUP

Secretary: Luca Borger

Other committee members:
Samantha Patrick; Theoni Photopoulou; Jonathan Potts; Garrett Street; Marie Auger-Méthé; Hawthorne Beyer; Hamish Campbell @BES_Move_SIG

There's a new SIG on the block! At the last BES Annual Meeting in Liverpool we launched a new Special Interest Group on Movement Ecology with a packed reception event. Movement Ecology is a rather wide-ranging and cross-disciplinary field, comprising all aspects of organismal spatial movements, from bacteria, to fungi, to seeds, to large animals, and is well represented with publications in all BES journals. We are a group of biologists, ecologists and mathematicians and our aim with the SIG is to act as a central forum to attract researchers, from within and outside the discipline of ecology and biosciences, and provide opportunities for discussions. For example, we will organise workshops to clarify conceptual and methodological misconceptions of general interest, or guide the development of novel research, especially interdisciplinary research combining technical, computational, and theoretical developments. In addition to the BES SIG site, we have set up a Facebook page (<https://www.facebook.com/BESmovementecology/>) and a Twitter account (@BES_Move_SIG) – see also the hashtag #movePubs for movement-related publications. An email list and a Blog will follow soon, which we hope will function to stimulate discussions and debates – everyone will be welcome to suggest and contribute posts! We are planning to organize a workshop later this year, so stay tuned. In the meantime, we are looking for interested students (undergraduate and graduate) to join our team, so do get in touch with us.



Luca Borger



Garrett Street



Samantha Patrick



Marie Auger-Méthé



Theoni Photopoulou



Hawthorne Beyer



Jonathan Potts



Hamish Campbell



AQUATIC ECOLOGY GROUP

Lee Brown, Nessa O'Connor and Becca Kordas
aquatic@britishecologicalsociety.org
@BES_aquaeco

After an active and successful programme last year, we are planning a myriad of new and exciting activities in 2017. As of January 2017, the BES Aquatic Group committee has a new member. Michelle C. Jackson from Imperial College London has started as our new SIG treasurer. Welcome Michelle!

Announcing a new BESAG Early Career Researcher Award

The British Ecological Society Aquatic Group (BESAG) will award this prize to one distinguished early career scientist at its annual meeting. The award will be made in recognition of excellent research, as demonstrated by first-authored publications in internationally relevant journals, to a scientist who is no more than 8 years after the start of their PhD and working on a relevant area of marine and/or freshwater ecosystem science.

The winner will receive the award at the BESAG annual meeting which is usually held between July-September in London. They will be invited to present their research in a keynote speech as part of the annual meeting. Conference fees, travel and accommodation expenses are covered, and the winner will receive a commemorative plaque.

Self-applications will not be accepted; nominations (of no more than 1 side A4) should be made by colleagues or collaborators. It is expected that the nominator will discuss the application with the nominee, in order to provide a summary CV (maximum 1 side A4) giving details relevant to the award criteria above. Nominees must be members of the British Ecological Society.

Please email nominations for the 2017 round to Lee Brown (l.brown@leeds.ac.uk) before June 1st 2017.

BES AQUATIC GROUP ANNUAL MEETING

14TH – 15TH SEPTEMBER 2017

CHARLES DARWIN HOUSE, LONDON

Thursday 14th

Early-Career Researcher workshop: Statistic & Networking

This workshop is designed for people who want to learn more statistical analysis with R. Time will be set aside for discussion during the meeting and there will also be ample opportunity for networking and a social in the evening.

Friday 15th

Advances in Aquatic Ecology

Confirmed keynote speaker: Mary O'Connor (CAD)

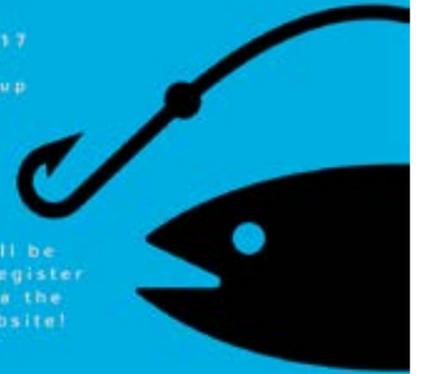
Leading aquatic ecologists will present their most recent findings and outline their priorities for future research. Students and early-career researchers are encouraged to present posters and give a "highlight talk" at the meeting.

 @BES_AquaEco #BESAG2017
 BES - Aquatic Ecology Group



#BESAquatic

You will be able to register soon via the BES website!



FORTHCOMING EVENTS

Join us for the *BES Aquatic Group Annual Meeting* on 14th and 15th of September 2017, at Charles Darwin House in London. Registration coming soon!

The BES Aquatic Ecology group is also pleased to announce another *Temporary Stream Workshop* at Nottingham Trent University, Clifton Campus. The workshop will take place on Thursday April 6 2017 and you can register for the meeting at this Eventbrite website:

<https://www.eventbrite.co.uk/e/besag-meeting-on-temporary-rivers-and-streams-2017-tickets-31193440420>

The hashtag associated with the event is #BESAG_NTU

The meeting will feature an invited keynote presentation from Dr Thibault Datry (IRSTEA, Lyon, France), whose research focuses on intermittent river ecology, with a particular emphasis on how flow intermittence influences aquatic and terrestrial community and metacommunity dynamics at multiple spatial and temporal scales. He chairs the EU COST Action *Science and*

Management of Intermittent Rivers and Ephemeral Streams (SMIRES) and previously led the IRBAS project on biodiversity in intermittent rivers.

Our second keynote speaker is Dr Petr Paril (Masaryk University, Brno, Czech Republic). Petr will present the BIODROUGHT project, an extensive Central European research initiative using taxonomic and functional aspects of aquatic macroinvertebrate communities as bioindicators of recent dry phases in temporary rivers and streams. The BIODROUGHT method has developed metrics based on perennial and intermittent bioindicator taxa, selected species traits, and community composition to indicate the occurrence and extent of dry phases; these metrics provide useful tools for the practical management of freshwater resources.

CALL FOR CONTRIBUTIONS

Oral papers and posters

Those interested in contributing a paper or poster should email Judy England (judy.england@environment-agency.gov.uk) by Friday 28th February 2017 with a 200-word abstract, including the title and the names and institutions of the contributing authors.

RECENT EVENTS

BES Annual Meeting in Liverpool

The BES 2016 Annual Meeting programme was crammed with talks in aquatic ecology, starting with the first plenary talk on fisheries and marine food webs. Fisheries ecology was a central topic of the whole meeting. The first thematic topic session on sustainable fisheries had a lot of very good speakers, including Julia Blanchard who received the BES Founders' Prize this year. On Monday evening a large group of aquatic ecologists met in the pub The Baltic Fleet. We would like to thank to everyone who joined us and to congratulate the team "The Swimming Lamb Bananas" for winning our great pub quiz. The quiz was organised by our ECR representative Billy Hunter.

The second day of the meeting included sessions in both marine and freshwater ecology. The first session on Management, Conservation and Ecosystems Services included presentations about invasive species, ecological resilience, fisheries and even ducks. In the second session on Methods, Monitoring and Models we learned about trophic structure in marine ecosystems, the impacts of flow on stream macroinvertebrates, and how the loss of marine fauna can alter carbon sequestration in coastal sediments. It was also refreshing to hear about the diverse uses of environmental DNA. The thematic topic sessions on Disturbances and Stressors and on Multiple Stressors and Ecological Surprises dominated the final day of the meeting. Overall, we left the BES Annual Meeting with new ideas, new friends and excellent contacts. Thanks to all the amazing speakers we had the pleasure to meet during the meeting!

OPPORTUNITIES TO GET INVOLVED

If you would like to suggest themes or topics for discussion for future meetings please contact Nessa O'Connor (n.oconnor@qub.ac.uk) or Lee Brown (l.brown@leeds.ac.uk). The BESAG is an active network of aquatic ecologists whose interests tend to overlap other SIGs and we are keen to develop cross-cutting activities. BESAG is growing and so is our following on social networks - we

now have more than 1800 followers on Twitter (@BES_AquaEco)!

For the latest news, future meetings and job advertisements you can follow us on Twitter: @BES_AquaEco (#Thursdayjobday), on Facebook: BES-Aquatic Ecology Group and you can join our mailing list by emailing Ronni (v.r.edmonds-brown@herts.ac.uk). You can also find us on the BES website in "Membership & Community", "Special Interest Group".

PARASITES & PATHOGENS GROUP

Bethany Levick
Parasites@britishecologicalsociety.org

The BES Annual Meeting at the end of 2016 brought together individuals and research from across the broad spectrum of disease ecology, featuring 2 thematic topics ("Shortening the hyphen in eco-immunology" and "Worlds within worlds: Host-microbe interactions in nature, health, and agriculture"), and many fantastic talks and posters spread throughout the programme. A body of excellent scientific content was shared, with research ranging from insect symbionts to wildlife pathogens, with speakers from across the whole career spectrum.

Great conversation and discussion followed, with many people joining us for our annual social event. For the first time this year we shared our social with the Plants, Soils and Ecosystems SIG as well as the Microbial Ecology SIG. With a fantastic turn out, we enjoyed an evening of good food, beer and cross-SIG discussion tucked away in the Black Lodge Brewery.

In another first, this year the SIG hosted a public outreach event at the FACT cinema in Liverpool. A mixture of ecologists and members of the public came together for the sell out event. A screening of *The Thing* was opened with a fascinating introduction on the real parasites and pathogens that inspired it by Dr Susan Withenshaw of the University of Liverpool. Many people joined us from outside the conference, who took the opportunity to start some great conversations with Susan about parasites, and the "science of the movies". One attendee was even inspired to put on their own event: a screening of *Die Hard* with an introductory talk on Information Security. The SIG would love to run a similar event again, so ideas for parasite-inspired films on a postcard please!

CITIZEN SCIENCE GROUP

Co-Secretaries Helen Roy and Michael Pocock
citizenscience@britishecologicalsociety.org

Coming up in 2017 we have a range of events building on the success of the past few years. More information on all these will be circulated via the JISCmail group. The JISCmail group is free for anyone to join to hear about citizen science events and projects (from the BES and elsewhere) and begin discussions - in order to subscribe go to www.jiscmail.ac.uk and search for BES-CITIZENSCIENCE.

CITIZEN SCIENCE 'RESEARCH DERBY' (AKA HACKATHON)

25 - 27 May, Oxford, UK
(provisional date)

FreshWater Watch is an Earthwatch global citizen science project which has so far collected over 17,000 data on water quality across more than 30 cities (<https://freshwaterwatch.thewaterhub.org/>). If you are an early career researcher (<10 years post PhD) with an interest in citizen science and a background in freshwater ecosystems then you may wish to attend the FreshWater Watch 'Research Derby'. The Research Derby (or hackathon) is a 24 hour 'pressure-cooker' style research event whereby the participants are i) introduced to the dataset and theme, ii) brainstorm data sources and complimentary data sets and, iii) are then split into groups to focus in on a research avenue with the aim of presenting preliminary findings in a paper format at the end of the 24 hour period. The Derby will take place in Oxford, with a provisional date set for the 25th to 27th May 2017 (accommodation provided). Anticipated cost to attend will be £50 to non BES members and £25 to members. Numbers will be limited to 24 participants. To register your interest or to ask any questions, please email Ian Thornhill (ithornhill@earthwatch.org.uk).

CONNECTING WITH THE CROWD

16 June, London, UK
(provisional date)

Crowdsourcing projects and platforms abound, involving over one million citizen scientists in the analysis or interpretation of images and data online. This conference will showcase the latest tools, technologies and approaches available to engage and collaborate with diverse audiences online. We will share lessons learned, and to explore collaborations with social researchers and how crowdsourcing can impact ecology. This one-day conference will follow the 'Constructing Scientific Communities' dissemination event. *Constructing Scientific Communities: Citizen Science in the 19th and 21st Centuries* is an Arts and Humanities Research Council funded programme which explored the

evolving interactions and collaborations between so-called 'amateur' and professional scientists. More details will be announced in due course.

DISCOVER 'LOST WOODS AND SHADOWS' IN THE PEAK DISTRICT

Summer 2017, Peak District, UK

This event is to celebrate and to share ideas on a citizen science project, running for 3 years so far, discovering 'Shadow Woods - a search for lost landscapes' in the Peak National Park. The implications of this project for understanding past and future woodland and forest landscapes are far-reaching and there are links across the UK and elsewhere in Europe. This will be a celebratory event with 1) workshops to recruit & train community science volunteers, 2) work with citizen science volunteers to help close the information gaps, 3) completion and update of the data-based species distribution maps and to evaluate using Ellenberg Indicator values, and 4) a project report with interpretation and management recommendations for stakeholders, an education pack, flier, key cards and an app. and more. For more details and booking: <http://www.ukeconet.org> Email: info@hallamec.plus.com

LEARNING THE SCIENCE FROM THE CITIZENS

Autumn 2017, Newcastle

This is a one day workshop turned upside-down: all the talks and workshops are decided by, focused on and run by citizen scientists. This is an opportunity to learn about how citizen science is perceived, and why people choose (or not!) to get involved. Rather than focusing on surveys, check-boxes and interviews, we hope to work collaboratively with active citizen scientists from across a range of projects, and learn together how we can improve both the experience and the science for future projects. We are looking for as many citizen scientists and organisations to be involved as possible, so please contact hannah.grist@sams.ac.uk for more information. We have a number of partially- or fully-funded places for citizen scientists to get involved.



LOOKING FOR A JOB IN AQUATIC ECOLOGY

#Job, #Postdoc, #PHD, #Internship... we give you the freshest job offers in marine & freshwater ecology every Thursday at 11am.

@BES_AquaECO #Thursdayjobday

Tag us to share your job offers



MICROBIAL ECOLOGY GROUP

Co-Secretaries Rachael Antwis and Xavier Harrison
Microbial@britishecologicalsociety.org
@BES_Microbial

Now we've found our feet as a special interest group, 2017 is set to be a busy and exciting year for the Microbial Ecology SIG!

We have joined up with the highly successful Pint of Science public engagement forum to showcase some of the best microbial ecology research being conducted nationwide. On Wednesday 17th May we will hold simultaneous events in four cities in the UK, including **Cambridge** with Professor Peter Convey from the British Antarctic Survey speaking about microbes in extreme environments, Dr. Otti Croze from the University of Cambridge explaining how swimming microbes source nutrients and find mutualistic partners, and Dr. Ellen Nisbet, also from the University of Cambridge, talking about using the remnant chloroplast in *Plasmodium* as a drug target. In **Birmingham**, we will hear talks from Dr. Tim Overton (University of Birmingham) about microbes in polymer production and recycling, and Professor Laura Piddock (University of Birmingham) discussing antimicrobial resistance. In **Manchester**, speakers include Dr. Jenny Rowntree (Manchester Metropolitan University) talking about soil/ plant microbial interactions, Dr. Chloe James (University of Salford) discussing the microbial ecology of chicken farms, and Professor Jon Lloyd (University of Manchester) explaining his work on the bioremediation of nuclear waste. In our final city of **Edinburgh**, Sarah Heath from the University of Edinburgh will talk about the little-known viruses and algae in the oceans, and Dr. Tony Gutierrez (Herriot Watt University) will explain his work on oil bioremediation. We will also have an exciting microbes-based quiz in all cities! If you are interested in coming along, please book tickets directly through the Pint

of Science website (<http://pintofscience.com>).

Our more academic events this year include a two-day symposium on *Microbial Pathogens of Plants and Animals* at Charles Darwin House, run jointly with Plants, Soils, and Ecosystems SIG, and the Parasites and Pathogens SIG. We will also host a Methods Workshop for postgraduate and early career researchers to learn how to analyse large datasets associated with microbial ecology studies. This will be run in conjunction with the Quantitative Ecology SIG, and as part of this we will be producing a Microbial Ecology Virtual Issue with the *BES Methods in Ecology and Evolution* journal.

We are also currently discussing other events tied in with other BES SIGs, and we are of course open to suggestions from our members and non-members alike (but why not join us?!). Please feel free to drop us an email at microbial-sig@britishecologicalsociety.org if you'd like to discuss events or ideas that would be useful to you and other members.



CONSERVATION ECOLOGY GROUP

Nathalie Pettorelli
nathalie.pettorelli@ioz.ac.uk
@BESConservation

ANNUAL MEETING

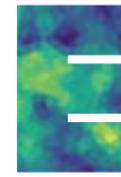
We kicked off the 2016 Annual Meeting with a social mixer- thank you to the new members who signed up and stopped by for a chat! The springboard session, co-hosted by the Conservation Ecology, Citizen Science and Agricultural Ecology SIGs, was a hit. Members from each SIG formed into four teams and, over a beer or two, designed an event that they then pitched to the other teams before votes were cast. The lunchtime early careers event went also down well. Guest speakers Juliet Vickery (RSPC), Mike Morecroft (Natural England), Camille Parmesan (University of Plymouth) and Ali Birkett (Lancaster University) gave potted histories

of their careers before answering questions from the audience. A couple of standout points included: PhDs aren't the only route to a career in conservation- experience counts for so much; and apply for jobs even if you don't meet all the criteria, if you meet some-give it a go!

COMING UP

Starting in February there will be a two-stage consultation, "What's the point of conservation science?", at the University of Brighton. The first meeting (February 1 and 2) will be an opportunity for conservation practitioners to identify what evidence they want and need and to identify research priorities. The framework of practitioner wants and needs mapped out at the initial meeting will then be presented at a second workshop held later in 2017 (date TBA) for both academics and practitioners. Outputs from the first meeting will form the basis of discussions during the second, to hone, enhance, clarify and take forward key issues. Following both consultations, a new practical guide will be published covering all aspects of integrating science into conservation action. For further information and to book please contact the event organisers at Mark@ert-conservation.co.uk

On March 3, PhD students and post-docs are then invited to attend "Establishing a career in conservation science", a BES/ZSL early careers event to be held at London Zoo. Through a combination of talks and activities, attendees will receive advice and training on a range of topics including funding opportunities, interviews, publication and knowledge dissemination as well as guidance on career paths outside of academia. Sessions will be facilitated by the great and the good from DICE, UCL, BES and ZSL. Tickets for BES/ZSL members and students are £15 (£25 full price). To book your place, please email scientific.events@zsl.org



QUANTITATIVE ECOLOGY GROUP

Nick Goulding
quantitative@britishecologicalsociety.org
@BES_QE_SIG

The SIG hosted two events in the latter half of 2016. The first was a workshop on point process models at the Statistical Ecology Conference in Seattle in July. The workshop brought together researchers working on different aspects of point process models to identify key areas of research and kick-start collaborations to work on them. You can find out more about ecological point processes and what we covered in the meeting report on our SIG blog (link below). The second was a one-day meeting on the challenges and opportunities of analysing citizen science data, held jointly with the Royal Statistical Society and the International Biometric Society in Cambridge in October. This meeting was well attended by a mix of statisticians, ecologists and conservation practitioners, with plans to begin a forum to continue the discussion.

As ever, we had a great time at the 2016 Annual meeting in Liverpool, where we ran several events. On the Sunday we held a pre-conference workshop jointly with *Methods in Ecology and Evolution* and the Macroecology SIG on best practices for code archiving. The event was well attended and featured break-out sessions on Git/GitHub (run by Tamora James), reproducible research in R (Laura Graham) and code publication and citation (Mike Croucher). These were followed by a discussion on the way forward for code archiving in journals. Dominic Bennett ran a Wikithon for our Quantitative Ecology Documentation site and plenty of new documentation and tutorials were begun in this session. If you would like to contribute, please visit <http://qedoc.wikidot.com>. Finally, we had our joint mixer with the Macroecology SIG, which was so well attended that the bar tab ran out within an hour!

In the coming year the SIG is co-organising four events:

- Another expert collaboration workshop titled *Correlative & demographic SDMs: reconciling theory to support decisions*, run in collaboration with ARC-CEED and held 27th-31st March at The University of Melbourne.
- A joint workshop with the Agricultural SIG: *Data integration in R* on 4th May 2017 at Somerville College, Oxford
- A methods workshop on *Analysing next-gen sequencing data for microbiome studies*, run jointly with the Microbial Ecology SIG in June 2017 in Cambridge
- Sponsorship of one of the BES's 2017 symposia: *The Macroecology of Alien Species*, 25-26 July 2017, Durham University

More details of each of these events will be posted on the BES website - keep an eye on our social media channels for updates. We're always keen to hear suggestions for future meetings, or where we can sponsor meetings planned by other groups. If you have any requests of ideas of ecological topics with a quantitative bent, please get in touch! (contact details below). We recently welcomed Rob Salguero-Gómez and Tom August to the SIG organizing committee. If you'd like to be more involved in the SIG too, please drop us a line!

You can get information on upcoming events, news on all things quantitative, and get in contact with the SIG committee via twitter (@bes_qe_sig), facebook (facebook.com/besquantitativeecology), on our blog (besquantitativeecology.wordpress.com), or via email (quantitative@britishecologicalsociety.org). Please do get in touch!



PLANTS SOILS ECOSYSTEMS

Mike Whitfield (@mgwhitfield)
@BESPlantSoilEco

Plants-Soils-Ecosystems is a special interest group for people interested in plant-soil interactions, plant and soil ecology, and biogeochemistry.

WINTER ECOLOGY MEETING

6 – 7 April 2017, Lancaster University, UK

Winter is coming. We'll be descending on Lancaster, north of the wall, for a spring meeting with a decidedly chilly theme. This meeting will be all about the challenges and opportunities that winter presents in our research. We're interested in cold climate research (arctic tundra, alpine, etc.) as well as seasonal research in temperate landscapes, including shoulder seasons – an aspect that is often overlooked. Our keynote speaker will be Gareth Phoenix (@GarethPhoenix), from the University of Sheffield. The outcome of the meeting will be a perspectives or opinion piece, and attendees will have the opportunity to be co-authors.

By the time you read this, the deadline for submitting abstracts will have passed, but if you're quick you can still register to attend the meeting! Check out our website, Twitter feed or Facebook page for more information (see below).

PSE AT BES2016

We had a great time at last year's Annual Meeting. Have a look at our Storify for the highlights: storify.com/BESPlantSoilEco/plants-soils-ecosystems-at-bes2016

Your SIG committee:

- Ellen Fry (Secretary) (ellen.fry@manchester.ac.uk)
- Mike Whitfield (Deputy Secretary) (mgwhitfield@gmail.com)
- Tom Crowther
- Rosanne Broyd

- Jessica Clayton
- Franciska de Vries
- Michael van Nuland

PLANTS-SOILS-ECOSYSTEMS BULLETIN

Plants-Soils-Ecosystems communicates interesting opportunities in the worlds of plant-soil interactions, ecology and biogeochemistry to its members via social media and the mailing list. We also compile a bi-monthly *Bulletin*, featuring news, jobs and studentships hand-picked by committee member Jessica Clayton. To receive the *Bulletin*, sign up to our mailing list – details below.

JOIN US!

Sign up to our mailing list by sending an email to listerv@jiscmail.ac.uk; subject: BLANK; message: SUBSCRIBE PLANT-SOIL-ECO
Firstname Lastname.

Follow us on Twitter @BESPlantSoilEco, like us on Facebook www.facebook.com/BESplantssoilsecosystems and check out our website, including the blog and journal club: besplantsoileco.wordpress.com.



PEATLANDS RESEARCH GROUP

Professor Ian Rotherham
Peatlands@britishecologicalsociety.org
@BES_Peat

Following a very hectic 2016, the Peatlands SIG and partners offer a full range of events and activities for 2017. We closed with a two-day seminar on peatlands, their exploitation for energy and the implications for understanding climate change and mitigation issues. This will be more fully reported at a future date.

UPCOMING EVENTS:

Wood Meadows & Pastures: May 23-24 2017. A 2-day conference in Sheffield, as part of the '*Wilder Visions*' programme [see **Forest Ecology SIG** – for full details]. With partners including South Yorkshire Biodiversity Research Group Ancient Tree Forum, Woodland Trust, Natural England, Hagge Wood Trust, JBA Consulting and others the conference will consider the potential of wood meadows and wood pastures in conservation as a part of a new 'Wilder Vision' for the future landscape - led by the work of Professor George Peterken. This places future landscapes into a valid framework of historical ecology and brings together key experts to exchange ideas and best practice. The event will provide a platform to launch a new national initiative with the aim to conserve or create a wood meadow / wood pasture in every parish. The intention is to ensure that such future conservation aspirations are underpinned by good, robust, ecological science. The scope of the work is at this stage national but with potential implications Europe-wide, and we already have partners in a number of countries. We expect participants in the launch from a wide area and the results to be disseminated to an extended audience. The 'vision' is related to the '*Wild Thing*' event which had representatives from around 20 countries. For more information see the Forest Ecology Group section which follows.

For more details and booking:
<http://www.ukeconet.org>
Tel: 0114 272 4227
Email: info@hallamec.plus.com

PEATLAND for BIRDS: Issues & Opportunities in Re-constructing Peat Landscapes in uplands & lowlands – A major conference in Sheffield, 6 – 8 September 2017.

This will be a significant national and international conference as a cornerstone of our longer-term programme '*Wilder Visions*' and leading to a major international conference and congress. The focus here will be on the management and re-construction of peatland habitats for birds and other wildlife. This is

with IPS, RSPB, and other major land-managing partners.

For more details and booking:
<http://www.ukeconet.org>
Tel: 0114 272 4227
Email: info@hallamec.plus.com

The Healing Harvest of the Peatlands, Autumn 2017, Peak National Park

An event organised in partnership with colleagues at the National Trust to engage the public, researchers, managers, and other stakeholders in peatland landscapes and their ecological histories in the Peak District area. The meeting will focus on the little-known uses of harvests of sphagnum and other materials for the WW1 and WW2 war efforts, raising people's awareness of the peatlands and of the profound implications of this exploitation for present-day site management.

For more details and booking:
<http://www.ukeconet.org>
Tel: 0114 272 4227
Email: info@hallamec.plus.com

Shadow Woods and Ghosts on peatland landscapes: March 2017 to November 2017, various locations with project based in Sheffield and the Peak District

This is a project to involve university researchers and students working with community citizen scientists to discover the lost 'Shadow Woods' and to analyse the palynological evidence for relevant landscape change. Partners will include University of Plymouth, University of Bradford, and Sheffield Hallam University, Peak National Park and the National Trust.

For more details and booking:
<http://www.ukeconet.org>
Tel: 0114 272 4227
Email: info@hallamec.plus.com

Red Deer - The grazing mega-fauna of peatlands: March 2017 - December 2017, based in and around the Peak District

This citizen science project is part of our '*Eco-science in the Park*' research to involve and engage local people in recording and studying the behaviour of our largest native land mammal - now spreading rapidly on peatland habitats across the UK.

The study will focus on the Peak National Park uplands and on Thorne Moors National Nature Reserve in the lowlands. The project will utilise the on-line learning and research tool developed with BES support.

For more details and booking:
<http://www.ukeconet.org>
Tel: 0114 272 4227
Email: info@hallamec.plus.com

History in the Cumbrian Bogs: Autumn 2017, Cumbria National Park & Solway Firth

We have a very special event with Cumbria Boglife and other partners as part of our citizen science and public engagement work with BES Peatlands SIG to bring people to the peat bog and the peat bog to the people - with a variety of key partners - the event will engage the public, researchers, managers, and other stakeholders in peatland landscapes and their ecological histories in Cumbria and surrounding areas. Through raising awareness of the history of exploitation we will consider issues and challenges for future restoration.

For more details and booking:
<http://www.ukeconet.org>
Tel: 0114 272 4227
Email: info@hallamec.plus.com

Climate change and blanket bog impact: with the Climate Change SIG

This exciting 1-day day seminar / workshop to be held at University of York on 28th March will debate and will address issues relating the blanket bog and future climate scenarios. [See the **Climate Change SIG** for full details and updates].

Early career development event for peat bog specialists - Peatlands of Britain, past, present and future, plus methods and techniques in peatland research: with Manchester Metropolitan University and partners. Date a week around July 17th (to be confirmed), Cors Focho (Borth Bog) in Ceredigion, west Wales.

The British Ecological Society Peatlands Special Interest Group, in collaboration with Manchester Metropolitan University and Natural Resources Wales, are hosting a multi-disciplinary short-course suitable for PhD students and early career

researchers wishing to acquire or develop field skills and gain experience in peatlands research. This is a unique event and numbers will be restricted. Details will be available shortly but email Ian (below) and check www.ukeconet.org and the Peatlands SIG page for updates.

On-line ID and training guides: Also, don't forget our on-line identification guides on sphagnum mosses, on waxcap fungi, and on deer species, with much more to follow shortly: www.ukeconet.org

For more information generally please email Ian Rotherham on i.d.rotherham@shu.ac.uk



Alan Jones
@BESForests

WOOD MEADOWS & PASTURES

2-day conference, 23 – 24 May in Sheffield as part of the 'Wilder Visions' programme; [with Peatlands SIG and partners].

Our 2-day international conference will examine issues of the conservation and creation of both wood meadows and wood pastures. With Professor Chris Baines we will consider aspects of habitat creation and community engagement, and with Professor George Peterken we will address both conservation and creation. The landmark event will also examine the influences of Dr Frans Vera and of the late Professor Oliver Rackham in transforming our understanding and attitudes towards these wonderful and iconic landscapes.

Relevant to key debates on the history of the British and European countryside, the topics will be important in helping shape our ideas of wilding or (re-wilding), and of our core theme of '*Wilder Visions*'. The event will be chance to celebrate George Peterken's volume '*Meadows*', and of Chris Baines' updated and

reissued book, '*How to Make a Wildlife Garden*'. There will also be a launch of Ian's book '*Shadow Woods – the search for lost landscapes*', and of a major new book on European woodlands edited by Ian Rotherham, Alper Çolak and Simay Kirca, and with a major chapter by the late Oliver Rackham, plus George Peterken, Frans Vera, and others.

The partners include South Yorkshire Biodiversity Research Group Ancient Tree Forum, Woodland Trust, Natural England, Hagge Wood Trust, JBA Consulting and others the conference will consider the potential of wood meadows and wood pastures in conservation as a part of a new 'Wilder Vision' for the future landscape - led by the work of Professor George Peterken. This places future landscapes into a valid framework of historical ecology and brings together key experts to exchange ideas and best practice. The event will provide a platform to launch a new national initiative with the aim to conserve or create a wood meadow / wood pasture in every parish. The intention is to ensure that such future conservation aspirations are underpinned by good, robust, ecological science. The scope of the work is at this stage national but with potential implications Europe-wide, and we already have partners in a number of countries. We expect participants in the launch from a wide area and the results to be disseminated to an extended audience. The 'vision' is related to the '*Wild Thing*' event which had representatives from around 20 countries. The project involves:

- 1) Launch event and workshops to develop ideas and a basic toolkit for community volunteers.
- 2) Recruiting & training project community 'champions'
- 3) Researcher and practitioner conference to share and disseminate key information, ideas, and good practice on establishing and managing wood meadows and wood pastures
- 4) Networking with locally-based stakeholders such as parish councils across England
- 5) Establishing potential demonstration sites and partners
- 6) Event to showcase the research



findings to national funders such as the Heritage Lottery Fund.

This landmark event comes at a time of colossal challenges for nature conservation – with globalisation, climate change, and economic austerity just a few of the issues. As a part of the overview of the themes of the conference, Ian Rotherham will present a review of the ideas stimulated by the works of Frans Vera, the late Oliver Rackham, and of George Peterken in driving forwards our understanding of ‘Woods’, ‘Wood Meadows’ and ‘Wood Pastures’ in landscape evolution. The presentation will review the impact of Vera’s ideas and how these can fit into robust frameworks of ecology, and of ecological and social history. This will address issues of historical derivation and continuity in landscapes, and of ‘futurescapes’ and ‘Wilder Visions’ – understanding the past to inform the present and to guide the future.

For more details and booking:
<http://www.ukeconet.org/woodmeadowspastures.html>

Tel: 0114 272 4227
Email: info@hallamec.plus.com

RAISING AWARENESS OF ANCIENT WOODLAND INDICATORS AND THE UNDERPINNING SCIENCE

Spring and summer 2017, South Yorkshire and North Lincolnshire

This project is responding to a request from national partners and a number of universities to provide support on the use of botanical indicators in the assessment of ancient woodlands. The work is in part a result of a Forest Ecology SIG project from several years ago and the on-going research findings from the detailed evaluation of the uses of botanical indicators. The initial research resulted in several

major research reports and published papers. A volume of workshop papers is about to be produced.

The research has major practitioner impact as it informs the planning and conservation processes with regard to ancient woodlands - presently under threat because of a lack of an appropriate evidence base to inform their designation. The intention is to develop and disseminate best practice guidance.

For more details:
www.ukeconet.org
Tel: 0114 272 4227
Email: info@hallamec.plus.com

OF INTEREST TO MEMBERS

MULTIVARIATE ANALYSIS OF ECOLOGICAL DATA USING CANOCO 5

Course tutors | Jan Lepš and Petr Šmilauer

Applications are now being accepted for this course, to be held at the Faculty of Science in Ceske Budejovice, Czech Republic, from **23 January – 3 February 2018**. This popular course, offered regularly since 1997, focuses on major modern approaches to the analysis of multivariate data, and is specially designed for researchers and students in all fields of ecology and conservation.

In-depth lectures and practical sessions cover the following topics:

- Classical ordination methods (PCA, DCA, PCO, NMDS)
- Constrained ordination methods (CCA, RDA), including partial analyses, permutation tests of multivariate hypotheses, variation partitioning, principal response curves, and working with functional traits
- Tuition on the efficient use of Canoco software and correct interpretation of ordination diagrams; all practicals are run with Canoco 5

- Course participants are expected to bring data from their own projects and will be given time to apply methods mastered during the course to their own datasets. The course lecturers will provide one-to-one assistance for such analyses.

The course follows the structure of our book Šmilauer & Lepš (2014): *Multivariate Analysis of Ecological Data using Canoco 5*, second edition, Cambridge University Press.

Further information about the course can be found at <http://regent.jcu.cz> and you are also much welcome to address any enquiries to the course manager, Petr Šmilauer, at his e-mail: petrsm@jcu.cz



**IMPORTANCE OF
FIELD STATIONS
FOR ECOLOGICAL
EDUCATION AND
RESEARCH**



Dominic J. McCafferty | Scottish Centre for Ecology and the Natural Environment (SCENE), IBAHCM, University of Glasgow, Rowardennan, UK
dominic.mccafferty@glasgow.ac.uk

There cannot be many ecologists who have not spent time in a field station, either as a student, researcher or while teaching field-courses.



The term 'field station' conjures up epic images of spartan field huts in polar regions or bamboo shacks within the rainforest, lit by gas lamps, and with microscopes and collecting jars alongside primus stoves. Yes, these are still to be found and enjoyed, but today many successful biological field stations have moved with the times and provide state of the art facilities for research and teaching.

There are reported to be more than 1,200 biological field stations currently in operation in 120 countries, stretching from the Arctic to the Antarctic (Tydecks *et al.* 2016). A large proportion of field stations were set up after World War II, and more than a third are currently linked with universities. They occur in all major biomes including terrestrial, freshwater and marine ecosystems, with a majority located in protected areas. Throughout the UK we are fortunate to have a number of important university and research stations, as well as an outstanding network of Field Studies Council (www.field-studies-council.org) centres and long established bird observatories. Sadly, we have lost some stations along the way but thankfully their contribution to ecological science lives on.

org) centres and long established bird observatories. Sadly, we have lost some stations along the way but thankfully their contribution to ecological science lives on.

In 2016-17 we are celebrating 70 years of environmental education and research on Loch Lomondside (inset box) and at an anniversary such as this, I cannot help but reflect on the important role of field stations in ecology. Buildings and technology have developed over the years but in many respects our field stations continue to function as they have always done, providing residential and teaching facilities for students of all ages and locations for pioneering scientific research. They have a shared outdoor and environmental ethos and welcome colleagues and visitors from across the World. That mix of close-knit community, hard work, and scientific endeavour (and of course good food) make them memorable places to live and work. The information age has, however, transformed communication and provides remote access to the internet making it

possible to link field stations with their parent organisations. Even in Antarctica, field stations have 24/7 communication via satellite and researchers can be flown directly to bases and remote field camps. These current developments and infrastructure support field skills training that are essential for future careers in ecology and for long term monitoring of natural ecosystems.

Despite conflicting reports of declines in field work skills in science education (Goulder & Scott 2016), in the last decade biological field course provision in UK universities appears to have remained stable and indeed there was optimism from institutions that fieldwork would continue to be an important feature of degree programmes (Mauchline, Peacock & Park 2013). This is good news for field stations in the UK and further afield. However, these are financially challenging times and biological field stations are being encouraged to modernise and communicate more effectively their mission to policymakers, funders, the public and even their own universities (National Research Council 2014). Funding, leadership, ICT infrastructure and



networking have been identified as critical areas for attention but the future appears to hold real opportunities for field stations to contribute to key environmental issues (Baker 2015).

As ecologists we may underestimate the importance of field stations on the scientific stage. Tydecks *et al.* (2016) suggest that "the global network of biological field stations constitutes an environmental infrastructure worth above US\$1.3 billion per year, which is comparable with the annual budget of CERN (approx. US\$1.2 billion in 2014)." This really puts our biological field stations and the work they undertake into perspective. A number of bodies, such as The Organization of Biological Field Stations (OBFS) (www.obfs.org) and the International Long Term Ecological Research

(ILTER) network (www.ilternet.edu) are providing coordinated activities across continents, but of course there is always the need to do more. We are supporting a global concern for environmental monitoring, research and education on a scale we often only associate with other scientific disciplines. Now that is a valuable resource for us to fully use, enjoy and promote for the future of ecology.

FORTHCOMING

We agree with Dominic that field stations are an important resource for ecologists and other field biologists; Markus Eichhorn will be contributing a series of articles on individual field stations in future issues.

REFERENCES

- Baker, B. (2015) The way forward for biological field stations. *BioScience*, **65**, 123–129.
- Goulder, R. & Scott, G.W. (2016) Conflicting Perceptions of the Status of Field Biology and Identification Skills in UK Education. *Journal of Biological Education*, **50**, 233–238.
- Maitland, P.S. & Hamilton, J.D. (1994) Glasgow University Field Station at Rossdhu, Loch Lomond: the first British University Freshwater Field Station. *Hydrobiologia*, **290**, ix–x.
- Mauchline, A.L., Peacock, J. & Park, J.R. (2013) The Future of Bioscience Fieldwork in UK Higher Education. *Bioscience Education*, **21**, 7–19.
- National Research Council. (2014) *Enhancing the Value and Sustainability of Field Stations and Marine Laboratories in the 21st Century*. National Academy of Sciences.
- Tydecks, L., Bremerich, V., Jentschke, I., Likens, G.E. & Tockner, K. (2016) Biological Field Stations: A Global Infrastructure for Research, Education, and Public Engagement. *BioScience*, **66**, 164–171.

FIELD STATIONS ON LOCH LOMONDSIDE

Similar to many field stations throughout the World, field based research and teaching on Loch Lomondside developed post-WWII when in 1946 field laboratories were assembled from ex-army huts on the west shore of Loch Lomond at Rossdhu (Maitland & Hamilton 1994). Pioneering studies were undertaken on sediments, zoo-benthos, plankton and fish of Loch Lomond. The first research on biting midges and feasibility of control measures in Scotland were also undertaken here. In 1964, the University Field Station was built on the current location on the east shore of the loch. Its current redevelopment, named the Scottish

Centre for Ecology and the Natural Environment (SCENE) was completed in 2014 at a cost of £7.2 million. Today SCENE is an integral part of the Institute of Biodiversity, Animal Health and Comparative Medicine at the University of Glasgow and has a wide portfolio of research in aquatic, terrestrial and applied ecology. Its geographical location and modern teaching and residential facilities create a unique educational environment for field courses and workshops, as well as hosting PhD and Masters students.

Dr Dominic McCafferty is a Senior Lecturer at the Scottish Centre for Ecology and the Natural Environment (SCENE) www.gla.ac.uk/researchinstitutes/bahcm/researchfacilities/scene/ at the University of Glasgow. Details of the MRes Ecology & Environmental Biology bursary scheme for students who wish to study at SCENE can be found at: www.gla.ac.uk/researchinstitutes/bahcm/study/msc/mres_accom/ Some of the information in this article is based on a recent blog at: <https://naturallyspeaking.blog/2016/12/07/back-to-the-future-scene/>



Field station Images: The first field station at Rossdhu in 1946, the University Field Station built in 1964, south of Rowardennan and today the Scottish Centre for Ecology and the Natural Environment (SCENE) which was completed in 2014. Photographs © SCENE

FEATURE

DO WE ARGUE ENOUGH IN ECOLOGY?



Roger Cousens | University of Melbourne, Australia | rcousens@unimelb.edu.au

THE CASE FOR MORE DEBATE

At home we love to have a good argument. – though with my son an argument often degenerates into the Monty Python sketch and may go on longer than “the full half hour”¹. My son was a keen debater at high school and has since trained debating teams and adjudicated competitions. He can run rings around me logically and has done from an early age. We tend to think of a debate as something that is healthy: far better to pull an issue apart and to explore differences, and evaluate the evidence to support any contrasting views, than to suppress differences of opinion, allow disagreements to fester and even become personal. Even if no resolution is reached, at least you have put your point of view (though it is so much

harder to accept the umpire’s decision if the umpire is also a player, as my children found out!).

I have taken this attitude into my career, on both scientific and management issues. A former boss once referred to me as our group’s *general irritant and stimulus!* So often a good debate on a scientific topic opens my eyes to things that I had never thought about, I had misunderstood or for which I was unaware of important data. I am grateful (truly!) for being shown why I was wrong (though we all get a kick out of being found to be right all along!).

I recognise, however, that people with valuable views often shy away from open public debates: some people lack confidence or need to

think things over more carefully before they respond. A view has been expressed that the very words *debate* and *argument* are too focussed on winning and losing and that what we need is more *discourse*. This may have semantic merit. In many walks of life *debate* has become all about taking sides, winning and losing, right and wrong; and there may be palpable (not just egotistical) rewards for winning and penalties for losing, even in scientific debates. An effective debate, to me, does not need to have a winner: knowledge and understanding – and the rate at which these are achieved – will be enhanced from the critical examination of an issue from more than a single angle. So, I do not really care what we call it: we just need to do *it* more often and we need to find ways of achieving the beneficial outcomes.

In my view, *debate/disputation/discourse/discussion/dialogue/dissent* (let’s just call it the *D* thing – noting that here it represents all the good *D* things and excludes bad *D*’s such as *dogma/despotism/denial/discombobulation/doodlesack*) among practitioners should be a central part of ecology. The cut and thrust of argument and counter-argument, with views challenged by logic and evidence, would seemingly ensure that ideas are thoroughly aired, criticised and either developed effectively or promptly rejected. The *D* thing (and even *self-D*) played a crucial part in the exploration of ideas and knowledge by the ancient philosophers. But we have relegated oral debate to a minor component of modern science, where the written word (and written, one-



Footnote

¹ Anyone puzzled by the Monty Python reference: please google ‘Argument Clinic Monty Python’

sided, argument) rules. I have often wondered why there is such an absence of multi-sided *D* in modern ecology and in science more generally. Do we not want frank and open *D*? If you believe the answer to this is “yes”, then I beg to differ. If we want the benefits of really great *D*’s, we have to be more pro-active and to try some very different approaches.

THE STATUS QUO

D features very little in the internal communication structures that we have built around science. In these times of social networking, it seems somewhat anomalous that we proceed in such a restrained way, avoiding open criticism, with its potential to cause offence and embarrassment to either “side” through the stigma of appearing in public to be wrong or naive. The ownership of ideas has become – perhaps has always been - highly personal and protective. And the scientific community is, at least superficially, built on politeness, inclusiveness and trust, not confrontation. When *D* does occur, it is usually highly constrained by editors and reviewers and involves few participants – although the print medium has the advantage that the arguments are well thought through first and clearly articulated. It also lacks that sparkle of spontaneity that can make real-time *D* fun and even exciting, in comparison with the slow-motion *D* via our journals.

Our current system can, in reality, be far from polite and inclusive, with its anonymity and - often - a lack of the right to reply (to funding committees and to journals) to incorrect or downright nasty comments, making it potentially susceptible to bias, censorship, coercion and the entrenchment of dogma - as was the case when our BES journals outlawed the Replacement Series experimental design in the 1980s. True, the gifted (and bullish) speakers and spontaneous thinkers can exert great influence in poorly chaired *D*’s, while the shy or inexperienced are inhibited, but such influence already occurs in other settings. Gifted writers of journal articles and invited speakers chosen for their oratory prowess can be highly persuasive even if their evidence and substance are weak; we

also bestow individuals with influence by deferring to them as “authorities” in their fields, inviting them to be on committees and to populate small workshops and think-tanks.

The emphasis in our conferences, workshops, scientific journals and web sites is overwhelmingly the one-way presentation of completed research to a passive audience, with minimal *D*. Conferences are simply not designed to engage us in *D*, either in venue design or in programming. There are many reasons for having conferences: to find out about new techniques, ideas and results; to communicate, and receive feedback on, our own ideas and advances; to be stimulated by thought-provoking presentations from our peers; to meet new scientists; and, don’t say it too loudly, for catching up with old friends and having a jolly good time!

But, we sit for up to 4 or 5 days in rooms devoid of sunlight and rapidly depleted of oxygen. We rush in and out of rooms to hear (often only part of) talks in parallel sessions that are often poorly synchronised and too far apart. If the speaker does not run out of time, they may get to answer a short question or two, but there is no time to get into a detailed discussion or a really good argument. The seats are arranged in a way that discourages interaction among the audience. After lunch, we try desperately to concentrate or even to stay awake; we may sneak out early when we have had enough (after making sure that we know when/where our friends are meeting to go out for dinner). We cannot relocate outside the presentation rooms to find someone to chat to, to initiate some *D*, because modern venues have little casual seating (perhaps to coerce people into giving deserved attention to those who have toiled over every slide and sentence). Laudable though the objective of filling the audiences might be, it suppresses useful *D* and potential collaborations. *Panel discussions* at conferences, when attempted, are seldom successful and become merely question and answer sessions. The panel is isolated on the stage and everyone else is in parallel lines facing them; there may be too many people, so that most are not actively involved, or the room is

too large and you have to wait for the roving mike and thus don’t get to speak until the topic has moved on. The same is true for sessions with insufficient speakers, where we designate time at the end as “general discussion” – which ends up as mostly questions for the last speaker.

Break-times at conferences are often little better. Once we have queued up for tea, coffee or food (seldom cold drinks for the non-addicts), how do we find someone to talk to? More often than not, we head for someone that we already know – and probably already share opinions with – and just “catch up”. The superstars or the person who has just given a really interesting talk, are already surrounded and it can be difficult to join in. We may look for another lonely-looking person; or we just cop out completely and go look at the posters..... If you haven’t yet given your talk (and someone always has to be on in the final session), not many people come up to you as a stranger. Even now, after almost 40 years in science (and in the BES), I find some large conferences a very lonely experience, though I still manage to get to know a *few* new people. Dedicated poster sessions are meant to allow people to meet a researcher and discuss their work. Unfortunately, these sessions may double-up as a social function: at some meetings they have started to make you earn stickers for a free drink at the bar by talking to poster presenters. Although this might encourage people to attend, how much does it increase meaningful *D* – especially as it increases the noise level? Poster areas may be so cramped with people eating and drinking (or earning stickers) that it is difficult to get to the posters.

Special meetings on single topics are certainly better at achieving *D*. Especially those that allocate time for “break out”, small-group discussions. Unlike conferences, such *D*’s are often focussed ahead, on research challenges, directions and actions, rather than past research. Many of the best workshops are organised by research centres or organisations, where attendance is by invitation. If you are neither a superstar nor well-connected, you will probably not be there. Thus it can be hard for outsider



early-career researchers (ECRs) to join in. Commonly, workshops are structured as mini-conferences with most time given to timed presentations.

There are opportunities for using social media for ecological *D*, thus avoiding travel and accommodation costs. They also potentially reach a very large audience with a much broader spectrum of background, experience and ideas than would be attracted to a conference. Simply having a blog or a chat site, however, does not necessarily achieve significant outcomes, especially in the absence of orchestration and a conductor. The social interactions that develop when people come together in person are much more important in achieving an effective *D*. They can also result in a greater likelihood of lasting collaborations and life-long friendships.

The paper review process, though potentially involving *D*, is confidential, confined to the handful of individuals involved and distinctly one-sided. The journal will do you a favour by publishing your paper if it is considered “good enough” and of interest to a sufficient proportion of their readers. One negative review from a person who misread your text or who does not share your view is enough for an editor to reject. Frustratingly, there is no opportunity to reply on contentious issues if your paper is rejected out of hand (and certainly not to a wider audience)! Or when someone else’s poor paper gets published. Radical ideas, worthy starting points for some great *D*, only get published once you have found the funding to gather new data, model or conduct meta-analyses (the proliferation of the latter concerns many ecologists, but refrain from taking on the modern dogma). Review papers summarise past research – from one person’s perspective - and future directions may be proposed, but again rarely openly debated. We rely on the issues, views and biases slowly percolating through the research community through the editorial filter. Funding agencies set broad directions, increasingly prescriptive in the applied sciences, which we must accept as rules of the game: there is no *D* on whether these are the right directions!



HOW DO WE INJECT MORE *D* INTO ECOLOGY?

In 2012, a small group of us decided to run international four-day workshops on applied plant ecology topics, designed specifically to achieve really good *D*. Something was seriously missing from our ecological lives and we wanted to do something about it. Three workshops later, and with a fourth in train, and we reckon we have hit on a pretty good thing. Responses from attendees have been outstanding; we even won an award in 2016!

Rather than try to fit *D* into a format to which it is simply not suited, we started from scratch. What ingredients do you need to do to achieve forthright, constructive, multi-directional exchange of views and ideas amongst a group spanning different cultures and different levels of experience? You cannot just put strangers in a conference room for a couple of hours – or on a teleconference - and say “Go! Start *D*’ing!”

There are (at least) four keys to success. Firstly, you need time. If you want open *D* among strangers, it takes time to reach a point at which everyone becomes comfortable and is able to engage without feeling threatened, inadequate or any of the other things that hold us back. You have to get to know and respect each other. Only then will all participants be prepared to say what they really

feel (or to be deliberately provocative). It also takes time to learn the art of *D*’ing, a skill that most scientists have not developed.

Secondly, you need the right venue, **as unlike a conference venue as possible**: big windows, comfortable armchairs and sofas, and in inspiring location. For us that means mountains and wildlife: so far Montana 2012, Spanish Pyrenees 2014, Alberta 2016, Argentinian Patagonia in 2018. You need to have the venue to yourselves, with accommodation and meeting spaces together, and no passengers.

Thirdly, you need to pay special attention to ways of developing social interactions and confidence as rapidly and effectively as possible. You do not need to thrust “team building” exercises down people’s throats; you take a more subliminal approach, making sure that activities are designed in a way that automatically enhances these things. For example, instead of trying to force people to concentrate after lunch in a darkened, airless room, we go walking together – what we call “free-range” workshopping. We clear our heads at the same time as discussing ecological (and non-ecological) topics, spotting birds and plants, taking photos and getting to know each other. Our light-hearted *soap-box* sessions are designed to encourage more way-out ideas and views. No one is allowed to give a paper or poster; there are no paid-for invited speakers and one third of attendees must be early-career researchers. Everyone is expected to

take on a role, to assume ownership of the meeting; everyone is listened to.

Then finally, you need some luck. It was our good fortune to discover Mike Williams, an innovative facilitator who has worked *pro bono* to help us to discover and to try out very different ways of doing things – and saving us from failure. We have been lucky to find enough people prepared to commit four days for a “mere workshop” (or perhaps we have enough contacts and friends to exploit their goodwill). The fact that so far there have been no punch-ups, however, is not a matter of luck: it is because of the way we design the entire workshop package.

We still get comments that there are too many meetings and that traditional conferences remain the priority for scientist’s time and money. Even though we are offering something quite different. Perhaps one day the tables may be turned? So, for now, we avoid clashes with more important things (i.e. major conferences). Sweeteners are important: everyone has a chance to get their name on at least one journal paper; we find funds to subsidise ECRs; we keep costs down; and we have fantastic locations. The reality is that most attendees have to fund themselves, as it is difficult to get funding for small international events (to date just two small national societies have helped out).

If anyone wants to help to put the “*D*” back into “*Doing*” ecology, we would love to hear from you: my email is rcousens@unimelb.edu.au



EXPLORING CITIZEN SCIENCE IN CHILE



Helen Roy | Centre for Ecology & Hydrology, UK | hele@ceh.ac.uk
Audrey Grez | Universidad de Chile and Directora de Kaueken, Chile
Tania Zaviezo | Pontificia Universidad Católica de Chile, Chile
Peter Brown | Anglia Ruskin University, UK

Chile has incredible appeal for ecologists. The Andes extend alongside the Eastern edge of Chile and essentially render it isolated from the rest of South America.

Not surprisingly the landscapes of this long and narrow country are extremely diverse and the biodiversity even more so. The species list for Chile includes around 31 000 species and about 37% of these are endemic. Justifiably Chile is considered a global biodiversity hotspot. But Chile is situated in the "Pacific Ring of Fire" and consequently prone to major perturbations such as earthquakes and volcanic eruptions. However, it is anthropogenic factors (the usual contenders: habitat destruction, climate change and invasive non-native species) that pose the greatest threat to biodiversity in this country; indeed the forest fires currently raging through the central zones of Chile are having devastating effects on habitats including national parks and reserves.

Over the last decade we have all been corresponding and working together through our shared passion for ladybirds (and other insects!). A few years ago, we began collaborating on a research project funded by Fondecyt (<http://www.conicyt.cl/fondecyt/>) and led by Audrey and Tania both based in Santiago, Chile. This provided Helen and Peter with a unique opportunity to visit Chile to work alongside Audrey and Tania. Citizen science is seen as emerging approach for environmental research in Chile and so we were delighted to receive some additional support from the British Ecological Society (alongside our other sponsors: FONDECYT (project 1140662); Kaueken Association; Doctorate in Agricultural and Veterinary Sciences, University of



Celebrating shared enthusiasm for bats

Chile; The Faculty of Agronomy and Forestry Engineering of the Pontificia Universidad Católica de Chile; Anglia Ruskin University; NERC Centre for Ecology & Hydrology) to host a one-day workshop on citizen science. Its objectives were to:

- Provide an overview of citizen science and its benefits and limitations
- Share examples of current initiatives in citizen science for biodiversity in Chile
- Build and facilitate citizen science interactions within Chile and between Chile and the United Kingdom

We were joined by 31 participants with a range of occupations and backgrounds, including people related to Universities, Colleges, NGOs, the Ministry of the Environment, the National Forestry Corporation (CONAF) and the Chilean Navy. It was inspiring to hear about the range of current citizen science activities in Chile. Global initiatives such as eBird and iNaturalist were enthusiastically represented but there were also many national and regional initiatives described. Birds seem to be universally popular with people but it was saddening to hear that bats in Chile are not held in the same high regard. However, it was incredible to hear of the way in which researchers are trying to change perceptions through the Program for the Conservation of Bats in Chile, with a lively communication campaign (including FaceBook <https://es-es.facebook.com/MurcielagosChile/>) but coupled with recording through iNaturalist.



Enthusiasing about citizen science initiatives in Chile

The excitement of insects was evident through many wonderful projects ranging from focussing on single species to those encompassing hundreds of species. There is only one species of native bumblebee *Bombus dahlbomii* in Chile and it is threatened by introduced species including *Bombus terrestris*. The initiative Salvemos Nuestro Abejorro (<https://salvemsnuestroabejorro.wordpress.com/>) engages people in monitoring this exquisite bee. Moscas Florícolas de Chile is a citizen science initiative run entirely through FaceBook with the aims of highlighting the diverse and important life histories of flies with specific focus on flies visiting flowers. The organiser of Moscas Florícolas de Chile described the importance of evaluation and the ways in which he seeks feedback on the project from the volunteers contributing observations. The harlequin ladybird is a widely distributed non-native species in Chile. It dominates many habitats alongside a number of other non-native ladybirds. Chinita arlequin (<http://www.chinita-arlequin.uchile.cl/>) is an initiative which engages people in recording harlequin ladybirds across the length and breadth of Chile. The research publications emerging from Chinita arlequin admirably highlight the value of citizen science.



Delving into the sweepnet samples. Spot the harlequin ladybird?



Meeting inspiring researchers at the University of Chile Audrey Grez's research group



Contributing ladybird records to the citizen initiative

A number of overarching themes emerged through the day. The importance of effective communication in connecting people with nature and with citizen science initiatives was discussed. It is not simply enough to post a webpage and expect people automatically to join in. There is a real need to help people gain the necessary confidence to get involved. Getting to grips with the incredible diversity of species is a challenge for scientists and conservation practitioners but for volunteers it can be overwhelming. The commitment to providing training and educational opportunities to volunteers and mentors is incredible.

For example Cequa (<http://www.cequa.cl/cequa/>) a foundation based in Patagonia provides training to tour guides and rangers to encourage visitors to engage with a number of citizen science initiatives. The way in which people work together to achieve so much was evident throughout the day. There are many barriers to overcome if the potential of citizen science is to be realised in Chile but there are also many opportunities. Most importantly there is a wonderful community of people committed to ensuring the future of wildlife and their habitats in Chile.

POLICY

WHAT ARE THE FORTHCOMING LEGISLATIVE ISSUES OF INTEREST TO ECOLOGISTS AND CONSERVATIONISTS IN 2017?

William J. Sutherland, Eleanor Burke, Andy Clements, Ben Connor, John Martin, Clive Mitchell, Kathryn A. Monk, Katharina Rogalla von Bieberstein and Des B.A. Thompson | w.sutherland@zoo.cam.ac.uk

This paper covers our seventh assessment of the forthcoming legislation that we consider to have likely consequences for the environment or for ecologists. We again review issues of a global scale, those in the European Union (EU), and those in the United Kingdom and constituent countries.

We have often been told that this paper is useful for policy makers desiring a review of the issues on the horizon, as well as for researchers wishing to learn either how their results may be used or their work may be affected by changes in legislation.

An overwhelming change on the horizon is the referendum decision of the UK to leave the EU, which was discussed speculatively in the last scan. This has enormous consequences, however, further speculation at this stage would be premature given there are so many uncertainties over the nature of negotiations. The election of Donald Trump as President of the USA is, at the time of writing in early February, showing signs of having global ramifications for the environment and science.

The legislative scans of previous years (Sutherland 2011-16) are freely available on the British Ecological Society website. Issues described in those scans are not repeated here.

GLOBAL

Climate change and biodiversity

Following the historically rapid entry into force of the Paris Agreement under the UN Framework Convention on Climate Change on 4 November 2016, a focus of the Marrakech Climate Change Conference held later the same month was on its implementation. Parties agreed to develop a 'rulebook' by 2018, delivering amongst others transparent global accounting of emissions reductions. Generally, developing a common and transparent framework for countries to describe and report on their efforts is one of the key challenges ahead. Regarding the development of Nationally Determined Contributions as stipulated by the Paris Agreement, a decision of the 13th Conference of the Parties to the Convention on Biological Diversity (CoP CBD, held in in Cancun, Mexico in December 2016) noted the importance of ensuring the integrity of all ecosystems, including oceans, and the protection of biodiversity, recognized by some cultures as Mother Earth, and noting the importance for some of the concept of "climate justice", when taking action to address climate change. Uncertainty regarding the Paris Agreement's implementation nevertheless remains with regard to the potential withdraw from the Paris Agreement by the USA, following Donald Trump's inauguration as president.

Ecosystem restoration

The international community has widely considered the issue of ecosystem restoration within different fora. The 13th CoP CBD adopted a short-term action plan on ecosystem restoration as a flexible framework to promote restoration of degraded natural and semi-natural ecosystems. The action plan is intended also to be taken into account in the preparation of the thematic assessment on land degradation and restoration being undertaken by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). The assessment was requested by the UN Convention to Combat Desertification and will be delivered to the 6th IPBES Plenary in early 2018 for approval. As is the case with the already adopted assessments on pollination, the assessment on land degradation and restoration will generate the evidence base for policy-making across all the Rio Conventions: the UN Framework Convention on Climate Change, the UN Convention to Combat Desertification and the Convention on Biological Diversity. Amongst others, the draft chapter on responses to avoid land degradation and restore degraded land assesses different institutional, policy and governance responses. Ecosystem restoration and their policy responses will also feature prominently in the regional and global assessments on biodiversity and ecosystem services, due at the end of 2017 and 2018, respectively.

Conservation and sustainable use of wildlife

In October 2017, the 12th CoP to the Convention on the Conservation of Migratory Species of Wild Animals will be held in Manila, Philippines. Next to reviewing implementation of the Strategic Plan for Migratory Species, Parties will look at relevant decisions and listing proposals passed at the 2016 World Wildlife Conference. This conference, held in September/October 2016 in Johannesburg, South Africa, was the largest ever meeting of the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Amongst several achievements, a number of animals and plants were brought under the convention's trade control regime. The CoP also adopted resolutions on crosscutting issues related to illegal wildlife trade, such as corruption and reduction of consumer demand for threatened wildlife and their parts, as well as cybercrime and traceability.

In addition, a significant achievement was the adoption of a non-binding recommendation on closing domestic markets for commercial ivory trade where it contributes to poaching or illegal trade. This recommendation follows a motion on closure of domestic markets for elephant ivory by the IUCN World Congress held in September 2016 in Hawaii. Following the Johannesburg conference, a decision on bushmeat and sustainable wildlife management, which also makes

reference to illegal wildlife trade, was adopted at the UN Biodiversity Conference in Mexico. At the upcoming 5th session of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services Plenary in March in Bonn, Germany, Member States will conclude discussions as to whether a thematic assessment on the sustainable use of wild species will be undertaken.

Whale conservation and management

At the 66th annual meeting of the International Whaling Commission in October 2016 in Portorož, Slovenia, achievements included a resolution calling for parties to work together to prevent the extinction of the critically endangered vaquita, agreed plans for new Bycatch Mitigation Initiatives, and the first formal recognition of the overall benefits that whales bring to the oceans. It was also the first time that cooperation with other organizations was tackled as a separate agenda item and that NGOs were allowed to participate both intersessionally and during the meeting. A controversial issue was the issue of special permit (also known as 'scientific') whaling. A resolution was adopted to improve the review process by the Commission. Special permit whaling was also addressed by the IUCN World Conservation Congress in September 2016 in Hawaii, as well as the establishment of the long-disputed South Atlantic Whale

Sanctuary, which was once again not successful at the meeting of the International Whaling Commission. Further, progress was made on issues such as collisions between whales and ships, ocean sound, marine debris and whale watching. Lastly, the Scientific Committee was asked to screen the existing research studies on the contribution of cetaceans to ecosystem functioning. At the next meeting, in 2018, a key agenda item will be the setting of aboriginal whaling limits, which are set in six year blocks.

The wider marine agenda

The issues of anthropogenic underwater noise and marine debris also featured on the agenda of the UN Biodiversity Conference. Regarding marine debris, a decision urges Parties to take appropriate measures to prevent and mitigate the potential adverse impacts of marine debris on marine and coastal biodiversity and habitats. The decision also welcomes the UN Environment Assembly Resolution on marine plastic litter and microplastics, adopted in May 2016, which calls on Member States to establish and implement necessary policies, regulatory frameworks and measures on the topic consistent with the waste hierarchy. In this context, some commentators even push for the development of a new international agreement on plastics as part of the chemical and waster cluster of environmental treaties: The Basel, Rotterdam and Stockholm (and



Minamata) conventions. The three conventions will have their next triple Conference of the Parties in April/May this year in Geneva, Switzerland.

The Port State Measures Agreement entered into force in June 2016 to combat illegal fishing. It requires foreign vessels to submit to inspections at any port of call and for port states to share information on violations. The European Union is a party to the treaty.

Amongst other issues, plastic pollution, overfishing and destructive fishing practices will feature prominently on the agenda of the upcoming UN High-Level Conference to Support the Implementation of Sustainable Development Goal 14 in June 2016 in New York, co-hosted by the Governments of Fiji and Sweden. The Conference aims to catalyse and scale up implementation of Sustainable Development Goal 14 on conservation and sustainable use of oceans, seas and marine resources. The conference will contribute to the follow-up and review process of the 2030 Agenda for Sustainable Development by providing an input to the high-level political forum on sustainable development. In 2017, the high-level political forum will be held in July in New York, reviewing Goal 14 and some other goals.

The urban environment

At the UN Conference on Housing and Sustainable Urban Development (Habitat III) in October 2016 in Quito, Ecuador, a global legislative conference held every 20 years, the UN's member nations adopted the New Urban Agenda. This global road map to address urbanization is a non-binding document, which will guide policies over the next 20 years with the goal of making cities safer, resilient and sustainable and their amenities more inclusive. The agenda sets out a host of general goals, such as development of sustainable and compact cities that do not harm the environment and redevelopment of informal settlements with the participation of residents. It was criticized by some commentators that the conference did not deliver a clear actionable roadmap for its implementation aligned with the ongoing implementation of the Sustainable Development Goals.

Following Habitat III, the CoP CBD adopted a decision promoting the understanding of health biodiversity linkages, including with regard to human settlements.

The next World Urban Forum, organized and convened by UN-Habitat every two years as a non-legislative technical forum, will take place in Kuala Lumpur, Malaysia in February 2018. The Forum will have a thematic focus on the implementation of the New Urban Agenda. An international conference on cities and climate change will be held in 2018 to further develop the scientific understanding of climate change and cities, in support of the implementation of the Paris Agreement, the New Urban Agenda, and the Sustainable Development Goals.

Additional developments under the Convention on Biological Diversity

Under the theme of mainstreaming biodiversity for wellbeing, the 13th CoP CBD adopted a comprehensive decision on mainstreaming of biodiversity within and across agriculture, forestry, fisheries, aquaculture and tourism sectors. Importantly, the decision encourages Parties to consider amending or developing new national policies, legislation and/or administrative measures, in particular with a view to modifying those that may have adverse implications for biodiversity, or to fostering new developments on specific topics, such as promoting sustainably sourced goods and services. Furthermore, it was agreed that at the next UN Biodiversity Conference in 2018, in Egypt, will consider mainstreaming of biodiversity in the following sectors: energy and mining, infrastructure, manufacturing and processing industry, and health.

Parties also recognized that the implementation of the 2030 Agenda for Sustainable Development provides a major opportunity for the mainstreaming of biodiversity and thus urge countries to integrate biodiversity in the implementation of all relevant Sustainable Development Goals.

Deriving from the deliberations on synthetic biology, an additional

decision to one on this subject matter was adopted, focusing on digital sequence information on genetic resources. The decision commissions a fact-finding and scoping study to assess the extent and the terms and conditions of the use of digital sequence information on genetic resources, including with regard to the Nagoya Protocol on access and benefit-sharing.

EUROPE

Better implementation of environmental legislation

As part of its 'democratic change' priority under the 2017 work plan, the European Commission will include an 'initiative on implementation and enforcement', which will focus on environmental compliance assurance in Member States; what this means in practice remains to be seen. However, a recent Commission Communication on this subject suggests greater use of the Network for the Implementation and Enforcement of Environmental Law (comprising member-state environmental regulatory officials) to improve member state inspection and enforcement systems. It seems likely that the Commission will now pursue a non-legislative route to improving implementation and enforcement, with the 2014 draft inspections instrument seemingly sinking without trace. The Communication also suggests a streamlined complaint procedure at European Commission level, with a focus on dealing with systematic breaches of EU environmental law. Depending on how this is implemented, this could lead to these strategic cases being handled and resolved more efficiently.

2030 climate and energy framework

The EU climate and energy framework builds on the 2020 climate and energy package and is in line with the longer-term perspective looking towards 2050. The framework covers many areas but the following are of significance for nature.

In early 2016 the European Commission presented two proposals as part of the framework. The proposal on 'Land Use, Land Use Change and Forestry' sets out the accounting rules and the targets that determine how

member states must act between 2021 and 2030. Ensuring land and forests are kept in good condition has been recognised as having an important role in averting climate change. Their role is to become increasingly important for stopping global warming due to the need to remove CO2 from the atmosphere, so called "negative emissions", in order to meet the 2° target, let alone the 1.5° target. This will have important implications for the future of land use and biodiversity. Where decarbonisation is advanced in the energy sector, the land use sector, especially agriculture, is only just starting. The European Commission estimates that by 2050 the agriculture non-CO2 emissions need to be below 2005 levels; based on current policies this target would be missed by a long way. The second proposal is the Effort Sharing Regulation, which sets our binding annual greenhouse gas emissions targets for Member states for their non-emissions trading scheme sectors, these include transport, buildings, agriculture and waste management and together account for almost 60% of total EU emissions. To ensure that the land use sectors make a fair contribution to achieving the EU's climate targets these regulations need to ensure that the EU is on track to meet the long-term climate goals, promote sustainable land use and are in line with achieving the EU's biodiversity goals.

In late 2016 the EU published proposals for how it should progress with the transition to a low carbon society out to 2030. These proposals include revisions to the Emissions Trading Scheme, renewable energy and energy efficiency legislation, as well as new legislation on governance of the EU. However, the proposals published in 2016 are unlikely to result in countries delivering enough renewable energy and efficiency improvements for the EU to meet its commitments made at the Paris Climate Summit in 2015. Additionally, there are insufficient environmental safeguards in place in the proposed legislation to ensure that the pursuit of renewable energy does not negatively impact on wildlife. Strategic spatial planning for energy infrastructure seems likely to be needed to avoid conflicts. Furthermore, the global biodiversity impacts of ever-

increasing bioenergy production are a significant concern.

These files are going through the so called "Codecision" process and will be negotiated by the European Parliament and the Council during 2017.

Common Agriculture Policy "Fitness check" initiative

As part of its Regulatory Fitness and Performance Programme, the EC established the "REFIT Platform" in May 2015 "to advise the Commission on how to make EU regulation more efficient and effective while reducing burden and without undermining policy objectives" (i.e. to provide advice on how to improve the effectiveness and efficiency of EU legislation). Set up in 2015 as part of the Commission's better regulation agenda, and chaired by EC First Vice-President Frans Timmermans, the Platform is composed of high-level experts from each Member State including representatives from governments, businesses, and civil society organisations.

In late 2016, the Platform adopted an opinion recommending that the EC undertake a strategic review or 'fitness check' of the CAP as a matter of priority. The opinion was supported unanimously by business and civil society members of the Platform but opposed by the majority of government representatives.

As part of its 2017 Work Programme, the EC committed to consulting widely this year on the "modernisation and simplification" of the CAP in line with opinion of the REFIT Platform. The results of this consultation process, to be launched in early 2017, will be the first step in the process towards a Communication on the future of CAP post-2020 (this should be published before the end of the year). This will consist of an options paper of five scenarios, which will range from the *status quo* to radical reform. It will be followed by an impact assessment process between April and August and then the publication of a proposal in September to November 2017. Legislative proposals will likely follow in early 2018.

Multiannual Financial Framework (MFF) of the European Union

Discussions on the post-2020 MFF of the EU are starting. This is a six-year budget plan, which sets maximum amounts of money to be spent on various priorities, including the fight against climate change, biodiversity and sustainable management of natural resources. The current MFF, geared towards achieving growth and stimulating innovation, will not allow the EU to meet its environmental targets because of other priorities. The EC is expected to consult the public and make a proposal for the next MFF before the beginning of 2018. The proposal will then be discussed by the European Council, and adopted around 2020. Environmentalists are increasingly focussing on the issue, with most of the discussion revolving around whether to ask for environmental protection to be financed through other policies, such as the Agricultural and Fisheries Policies, as is the case now – the so-called "mainstreaming approach" – or separately, which could allow better control and more efficient use, but some argue would result in poorer integration.

Fitness Check of the Birds and Habitats Directives

The Fitness Check of the Birds and Habitats Directives concluded at the end of 2016 with the publication of the Consultants' Final Report and a Staff Working Document from the European Commission, both confirming that the Directives are fit for purpose but that additional action is needed to address poor implementation. The Commission has therefore confirmed that it will develop an Action Plan to correct the deficiencies in implementation of the Directives identified by the Fitness Check. The Action Plan is expected to set out a series of concrete measures such as holding regular meetings with mayors and other local authorities to assess implementation challenges and help Member States take the necessary corrective action. Moreover, the Commission has proposed that the Action Plan will, 'design, in partnership with Member States and relevant stakeholders, appropriate implementation guidelines for regional actors, reducing unnecessary burdens

and litigation, and incentivising national and regional investment in biodiversity.' The EU's Committee of the Regions will be closely involved in these actions.

Invasive non-native species

In 2015, the EU's Invasive Alien Species Regulation came into force. The Regulation follows a 'Black List' approach; whereby, all non-native species are allowed to be present and traded in the EU – unless they are identified as being highly invasive. In which case, they are included on the Regulation's black list.

Species are included on the black list by secondary legislation which the European Commission, the European Parliament and all the Member States can influence. Legislation to include the first 37 species on the black list was passed in 2016. The institutions of the EU anticipate that the list will be updated annually. Legislation to include up to a further 12 species on the black list will come into force in 2017. The exact number of additional species that will be listed is unknown. Secondary legislation to specify the evidence base required for species to be included on the black list will likely come into force in 2017.

Common Fisheries Policy

The Data Collection Framework of 2008 is in final stages of revision and, when adopted, is expected to require Member States to collect data on ecosystem pressures, including an unprecedented duty to report systematic data on seabird bycatch. The Technical Measures Regulation is also being revised and, following the EC's proposal on how, where and when fishing can be done in sea basins (e.g. North Sea), may be adopted in 2017. The proposed new Technical Measures Regulation aims to reduce impacts on not just fish stocks but also the wider marine environment, aligning it with the reformed Common Fisheries Policy in respect of, e.g., multiannual plans, discard policy and environmental legislation (Nature Directives, and Marine Strategy Framework Directive). To implement regionalised decision-making under the reformed Common Fisheries Policy, multiannual plans for each of the sea basins are to be

developed, starting with a new Baltic plan in 2016. The Commission's proposed plan for the North Sea may be adopted by the end of 2017.

UNITED KINGDOM

Higher Education and Research Bill

The Higher Education and Research Bill aims to provide the legislative underpinning to the Government's policies to reform universities and research funding. At the time of writing the Bill is at the Committee Stage in the House of Lords, where it is facing substantial opposition, and a number of amendments have been proposed. It is likely that the Government will need to make some concessions to obtain the support of the House of Lords, however it has not yet indicated its willingness to do so. The Bill is currently scheduled to pass the Lords before Easter 2017 and would be expected to receive royal assent soon afterwards.

The primary aims of the Bill include Establishing a new higher education regulator in England, the Office for Students, replacing the Higher Education Funding Council for England and the Director of Fair Access to Higher Education and integrating the current seven research councils and Innovate UK, into a new single body: UK Research and Innovation. The research councils would no longer possess their own royal charters, but would become committees of UK Research and Innovation.

A number of concerns about the Bill have been expressed by Peers and MPs, including over university and scientific autonomy due to the enhanced ministerial powers the Bill presents, privatisation, the quality of new providers, and the proposed link between the Teaching Excellence Framework and differentiated fees.

Industrial strategy

On 23 January 2017, the UK Government launched its proposals for a "modern industrial strategy", with a Green Paper, "Building our Industrial Strategy", which will be open for consultation until 17 April 2017.

A more interventionist approach to the economy has been highlighted as one of the priorities of Theresa May's

administration, and the objective of the strategy is "to improve living standards and economic growth by increasing productivity and driving growth across the whole country". Science, research and innovation is at the heart of this strategy.

The Green Paper firms up the Government's commitment to spend an additional £4.7 billion on research and development by 2020-21, as announced in the 2016 Autumn Statement, which will be delivered through UK Research and Innovation. Initial proposals for investment priorities include: improving the translation of research into commercial outcomes; new funding streams to support local world-class research and innovation clusters across the UK; substantially increasing the number of PhD and research fellowships in science, technology, engineering and maths; active recruitment of top international talent; new capital spending; sector-specific funding to support business investment in research and development. A new Industrial Strategy Challenge Fund will support technologies where the UK has the potential to take an industrial lead. Relevant suggestions include smart, flexible and clear energy technologies; and bioscience and biotechnology.

Other proposals within the Industrial Strategy Green Paper of relevance to ecologists and conservationists include "greater certainty and long-term direction across infrastructure policy, including, where relevant, how we use and improve our stock of natural capital", and delivering affordable energy and clean growth in a way that can "secure the economic benefits of the transition to a low-carbon economy".

Proposals to ban the use of plastic microbeads in cosmetics and personal care products

On 20 December 2016, Defra, in partnership with the Scottish Government, Welsh Government and Department of Agriculture, Environment and Rural Affairs in Northern Ireland set out its proposals to ban the use of plastic microbeads, in cosmetics and personal care products, which may cause harm in the marine environment. A UK-wide consultation is open until 28 February

2017. As currently proposed, legislation banning solid microplastic ingredients smaller than 5mm in size would come into force in England by 1 October 2017, with Devolved Administrations introducing their own legislation in a co-ordinated manner. The ban on manufacture is expected to come into force on 1 January 2018, with a ban on sale expected from 30 June 2018.

Changes to Environmental Impact Assessment Regulations

Defra, the Scottish Government, Welsh Government, Forestry Commission England and the Northern Ireland Executive are consulting on the approach to implementing European Directive 2014/52/EU, which updates Directive 2011/92/EU, consolidating the original 1985 Environmental Impact Assessment Directive and its amendments. The consultation is open until 30 January 2017. The amendments introduced by Directive 2014/52/EU must be incorporated into national legislation no later than 16 May 2017.

The consultation covers proposed amendments to domestic legislation reflecting these changes and covers agriculture in England only, forestry, water resources, land drainage and fin-fish farming in England and Wales, and marine works in England, Wales, Northern Ireland and Scotland-offshore. The amendments will aim to simplify the rules for assessing the potential effects of projects on the environment, improve environmental protection, and focus procedures on the environmental factors that are significantly affected by projects.

ENGLAND

Much of the recent activity in England is either driven by, or covered in the UK section, following the UK's referendum vote to leave the EU. The Environmental Audit Committee has recently published its report on The Future of the Natural Environment after the EU Referendum. A leading recommendation calls for new legislation – the Environmental Protection Act – to ensure equivalent or better environmental protection than we are subject to while part of the EU.

In early 2017 Defra will release the draft 25-year Environment Plan as a

Green Paper, followed by a period of consultation, with the expectation of producing a White Paper by the end of the year.

In January 2017 the Natural Capital Committee published its fourth report *Improving Natural Capital: An assessment of progress*. Its main recommendations include placing the Defra 25-year Environment Plan on a statutory footing with a specific lead institution and making it part of an overarching framework for the development of agricultural policy from 2020. In addition, it states that the Office for National Statistics has committed to developing national natural capital accounts by 2020.

The latest Climate Change Risk Assessment draws on the independent evidence report of the Adaptation sub-Committee of the Committee on Climate Change, and indicates that a National Adaptation Programme will be published in 2018.

Government commissioned an Independent Review of tidal lagoons published by Charles Hendry in January 2017. This report, while recommending that the Swansea pathfinder project goes ahead to inform the contribution of this renewable energy source to the overall energy mix, recognises that very long-term value needs to be considered in assessing overall cost.

Fifty-one organisations across the environment sector came together to publish the second *State of Nature* report in September 2016. While over half of the species studied have declined since 1970, and specialists continue to do worse than generalists, there are signs that some rates of loss may be slowing. During the year, there were two significant developments for species protection involving Natural England. Firstly, a consultation on new policies for European Protected Species licensing introduced a strategic approach for licensing developments affecting great crested newts operating at a population scale facilitated by e-DNA technology. This is being trialled in southern England – the Woking Pilot. Secondly, the High Court ruled that license applications for the control of buzzards affecting pheasant shoots should be considered no differently than similar applications

for other species, and this resulted in the issuing of a small number of licenses in 2016 for this purpose.

SCOTLAND

The Scottish Government's legislative programme for 2017-18 sets out three Bills directly relevant to nature and landscapes. The Forestry Bill will create a new forestry and land management body for Scotland. The initial focus is likely to be on the National Forest Estate. This may be extended to include other publicly-owned land in the future, such as National Nature Reserves. The Islands Bill is intended to island-proof future legislation and policies especially in Shetland, Orkney and the Western Isles. A 'National Islands Plan' will extend the powers available to the Islands' councils. The Climate Change Bill follows on from the 2009 Act and will increase the emissions reduction target for 2020 from a 42% reduction over 1992 levels to a 50% reduction.

Climate change

Discussions about the Climate Change Bill are at an early stage, with a focus on the international context (post-Paris, COP 21). A consideration is whether Scotland can have a zero-carbon economy by 2050 and what this would look like; there are challenges for agriculture, where emissions are dominated by biological sources. Another issue concerns the roles of carbon capture and storage. There seems to be a consensus that targets need to be simple to motivate people and to inform clear action.

Currently, there is an 18 month lag between the UK and Scottish carbon inventories, and we may see a bespoke Scottish inventory being devised. This could also include blue carbon, adding weight to the need to nurture this significant and important carbon stock.

Delivery is a major theme of the Scottish Government's Climate Change Plan, published for consultation on 19th January 2017, with 60 days for parliamentary scrutiny. It sets out policies and plans for meeting Scottish climate change (emissions reduction) targets over 2017-2032, as required under the Climate Change (Scotland) Act 2009.

The new Plan replaces the earlier 'Reports on Policies and Proposals', and has a more user-friendly name! It covers the period up to 2028-2032. The main emission-reduction challenges lie in heat (in buildings – mainly gas), transport (mainly cars) and land use (especially food and farming).

The Plan requires that 10,000ha of peatland is restored in 2017/18, rising to 20,000ha a year from 2018/19 to contribute to a target of 50,000ha by 2020 and 250,000ha by 2030. On 24th January 2017 Scottish Natural Heritage (SNH) welcomed the announcement by Cabinet Secretary for Environment, Climate Change and Land Reform, Roseanna Cunningham MSP, of a further £8 million for the award-winning Peatland Action initiative. This has run since 2012, as one of the key projects helping to deliver the '2020 Challenge for Scotland's Biodiversity'. The investment enables SNH to continue working with its Peatland Action partners to restore a further 8,000ha of peatlands, to add to over 10,000ha of peatland already restored under the scheme. Peatland restoration involves blocking vast stretches of ditches, as well as other measures, to reduce the rapid runoff of water from bare peat surfaces. This is good news for peatland conservation.

Other policies in the Climate Change Plan with implications for nature and landscapes include woodland and hedgerow planting targets (increasing from 10,000 to 15,000 ha per year) and associated Local Authority locational strategies, renewable electricity generation to support low carbon heat and transport (especially onshore wind), public body contributions (energy efficient buildings and electric vehicle use), and promoting active travel (walking and cycling).

Throughout, the Plan emphasises the co-benefits of action on climate change for other important areas of policy, including population health, air quality and a sustainable inclusive circular economy.

Deer management

In November 2016, SNH published a report to the Scottish Government on deer management in Scotland. This has given rise to considerable debate, and the Scottish Parliament's

Environment, Climate Change and Land Reform Committee has taken much evidence on this. There is likely to be considerable scientific and public commentary on this matter over 2017.

Biodiversity and meeting the 2020 targets

There is already considerable political interest in progress towards meeting the 2020 Aichi targets for biodiversity. The Environment, Climate Change and Land Reform Committee recently took evidence from stakeholders on the publication of Scotland's Biodiversity – A Route Map to 2020 First Progress Report 2015/16 - the first annual review of the Route Map to 2020 and Scotland's Biodiversity Progress to 2020 Aichi Targets Interim Report 2016. There will be growing interest in this nationally and at the UK level as we approach 2019.

WALES

Wales continues to implement its legislative framework for sustainable management of natural resources and to strengthen efforts to tackle key intergenerational challenges, like climate change. All three landmark Acts are being progressed, and now form an interesting foundation for EU-Exit discussions in terms of the future of Wales and its unique brand. For Wales to develop sustainably, the law was changed to put in place the key elements that will enable it to happen.

The Well-being of Future Generations (Wales) Act

The Act became law in April 2015 and many of the duties came into force from April 2016. The Act strengthens existing governance arrangements for improving the well-being of Wales to ensure that present needs are met without compromising the ability of future generations to meet their own needs. The statutory Public Service Boards are now established and have been undertaking, during 2016, an assessment of the state of well-being (as defined in the Act – socially, economically, culturally and environmentally) in their areas. This state of well-being assessment will be consulted on and a final published by March 2017. This will be used to identify the well-being objectives for that area and these will be set

out in a Well-being Plan during 2017-18. This will then be delivered through collaboration of partners at the Public Services Board and wider interests. Wales' first statutory Future Generations Commissioner has also been appointed – one of the first in the world - and her office established. A consultation on the strategic plan for the Commissioner will be undertaken in 2017.

Environment (Wales) Act

The Environment (Wales) Act came into force in May 2016. One of the first products, as part of the statutory framework for sustainable management of natural resources, was the *State of Natural Resources Report* – published by Natural Resources Wales at the end of September 2016. The report makes a first assessment on the extent to which sustainable management is being achieved. It includes an assessment of the resilience of ecosystems in Wales, the benefits that natural resources and ecosystems provide and contribute to Well-being goals in Wales, and it pulls together a risk register linking the management of natural resources and ecosystems to wellbeing, now and in the future. Natural Resources Wales is actively seeking ideas on how to improve their assessment and reporting process.

The report and its high level recommendations are now being considered by Welsh Ministers as they develop their first statutory National Natural Resources Policy. A consultation on the development of the policy was launched in November 2016 and closes on 13 February 2017. The main themes covered by the policy are expected to be accelerating green growth by increasing resource efficiency, renewable energy and supporting innovation, delivering nature-based solutions to improve resilience and the benefits derived from natural resources, and improving community and individual well-being by taking a place- and landscape-based approach. The final policy is expected in April 2017.

Natural Resources Wales is then required to develop Area Statements to help facilitate the implementation of the National Natural Resources Policy. In September 2016, Natural



Resources Wales began a collaborative process with a range of stakeholders to help agree the key steps required in the development of Area Statements – from agreeing the scale at which Statements should be produced, to looking at engagement and evidence requirements, and finally forms of publication. This process is ongoing and iterative, and is designed to ensure that end-users of Area Statements have the evidence they need to inform more sustainable decisions.

Management of marine protected areas of Wales

The seas around Wales make up over half the area of Wales. There are 128 marine protected areas covering over 5500 square miles, or 35% of the Welsh seas and 75% of the coastline. This includes sites such as Skomer Marine Conservation Zone in Pembrokeshire that has been a marine protected area in some form for over 25 years.

In its inquiry into marine policy in Wales, the Fourth Assembly's Environment and Sustainability Committee expressed concern about the level of priority given to the marine environment by the Welsh Government. Amongst its recommendations, the management of marine Protected Areas was highlighted as a priority area for improvement. The Climate Change, Environment and Rural Affairs Committee is calling for evidence to support its inquiry into the management of marine protected areas in Wales. One of the more specific questions focuses on how Area Statements, which will be developed by Natural Resources Wales, should cover Welsh seas. The consultation closes on 10 February 2017.

Welsh emission accounting

The Environment (Wales) Act 2016 set a legal target of reducing emissions by a minimum of 80% by 2050. The Act provides Welsh Ministers with powers to establish statutory emission reduction targets and carbon budgets that will act as stepping stones to ensure that regular progress is made towards the 2050 target. The Welsh Government is establishing an evidence base to ensure in setting the

carbon budgets and interim targets, Wales reduces emissions to deliver on its obligations as well as maximising economic and social benefits for the people of Wales. Wales asked for expert advice from the UK Committee on Climate Change (UKCCC), which has issued a call for evidence on defining what emissions are counted in the Welsh account and looking at mechanisms for delivery. The call for evidence is available on the UKCCC website and closes on 6 February 2017

Welsh Government and clean energy

In December 2016, the Welsh Government set out how it will use its devolved powers to take advantage of opportunities Wales has to deliver secure and affordable low carbon energy. This will include ensuring Wales secures transformational benefits from major energy projects and setting ambitious and realistic targets for renewables, including community energy.

The Welsh Government is already supporting the development of low carbon energy projects in Wales, for example, providing funding towards local renewable energy projects such as the Awel Aman Tawe Community Energy scheme in Swansea.

National Development Framework

The Welsh Government has commenced work on the preparation of the National Development Framework. It will be a national land use development plan and will replace the existing Wales Spatial Plan. It will set out the 20-year spatial framework for land use in Wales, providing a context for the provision of new infrastructure and growth, and setting out how the Government's land use objectives will be taken forward at national, regional and local levels. A call for evidence started in December 2016 and closes on 7 March 2017. Access is online and stakeholder events are being held in late January across Wales.

Wales Bill

This was introduced by the Wales Office and aims to create a stronger Wales within a strong United Kingdom. The draft Bill sets out in detail how the UK Government plans to deliver the St David's Day

commitments to create a stronger, clearer and fairer devolution settlement for Wales that will stand the test of time. The key measures include a reserved powers model so that the people of Wales know precisely what powers the Assembly has and can hold it to account, important new powers for Wales over energy, transport and local government and Assembly elections and greater powers for the Assembly over its own affairs including the ability to change its name.

NORTHERN IRELAND

On January 26 2017 The Northern Ireland Assembly closed for business to prepare for a snap election, which will take place on the 2 March. The Assembly institutions collapsed because of a botched Renewable Heat Incentive (RHI) Scheme, and the resignation of the Deputy First Minister, Martin McGuinness. While there is much political uncertainty, it has been agreed that the Assembly will slim down from 108 members to 90, which means each constituency will now elect five, rather than six Members of the Legislative Assembly (MLA).

The breakdown in political relations between the parties raises some serious questions about if, and when, power-sharing will be restored post-election, presenting significant risk for the environment. Prime Minister Theresa May has been very clear that Article 50 will be triggered by the end of March, signalling the start of formal proceedings to disengage from the EU.

There is real concern that an Executive may not be in place to influence these wider Brexit negotiations. There will be many environmental issues and considerations raised throughout these negotiations and without a functioning Executive to represent Northern Irish interests at a Westminster level.

Before the assembly collapsed two important environmental initiatives had been set in motion.

Environmental Farming Scheme

The Environmental Farming Scheme is a key mechanism in helping improve the sustainability of the wider countryside. This scheme is designed to encourage farmers to protect and enhance the environment on their farmland. This means farmers will be funded to put in place measures that will support threatened breeding wader species, such as curlew and lapwing, seed eating species, such as yellowhammer and linnet, and important habitats, such as peatland. The scheme also seeks to address issues of water quality, expansion of native woodland and options for pollinating insects.

The Environmental Farming Scheme is due to open in February 2017, however there are still major concerns about the timings of applications and how they will benefit key species on the ground. Of particular concern are arable areas suitable for seed-eating farmland birds and wet grassland areas suitable for breeding waders. On both accounts the application window and internal Department of Agriculture Environment and Rural Affairs assessment will be too long to be of benefit to either species in 2017. However, other options which will benefit water quality, forestry and rural heritage will be operational in 2017.

Four new Marine Conservation Zones for Northern Ireland

After several years of detailed deliberation and extensive evidence gathering, the Northern Ireland government has designated four new Marine Conservation Zones as of December 2016. These new designations are now providing vital protection for some of Northern Ireland's most vulnerable marine species and the habitats they rely on.

The new Marine Conservation Zone off Rathlin Island, County Antrim is the first UK Marine Conservation Zone to have a seabird species - the black guillemot - as its primary designation feature. An extension of the southern boundary of the designated area ensured that the entirety of the species' foraging habitat was placed under the protection it needs. Alongside this, long-term monitoring

data allowed the Marine Division to move the conservation status of black guillemots to 'unfavourable', meaning government is now committed to restoring the species back to good health.

Three other marine conservation zones are now protecting seagrass meadows at Waterfoot, Co. Antrim, fragile sea pens and mud communities at Carlingford Lough, Co. Down and the ancient ocean quahog at outer Belfast Lough, Co. Antrim. The latter site, in Belfast Lough, now protects the ocean quahog. This marine clam is considered by science to be one of the longest-living species on our planet and some individuals have been found to be over 500 years old.

2017 will be a key year for these sites, not only because they are new, but because Marine Division has plans to galvanise the Marine Protected Area network through the extension of the European Special Protected Area network. This will add a further 96 Thousand hectares to the marine protected area off the east coast of Northern Ireland.

Sutherland, W.J., Barlow, R., Clements, A., Harper, M., Herkenrath, P., Margerison, C., Monk, K.A., Robinson, J.A. & Thompson, D.B.A. (2011). What are the forthcoming legislative issues of interest to ecologists and conservationists in 2011? *Bulletin of the British Ecological Society*, 42, 26-31.

Sutherland, W.J., Burke, E., Clements, A., Connor, B., Martin, J., McNamee, P., Mitchell, C., Monk, K.A., Rogalla von Bieberstein, K., & Thompson, D.B.A. 2016. What are the forthcoming legislative issues of interest to ecologists and conservationists in 2016? *Bulletin of the British Ecological Society* 47, 45–54.

Sutherland, W.J., Clements, A., Benwell, R., Burke, E., Connor, B., Martin, J., Monk, K.A., Rogalla von Bieberstein, K. & Thompson, D.B.A. (2015) What are the forthcoming legislative issues of interest to ecologists and conservationists in 2015? *Bulletin of the British Ecological Society* 46, 48-56.

Sutherland, W.J., Clements, A., Crane, E., Pilbeam, C., Martin, J., Monk, K.A., Rogalla von Bieberstein, K., & Thompson, D.B.A. (2014). What are the forthcoming legislative issues of interest to ecologists and conservationists in 2014? *Bulletin of the British Ecological Society* 45, 32-37

Sutherland, W.J. Clements, A., Harper, M., Herkenrath, P., Margerison, C., Martin, J., Monk, K.A., & Thompson, D.B.A. (2013). What are the forthcoming legislative issues of interest to ecologists and conservationists in 2013? *Bulletin of the British Ecological Society* 44, 38-43.

Sutherland, W.J., Clements, A., McDevitt, A.-M., Harper, M., Herkenrath, P., Prichard, S., Margerison, C., Monk, K.A. & Thompson, D.B.A. (2012). What are the forthcoming legislative issues of interest to ecologists and conservationists in 2012? *Bulletin of the British Ecological Society* 43, 12-19.

ACKNOWLEDGEMENTS

This is an activity initiated by the Cambridge Conservation Initiative and carried out as a collaborative partnership. We thank Claire Brown, Cordula Epple, Daniela Guarás, Kelly Malsch, Abisha Mapendembe, Corinne Martin, Elsa Sattout and Massimo Zortea for contributing to sections. WJS is funded by Arcadia.

William J. Sutherland is at the Zoology Department in Cambridge; Eleanor Burke is European Policy Advocate for RSPB, Andy Clements is Chief Executive of the British Trust for Ornithology; Ben Connor is Policy Manager for the British Ecological Society; John Martin is Senior Conservation Officer for RSPB Northern Ireland; Clive Mitchell is Strategic Direction Manager with Scottish Natural Heritage (SNH), Kathryn A. Monk is the Principal Adviser for Science for Natural Resources Wales; Katharina Rogalla von Bieberstein is Programme Officer at the United Nations Environment Programme World Conservation Monitoring Centre in Cambridge; Des B.A. Thompson is Principal Adviser on Biodiversity with SNH.

FEATURE

THOUGHTS OF A SOUTHERN MEDITERRANEAN ECOLOGIST

Tarek Mukassabi | University of Benghazi, Libya | Tarek.mukassabi@uob.edu.ly



Cyrenaica is a unique ecosystem on the southern Mediterranean coast in Libya, which is a complex of typical Mediterranean communities and the Sahara that lies just a hundred kilometres south of the coastal line. A huge number of arid and semi-arid plant species are found in this area, as well as many fauna species. Moreover, the marine ecosystem is still largely unexplored in this part of the Mediterranean. However, there is a collection of more than twenty thousand plant specimens preserved in the Cyrenaica Herbarium at the University of Benghazi in Libya. This collection includes all Libyan plants that grow wild in this area, including most of the Libyan native species. Unfortunately, the university campus in Benghazi is located within the hottest armed conflict area in the city, and very close to the old regime's army bases and compounds. Because of this, since 2014, the university buildings have been in the range of artillery, which turned the whole campus into a horrific battleground. It is likely that this valuable plant collection has been dreadfully damaged.



Chancellor's building, University of Benghazi

The scientific research sector in this country, specifically in ecology, had made a few good steps at the beginning of this century. But since the Arab spring uprising in 2011, everything has been disturbed and the passion turned into a nightmare. There is a shortage at all levels, even the essential needs for everyday life, such as electricity, internet connection, phone networks and even currency liquidity. We are still paid our monthly salary, which goes into your account in the bank, but there is no cash. The transitional government attempts to find urgent solutions for all these difficulties, but it has not quite succeeded, not in all issues.



Out in the field. A tranquil scene, but heavily armed security personnel can appear at any time.

Yet, research is still ongoing but very slowly; we lost most of our superior laboratories, glasshouses and equipment. Moreover, doing research in open areas has become relatively challenging. Visits by the security forces, which come from nowhere when you set your quadrats out in the field, are common. As they are civilians turned into security forces in a very short time, they do not understand that the richness of plant annual species has to be studied, or even that the annual seed production by Juniper trees in a spectacular area in the Green Mountain can be predicted. You have to be very diplomatic and professionally persuasive to convince these people that what you are doing does not harm anyone and more specifically is not affecting national security. If you have a digital camera with you, that would be an unfortunate coincidence.

Since 2008, I have been a regular attendee at the BES annual meeting. For an ecologist coming from a developing country, the annual meeting is a spectacular event that should not be missed out. Currently, the cost of attending such events is hugely expensive for us. There have been no functioning foreign embassies in Libya for more than two years because of the consequences of the armed conflict following the Arab spring, and so we need to travel to Tunis in Tunisia which is the nearest place to apply for a UK visa, and this journey itself is a nightmare. The airport in Benghazi has been closed down since 2014, again because of the armed conflict; we drive to the nearest airport in the city of Al Bayda, two hundred kilometres in the east, then take a flight to Tunis. However, if you are fortunate, you successfully come back to Benghazi with a visa stamped on your passport. Having

permission to travel to the UK gives you a great desire to get yourself ready for the grand journey. You need to take the same trail, driving a couple of hours to Al Bayda city, taking the flight to Tunis, staying overnight and on the next day from dawn you have to be at the airport heading for London. In London, which is the point when you incredibly start enjoying your journey, you take whatever appropriate transportation to reach the conference site. In a best-case scenario, the journey for the visa takes at least a whole week and about £900 for flight tickets, visa fees and accommodation. Attending the meeting adds another £1150, so in total £2050 which, based on the present currency exchange rate in the parallel market, is about 15,000 Libyan Dinar; this is my basic net salary for eight months.

As well as attending the BES annual meeting, the visit is useful in bringing together the loose ends of ongoing projects in collaboration with British researchers that could not be finished over the electronic mail. In a developing country such as Libya, and irrespective of the official economic status, getting funding for research and attending conferences is very difficult. There are only two restricted sources of funds, the National Association for the Scientific Research and the University. If you are lucky enough and have good relationships with people in authority, you could get some funds to support your research projects, and otherwise you are on your own and usually have to pay from your own budget. But regardless of the huge effort and price that you have to give to your research, the rewards of attending BES events, meeting different researchers from all over the world and publishing good articles makes it all worthwhile.

OPINION

SUPPORT FOR A BES FOOD POLICY



Ben Phalan | Oregon State University, USA | benphalan@gmail.com

I expected to see a response to Simon Leather's criticism of the decision not to serve ruminant meat at the BES annual meeting (Bulletin 47(1): 71-72), but as time has passed without one, I decided to write one myself. In my view, the BES was taking a small step in the right direction, and I would love to see it do more.

It is well established that livestock production is one of the most damaging activities to biodiversity on a global scale. Each year, we raise and slaughter tens of billions of animals, and their biomass now vastly exceeds that of all large-bodied wild mammals (Barnosky 2008). Considering both pasture and cropland devoted to animal feed, livestock production occupies a staggering ~75% of global agricultural land (Foley *et al.* 2011), and accounts for the bulk of greenhouse gas emissions from agriculture (Figure 1). The crops which are expanding in tropical countries by the greatest amount by far each year – soybeans and maize – are both major feed crops (Phalan *et al.* 2013). It seems paradoxical, but if we ate more soybeans and other legumes, instead of feeding them to livestock and losing 90% of the energy along the way, we could meet human needs with fewer soybeans and keep more of the Cerrado and Chaco intact (Reijnders & Soret 2003). Because raising livestock is so inefficient, eating fewer animal products would mean we'd use far less land to grow crops, not more (Figure 2).

CARBON EQUIVALENT FOOTPRINT (kgCO₂e per kg product)

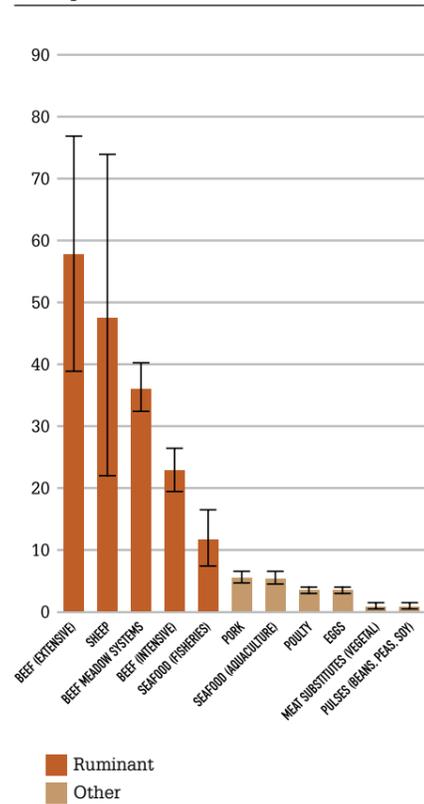


Figure 1: Emissions per kilogram of different protein-rich foods, from Ripple *et al.* (2014).

Simon points out that humans evolved as omnivores. He's right, but we evolved as omnivores at a time when it would have been difficult to get enough nutrition without eating meat. Nowadays, we live in a very different world, where it is increasingly straightforward to have a healthy diet without animal products. In fact, there is evidence that switching to beans, pulses and other nutritious plant-derived proteins in wealthy countries could help to reduce health problems such as heart disease and cancer (Tilman & Clark 2014). Our dentition and gut structure have no problem at all with an entirely plant-based diet. We would only need the paunch of a proboscis monkey if we were to eat nothing but leaves. Even with respect to the one or two micronutrients not adequately supplied by plant-based foods, there is now enough added to breakfast cereals, non-dairy milk and so on that vegans can meet all of their needs without animal products.

Some argue that we need livestock because they can convert plant material that is unfit for human consumption. There is a role for livestock raised on wastes and residues, and if we could reduce livestock farming to levels where the bulk of their food came from such sources, the sector would fare much better on a range of sustainability metrics (Fairlie 2010). But this argument is often extended to "marginal lands" unsuitable for crops, overlooking the possibility to leave these areas as wildlife habitat instead of grazing them, and so dismissing the potential

CROPLAND DEMAND (million km²)

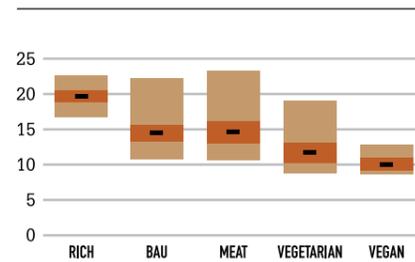


Figure 2: Global cropland demand under a range of scenarios for 2050, showing that vegan diets would reduce the amount of cropland required for food production, and could halve the total cropland area compared to global adoption of current North American-style ("rich") diets. From Erb *et al.* (2016).

benefits of habitat restoration and rewilding. Ecologists in the UK tend to think of the value of livestock in conservation grazing, but how much of the UK's meat and dairy is derived from habitats where livestock contribute to, rather than detract from, their conservation value? My back-of-the-envelope calculations suggest it's unlikely to be more than about 1%. Certainly, let's find ways to support and maintain that 1% (or 5%, or whatever tiny fraction it is), but at the same time, I have found no serious argument that a substantial reduction in livestock numbers in the UK would be anything but beneficial for biodiversity.

Ethically and practically it is clear that the onus is on us, as relatively wealthy, well-informed and privileged western conservationists and ecologists, to make the most effort to reduce our consumption of animal products. Doing so should not fall to the poor and food-insecure, and certainly not to those living subsistence or pastoralist lifestyles in the developing world. In my view, we should be leading by example, and reduce, if not eliminate, animal-based foods from our diet.

Simon Leather writes about the need to reduce air travel, and about his admirable efforts to cut his own flying. I fully agree with the need

to break our societal addiction to frequent air travel, or at least that of the privileged global minority who can afford it. Anyone who recognizes the urgency of the climate challenge should indeed back calls to halt any further construction of airport infrastructure, should make every effort to fly less or not at all, and should support campaigns on these issues such as Plane Stupid and A Free Ride. However, pointing to one important problem does not reduce the need to address another. There are always ways to pass the buck, and flying less should not preclude efforts to reduce the environmental impacts of the food we consume.

A crucial point, for me, is that the greatest threat to terrestrial biodiversity today is land-use change, not climate change. As ecologists, we must be the first to recognize the imperative to reduce our land footprint as well as our carbon footprint (Meier *et al.* 2014). Eating less meat and dairy, or eliminating it from our diets, does both. Eating local can have some benefits too, but its impact on emissions and land use pales in comparison to cutting animal products from the menu (Weber & Matthews 2008). I strive to fly as little as possible largely because I care about coral reefs and future generations, and I have become mostly* vegan in the last two years largely because I care about birds, beetles and the uncountable throngs of other species whose habitats we clear to produce our food.

Of course, individual efforts can go only so far. Personal sacrifices will be in vain unless they help us progress towards radical, system-level change. That's why it is important for organizations such as BES to take a public, evidence-based position on issues such as travel and food. The value of taking a position probably lies more in how it influences the ways that we – as a Society and as society – think about these issues than in the specific impacts that will be avoided. A pragmatic way forward would be an opt-out system, where conference-goers are informed that food will be by default vegetarian (or better, vegan), unless individuals specifically opt out. That would

help to reshape social norms and expectations, while addressing concerns about decisions being imposed on members, and I expect that most BES members would support it. As to Mike Morecroft's call to measure the footprint of the BES and its meetings, please do (and include an estimate of land footprint). But don't let that be an excuse to delay action.

*Why "mostly"? Because the point is to do what we can, and inspire others to do what they can too – not adhere to a rigid, difficult to achieve, sackcloth-and-ashes level of purity.

REFERENCES

Barnosky, A.D. (2008) Megafauna biomass tradeoff as a driver of Quaternary and future extinctions. *Proceedings of the National Academy of Sciences* 105, 11543–11548.

Erb, K.-H., Lauk, C., Kastner, T., Mayer, A., Theurl, M.C. & Haberl, H. (2016) Exploring the biophysical option space for feeding the world without deforestation. *Nature Communications*, 7, 11382.

Fairlie, S. (2010) Meat: a Benign Extravagance. Permanent Publications.

Foley, J.A., Ramankutty, N., Brauman, K.A., Cassidy, E.S., Gerber, J.S., Johnston, M., *et al.* (2011) Solutions for a cultivated planet. *Nature*, 478, 337–342.

Meier, T., Christen, O., Semler, E., Jahreis, G., Voget-Kleschin, L., Schrode, A. & Artmann, M. (2014) Balancing virtual land imports by a shift in the diet. Using a land balance approach to assess the sustainability of food consumption. Germany as an example. *Appetite*, 74, 20–34.

Phalan, B., Bertzy, M., Butchart, S.H.M., Donald, P.F., Scharlemann, J.P.W., Stattersfield, A.J. & Balmford, A. (2013) Crop expansion and conservation priorities in tropical countries. *PLoS ONE*, 8, e51759.

Reijnders, L. & Soret, S. (2003) Quantification of the environmental impact of different dietary protein choices. *American Journal of Clinical Nutrition*, 78, 664S–668S.

Ripple, W.J., Smith, P., Haberl, H., Montzka, S.A., McAlpine, C. & Boucher, D.H. (2014) Ruminants, climate change and climate policy. *Nature Climate Change*, 4, 2–5.

Tilman, D. & Clark, M. (2014) Global diets link environmental sustainability and human health. *Nature*, 515, 518–522.

Weber, C.L. & Matthews, H.S. (2008) Food-miles and the relative climate impacts of food choices in the United States. *Environmental Science & Technology*, 42, 3508–3513.

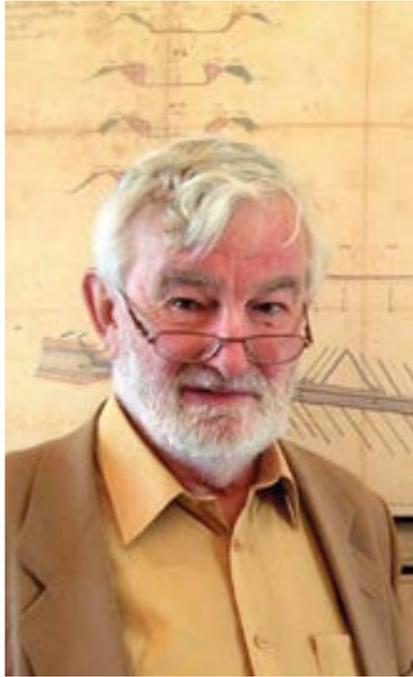
PALMER NEWBOULD 1929 – 2016

Peter John Newbould, known, even as a child, as Palmer (probably after a heroic uncle), was a committed and influential nature conservationist, initially and late in life in England, and for more than half his working life in Northern Ireland. He was generous, warm-hearted, and had a wide range of interests in both arts and science. He was plain-speaking, humorous, unpretentious, always helpful, had considerable presence, and was universally liked and trusted.

He was born to Dorothy and Alfred Newbould, in south London. His father worked on the edge of the cinema industry, and as a boy Palmer met many of the famous names of the time. After early schooling he won a scholarship to Charterhouse. There he was expected to specialise on the classics side, but (in his own words) could not see the point of that, and after School Certificate turned to the sciences. He had his early experiences of ecological fieldwork, first at Start Point (South Devon), and then at Lough Ine. He also discovered a taste for beer and cider, and formed friendships that lasted the rest of his life.

He then went to Balliol College (Oxford) to read forestry, but realised that the need for foresters was rapidly diminishing, as Empire contracted, so switched to Botany, graduating in 1950. By that time he had decided that he wanted to do ecological research. The Nature Conservancy (NC) had been started in 1949, and the next year Palmer won a Research Studentship from them, and moved to UCL to work with W.H. Pearsall (WHP). Palmer's recollection of the interview was that he had a pleasant conversation with WHP, who then accepted him.

WHP's supervision method was, deliberately, what would now be called 'light touch'. He suggested working on one or both of two peat bogs. Palmer chose Cranesmoor: a valley bog in the New Forest (Newbould 1960). It was at UCL that he met Jo Pugh, a fellow PhD student in botany. They married in 1954.



Then, as was required at that time, Palmer was conscripted into the army for National Service. For the first time, during initial training, he met all sorts and conditions of men. Later he was selected for officer training. Having missed a critical Mess meeting he found himself with responsibilities he had not sought – a valuable lesson. Palmer looked back on all this as wasted time but quite educational.

WHP had already reserved a post for him in Botany at UCL: no Interview Panel, no HR, no Job Description, no Person Description. In 1955 Palmer returned to UCL as Assistant Lecturer in Ecology, and in 1957 two colleagues and I began work as his first PhD students (though technically he was not yet recognised for this purpose).

Far more important was the start of the Conservation Course in 1960. Max Nicholson, head of the NC, decided that they should support a postgraduate course for conservationists (the NC charter required them to undertake education). With WHP and

serendipitous help from the University Grants Committee (UGC) Palmer became responsible for designing and running the new course from 1960-67. It began as a Diploma, and in 1965 became an M.Sc. The intention was, and still is, to provide professional training in nature conservation to students from a wide range of disciplines. For that reason the first intake started in September 1960 with several weeks of intensive field work in half a dozen contrasting places (I ran one of these weeks, at Blakeney Point). This emphasis on field experience, with theory and practice of conservation and its social context still exists in the current incarnation of the course 56 years later. "To the solid ground of Nature trusts the Mind that builds for aye." The UCL course was followed in the next decade by five others.

Soon after, Palmer became active in the BES. (Sheail 1987).

In 1961 he supported, in the face of opposition, the then President of the BES, J B Cragg, in a move to start a new journal, provisionally named the *Journal of Applied Ecology and Conservation*. That began in 1964, though without the 'and Conservation' because some members of the BES Council of the time considered that conservation was not adequately scientific. In 1963, together with Amyan Macfadyen, he organised the celebration at UCL of the BES' 70th year. In 1969 Palmer, now as BES Vice-President, instigated and chaired a working group to consider the future of the BES. One of the group's recommendations was that the Society should start a regular Bulletin, to keep members informed. That innovation is now in its 48th year.

The same working group recommended that the Society should form an Ecological Affairs Committee. Palmer had launched the idea informally in 1963, following an initiative of the same kind by the Ecological Society of America. This was contentious. The battle over the Cow Green Reservoir had been lost (though in retrospect the

war to get ecological advice noticed had been won). Many, perhaps a majority, of BES members thought that the Society should stick to science, and should not itself seek to influence affairs in the world outside. They argued that it was impossible to have official BES statements or actions that every member would agree with. But the outside world had hi-jacked the word 'ecology' and clearly did not understand it. The counter-argument was that the BES was a main source of ecological knowledge, and had better start getting its collective hands dirty. Council agreed, reluctantly, to give the idea a trial, but made Ecological Affairs a sub-committee so it could act only through Council. Palmer was its first chairperson, and in 1974 the group was given the power to act independently.

Meanwhile the International Programme (IBP, 1964-74) was in progress. It was an early example of 'big science' in biology, and sought to emulate the successful International Geophysical Year (IGY). Its purpose was to establish 'The Biological Basis of Productivity and Human Welfare', though this objective was vaguer than the IGY's, and success was patchy. It did have three effects: it brought more money into ecology, it stimulated co-operation among specialists, and it gave cover for scientists in 'closed' countries to travel abroad.

Palmer was the author of one of the IBP Handbooks on how to measure the production of forests (Newbould 1967). It was short and delivered on time. Other similar books were long, complex, and late. This work got him onto one of the UK committees dealing with productivity, and was an early example of a lifetime of such advisory work.

With this record it was not surprising to hear in 1967 that Palmer had been appointed a founding Professor of a new department: the School of Biological and Environmental Studies (SB&ES) in the New University of Ulster (NUU) at Coleraine, where Alan Burges (former President of the BES) was Vice Chancellor. It was a surprise though that Palmer and a second professor, Amyan Macfadyen, were to be joint heads of the new School. This was an inspired decision. The two (and Frank Oldfield as Dean) worked together amicably and effectively to produce the best School in the university at the

time. They began among the earliest undergraduate programmes in ecology and in environmental science, though Palmer regretted that some of the NUU founders' more radical intentions foundered on academic conservatism.

Amongst many other duties, Palmer was responsible for starting, and supervising for years, a collection of daffodil species/varieties that became the National Collection, and for planning and implementing the planting of trees across the campus converting those exposed windy agricultural fields into a wooded landscape.

During this period Palmer's advice on conservation was widely sought. He served on the Nature Reserves Committee, and on the Ulster Countryside Committee; both statutory bodies, and as the Northern representative on the Irish Republic's Nuclear Energy Board (1973-1988)

From 1982-84 Palmer was Acting Vice-Chancellor. The government had decided to merge the NUU with the Ulster Polytechnic (UP). The NUU Court resisted. Palmer could see that that would probably lead to closure. By detailed discussion, and because he was trusted, he got the Court to agree the merger, and for 1985 became the first Provost of the Coleraine campus of the new entity: the University of Ulster. But he was a reluctant administrator, and in 1985 at 56 took early retirement.

He and Jo remained in Northern Ireland for the next 14 years, during which he continued to serve on advisory bodies: the Ulster Wildlife Trust (1985-89); chairman of the Council for Nature Conservation and the Countryside (in Northern Ireland; CNCC, 1989-93). Some people achieve notice by a single conspicuous action, but Palmer had a notable influence in uncounted smaller events: Whitepark Bay, Garry Bog, Ness Wood, and The Umbra may stand for all. He also represented Northern Ireland on the Joint Nature Conservation Committee (JNCC) advising the UK government; and was a Trustee of the National Heritage Memorial Fund, later the Heritage section of the National Lottery (NHMF/HNLF, 1993-2002), with responsibilities for both Northern Ireland and conservation. This allowed Palmer to become involved with a wider sort of conservation: Mar Lodge, Dulwich Picture Gallery, the Cutty Sark,

and others. For his work, especially with the CNCC, he was honoured with the OBE in 1993.

During this time too, he and Jo contributed, hands on, to a project monitoring biodiversity in the Albufera wetlands in Mallorca.

In 1999 he and Jo moved to Cirencester, back in England, for the last 17 years of his life, to be closer to their three children and five grandchildren. Palmer, with his wide range of knowledge, interests, and people, became active in the local Science and Technology Society. The Wiltshire and Gloucestershire Wildlife Trusts, and others.

Many ecologists are remembered for their publications. Palmer lived a life more difficult to assess. His success as Acting VC in the NUU/Polytechnic merger is clear enough. But his advisory work and its effects (such as the practical details of nature reserve acquisition, management, education, and so on) are more diffuse. What one can say is that, in the opinion of those who worked with him, he had more important positive effects on conservation (particularly in Northern Ireland) than anybody else in the field at the time. And he taught and inspired uncounted students, many of whom now occupy influential positions in conservation.

It is fitting to remember that F.W. Oliver, co-founder with A.G. Tansley of the BES, was active in the practical application of the ecology he was helping to develop. Palmer Newbould's life was spent in that same cause.

Dicky Clymo, with help from R. Battarbee, A.C. Hamilton, Jo Newbould, P. Roebuck, S. Smart, D. Wilcock.

REFERENCES

- Newbould PJ (1960) The ecology of Cranesmoor, a New Forest valley bog: I. The present vegetation. *Journal of Ecology* 48: 361-383
- Newbould PJ (1967) IBP Handbook number 2. Methods for Estimating the Primary Production of Forests. Blackwell Scientific Publications, Oxford.
- Sheail J (1987) Seventy-five Years in Ecology: the British Ecological Society

Sagebrush shrubsteppe in central Oregon. The monolith (called Fort Rock) is a volcanic tuff ring, formed when molten basaltic magma rose to penetrate the mud at the bottom of the lake that covered the area during the ice ages; Wikipedia has a nice description.

Photo © Loren Kerns

A SENSE OF PLACE

By John Wiens



It had occurred to me to write about the rise and consequences of a post-factual culture. To a distressing number of people, “facts” don’t seem to matter any more; consistency with beliefs is what’s important. This threatens the very foundations of science, its credibility, and its ability to influence public debate about such things as climate change.

But all of this is too depressing. So I decided instead to write about something that is more uplifting—what has been called a sense of place. There are places that have special meaning; places whose air, sounds, and beauty generate a feeling of calmness and serenity; places that reassure one that, despite all else going on, in this place at this time all is well.

Everyone has such a place. For a New Yorker it may be the sounds of bustling traffic and the smells of the Deli down the street. For a mountaineer it may be a lake nestled in a mountain cirque, mirroring the lofty, beckoning peaks. I’ve recently been reading Bill Bryson’s book, *The Road to Little Dribbling*;¹ to him it is the allure of

out-of-the-way places in Britain that still retain something of what he regards as Britishness. For me, it is the sagebrush shrubsteppe of much of the western United States, from Wyoming to Oregon and Nevada. Here sagebrush² often covers the land as a vast inland sea, extending for miles only to be interrupted by mountain ranges or (increasingly) irrigated fields and pastures. I well remember driving through sagebrush expanses in Utah and Idaho, decades ago, where roadside signs proclaimed, “Sagebrush is free – take some.”

It all must have made an impression on me, for not long afterward I began ecological studies in the sagebrush shrubsteppe of the northern Great Basin, drawn there by the little brown birds and the apparent simplicity of the ecosystem. It seemed like just the thing a scientist starting a career needed to generate quick publications. But the simplicity of the system was a beguiling guise. The system only reluctantly yielded answers to our questions, and then only in fragments that led to questions and more questions.

So my students and I kept going back, year after year. We began by asking (in the fine tradition of David Lack³) what factors might limit bird populations and structure the bird community. We considered competition for food, but found little supporting evidence. Perhaps predation on nests might cap population growth? But snakes (the primary nest predator on songbirds in many systems) didn’t occur in our study area, prohibited by the prospect of freezing temperatures at virtually any time of year (tough going for a poikilotherm). Thinking the answer might lie in limitations on brood sizes of the birds, we conducted brood-size manipulations and found that, by adjusting foraging behavior and prey selection, adults could successfully fledge nearly twice as many young as the normal clutch size.⁴ We delved into habitat relations, finding that what represented “habitat” to the birds depended on the scale of analysis.⁵

Our inability to derive clear, simple answers to our clear, simple questions led some of our colleagues to dismiss the studies as irrelevant to existing theory or to suggest that the problem was with us rather than the system⁶.

So we made forays into other areas. The songs of one species (appropriately, sagebrush sparrows⁷) were part of what made sagebrush such a special place, so I recorded and analyzed vocalizations to determine whether there were song dialects, as in many other sparrow species. There was variation in song structure, to be sure, but the spatially inconsistent patterns of variation led me to ask whether the “dialects” were instead epiphenomena (much to the consternation of my colleagues whose careers were built on studying vocal dialects). We joined forces with a plant chemist to explore the relations between the secondary chemistry of sagebrush, insects, and birds (the sparrows, once again) who fed on the insects. We experimentally removed insects (“defaunation”) from some shrubs, finding that the secondary chemistry of the treatment shrubs then changed, perhaps in response to removal of herbivorous insects. We put cages around some plants to exclude birds; the insects that responded most strongly, however, were taxa not eaten by the birds. Once again, intriguing glimpses of something interesting going on, but more questions than answers.

Eventually, our studies in the shrubsteppe ended, as all things must.⁸ Most of our simple questions were only muddled by our findings. We put most of it down to the effects of environmental variation in time and space over multiple scales, which might account for the muddling but didn’t really generate testable hypotheses. Rather, our studies in the sagebrush seemed to confirm one of the basic laws of ecology, that everything is contingent on something else (i.e., “it all depends”).

I’ve often wondered why we kept on so doggedly trying to wrestle clear, simple answers from a system that refused to give them. Perhaps it was my stubbornness (surely I’m no longer like that?). But the longer we worked there, the more deeply the sagebrush expanses gripped my heart and mind—it became my sea of tranquility, my place. Following job opportunities, I moved far away, first to New Mexico and Colorado and then to Washington, DC, and California. These were interesting, beautiful, and exciting places in their own ways, but none was special to me. Now we live in Oregon, and when I travel across

the mountains to sagebrush country I get the same old feelings: a release, a calmness, an unbridled joy of being—a sense of place.

John Wiens
Oregon State University, USA
jwiens300@gmail.com

Footnotes

- 1 Doubleday, New York, NY, 2015.
- 2 *Artemisia* of several species and varieties.
- 3 Lack, D. 1954. The natural regulation of animal numbers. Oxford University Press, Oxford.
- 4 We came up with a novel hypothesis to explain why clutch sizes weren’t larger, but the hypothesis was untestable and was never published.
- 5 We conducted a field experiment on this, too. The main finding was that the scale of the experimental manipulations was wrong, although we did manage to publish the results.
- 6 An hypothesis we rejected without bothering to test.
- 7 *Artemisiospiza nevadensis*
- 8 Although not always. Bob Paine kept going back to Tatoosh Island to study intertidal systems for over 45 years, and Charley Krebs has been investigating snowshoe hares in the Yukon for a similar period, both drawn in part, I suspect, by a sense of place.



A singing sagebrush sparrow

Photo left © dirburtoni / Photo right © Ron Knight

FROM OUR SOUTHERN CORRESPONDENT



Richard Hobbs | University of Western Australia, Australia

I just had a quick look at the last piece I wrote for the *Bulletin* (I find this useful in that it prevents me repeating myself too frequently). Although written only just over 6 months ago, the article has the feel of something written a long time ago in a galaxy far, far away. It focussed on statistics in ecology, but started with observations on the (then) pending US Presidential elections, the Brexit poll and a Federal Election here in Australia. I'm sure I don't need to comment on the feelings of shock and foreboding that many people experienced following the results of the US election and the Brexit poll, or on what's been happening since (here in Australia, we ended up with the same crap government we had before - although even here we thought things couldn't get much worse, but they since have).

Rereading my last article, it struck me that we seem increasingly to be living in two parallel universes. In the universe inhabited by people who read the *BES Bulletin*, sound evidence, statistical rigour and logical argument are key elements in people's day-to-day existence. In the other universe, inhabited by some of our political leaders and, it appears, a significant proportion of the general public, such elements hardly seem to feature at all - who needs evidence when you can say what you like, whether it comes close to matching reality or not? Who needs statistical rigour when you feel you can ignore the whole matter, never mind check to see whether the evidence is rigorous or not?

There are worrying signs that this second universe is slowly swallowing the first. Climate change, vaccination,



Protesters against a road development in Western Australia were labelled as "layabout ratbags".

the role of migrants in the economy, the performance of the NHS: all examples of issues for which there is clear evidence based on sound research - evidence that assorted political leaders choose to ignore, wipe from government websites, misrepresent or even ridicule. It's almost as if the Enlightenment hadn't happened.

Here in Western Australia, we're experiencing our own little descent back into the dark ages. My part of the world is characterised by some of the most amazing ecology on the planet - hyper-diverse plant communities, weird and wonderful flora and fauna (see Alan Crowden's frontispiece photo in the previous issue), with a healthy smattering of

endemic taxa. It's also characterised by a kind of bipolar approach to protection by our state government. On one hand, there have been truly amazing additions to the conservation estate this year with large areas of marine parks being declared in the remote Kimberley region (<http://www.abc.net.au/news/2016-11-23/kimberley-marine-park-created-around-horizontal-falls/8050330>). On the other hand, a ruckus over a major road extension through protected wetlands and a threatened woodland community in Perth has pitted the current conservative government against a broadly-based citizen protest movement, and at the same time exposed serious problems with the state's environmental protection laws.

The Roe 8 road extension is part of a long-standing plan to extend an existing highway to provide a more direct route for trucks in and out of Fremantle Port. In addition to being home to Little Creatures Brewery, Fremantle has a busy and active port, and most of the freight goes in and out via trucks. The Roe Highway currently ends about 20 km east of the port and, on the face of it, it would seem to make sense to carry on and fill in the gap. The problem is, however, that the 8th stage of the highway is being routed through areas of high conservation, Aboriginal heritage and social value and has been subject to long-standing community opposition. The 5km extension still leaves the remaining 15 km to the port as is, and there is ongoing debate and uncertainty about how to complete the link. In addition, the rationale for the road is being questioned in terms of the long-term future of the port and the eventual need for a new more accessible port facility at the city's industrial hub south of Fremantle.

The initial 5 km extension cuts through the Beelias Regional Park, which incorporates the Beelias Wetlands, two chains of lakes and wetlands that run parallel to the west coast and Banksia woodland that has just been given Threatened Ecological Community status under the federal

Environmental Protection and Biodiversity Conservation Act. The wetlands and woodland are popular areas for recreation and habitat for a wide range of fauna, including Carnaby's black cockatoo, which is also listed under the EPBC act.

The WA Environmental Protection Agency concluded in 2003 that it would be difficult to make the road project environmentally acceptable and that it would lead to the ecological values of the area as a whole being diminished in the long-term. However, in a 2013 report the EPA concluded that the significant residual impacts of the development (including clearing of native vegetation and protected wetlands and loss of cockatoo habitat) could be offset by a range of measures including acquisition of conservation land elsewhere, wetland restoration and weed control programs. In September 2015 the group Save the Beelias Wetlands took legal action against the EPA, arguing that the EPA did not follow its own policies. The Supreme Court supported this argument and found that the EPA assessment and subsequent approval of Roe 8 was invalid. That stopped work on the road in its tracks for a while, but the WA Government took the matter to the Court of Appeal in July 2016, and the Court ruled in favour of the State Government,

finding the EPA was not obliged to take its own policies into account. Let's say that again: "the EPA was not obliged to take its own policies into account". Insert suitable exclamation here. Towards the end of the year work started on clearing bushland in preparation for the road, and further legal actions initiated by the community group have so far failed.

Added to this is the unseemly rush with which various environmental management plans were assembled to cover the Roe 8 project just before or even after the clearing had begun (<https://project.mainroads.wa.gov.au/roe8/Pages/default.aspx>), and observations that the management plans were not even being adhered to as work commenced. It does not appear that the plans were open to any feedback or peer review, and hence their adequacy has not been assessed. This is particularly concerning in relation to the plans for actions that form part of the offsets that were put forward to compensate for the loss of woodland and wetland. The process of negotiating the terms of these offsets was opaque, and there has been no independent assessment of whether the implementation plans actually meet the stipulated criteria. Offsets have increasingly become a tool of choice to ensure that developers have to demonstrate some conservation outcomes to make up for the environmental damage caused by the development. However, offsets are also increasingly seen to be fraught with difficulties (Maron *et al.*, 2016) and have been called "Faustian bargains" (Maron *et al.*, 2012). Our recent research suggests that application of offset policy in Western Australia has been patchy at best (May *et al.*, 2017).

Why the rush to get plans completed and work started? Four words provide the answer - an election in March. Colin Barnett, the WA Premier, has been determined to get the Roe 8 extension started and is forging ahead now that legal impediments have been cleared away. This is the same guy who doggedly continued with a programme of shark drum lines a few years ago to reduce the risk of shark attacks on Perth beaches, even though a Fisheries Department report stated that drum lines are ineffective



The Beelias Wetlands, threatened by roadbuilding

(this was the topic of an earlier *Bulletin* article). The Labor opposition party has stated that it will can the entire project if elected, and there have been calls to halt the clearing until the results of the election are known. But, in the face of mounting community dissent and evidence of lack of adherence to due process and relevant policies and procedures, the bulldozers are out and woodland is being obliterated. WA Environment Minister Albert Jacob stated that he was “comfortable with” the possibility that 97.8 hectares of vegetation may be cleared for Roe 8, even if a newly elected Labor government cancels the project (<http://www.abc.net.au/news/2017-01-11/wa-election-roe-8-no-pause-for-work-albert-jacob-says/8176280>).

Why, you might ask, am I dwelling on our little local problem in the *BES Bulletin*? Well, it seems that our little local problem is being replicated in different ways around the world. And it’s symptomatic of the bigger issues facing society as governments and corporations entrench neoliberal policies (Mendoza, 2015). Gus Speth has recently written about his experience in science and environmental activism, and discussed the way in which the huge advances in environmental protection made a few decades ago are now being eroded. For instance, “government agencies lose their luster and their drive and become partly or wholly captives of those they are supposed to regulate” (Speth, 2014). And, for environmental groups “Major resources shift from offense to defending past gains” –in other words, inordinate efforts need to be focussed on not losing what we’ve got, never mind improving things.

For me, Speth hit the nail on the head with the remark: “I used to think that top environmental problems were biodiversity loss, ecosystem collapse and climate change. I thought that thirty years of good science could address these problems. I was wrong. The top environmental problems are selfishness, greed and apathy, and to deal with these we need a cultural and spiritual transformation. And we scientists don’t know how to do that.” (<http://canadiancor.com/scientists-dont-know/>). Conducting



Western Australians taking direct action against a development they consider ill-advised and unnecessary

and communicating good science is what we ecologists mostly do. Accumulating evidence and feeding it into management and policy circles is the way we have an impact, right? Well, maybe only partially right now. This is still essential but not necessarily sufficient any more. As exemplified by our little local issue of valuable wetlands and vegetation getting trampled to make way for a road that has dubious merit, governments are increasingly able and willing to ignore evidence and push agendas despite, rather than because of, scientific advice and environmental policies.

So, that’s why it appears essential to recognise that being a scientist does not preclude also being a citizen. Many of my American colleagues recently marched in resistance to the new regime in the US. In the case of Roe 8 and the Beelihar wetlands, the government’s actions have been met with a growing campaign of citizen protest and civil disobedience. Protesters were initially labelled by the government as layabout ratbags, but the protests have swollen to include people from all walks of life – including university professors. The Leeuwin Group of Concerned Scientists is pushing for more effective environmental protection

processes (http://theleeuwingroup.org.au/_data/papers/), and other groups are forming to add their voice to the protests.

All this is a long way from quadrats and bird counts. But quadrats and bird counts aren’t much use in the middle of a freeway. May the force be with you, wherever and however you need it.

REFERENCES

- Maron, M., Hobbs, R.J., Moilanen, A., Matthews, J.W., Christie, K., Gardner, T.A., Keith, D.A., Lindenmayer, D.B., & McAlpine, C.A. (2012) Faustian bargains? Restoration realities in the context of biodiversity offset policies. *Biological Conservation*, **155**, 141-148.
- Maron, M., Ives, C.D., Kujala, H., Bull, J.W., Maseyk, F.J.F., Bekessy, S., Gordon, A., Watson, J.E.M., Lentini, P.E., Gibbons, P., Possingham, H.P., Hobbs, R.J., Keith, D.A., Wintle, B.A., & Evans, M.C. (2016) Taming a Wicked Problem: Resolving Controversies in Biodiversity Offsetting. *BioScience*, **66**, 489-498.
- May, J., Hobbs, R.J., & Valentine, L.E. (2017) Are offsets effective? An evaluation of recent environmental offsets in Western Australia. *Biological Conservation*, **in press**.
- Mendoza, K.-A. (2015) *Austerity: The demolition of the welfare state and the rise of the zombie economy* New Internationalist Publications, Oxford.
- Speth, J.G. (2014) *Angels by the River: A Memoir* Kindle Edition Chelsea Green Publishing, White River Junction, Vermont.

UPDATE

So, a lot has happened between my writing of this article to meet the *Bulletin* Editor’s deadline and the *Bulletin* Editor actually finalising the copy. England whopped Scotland in the rugby, but I won’t dwell on that. Instead, I’m happy to provide an update on the Roe 8 road extension in Western Australia. Since I wrote my article, there has been an ongoing and persistent campaign against the development. Community-lead efforts included ongoing protests and a citizen science effort that monitored the environmental aspects of the process and uncovered countless instances of non-compliance with the environmental management plans put in place by the agencies involved. Then there was the State election on Saturday 11 March. The opposition Labor party ran a campaign based partly on terminating the road development – and it turns out that they romped home in a landslide victory that saw swings of nearly 20% against the conservative government in some seats. The new Premier, Mark McGowan, made his first order of business the cessation of work on the road project. Significant clearing of valuable woodland has already occurred, but some has been saved. And there is talk of a massive restoration programme on the land that has been cleared already. This is being seen as a massive victory for the community and common sense – and, importantly, science played a part in this through academics getting involved in the protest movement, providing evidence to Senate inquiries and the like. In the post-truth Trump era, this is something to be celebrated. It also provides hope that we will get through this weird period in global history.



CHARTERED INSTITUTE OF ECOLOGY AND ENVIRONMENTAL MANAGEMENT



Sally Hayns CEcol MCIEEM | Chief Executive Officer, CIEEM
T: 01962 868626 / Email: Enquiries@cieem.net

ACHIEVING NET GAIN FOR BIODIVERSITY

CIEEM has been working in recent months with the Institute of Environmental Management and Assessment (IEMA) and the Construction Industry Research and Innovation Association (CIRIA) to produce new Principles for achieving Net Gain (NG) in biodiversity through development (<http://www.cieem.net/news/364/biodiversity-net-gain-eo-principles-and-guidance-for-uk-construction-and-developments>).

Whilst No Net Loss (NNL) is well supported in policy (though worryingly often not achieved), going beyond this to deliver better outcomes for biodiversity has been aspirational. To some extent it still is, but there is growing evidence that developers are seeing the importance of biodiversity and ecosystem services to their 'bottom lines' and are setting themselves targets of moving beyond NNL to NG over the next few years. Thus industry is driving the demand for evidence on how to achieve NG in a range of practical situations. CIEEM, IEMA and CIRIA used the principles developed by the Business and Biodiversity Offsetting Programme (BBOP) as a starting point to develop 10 overarching principles for achieving net gain in the UK and Ireland. The principles cover topics such as measuring net gain, transparency, stakeholder involvement, legacy and sustainability.

The next stage of this partnership project is to produce good practice guidance on how to deliver net gain in a range of development situations. It is hoped that the guidance will be published in early 2018.

WORKING IN PARTNERSHIP OVER BREXIT

As reported previously in the *Bulletin*, we are doing a lot of policy work around Brexit and the implications for environmental policy and legislation. I am delighted that we are working closely with the British Ecological Society, the Institution of Environmental Science and the Landscape Institute in order to ensure that we maximise our resources and expertise in this area and produce 'joined-up' evidence and arguments to decision-makers. One such example was a joint letter to the Secretary of State, Andrea Leadsom, following up on the Environmental Audit Committee's report on the Future of the Natural Environment after the EU referendum. The letter provided support for a number of the EAC's recommendations as well as setting additional ideas for future policy with respect to land management and the natural environment.

We believe that collaboration is vital if professional bodies, learned societies and NGOs with limited resources are to influence decision-makers effectively. We are also liaising closely with Wildlife Link and UKELA (the United Kingdom Environmental Law Association).

It is very important not to forget the needs of those working in the environment sector in Ireland. The decision to leave the EU has profound implications for those working and learning on both sides of the border between the Republic and Northern Ireland and for those who regularly move between the two.

MORE CIEEM-ACCREDITED DEGREES ANNOUNCED

Since its launch in 2013 CIEEM's degree accreditation programme has gone from strength to strength. Designed in consultation with employers of graduates coming into the sector, the scheme recognises those undergraduate and taught postgraduate degree programmes and pathways that can produce graduates with the knowledge and skills that employers require.

We are delighted to congratulate the following newly accredited and re-accredited programmes.

New Accreditations

Harper Adams University
BSc (Hons) Wildlife Conservation and natural Resource Management

Liverpool Hope University
BSc (Hons) Environmental Science, MSc Ecology and Environmental Management

University of Derby
BSc (Hons) Biology, BSc (Hons) Zoology

University of South Wales
BSc (Hons) Natural History and MSc Wildlife and Countryside Management

Re-accreditations

Writtle University College
BSc (Hons) Global Ecosystem Management

Harper Adams
BSc (Hons) Countryside and Environmental Management

MEMBER NETWORK ACTIVITIES

CIEEM's Geographic Sections and Special Interest Groups, led by volunteer members, do an excellent job of providing an informative, and usually free or very low cost, programme of knowledge-sharing events including talks, site visits and seminars. Although aimed at CIEEM members they are often open to non-members: students are particularly encouraged to attend. The Member Networks also plan events and activities specifically for students including careers advice from a range of members working in different roles and sectors.

Further details on CIEEM Member Network activities can be found here (<http://www.cieem.net/events>). Please do draw them to the attention of those who you think might be interested.

BAT MITIGATION RESEARCH

CIEEM is currently working with Professor Fiona Mathews and Dr Paul Lintott at Exeter University on a desk-based research project into the effectiveness of common mitigation strategies used to protect bat populations impacted, or likely to be impacted, during development in the UK and Ireland. Mitigation is commonly used in the UK and Ireland as part of the development process in order to manage adverse impacts on bats. Cumulatively it accounts for a significant proportion of development costs associated with protecting European Protected Species. However, there is little published research evidence on the outcomes of commonly used mitigation strategies to help guide the developer, planning authority or consultant ecologist and to ensure that the proposed solutions are likely to be effective and proportionate.

Further details of the research can be found at (<http://www.cieem.net/bat-mitigation-strategies-research-project>).

*The Greater Horseshoe bat
Rhinolophus ferrumequinum.
Photograph from Shutterstock*

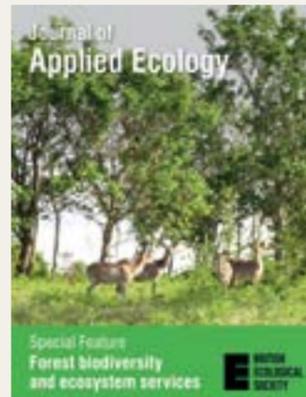


PUBLICATIONS NEWS

CONTENT HIGHLIGHTS



Journal of Ecology Issue 105.1 includes a Special Feature titled 'Dispersal Processes driving plant movement: Range shifts in a changing world'. Assembled by Guest Editors Cristina García, Etienne Klein and Pedro Jordano, the Special Feature covers a broad range of research topics relating to dispersal ecology, from conceptual and methodological advances to the study of the ecological and evolutionary outcomes. Issue 105.1 also includes the annual Harper Review, this year written by Jason Fridley on the topic of plant and ecosystem energetics.



In the *Journal of Applied Ecology* annual Editorial (54:1-6), the Senior Editors write about the need to bring novel theoretical advances into the applied ecology fold. The article

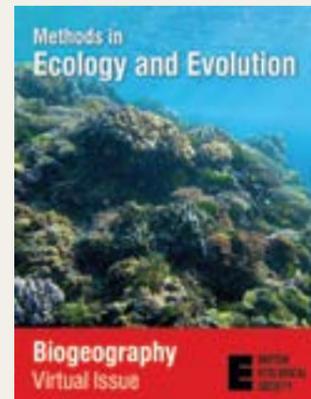
examines how and why some theories, concepts and methods successfully transition to the applied realm and ask if some other areas of research have more to offer applied ecology than has yet been realised. Issue 54:1 also includes the 'Forest biodiversity and ecosystem services' Special Feature edited by Akira Mori (<http://bit.ly/JPEforests>). The feature focuses on the potential of research in the areas of forest biodiversity and ecosystem services and the studies include field-based work from different forests as well as ecological modelling of tropical, temperate, boreal and high-elevation forest landscapes.



Rounding out *Functional Ecology's* 30th anniversary celebrations - which included a Thematic Topic at the Annual Meeting and two new Virtual Issues (Towards a mechanistic understanding of global change ecology and 30 years of *Functional Ecology*) - Issue 31.1 included an editorial looking back over 30 Years of *Functional Ecology* and looking ahead to the next 30. Issue 31.1 also included our latest Special Feature: 'Plant-Pollinator Interactions from Flower to Landscape' (<http://bit.ly/FESFppi>) and an accompanying Virtual Issue highlighting 10 papers published over the past two

years that address plant-pollinator relationships (<http://bit.ly/FEVIppi>).

A phylogenetic meta-analysis of temporal shifts and temperature sensitivity of avian spring migratory phenology by Takuji Usui, Stuart Butchart and Albert Phillimore has recently been published in *Journal of Animal Ecology*. In the paper, the authors show that advances in bird migration phenology over time and with rising temperatures exhibit substantial intra- and interspecific variation.



To truly understand how species' distributions vary through space and time, biogeographers and ecologists make use of analytical techniques from a wide array of disciplines. In January, *Methods in Ecology and Evolution* released a Biogeography Virtual Issue to highlight this fact. It includes articles from a broad range of fields including evolutionary analysis, remote sensing, disease modelling and much more. You can find the full Virtual Issue, edited by Pedro Peres-Neto and Will Pearse, here: <http://bit.ly/ibs17mee>

Remember - Issue 1 of all the BES journals are free to access!

IN THE NEWS

Clean sweep for BES Journals in the 2016 Watson Raptor Science Prize!

We are delighted to learn that the winner of the 2016 Watson Raptor Science Prize has been awarded to a paper published in *Journal of Animal Ecology*. The paper, 'Age and sex-selective predation moderate the overall impact of predators,' from Sarah Hoy and colleagues examined selective predation by goshawks on juvenile and female tawny owls, drawing on long-term data to exploit a unique situation where data from a prey species were obtained over a period of Goshawk increase.

Furthermore, the two highly commended papers were both published in the *Journal of Applied Ecology*. Firstly, 'Retrofitting of power lines effectively reduces mortality by electrocution in large birds: an example with the endangered Bonelli's eagle' from Clément Chevallier and colleagues looked at the positive effect of power cable modification on the survival of the endangered Bonelli's eagle. The second highly commended paper 'No effect of satellite tagging on survival, recruitment, longevity, productivity and social dominance of a raptor, and the provisioning and condition of its offspring' from Fabrizio Sergio and colleagues studied the effect of radio-transmitters on Black Kites and showed no effect of their use on almost every aspect of performance of the birds.



Lichens and the "health" of ecosystems

For the first time, it is possible to integrate at the global scale the results obtained with the most widely used methods to evaluate the "health" of ecosystems using lichens. This is the result of a study now published in *Methods in Ecology and Evolution* and represents a fundamental step for this indicator to be considered at the global scale and in the list of indicators of the United Nations. You can read the full press release here: <http://bit.ly/2iu5ULW> and the related article here: <http://bit.ly/2iE9fqm>

Salamanders hit the treadmill in the name of science

Tracking animal dispersal can be a tricky job, especially with salamanders, that often only appear for a few days in spring and whose fragile skin can make implanting tracking devices impossible. To get around this, researchers at Ohio State University used a combination of DNA analysis and endurance-testing in their study published in *Functional Ecology*. They found the sexual *Ambystoma* salamanders could keep walking four times longer before reaching fatigue than the unisexual, all-female mole salamanders.

What will the wasp plague be like this year?

New research from Victoria University of Wellington in New Zealand, published in *Journal of Animal Ecology*, has revealed the population of the common wasp is amplified by spring weather, with warmer and drier springs often meaning more wasps and wasp stings in summer. The study examined 23 years of data from New Zealand and 39 years from the United Kingdom, which included the annual Rothamsted Insect Survey. The study also found population densities for the upcoming year are heavily dependent on numbers from the previous year.



An excavated nest of common wasps, removed from the ground in a New Zealand Beech forest. Up to 40 nests per hectare can be found in these NZ forests

NEW ASSOCIATE EDITORS

Journal of Animal Ecology is pleased to welcome Isabella Cattadori (Pennsylvania State University), Damien Farine (Max Planck Institute for Ornithology) and Garrett M. Street (Mississippi State University) to the editorial board.

Functional Ecology welcomes new Associate Editors, Julia Cooke (Open University), Oscar Godoy (Instituto de Recursos Naturales y Agrobiología de Sevilla-CSIC) and Dan Crocker (Sonoma State University).

Kathy Van Alstyne (Western Washington University), Kun-Fang Cao (Guangxi University), Giselda Durigan (Instituto Florestal) and Mahesh Sankaran (National Centre for Biological Sciences) have joined the *Journal of Ecology* editorial board.

ONLINE EXTRAS

Journal of Applied Ecology has started to publish 'Spotlights', which are groups of papers on a current, important theme in applied ecology (<http://bit.ly/JPEspotlight>). The papers are individually submitted to *Journal of Applied Ecology* and the Editors group them together after acceptance. Rather than providing a complete overview of the topic, Spotlights are intended to showcase the latest high-quality research on a subject and are accompanied by a blog post on The Applied Ecologist's Blog. Recent Spotlights include 'Wildlife and renewable energy' and 'Genetics and restoration'.

BES Press Officer Becky Allen interviewed authors of two *Journal of Applied Ecology* papers for Q&A pieces (<http://bit.ly/BESQAs>). John Measey, the author of the article 'Counting chirps: acoustic monitoring of cryptic frogs' discusses the acoustic technique he has developed to monitor the Cape peninsula moss frog - a common frog, but one that very few people have seen - without disturbance. Amanda Sigouin talks about the importance of conserving less charismatic species and her Practitioner's Perspective 'Priorities for the trade of

OUR PUBLICATIONS TEAM

Catherine Hill, Head of Publishing

Emilie Aime, Managing Editor

Andrea Baier, Senior Managing Editor

Chris Grieves, Assistant Editor,
Methods in Ecology and Evolution

Kate Harrison, Assistant Editor,
Ecological Reviews

Simon Hoggart, Assistant Editor,
Journal of Animal Ecology

Jennifer Meyer, Assistant Editor,
Functional Ecology

Erika Newton, Managing Editor

Alice Plane, Assistant Editor,
Journal of Applied Ecology

James Ross, Assistant Editor,
Journal of Ecology

less charismatic freshwater turtle and tortoise species'.

The *Journal of Ecology* blog has published a review of 2016 and a preview of 2017 from both Executive Editor David Gibson and Blog Editor Pierre Mariotte. We have also published interesting blogs related to National Tree Week and World Soil Day, as well as a review of the BES Annual Meeting 2016 from Associate Editor Jane Catford (jecologyblog.wordpress.com).

The first step in any research endeavour is to wade through the titanic amounts of articles available to become acquainted with the existing knowledge. For many people, it's one of the most dreadful and tedious parts of the scientific process. But what if we could streamline this step by automatizing parts of it? Automated content analysis (ACA) gives us the opportunity to do just that. Find out how in Gabriela Nunez-Mir's post on the Methods blog: <http://bit.ly/2jbdyQ>

BOOKS

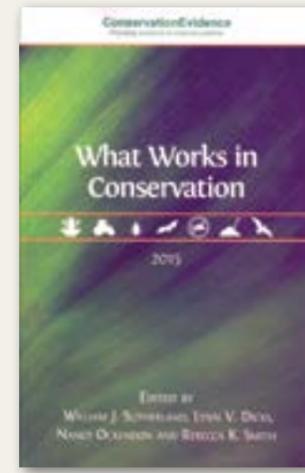
Forthcoming Ecological Reviews include volumes on: enhancing the resilience of agriculture; wildlife disease ecology; and grasslands and global change. Keep an eye on our website for when pre-orders are available.



After a spring clean in the BES office, we have a few Ecological Reviews volumes looking for a good home. If you'd like one, email Kate (kate@britishecologicalsociety.org) with an idea for a future volume together with a note of the published title you would like. Not all titles are available and first come, first served!

BOOK REVIEWS

Reviews in this issue have been collected and edited by Alan Crowden.



What Works in Conservation

W.J. Sutherland, L.V. Dicks, N. Ockendon and R.K. Smith (2015)

Open Book Publishers, Cambridge £29.95 (hbk), £19.95 (pbk). The PDF is free to download

ISBN 978-1-78374-157-1 (ppk)

ISBN 978-1-78374-158-8 (hbk)

ISBN 978-1-78374-159-5 (digital PDF)

What Works in Conservation? Well, this book does, and yet it does not even pose the question! This is a remarkable piece of work, providing an assessment of the effectiveness of 648 conservation interventions based on a distillation of the underlying scientific evidence. Using panels of many experts the seven chapters focus on amphibian conservation (highly topical), bat conservation, bird conservation (more than 430 interventions), farmland conservation, the control of freshwater invasive species, enhancing natural pest control, and enhancing soil fertility. For each intervention, such as 'creating a skylark plot',

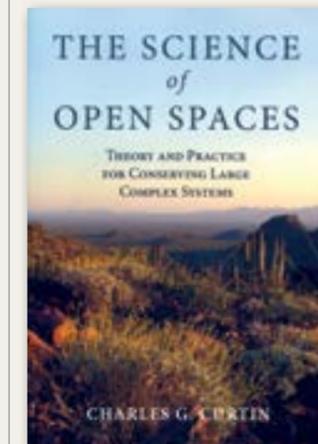
'providing nest boxes for birds', 'taking field corners out of management' there is a simple summary of the evidence, with broad headings providing overviews of interventions likely to be beneficial (in green shading) through to harmful (in red shading), with quite a large number difficult to assess due to no evidence being found.

Judgements on interventions were based on experts' scorings of effectiveness (size of benefit or harm) and certainty (strength of evidence). A substantial amount of the background material is accessed through web links given in the book, with www.conservationalevidence.com providing fuller texts and references. It is planned to revise the book on an annual basis, and it is free to download as a PDF.

The 338 pages contain a wealth of fascinating information, and I for one was left staggered at two findings. First, there is a dearth of experimental evidence to support the vast majority of conservation interventions. Second, even for popularly deployed management (such as bracken control, creating beetle banks, installing green bridges as road crossing structures for bats) there is either no or extremely limited evidence to support the practice. So why is there so much rhetoric, confidence, and perhaps most worryingly, staff and monetary investment in so many of these techniques? Why is this happening, with nature reserves and all manner of other protected areas subjected to so many

of these interventions without underpinning evidence? Practical nature conservation has to benefit from what is reported here – we need to move on from the body of knowledge known as 'lore'!

Des Thompson



The Science of Open Spaces. Theory and Practice for Conserving Large Complex Systems

Charles G. Curtin (2015)

Island Press, Washington. 270pp £59.00 (hbk) £25.00 (pbk)

ISBN 978 1 59726 992 6 (hbk)

ISBN 978 1 61091 993 3 (pbk)

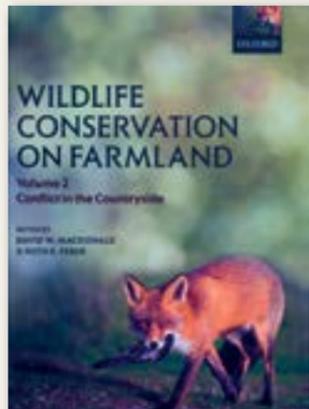
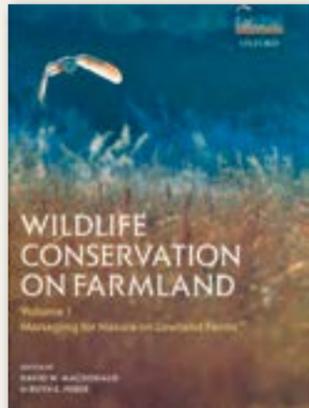
As I flicked through this delightful book it was the pictures and diagrams that initially caught my eye. First, on page 96 we have a 'cod relay' with men running with dead cod along the main street of North Haven Island, Maine – evidently an important cultural phenomenon. Second, on page 161 a snapshot taken in a car has the caption 'Monitoring is akin to driving only with a rearview mirror in that you see what you have passed through, but not what you are about to hit.' I like that!

And on page 47 there are two images of the Mexico-US boundary markers at the south edge of the McKinney Flats taken in 1893 (with a horse and dismounted rider) and in 1994 (with a fence, yes a fence, not a wall) with a caption remarking '...site was relatively unchanged since European settlement, with much the same vegetation as existed in the 1800s.' Well, that may change!

As with most Island Press books, there are idiosyncrasies, and in this regard the book does not disappoint! It is an important book, with the landscape ecologist author urging a paradigm-changing, science-based approach to pursuing large-scale, transboundary conservation. The core of the book is made up of reports on policy and research 'experiments', with the comment that 'the narratives recounting these experiences provide an intellectual road map of my path of discovery.' I'll say! The six chapters provide a perspective of place, important studies of US Southwestern rangelands and Maine's coastal fisheries, and interesting essays on preservation, resilience and sustainability of open spaces. I found the historical ecological and sociological accounts about landscape change especially interesting, and for landscape ecologists I think this is an important book. It is sensible in setting out some principles and ground rules for adaptively managing and sustaining 'open spaces', and with 33 pages of references and supporting notes it is well researched. On many pages

I found myself cheering and disagreeing in equal measure – no bad thing for a lively read.

Des Thompson



Wildlife Conservation on Farmland. Volume 1. Managing for Nature on Lowland Farms
Volume 2. Conflict in the Countryside

Ed. by D.W. Macdonald and R. E. Feber (2015)

Oxford University Press, Oxford £85 for two volume set

ISBN 978-0-19-964683-8 (hbk)

This is a superb two-volume set, written and edited to the highest of standards. Volume 1 has 16 chapters ranging over an eclectic array of studies. Field margin management, organic farming, landscape scale management of dragonflies and damselflies,

and of wooded habitats, are just some of the topics, with many of the chapters co-authored by the editors. The final two chapters are insightful: Tom Moorhouse *et al* writing about applications of effective conservation research on water voles, and Christopher Sandom and David Macdonald delving into 'rewilding', which is mooted as offering a radical future for the British countryside.

The second volume, dealing with countryside conflicts, has 15 chapters, covering foxes (of course!), badgers (with a very good chapter on bovine tuberculosis), American mink, brown rats, moles and, for good measure, a welcome critical evaluation of citizen science.

Two things stand out in the book: an integrated approach across genetics, epidemiology, behaviour, ecology and many other disciplines; and the development of practical and sensible suggestions for resolving farmland conservation problems. Often these are described as 'solutions' – I'm not so sure about that – but they are certainly important. Beyond practitioners and conservation advisers, this book deserves an advanced undergraduate readership which should be inspired by the approaches described.

Des Thompson

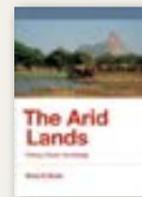
Bilslands' Bakery

Paul Walton
paulwalton@gmail.com
2015-16

In 36 monochrome views of a Glasgow Bakery, built in 1881 and demolished in 2015, we see the extraordinary diversity and starkness of a decaying

cityscape. Surely no ecosystem in Europe comes close to matching the dynamism of an urban landscape, yet most ecologists pay scant regard to the unkempt redbrick and concrete towers and their eco-cultural environs. No words, just simple images, remind us of the discordant pace and complexity of change in our cities that wildlife and people cope with.

Des Thompson



The Arid Lands. History, Power, Knowledge

Diana K Davis (2016)

MIT Press. Cambridge, Massachusetts 292pp
£23.95 (hbk)

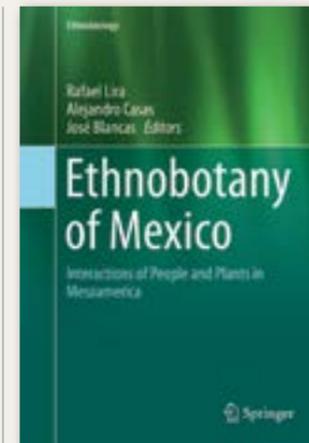
ISBN 978-0-262-03452-4 (hbk)

Deserts and drylands occupy about 41 per cent of the Earth's land surface and are home to circa 38 per cent of the world's population. Complex is perhaps the most appropriate word to describe the environmental, cultural and historical characteristics of these regions, and their interactions in space and time. This is the underpinning theme in Davis' synthesis which focuses on a political ecology approach. Chapter one defines deserts and drylands and the attempts over the last few centuries to promote development and alleviate perceived environmental problems such as desertification and land degradation. Davis argues the case

that the latter have been exaggerated in the context of the ecological theory of the last 200 years, colonial governments and the often ineffective policies adopted by agencies such as the UN. In Chapter two reference is made to the perception of drylands in the Classical, early Christian and Medieval periods when such regions were considered in a generally positive and intrinsic light without any great need for 'improvement'. During the Age of Exploration from c.1450-1900 AD, the subject of Chapter 3, perceptions began to change; Davis suggests that the combination of capitalism and colonialism plus the development of desiccation theories altered management approaches and inspired mistaken links between forests and deserts. All of these opened up prospects for improvement, a form of what might be described as environmental imperialism, ensued as discussed in Chapter 4. Traditional practices such as nomadism, free grazing, and management by fire were not encouraged, or were controlled in space and time, and, as presented in Chapter 5, the issue of desertification became established as a matter of grave concern. This was amplified by the great drought of the 1930s and the later drought in the African Sahel during the 1970s both of which resulted in considerable loss of life and international concern. Political intervention resulted in numerous amelioration/improvement programmes, many under the auspices of the UN e.g. the Arid Zone Research Program (1951-1964). The relatively

poor degree of success of such programmes is evaluated in Chapter 6. Davis concludes that deserts/drylands should be considered as 'resplendent', as they truly are! On a positive front, this book provides a novel analysis of the world's drylands. On a minor negative front it comprises 292 pages of which only 175 pages are text, plus Foreword, while the remaining c.30 per cent are 'notes' i.e. observations and essential references. Marrying the two is vital in order to comprehend the many issues discussed; whilst the separation does not help with comprehension, the detail is useful for further reference. Throughout the text maps are basic but vital and helpful, and the few centrepiece colour photographs are iconic. However, the most important message relates to social and environmental interactions in drylands (which have a long history) and whether or not sustainable development in the twenty first century can be achieved. This is a thought-provoking text and a welcome addition to the literature on drylands. It should be essential reading for university undergraduates and postgraduates in environmental science and geography with interests in arid and semi-arid regions.

Dr A. M. Mannion



Ethnobotany of Mexico

Edited by R. Lira, A. Casas and J. Blancas (2016).

New York: Springer, 576pp,
£159.50 (hbk)

ISBN 978-1-4614-6669-7

The vital and reciprocal relationship between plants and society takes many forms and is examined in a variety of disciplines. One such discipline is ethnobotany which focuses on the traditional uses of plants for various purposes, including food, medicine and religion, and how those practices have sometimes developed into commercial activities. Many such traditions characterise Mesoamerica, notably Mexico, which has a rich cultural history and a rich biodiversity. This context is outlined in the opening chapters followed by a chapter on sources of information which includes indigenous documents known as codices and chronicles of Europeans as the New World was annexed by the Old World in the 1500s and later. Subsequent topics include Pre-Columbian food systems, native edible plants of which there are 2168 species out of 25,000 – 30,000 plant species in total, and contemporary Mayan food systems in the Yucatan where Zea

mays dominates food dishes. Traditional markets and trade links past and present are also discussed as mechanisms for crop dissemination beyond regions of domestication as is the role of ethnobotany in sustainable ecosystem management in the Tehuacán Valley. There is a chapter on plant domestication which is a reminder that Mexico has provided many crop plants including maize, squashes, chile and avocado, another chapter on management and cultural imperatives follows, while incipient domestication in agriculture and silviculture is also discussed. Where agriculture is practised weeds follow and in Mexico's case some of these have themselves become useful species. A further examination of domestication patterns and processes adopts a phylogeography i.e. an approach based on population genetics. The histories of individual crops e.g. beans, squashes, maize, chile peppers and cotton are also considered in individual chapters. All have become significant crops though maize and cotton (*Gossypium hirsutum*: upland cotton) have become especially significant as economic crops globally. The final four chapters focus on recent developments and concerns. One included topic is the loss of traditional ecological knowledge as exemplified by developments in the Tehuantepec Isthmus of Oaxaca, while another is an examination of conservation of plant genetic material in both *in situ* and *ex situ* contexts. The issues surrounding biosafety, especially in relation to the release of GM crops, are also examined with

particular respect to current knowledge and possible causes of biodiversity loss. The book ends with a 45-page perspective on human rights in relation to the plant genetic resources of Mesoamerica including their control by government, industry etc and conflicts of interest which might arise in respect of future use. This book is a tour de force. The 59 contributors, who are mainly from research groups in Mexico with additions from international scholars, provide a wealth of information in its 22 chapters, each of which is well referenced via footnotes. It presents both introductory and advanced material but also asks important questions about gaps in knowledge; this makes it relevant to undergraduates, postgraduates and postdoctoral scientists/researchers as well as policy makers and anyone concerned with establishing sustainable development. To bring such a variety of material together is a credit to the editors though the publishers have hardly helped the cause by charging such a high price which will inevitably limit access to libraries.

Dr A. M. Mannion

Asian Sacred Natural Sites. Philosophy and Practice in Protected Areas and Conservation.

Edited by B. Verschuuren and N. Furuta, (2016)

Earthscan from Routledge, London and New York, 340pp, £39.99 (pbk)

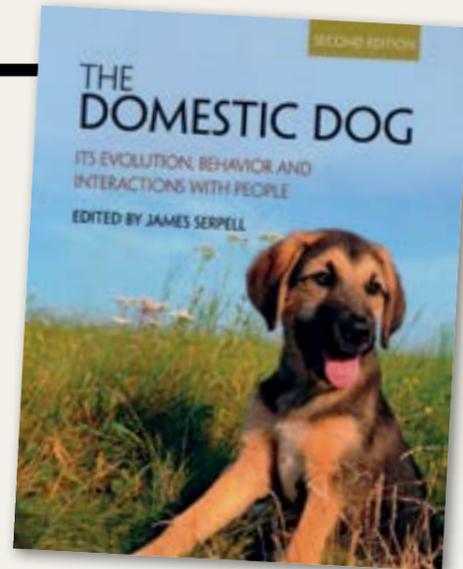
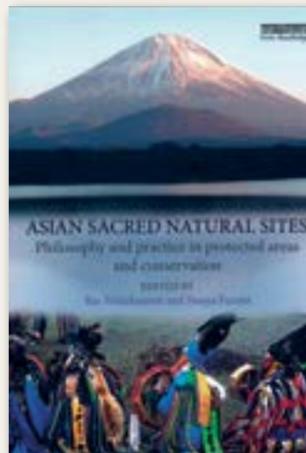
ISBN 978-1-138-93631-7

The value of sacred sites for the conservation of ecosystems and organisms is increasingly being recognised. This

is especially evident in Asia where there is a considerable range of sites that reflect the longstanding relationship between Nature and religion. The emphasis in this book is on examples from IUCN's protected areas with reference to the challenges of environmental and cultural conservation, and continued religious governance in the light of intense modernisation throughout Asia. It emerged from the Sacred Natural Sites Network Project and has 50 plus contributors. The introduction describes the framework for analysis, notably themes, national considerations, legal contexts, conservation details, the role of custodians/religious leaders, and the coupling of science with spiritual belief. These topics are then examined individually in six Parts. Part 1 sets out the Asian philosophy of protected areas, underlines the importance of sacred mountains and the value of world heritage status. Part 2 focuses on national perspectives and practical aspects of conservation; examples are drawn from Bhutan, India and Nepal. The legal context and governance is examined in Part 3 with reference to specific sites, notably Xe Champhone in Lao, the sacred sites of the Donaria Kondhs tribe in India. Forum Pekaseh in Bali, and the Pa'oh peoples site of Kakku in Burma. How development and conservation can proceed in tandem is the subject of Part 4 with reference to examples from Japan, Cambodia and southwest China as well as the transboundary Kailash Sacred Landscape. The significance and roles of custodians and religious leaders are examined

in Part 5 with reference to diverse examples from India, Kyrgyzstan, Nepal and Oman. Part 6 highlights the reconciliation or discrepancy between spiritual/religious foundations and conservation science over time and the current need to modernise. Examples are given from Northern Thailand, the Tibetan 'spiritscapes' (an intriguing new term) of North West Yunnan, the Takht-e Soleyman Lake in Iran, and Tuvan sites in China. The conclusion reflects on the many cultural, philosophical and religious variables which have produced such sacred sights and points out how they can contribute to conservation and complement government action which is mostly science-based. It thus espouses a biocultural approach. The illustration of chapters is variable but each presents a useful reference list. This is both a wide-reaching and specialist text which brings together a broad range of authors, disciplines and examples; it is to be followed by similar texts on the Americas and the Arctic.

Dr A M Mannion



ALSO RECEIVED

Notes by Alan Crowden

The Domestic Dog. Its evolution, behavior and interactions with people. Second edition

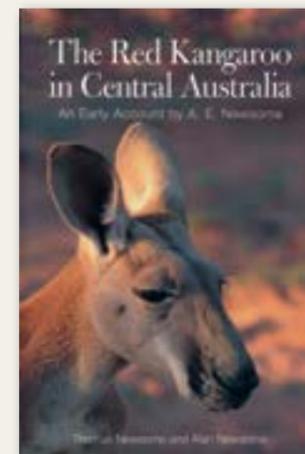
Edited by James Serpell (2017)

Cambridge University Press, Cambridge 426pp, £69.99 (hbk), £34.99 (pbk)
ISBN 978-1-107-02414-4 (hbk)
ISBN 978-1-107-69934-2 (pbk)

I should declare an interest in this book. I commissioned the first edition which was published in 1995, and basked in the reflected glory as copies flew off the bookshelves with the speed that a dog's dinner disappears off the plate. While the largest audience turned out to be students taking companion animal courses in veterinary school, we also sold copies at virtually every scientific conference at which the book was displayed. I probably sold copies to some *Bulletin* readers in the days when I attended BES meetings to man a book exhibit.

So how does this new edition compare to the original? Producing a new edition can be a challenge for both editor and

contributors – how much of the original should be retained, is there enough significant new material to be added, is the subject still important enough to merit a book at all? It helps that more than 20 years have passed, but I have to say that the new version is a brilliant update. While retaining the character of the original, it has been expanded with the addition of 7 new chapters, while authors retained from the original, who are 20 years more eminent than they were, have been diligent in updating, especially when acknowledging that ideas and interpretations have changed. As well as a superb new set of chapter openings from the pencil of Priscilla Barrett, the illustrative content as a whole has been improved and the overall design updated. If you liked the previous edition you'll want the new one, if you're a dog owner and don't know the book you'll enjoy it, and if you disapprove of domestic dogs you'll at least be relieved to know that there is acknowledgement of the issues relating to the impact of dogs on wildlife and dog population management. A superb update of a classic book.



The Red Kangaroo in Central Australia. An early account by A. E. Newsome

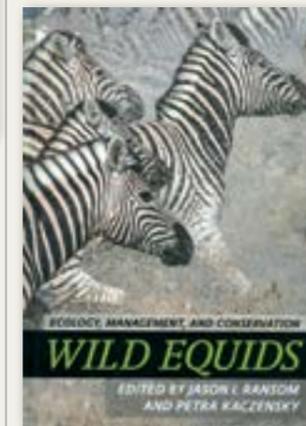
Thomas Newsome and Alan Newsome (2016)

CSIRO Publishing, Melbourne. 176pp, £23.99 (pbk)

ISBN 9781486301553

Between 1959 and 1962 the young scientist Alan Newsome shot 2000 red kangaroos on the plains of central Australia. The data collected were published in 12 papers between 1964 and 1980, but Newsome also worked on a manuscript on the natural history of the red kangaroo that was initially for publication in book form, but which was never finished. The manuscript was only discovered in his late father's papers by Newsome's son, who revised and edited it for publication in 2016. Sounds a bit unpromising, doesn't it? But it's a little gem of a book; after an unusually informative foreword there are 8 pages of colour plates of 1970's central Australia, followed by the text which retains Alan's voice (and he was a character in a country full of characters). Obviously the book is most apposite for those living and working in Australia,

but as Hugh Tyndale-Biscoe points out in the foreword, it is unusual for a practising scientist to write about the process of discovery and how it is done. All credit to Thomas Newsome for doing his Dad proud, and to CSIRO Publishing for having the imagination to support such work.



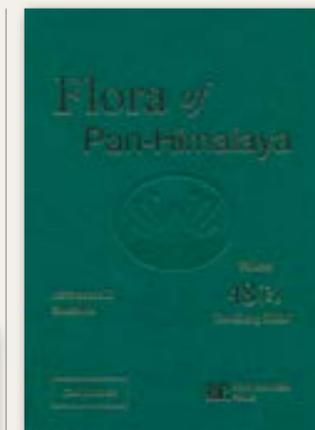
Wild Equids. Ecology, Management, and Conservation

Edited by Jason I. Ransom and Petra Kaczensky (2016)

The Johns Hopkins University Press, 244pp £45 (hbk)

ISBN 978-1-4214-1909-1

A book which apparently originated from discussions at an International Wild Equid Conference in Austria, developed into a very interesting collection of essays on many of the key topics of concern in equid conservation. A very strong list of contributors has been corralled, resulting in a tightly edited volume that is more compact than most and all the better as a consequence. If you're setting out on a research programme or just curious about the current state of knowledge of this group, here's the place to start.



Flora of Pan-Himalaya Volume 48(2) Asteraceae II Saussurea

You-Sheng Chen. Editor in Chief De-Yuan Hong (2016)

Cambridge University Press and Science Press Beijing, 350pp

ISBN 978-1-107-15896-2

The second volume in a flora that is planned for publication in 50 volumes spread over 80 books.



SPONSORSHIP

EXHIBITION & SPONSORSHIP OPPORTUNITIES AT OUR EVENTS



Paul Bower | Fundraising and Development Manager | paul@britishecologicalsociety.org

Ecology Across Borders is our joint Annual Meeting organised in partnership with GfO (the ecological society of Germany, Austria and Switzerland) and NecoV (the ecological society of the Netherlands and Flanders) and in association with the European Ecological Association. Ecology Across Borders presents an ideal opportunity to raise your profile within the European ecological science community by taking an exhibition stand or becoming a conference sponsor. Our 2016 Annual Meeting in Liverpool attracted 1,200 delegates, 27% of whom were from outside of the UK.

THE BENEFITS

Cost Effective. Europe's largest gathering of ecologists in one place over four days. No other event outside the USA offers this kind of opportunity.

Pan-European Collaboration. At a time of political uncertainty Ecology Across Borders offers a forum for networking and new ideas. Whether Brexit is hard or soft, ecologists will be sharing knowledge and building new collaborations in Ghent between 11-14 December 2017.

Sales Leads. An opportunity to put your products and services in front of key influencers and the people who make the buying decisions.

Brand Building. The opportunity to raise awareness of your brand with thought leaders and decision makers in the ecological science community across Europe and beyond.

Networking. Participation in a packed calendar of free events and receptions for delegates, exhibitors and sponsors. Exhibitors are placed at the heart of the conference and are always an integral part of the experience at BES run events.

Long Term Partnerships. Sponsors and exhibitors at **Ecology Across Borders** will be given priority on exhibition space and sponsorship opportunities at our Annual Meeting in Birmingham in December 2018 where we expect 1,500 delegates.

TAKE A STAND FOR ECOLOGY

We have a limited number of exhibition packages which are likely to sell out quickly. The exhibition at our last annual meeting in Liverpool sold out five months in advance. You can guarantee your place and choose your stand position for a non-refundable deposit of just 20% of the prices quoted below. All prices are exclusive of VAT at 20%.

- 9 square metre fully fitted stand in a premium position €1,850
- 9 square metre fully fitted stand in standard position €1,350
- 54 square metre feature stand in a premium position €11,200

All prices include: full shell scheme, carpet, name and logo on fascia, table and two chairs, wi-fi – spot light and 900w power which is sufficient for a lap top. Stands will be located in the main ground floor exhibition hall where delegate lunches, coffee breaks and networking events will take place. Premium position stands are

located in the areas of highest footfall. Additional furniture or increased power supply can be bought directly from the venue.

A limited number of display tables costing €200 per day will be available and are in the first instance reserved for smaller not-for-profit organisations.

SPONSORSHIP AND ADVERTISING

We have created several cost effective sponsorship opportunities as well as advertising options in the conference programme and our quarterly full colour A4 magazine 'The Bulletin' which goes out to 4,500 members in 96 countries. Reduced advertising rates will be offered in both publications to sponsors and exhibitors at **Ecology Across Borders**.

Opportunities include:

- Official conference sponsor
- Official conference supporter
- Thematic session sponsors
- Lunchtime workshop sponsors
- BES Annual Photographic Competition sponsor
- Special events supporter for our gala dinner and/or welcome mixer drinks
- BES awards sponsors.

WHAT EXHIBITORS SAY ABOUT OUR ANNUAL MEETING

PR Statistics, a commercial training provider in the field of the analysis of ecological data, exhibited at our Annual Meeting in Liverpool in December 2016.

'As a new business I was at first a little unsure as to the benefits of taking a trade stand at what would be our first scientific conference. However, the whole process and organisation was made so easy with the help of BES staff both during the build-up and at the conference. Everything went extremely smoothly.

The benefits of taking a stand at the BES Annual Meeting have surpassed my expectations. I reached many more potential customers than I anticipated. We received lots of enquiries during and after the conference for statistics courses from the delegates that we spoke to over the 3 days. Being able to speak directly to people face to face and answer questions really helped us contact people who we would not otherwise have been able to reach and helped us generate new leads.

I have already reserved my stand for the Ecology Across Borders conference and joint Annual Meeting in Ghent in December 2017.'

Dr. Oliver Hooker
Director, PR Statistics
<http://www.prstatistics.com>

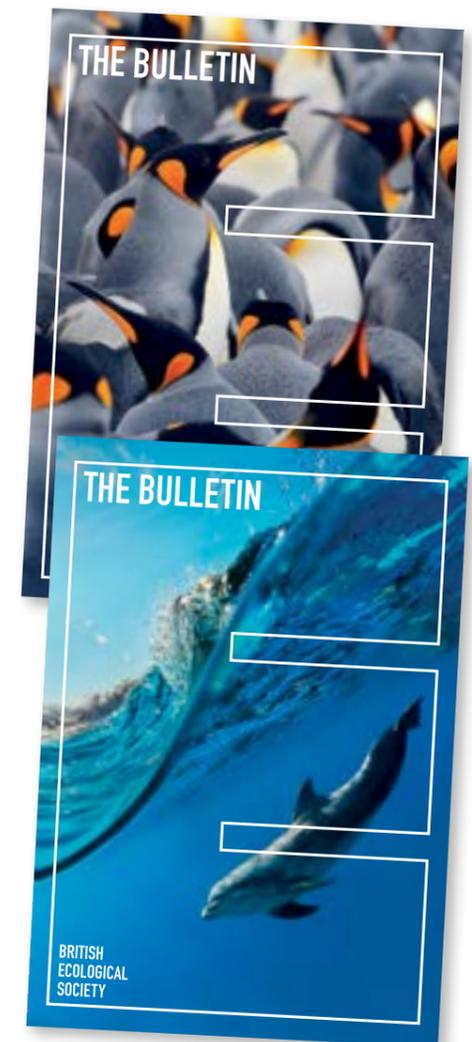
For more information about exhibition, sponsorship and advertising opportunities, please contact:

Paul Bower
paul@britishecologicalsociety.org
Tel +44(0)207 685 2500.

ADVERTISE YOUR SUPPORT FOR ECOLOGY – ADVERTISE IN THE BULLETIN

Established in 1913, we are Europe's largest ecological society. We offer a limited amount of advertising in each issue of our full colour quarterly Bulletin which is mailed directly to our membership. Advertising can be booked on an issue by issue basis and substantial discounts are offered to regular advertisers. You can choose to supply artwork directly to us, or we can provide a full design service

If you would like to reach 4,600 ecologists in 96 countries with your message, please contact Paul on +44(0)207 685 2500 or paul@britishecologicalsociety.org





EndNOTE

At the BES Annual Meeting, held in the port city of Liverpool, delegates were able to meet sniffer dogs and an owl in the exhibit area. At the Ecological Society of Australia meeting, held in the port city of Fremantle, the exhibit area petting zoo consisted of skinks or this carpet python, *Morelia spilota*.

CONTACT DETAILS

OFFICERS:

President: Sue Hartley
Sue.Hartley@york.ac.uk

President-Elect: Richard Bardgett
richard.bardgett@manchester.ac.uk

Vice-President: Rosie Hails
rha@ceh.ac.uk

Vice-President: Andrew Pullin
a.s.pullin@bangor.ac.uk

Honorary Treasurer: Drew Purves
dpurves@microsoft.com

Honorary Secretary: Adam Vanbergen
ajv@ceh.ac.uk

HONORARY CHAIRPERSONS:

Public and Policy: Juliet Vickery
Juliet.Vickery@rspb.org.uk

Meetings: Zoe Davies
Z.G.Davies@kent.ac.uk

Publications: Jane Hill
jane.hill@york.ac.uk

Education, Training and Careers: Will Gosling
W.D.Gosling@uva.nl

Grants: Rosie Hails rha@ceh.ac.uk

Membership Services: Andrew Pullin
a.s.pullin@bangor.ac.uk

EDITORS:

Journal of Ecology: Edited by David Gibson (Executive Editor), Richard Bardgett, Mark Rees and Amy Austin, with Andrea Baier and James Ross.
Email: admin@journalofecology.org

Journal of Animal Ecology: Edited by Ken Wilson (Executive Editor), Ben Sheldon, Jean-Michel Gaillard and Nate Sanders with Erika Newton and Simon Hoggart.
Email: admin@journalofanimalecology.org

Journal of Applied Ecology: Edited by Marc Cadotte (Executive Editor), Jos Barlow, Nathalie Pettorelli, Phil Stephens and Martin Nuñez, with Erika Newton and Alice Plane
Email: admin@journalofappliedecology.org

Functional Ecology: Edited by Edited by Charles Fox (Executive Editor), Duncan Irschick, Ken Thompson, Alan Knapp and Craig White, with Andrea Baier and Jennifer Meyer.
Email: admin@functionalecology.org

Methods in Ecology and Evolution: Edited by Rob Freckleton (Executive Editor), Bob O'Hara and Jana Vamosi, with Andrea Baier and Chris Grieves.
Email: coordinator@methodsinecologyandevolution.org

Biological Flora:
Anthony Davy, University of East Anglia, Norwich a.davy@uea.ac.uk.

The Bulletin:
Edited by Alan Crowden
Email: bulletin@britishecologicalsociety.org

ECOLOGICAL REVIEWS:

Series Editor: Phil H. Warren
p.warren@sheffield.ac.uk

Editorial Office: Kate Harrison
kate@britishecologicalsociety.org

SPECIAL INTEREST GROUPS:

Agricultural Ecology: Barbara Smith
agricultural@britishecologicalsociety.org

Aquatic Ecology: Nessa O'Connor and Lee Brown
aquatic@britishecologicalsociety.org

Citizen Science: Helen Roy and Michael Pocock
citizenscience@ceh.ac.uk

Climate Change Ecology: Mike Morecroft
mike.morecroft@naturalengland.org.uk

Conservation Ecology: Nathalie Pettorelli
nathalie.pettorelli@ioz.ac.uk

Ecological Genetics: Paul Ashton
genetics@britishecologicalsociety.org

Forest Ecology: Alan Jones
forest@britishecologicalsociety.org

Macroecology: Rich Grenyer
besmacroecol@me.com

Microbial Ecology: Rachael Antwis and Xavier Harrison
microbial@britishecologicalsociety.org

Parasite and Pathogen Ecology and Evolution:
Jo Lello LelloJ@cardiff.ac.uk

Peatland Research: Ian Rotherham
peatlands@britishecologicalsociety.org

Plant Environmental Physiology: Katie Field
plant@britishecologicalsociety.org

Plants, Soils, Ecosystems: Ellen Fry
plantsoileco@britishecologicalsociety.org

Quantitative Ecology: Nick Golding
quantitative@britishecologicalsociety.org

Tropical Ecology: Lindsay Banin
tropical@britishecologicalsociety.org

OUR OFFICE:

The British Ecological Society, Charles Darwin House, 12 Roger Street, London WC1N 2JU, UK.
Tel: +44 0207 685 2500. Fax: +44 0207 685 2501.

General email: hello@britishecologicalsociety.org
www.britishecologicalsociety.org
@BritishEcolSoc
www.facebook.com/BritishEcolSoc

OUR STAFF:

Executive Director: Hazel Norman
Email: hazel@britishecologicalsociety.org

Communications Manager: Richard English
Email: richard@britishecologicalsociety.org

Membership and Support Assistant: Hamish Boyle
Email: hamish@britishecologicalsociety.org

Events Manager: Amy Everard
Email: amy@britishecologicalsociety.org

Membership Manager: Helen Peri
Email: helen@britishecologicalsociety.org

Fundraising and Development Manager: Paul Bower
Email: paul@britishecologicalsociety.org

External Affairs Manager: Karen Devine
Email: karen@britishecologicalsociety.org

Policy Manager: Ben Connor
Email: ben@britishecologicalsociety.org

Senior Policy Officer: Camilla Morrison-Bell
Email: camilla@britishecologicalsociety.org

Public Engagement Officer: Jessica Bays
Email: jessica@britishecologicalsociety.org

Head of Publishing: Catherine Hill
Email: catherine@britishecologicalsociety.org

Managing Editor: Emilie Aimé
Email: emilie@britishecologicalsociety.org

Senior Managing Editor: Andrea Baier
Email: andrea@britishecologicalsociety.org

Managing Editor: Erika Newton
Email: erika@britishecologicalsociety.org

Assistant Editor, Journal of Animal Ecology: Simon Hoggart
Email: simon@britishecologicalsociety.org

Assistant Editor, Functional Ecology: Jennifer Meyer
Email: jennifer@britishecologicalsociety.org

Assistant Editor, Methods in Ecology and Evolution: Chris Grieves
Email: chris@britishecologicalsociety.org

Assistant Editor, Journal of Ecology: James Ross
Email: james@britishecologicalsociety.org

Assistant Editor, Journal of Applied Ecology: Alice Plane
Email: alice@britishecologicalsociety.org

Assistant Editor, Ecological Reviews: Kate Harrison
Email: kate@britishecologicalsociety.org



LOOKING BACK

This issue's backward look comes from the frozen North of England, and records participants in a field trip to Moor House in 1975. Left to right in the group photo: Ken Robertson, John Grace, Richard Hobbs, Liz Telford and Charles Flower. The photograph was provided by Richard Hobbs, who was not even old enough to grow a beard when the picture is taken. He is now so old he can't remember the name of the University of Edinburgh lecturer on the far right.

The Moor House area of Upper Teesdale in England was one of Britain's first National Nature Reserves, designated in 1952. Its potential as a research area was already apparent through the work of scientists such as Jim Cragg and Gordon Manley. In the early 1950s the Nature Conservancy oversaw the purchase of the Moor House Shooting Lodge and established a field station to act as a base for research into ecological relationships in a mountain and moorland ecosystem.

Sadly, the Moor House station shared the fate of many Nature Conservancy research stations and was closed in 1982.

There is a Moor House Archive maintained by CEH at Lancaster. Attempts have been made to make earlier science outputs more accessible. An annual report, containing research updates and meteorological reports, was produced from 1960-1984 and these have been digitized. Full text copies of these and other documents can be downloaded from the NERC Open Research Archive (NORA).