THE BULLETIN

BRITISH
ECOLOGICAL
SOCIETY

InFOCUS

We like to include in the *Bulletin* subjects that appeal across the ages. In the summer of 2017 a highlight for the group of lucky undergraduates attending the BES Summer School was a day on the island of Skomer meeting the puffins, as reported on p8 -11; a couple of months earlier the *Bulletin* editor was just as excited to visit the island for the first time in the year he reached state pension age.

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

Associate Editor: Lauren Ratcliffe
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).

Submissions can be sent to the editor by email and pictures should be either jpeg or tiff files suitable for printing at 300dpi.

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REGULARS

FEATURES

WELCOME

ECOLOGY FOR THE LONG TERM

Alan Crowden | **Editor** | bulletin@britishecologicalsociety.org

Ecology as a discipline can be viewed as a mixture of dynamism and constant renewal combined with careful long-term assembly of evidence and the chance for calm reflection. Talk to any ecologist who has studied a field site or system over a long period of time and she or he will almost invariably tell you that their understanding of the processes going on are different from their ideas of five, ten, twenty years ago. It is not because ecologists are prone to sudden whims or are being swayed by ecological fashion, but when the facts change, they change their mind. We have persuasive advocacy of long-term projects in the two pieces from the Ecological Continuity Trust (pp 20-23) and from George Peterken on Lady Park Wood (p30). I do encourage you also to look at George's photographs on the back cover, taken 32 years apart. A tribute to long-term research, and durable partnerships, both professional and personal.

For all ecologists, the prospect of an entire career serenely pursuing your own aims and objectives is but a dream – many BES members will be more concerned about getting the first foothold on a job in ecology, let alone being confident of building a life-long career. We need to make sure ecology has a role and a voice in a fast-changing world. The BES seeks to support ecologists in as many ways as possible, and to ensure that this is done in the most efficient and effective ways. Our President Sue Hartley and Executive Director Hazel Norman have led a review into Society governance, and now seek your feedback (p5). I urge every member to consider the proposals and express a view; it really is YOUR Society. The executive staff do a brilliant job of putting your wishes into effect, but it is the ideas, energy and enthusiasm of actively-participating ecologists that have made the Society what it is today, and will make sure it is fit for purpose into the future. And while you're at it, read the annual report and accounts beginning on page 65.

Elsewhere in this issue Events Manager Amy Everard invites you (p6) to the annual meeting in Ghent (Liverpool 2016 was worth the entrance money just to see Zoe Davies wearing a tinsel halo); Karen Devine highlights another successful Summer School (p8) and Kate Harrison encourages potential book authors to step forward (p52). Zenobia Lewis calls for a level playing field for those on teaching only contracts (p34), and to stretch the analogy Richard Hobbs wishes university administrators would get off the pitch and let the players get on with it (p46).

TIME FOR A CHANGE

This summer I completed 10 years as Editor of the *Bulletin*, having enjoyed every minute. The support from contributors, production colleagues, the BES staff and the Society membership has been tremendous. Which makes me think it is time to quit while I'm ahead, and allow someone with fresh ideas and a different outlook to take our membership newsletter onward and upward. Details of the role are advertised on p29.

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 6,000, 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.

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Charles Darwin House
12 Roger Street
London WC1N 2JU

CHANGES IN YOUR SOCIETY

REVIEWING GOVERNANCE IN THE BES

Sue Hartley | **President of the British Ecological Society** | sue.hartley@york.ac.uk

Good governance, the way that an organisation operates and is held accountable, is really important for any charity to deliver its objectives effectively. The BES has not had a major review of its governance in over 20 years, but during that time both staff and income have increased seven-fold whilst expenditure and assets have increased ten-fold. The size, portfolio of activities and complexity of the organisation have changed greatly, so a review of our decision-making processes is timely. That is why the 2015-19 Strategic Plan included an objective to ensure that our governance is efficient and fit for purpose, as well as robust in the face of likely future challenges and opportunities.

A working group of current and former Council members, chaired by the current BES President and supported by an expert in governance issues, was set up in late 2016 and developed a set of recommendations, taking account of the following issues:

- The need to consider what was best for the BES to deliver its strategic objectives effectively, both now and in the future;
- How the governance of the BES compared to similar organisations and standards of good governance in the voluntary sector;
- Speeding up decision-making and the ability of the Society to respond quickly to new challenges and opportunities;
- Delegating authority beyond Council to Committees and to staff;
- Reducing duplication of effort; and
- Increasing opportunities for members to be involved in the activities and decision-making of the Society.

RECOMMENDED CHANGES

BES Council considered the recommendations in June this year and supported a wide range of proposed changes, the most significant of which include:

Refocusing Council, which will concentrate more on strategic oversight in future, and delegate greater authority to the Committees and staff to drive forward the activities of the Society. In recognition of this change in function, Council will be renamed the Board of Trustees;

Introduction of online voting for the election of Board of Trustees which will enable all members, not just those who are able to attend the AGM, to select who represents them;

Reducing the number of trustees from 22 to 13 and increasing the frequency meetings from 2 to 4 a year. The current Council is too large and meets too infrequently for decision-making to be effective, or sufficiently nimble to deliver our future ambitions;

The Officers of the Society will remain unchanged at 10 and comprise the President, President Elect or Past President, two Vice Presidents, Honorary Secretary, Honorary Treasurer, and Chairs of the Education and Careers Committee, Meetings Committee, Policy Committee and Publications Committee. The remaining 3 trustee posts will be for Ordinary Members of the Board representing early careers, ecologists working in academic research and ecologists working outside HEIs and research institutes;

Terms of Office for Ordinary Members of the Board will be reduced from four years to three years;

The composition of Committees will be changed so there is more opportunity for BES members to get directly involved in the decisions and activities of the Society by becoming a member of a Committee;

The Memorandum and Articles of Association will be updated to reflect the relevant changes, as well as to bring them up to date with current best practice as they have not been thoroughly reviewed since 2006.

WHEN WILL CHANGE HAPPEN?

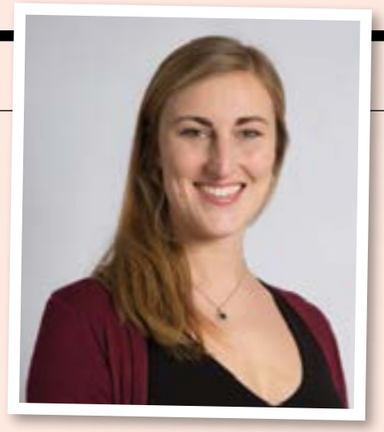
These are significant changes to the governance of the Society and would take time to implement, although we hope that most of the work would be completed in the early spring of 2018. No current Council members will be asked to resign and there will be a transition period where the size of the Board of Trustees will gradually reduce. The changes to the Articles will require the approval of BES members at the AGM in December which is being held, as usual, during the Annual Meeting.

ANY QUESTIONS OR COMMENTS?

We hope that we have explained the need for change clearly and put forward a set of proposals that increases the operational effectiveness and accountability of the Society. BES Council is keen to hear your views on these important proposals before they are put to the AGM in December. If you have any comments or questions please get in touch with Hazel Norman, BES Executive Director, **hazel@britishecologicalsociety.org** by 6 October.

ANNUAL MEETING

WE INVITE YOU TO 'ECOLOGY ACROSS BORDERS'



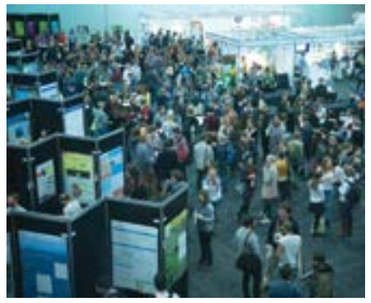
Amy Everard | **Events Manager** | amy@britishecologicalsociety.org

If you are reading this Bulletin as a member, there is a high chance you have attended one of our renowned Annual Meetings. If you haven't, this year is a great year to start!

From 11 – 14 December, over **1,200 ecologists** representing academia, business, NGOs and professional bodies from all over the world will make their way to Ghent in Belgium for Europe's largest and most **influential ecological conference**.

This year is particularly special as we will be holding the meeting in **partnership** with the GfÖ (the ecological society of Germany, Switzerland and Austria), NecoV (the ecological society of the Netherlands and Flanders), and in association with the European Ecological Federation.

This is the first time these societies have held a conference together and it provides us with a great opportunity to build closer ties with our **vibrant ecological communities** across Europe and worldwide.



There are 13 diverse **Thematic Topic Sessions** providing high profile forums for the discussion of timely, innovative and/or important questions, local 'flavour' within the programme, and showcasing integration among disciplines.

Workshops will take place throughout the lunchtime period, with 13 interactive sessions that encourage networking, skills development, and creative thinking. We also have three pre-conference full day workshops on Monday 11 December.

We are proud that the majority of talks and all poster presentations for the meeting are selected from an open call, giving all delegates the **opportunity to present their research**. 500 talks and 600 posters will be presented by our delegates.

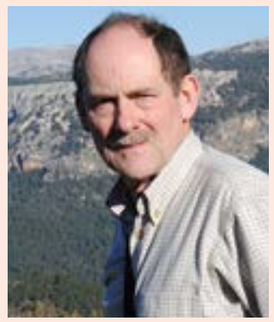
Our **Exhibitors** are a vital part of the meeting; this year we have almost sold out, with over 30 exhibitors from publishers, equipment companies, training providers and academic institutions ready to engage with you.

In addition to the core scientific programme, we strive to ensure there are opportunities for delegates to network, meet old friends and build new relationships. This could be through one of our two evening **poster sessions**, over a **game of fuzboll**, or at one of our **Special Interest Group** social events, which are free for all to attend. We regularly have groups organising other social events, such as our **LGBT mixer** and **Christian breakfast** event. If you are involved with other groups that you would like to support, please do get in touch.

AT THE CORE OF THE CONFERENCE ARE FOUR INTERNATIONALLY RENOWNED PLENARY SPEAKERS:

Iain Couzin
(Director of the Max Planck Institute for Ornithology, Department of Collective Behaviour, and the Chair of Biodiversity and Collective Behaviour at the University of Konstanz, Germany)

Sue Hartley
(BES President and Director, York Environmental Sustainability Institute, University of York, UK)



Carlos Herrera
(Professor of Research, Consejo Superior de Investigaciones Científicas)

Louise Vet
(Director of the Netherlands Institute of Ecology (NIOO) and professor of Evolutionary Ecology at Wageningen University)

The final day of our Annual Meeting has become known as **Christmas Day**. This is an opportunity to grab your festive frocks and jingly jumpers and get in the holiday spirit – there might even be some Glühwein!

The fun doesn't finish there: Ghent is a beautiful city, often referred to as Belgium's best kept secret, with other historical cities nearby. We have put together a number of **post conference tours** to enhance your stay in Belgium, including tours of Ghent, Bruges and Antwerp. We also have a trip to the Aalmoeseneie Forest Long Term Ecological Research Site.

We might be biased, but we think our Annual Meeting is a great event and we would love to see you all there. **Earlybird registration is open until Friday 20 October, so book now to save up to £100.**

FIND OUT MORE

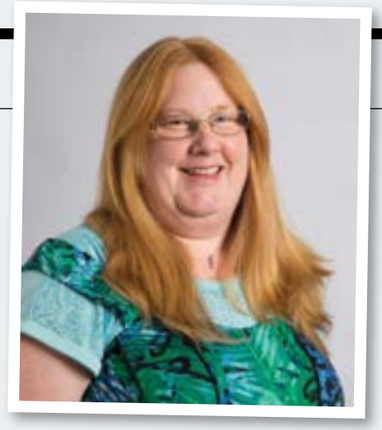
The conference website contains all information about the event, including travel and accommodation advice and information for those travelling with families. If you have any questions, please get in touch with our Events Manager, Amy Everard.

www.Ecology2017.info
amy@britishecologicalsociety.org
#EAB2017
Follow the conversation on Twitter with #EAB2017

We hope to see you there this December.

ENCOURAGING THE NEXT GENERATION

CELEBRATING OUR THIRD SUMMER SCHOOL AT FSC DALE FORT IN WALES



Karen Devine | **External Affairs Manager** | karen@britishecologicalsociety.org

On four days in July 2017 we took 50 students representing 39 universities from across the UK and Ireland to Dale Fort on the Pembrokeshire coast. We got them out of bed and ready for a 6.00am field start and most days we didn't finish until near midnight.

We could write about the programme but we thought instead it would be better to acknowledge the enthusiasm of the lecturers, speakers, mentors and visitors who helped us deliver what was for most students one of their best experiences to date. And to prove that, we'd like to share the written feedback students provided when we asked for their highlights of the week.

Some of the participants identified particular areas that truly stood out for them; others simply enjoyed the experience of being immersed in ecology.

Demonstrating how UV tracking of invertebrates is used in crop protection research

A huge thank you to Professor Simon Leather and Francisca Sconce for the entomology session and Dr Dan Forman for his mammal ecology sessions.

"My personal highlight was the moth trapping and insect tracking - showing us how more traditional techniques are still effective and improved upon, as well as showing us some really revolutionary new techniques that I hope to be able to use in my own research in the future"

Our wonderful mentors Kim Simpson (Sheffield), Paula Tierney (Trinity College Dublin), Simon Tarr (Nottingham), Catie Gutmann Roberts (Bournemouth), Will Kay (Swansea) and Melanie Edgar (Manchester)

Professor Jane Memmott answers questions in a small group session with our In2Science students

Some struggled a little more to identify any one highlight:

"THE VARIETY OF THE WHOLE WEEK WAS THE HIGHLIGHT FOR ME. EXCELLENT LECTURERS WERE INVITED WHO RADIATED ENTHUSIASM, AND THE MENTORS AND BES STAFF WERE JUST AMAZING. IT COULD BE 6AM OR 11PM, THEY WERE SO LOVELY WITH ALL OF US 24/7".

"Everything was covered, CV, research, careers, statistics. The policy session was incredibly useful as on my programme we never touched it and finally I understand the way it works and how I might even be able to influence it in the future. It was all about absorbing everything for me, everyone gave us useful hints, tips and insights. The mammal ecology and bat ecology were just superb, I never studied entomology before and I loved how even complex gadgets were introduced to us and the CIEEM sessions were full of great practical examples. The fellow students were a great surprise for me too, as I don't often bump into folks at uni who I could have a great scientific discussion with, and I made many friends here - and finally fully understood the importance and usefulness of Twitter."

Our wonderful PhD students led on many of the early and late activities including several workshops and breakout sessions. Throughout the week, we worked hard to ensure that the all aspects of a research career were presented and integrated into the science programme and we packed in as much as we could: Once more we were very pleased to have the support of CIEEM (Chartered Institute of Ecology and Environmental Management) and 6 of their members who came along to guide students through the consultancy process, practitioner perspective and the breadth of careers beyond academia.

"The whole ecology and careers programme went way, way, above my expectations. I didn't realise how useful these will be, as they were not delivered as dry sub-units but everything was somehow integrated. I actually took on board the many different aspects of a possible scientific life being introduced to us from many different angles"

For our budding photographers, the islands residents provided plenty of opportunities.

The advantage of a trip to the Pembrokeshire coast is the opportunity to get a behind the scenes look at the research being conducted on Skomer. Dr Mark Ward of the Field Studies Council generously led this excursion and students spent time with island staff in smaller groups. For all the students attending this was one of the favourite days.

And finally, on behalf of the UG students attending this year to all our members who help deliver and support the summer school every year:

"I loved the Summer School and I was sad when it finished. It opened a whole new set of doors for me and changed my future possibilities for the better and also very hands-on in my goal of developing a wider skill set. I felt incredibly privileged and proud to be the part of it.

Thank you again for all your hard work making it an epic week for all!"

The 2018 Summer School will be returning to Malham Tarn Field Studies Centre and will run 16-20th July 2018. Please do get in touch with the office if you'd like to nominate your students, want to be a PhD mentor or would like to help in delivering workshops.

"I GOT SO MUCH MORE HELP AND INFORMATION IN JUST 5 DAYS THAN I DID 2 YEARS AT UNIVERSITY WHICH IS NO EXAGGERATION."

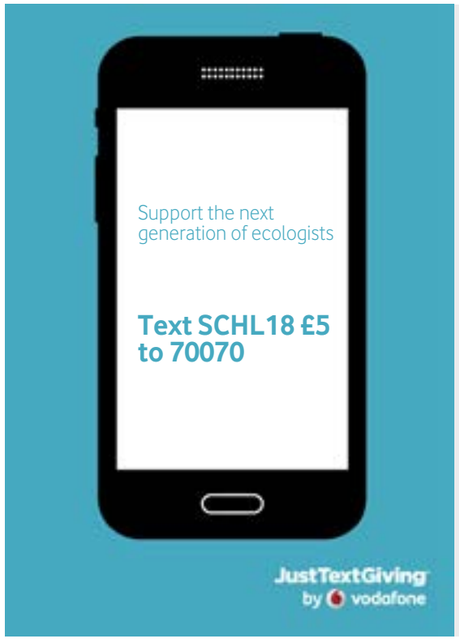
The 2017 Summer School

FUNDRAISING

BES FUNDRAISING GOES DIGITAL

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

Six months ago I said that for the first time in our 104 year history, we would be launching a fundraising campaign so that we can give even more ecologists the support that they deserve. Well it's here. But don't worry, we will not be bombarding you with emails, phoning you or filling your recycling bin with endless mail shots. Instead we have set up BES on the JustGiving platform which will allow anyone who is passionate about ecology to make a Gift Aided donation online or by text.



TEXT GIVING TO SUPPORT YOUNG ECOLOGISTS

Our first text giving campaign will raise additional funds for the BES 2018 A' level Summer School. Building on the success of our 2017 Summer School, where we invited a small cohort of 6th formers to join the under graduates, we are now planning to run an additional residential Summer School in 2018 exclusively for Year 12 students. The focus will be on supporting 17-18 year olds from low income backgrounds, black and ethnic minority groups and young women. They will be mentored by PhD students and professional ecologists who are giving their time for free We are appealing for donations of £5 to increase the budget to pay for protective clothing and equipment for the students.

If you would like to donate the cost of two cups of coffee to support these young ecologists please:

TEXT SCHL18 £5 TO 70070

You can only make donations from UK mobile phones when you are in the UK. You can donate up to a maximum of £10 in a text. Simply insert a space and then £6, £7, £8, £9 or £10 after the code if you wish to donate more than a fiver.

If you donate by text we will always respect your privacy and never make a follow up call.

There are four ways you can support our work.

GIVING ONLINE

You can make a one-off or monthly donation to help us *'generate, communicate and promote ecological knowledge and solutions'* Donate at **www.justgiving.com/britishecologicalsociety**

Alternatively, you can tell us how you would prefer your money to be spent by allocating your donation to one of three campaigns.

Just go to the donate tab on the top right hand of the BES home page **www.britishecologicalsociety.org/membership-community/donate-now**

There are separate donate buttons for each of our three campaigns:

Ecology – The Next Generation

This fund will support initiatives designed to attract the best talent and increase the diversity of people studying and working in ecology. This year's campaign will support ecologists with limited funds to attend Annual Meetings and symposia. We will also draw on this fund to support BES initiatives designed to attract more women and people from black and ethnic minority communities into ecology.

Ecology in Africa

This fund will provide additional funding for our work with local partners in Africa including our successful **Ecologists in Africa** grant programme. Many thanks to Dr Derek Langlow for kicking us off with a £100 donation.

Bridging the Gap

This fund will support PhD students and early career ecologists in the difficult period when funding has ended and they are looking to secure their first position in the profession.

SUPPORT OUR MISSION

You are now just one click away from supporting ecologists in the UK and across the developing world with a one-off or recurring donation. Just click on the brand new **DONATE** button at the top of our home page **www.britishecologicalscociety.org**

FUNDRAISING IN THE FUTURE

Later in 2017 we will be exploring how we can use the functionality available on the JustGiving platform to put you in control and run your own community fundraising campaigns under the BES banner. As part of our membership of JustGiving, we will have access to places at major sporting events such as the Great North Run.

For now, we would just like members who feel that they can afford it, to support ecology and fellow ecologists. Every donation, however large or small, will make a difference.

Remember that you can also make a donation to any of the above campaigns or for general purposes in the old-fashioned way by sending us a cheque to:

Fundraising, British Ecological Society, Charles Darwin House, 12 Roger Street. London WC1N 2JU. Please write which campaign you would like your donation to be allocated to on the back of the cheque.

**We can only claim Gift Aid on your behalf if you are a UK Tax Payer. Typically Gift Aid will increase your donation by 25p in the £.*

MEDIA ENGAGEMENT

ECOLOGY IN THE PUBLIC SPOTLIGHT

Sabrina Weiss | Press Officer | sabrina@britishecologicalsociety.org

Our recent symposium on the 'Macroecology of Alien Species' brought together invasion ecologists and macroecologists, working on many different taxonomic groups, to gather the latest evidence on the geographical distribution and abundance of alien species worldwide.

To address some of the fundamental questions and ambiguities regarding this topic - a topic which is often subject to controversial public debate - we held a press background briefing in conjunction with the Science Media Centre in London. Our panel of experts consisted of symposium speakers Helen Roy from the NERC Centre for Ecology & Hydrology, Mark van Kleunen from the University of Konstanz (Germany), and Rob Colautti from Queen's University (Canada). They explained to journalists how and why plant and animal invaders spread, how they can impact their new environment, and how science can inform policymakers and the public, and to try to prevent further introductions and establishment.

When asked about the most concerning troublemakers, our experts pointed out a number of alien species that could pose a serious threat to biodiversity and ecosystem functioning in the UK and elsewhere. Journalists representing major UK newspapers and broadcasters - including the Guardian, Daily Telegraph, Daily Mail and the BBC - attended the briefing and, as a result, published articles highlighting invasive species such as the Argentine ant, Asian hornet and racoon, which the public should be looking out for.

Engaging the media is one of the most effective ways to reach an audience of thousands or even millions. Many people trust and get most of their information about science from newspapers, TV and radio programmes, and online outlets. The media plays a central role in awareness-raising and shaping public opinion, particularly when reporting on complex and often misunderstood issues. In fact, many journalists specialise in and are genuinely passionate about science and the environment. They want to hear about the latest developments in research, why it's important and how it might affect their readers and viewers. Giving them access to experts and the latest scientific evidence is key to ensuring factual, accurate and balanced reporting.

Journalists often approach the BES press office to find an ecological expert for a news story. Covering topics from conservation, particular species and ecosystem services to agriculture, sustainability and climate change, expert comments add credibility to a media report and can bring a story to life. Please do get in touch if you would like to join our expert database and act as a spokesperson in your field.

Having recently joined the BES as full-time Press Officer, I look forward to helping our members engage with the media and to creating more opportunities for you to communicate your work to a wider audience. Whether you are about to have an interesting paper published, you are reaching a new milestone with a project, or are organising a topical and timely event, the BES press office can assist you in identifying the right audience and channel for your story. We also like to hear from your institution's press office and are happy to jointly work towards increasing exposure for your work.

Helping our members share the excitement of ecology and its importance for society is one of our major goals. The public is fascinated by nature and curious about the world we live in. Learning about it through the media may even inspire the next generation of ecologists.

Above: The grey squirrel arrived in Britain in the 1870s and are now widely distributed across the UK.
© Tim Blackburn

The rose-ringed parakeet is the UK's most abundant naturalised parrot, the population having become established after escapes or introductions in the 1970s.
© Tim Blackburn

POLICY

ENVIRONMENTALLY SUSTAINABLE AGRICULTURE:

OPPORTUNITIES AND CHALLENGES FOR THE UK IN A POST-BREXIT WORLD

Samuel Leigh | Policy Intern | policy@britishecologicalsociety.org

Amidst the fog of uncertainty that surrounds Brexit, there are some aspects of our future that have greater clarity than others.

Leaving the EU means that the UK will no longer be required to fund and comply with the EU Common Agricultural Policy (CAP) after 2020. We will get a greater insight into the Government's plan for agriculture in this parliament with the Agriculture Bill, mentioned in this year's Queen's Speech[1].

For those concerned by the current state of our countryside, this presents a crucial opportunity to design an agricultural policy that promotes and rewards an approach to agriculture that minimises its impact on the natural environment and ensures farming continues to produce food in the future. The CAP was never conceived to achieve these aims. Despite recent modifications through voluntary agri-environment schemes (AES) and the 'greening' of farm subsidies, overall the support of intensive agriculture through the CAP has had a negative impact on the environment.[2,3,4] The Government's focus on 'public money for public goods', articulated in Environment Secretary Michael Gove's recent 'Green Brexit' speech,[5] suggests that in the future farmers will be paid to deliver things that people value, which could include environmental goods such as clean water, beautiful landscapes and skylarks. This new direction from Government is promising, but also raises important questions.

What is environmentally sustainable agriculture? © Keith Edkins

What is environmentally sustainable agriculture and how can it be achieved through a new agricultural policy? As we leave the EU, what forces will encourage farmers to adopt better practices and what constraints may there be on any future agricultural policy?

ASSEMBLING THE PIECES OF A POSTNOTE

In a committee room in the Palace of Westminster, I sat listening excitedly as it was decided by MPs and peers that I would help write a POSTnote for Parliament that would attempt to address these questions. In my role as an academic fellow at the Parliamentary Office of Science and Technology (POST),[6] my advisor and I drew up a list of researchers that I would approach to discuss some of these questions. POST provides impartial, accessible overviews of public policy issues relating to science and technology for parliamentarians. Fortunately, as a PhD student exploring the ability of novel crop rotations to enhance multiple ecosystem services, I was broadly familiar with this topic area. One of the researchers on my list was my academic supervisor.

In order to find an answer to what environmentally sustainable agriculture is and which practices it involves, I travelled from Southampton to Sheffield where, more often than not, as we sat over a coffee, the researcher I was interviewing began their answer with "Well, it depends…"

It quickly became apparent that the most relevant practices and approaches vary from farm to farm, on the wider environmental context and are dependent on the agricultural system in place. For example, an arable farmer in East Anglia will likely need to do something very differently to a sheep farmer in Wales. In some cases, there may be no appropriate practice that is environmentally sustainable and an entirely new land-use may be the best option. In the POSTnote we ascribed potential measures to two broad categories – restoring natural capital and improving resource efficiency.

One thing I learnt during my fellowship was the importance of communicating in language familiar to policy makers and relevant to the policy context of the day. For example, as a PhD student I often speak to other researchers about "ecosystem services", whereas in this POSTnote the focus was on "natural capital". The reason, in short, was due to the existence of Natural Capital Committee, set up by the 2010 coalition government. If it had been named the Ecosystem Service Committee then the choice of language may have been different. MPs and peers are more likely to have some familiarity with the term Natural Capital or be aware of the Committee. They have to deal with so many different topics that being consistent with the policy language *du jour* can help you to communicate more effectively to policymakers.

Given this, the POSTnote laid out some examples of approaches to restoring natural capital. With a focus on soil, biodiversity and water quality we described how researchers felt that there needs to be a better idea of what the status and trends of these assets are. Additionally, we emphasised how management interventions intended to halt declines or restore assets required robust monitoring to ensure that they are effective. Practices to restore these assets will in some cases require famers and landowners to work together across a river catchment or a landscape, as uncoordinated piecemeal action will rarely be effective. The spatially targeted deployment of agri-environment schemes could be one mechanism to achieve this, perhaps facilitated by river trusts, wildlife groups or National Park Authorities. The researchers I spoke to emphasised how this will need to be facilitated and incentivised for farmers to engage.

In order to understand the challenges that farmers face in adopting these measures, the next people on my hit list included individuals working in think tanks, NGOs, industry and farmer groups. Here it became clear how one obstacle to the delivery of environmental benefits was the fragmented and disjointed state of farming advisory services. It was also interesting to learn about the potential constraints from international obligations and future trade deals on achieving more environmentally sustainable agriculture. Although this concerns a degree of speculation, it was interesting to attend a Lords' Select Committee hearing on the implications of Brexit for agriculture. This session talked in depth about how a trade deal with the US could reduce farmers' willingness to reduce environmental impacts whereas a trade deal with Japan may not. Discussions touched on how a close trading relationship with the EU could limit the scope for reductions in environmental standards and how WTO membership could limit payments to farmers for environmental goods.

AN AGRICULTURE BILL UNDERPINNED BY EVIDENCE

My POST fellowship allowed me to find out more about my research area as well as introducing me to subject areas I had never thought about. Writing and then finally publishing my POSTnote was one of the hardest and most demanding things I have done in my life. I have never had my writing scrutinised so carefully, every sentence pulled apart, dissected and examined. Talking to my final stakeholder, the government, became increasingly difficult as a snap election and an unforeseen minority government meant that there was little they could discuss due to the uncertainty at the time. These events required several additional drafts and a fair amount of head scratching.

It became clear as I listened to a debate on the triggering article 50 bill in the House of Commons just how important and useful the work of POST is. It is fair to say that the political motor car is going full throttle at these times and POSTnotes provide an essential navigation tool for parliamentarians through the enormity of legislation that needs to be generated and scrutinised, especially in this parliament. The Agriculture Bill is a crucial piece of legislation with far reaching consequences, and it is essential that it is underpinned by the latest, highest quality scientific evidence.

The POSTnote on Environmentally Sustainable Agriculture is available at: http://bit.ly/2ujggzl

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WHAT NEXT?

The BES Policy Team is developing a policy brief that gives an overview of the evidence base on the positive and negative effects of agri-environment schemes, and what new approaches could form part of a new agricultural policy. **If you are interested in hearing more about this work please join our Brexit Working Engagement Group mailing list.**

WILLS AND LEGACIES

CELEBRATING ECOLOGY

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

Last month Professor Sir John Lawton and Professor Sue Hartley contacted me to let me know that they had answered my appeal. They will be leaving a gift to the BES in their respective Wills. This is great news because I know from my experience in marketing that when someone we respect takes an action we are all more likely to follow suit.

So, I did. I decided that it was time for me to put my money where my mouth is and follow their example. Using the Will codicil which you can find in the Membership & Community section of the BES website under 'Remember Ecology in Your Will', I made a small cash gift to BES and asked my solicitor to attach the new instruction to my Will. The whole process took less than half an hour including the call to my wife.

'Hi Heather. Do you mind if I amend our Will to include a cash gift to BES?'

'How much?.....Oh that's absolutely fine. Good idea'

So, how much are two of the United Kingdom's most distinguished ecologists and a man with one Chemistry O Level (my training is in Spanish, Modern History and Marketing) leaving to the BES? Well, that is our business. The Society will always protect the privacy of anyone leaving a gift in their Will. The same will apply to you if you decide to follow the example of Professor Sir John Lawton and Professor Sue Hartley. Your privacy is paramount and our Legacy Promise outlines how we will treat you in a process that you will always control.

BUT WHY DO I NEED A WILL?

I get asked this question quite a lot even by highly organised and successful people with assets. Sometimes they will say *'I do not have any children, so why bother?'* The reason is simple: because the property and assets of anyone dying without a Will are subject to the Rules of Intestacy. This means that:

- There is a strict order of who will inherit your estate.
- Only direct family will inherit under intestacy: not unmarried partners, friends or good causes that you might want to support.
- Depending on the size of your estate there are even limits to how much your spouse or civil partner can inherit if you do not leave a Will.
- Making a legally valid Will is the best way to protect your estate and have a say on who inherits.
- Having a valid Will cuts down the time it will take a solicitor to distribute your estate and consequently the fees that they will charge.

So really we should be asking that question *'Why wouldn't you make a Will?'*

BES does not recommend or offer advice on how to make your Will. However, we do advise that you do it properly and employ the services of a qualified solicitor. You can find links to the Find a Solicitor services of the three UK law societies:
www.lawsociety.org.uk
www.lawscot.org.uk
www.lawsoc-ni.org

I will be hosting a very short presentation and reception at our Joint Annual Meeting in Ghent in December for anyone who wants to talk about the most effective way of supporting ecology through a gift in their Will. Details will follow as part of the joining instructions and in the next e-Bulletin.

Alternatively, you can email me to set up a confidential conversation.

Over the years BES has benefited greatly from the generosity of members who have remembered ecology in their Will. Their legacies have helped ecologists from all over the world travel to BES meetings, as well as supported a wide range of research projects. Every gift in every Will, however large or small, will make a difference because demand for all our programmes always exceeds supply. Any help members can give will support ecological science and ecologists in the coming decades, so please consider supporting the Society and its activities in this way.

Professor Sue Hartley
Director, York Environmental Sustainability Institute

> Leaving a legacy to the British Ecological Society is a way for me to give something back to a discipline that has given me so much pleasure over the last 50 years. Making a Will is an important event in all our lives. Quite rightly, family and friends come first. However, even a small gift could make a big impact on the work of ecologists in the future. I hope that you will join me in leaving a gift to BES when you make or change your Will.
>
> **Professor Sir John Lawton**

THE ECOLOGICAL CONTINUITY TRUST

MAKE YOUR RESEARCH LONG-TERM

Cors Fochno

Jessica Bays | team@ecologicalcontinuitytrust.org

The Ecological Continuity Trust champions long-term ecological experiments throughout the UK.

With 33 active experiments at 29 different sites throughout the UK, the sheer diversity of LTE research being undertaken is vast. From grazing experiments at Glen Finglas, to floodplain meadow restoration at Somerford Mead and climate manipulations at Clocaenog, UK LTE research covers a wide range of life science disciplines.

The ECT provides grants to facilitate research on LTEs. We encourage Society members and the wider ecological community to explore LTEs as potential locations for their research.

Eligible for discrete research projects, site upgrades and travel costs associated with presenting LTE research at conferences, we award grants of up to £1000. More in cases where emergency repairs are required or bridging funds necessary to maintain the integrity of the experiment. Recent awards have included:

Bridging funds for the Cors Fochno experiment. Recently listed on the LTE register, this experiment was established on a Welsh lowland bog in 2010 to investigate peatland response to climate change. Focusing on the combined impacts of drought and warming, Cors Fochno is a globally unique experiment, as it includes both long-term warming and active simulation of realistic summer drought on a bog community. The ECT grant awarded to Dr Richard Payne at the University of York enabled researchers to travel to the site to undertake vital monitoring and maintenance during a period where no other funds were available. This site has subsequently been awarded a Leverhulme Trust grant securing the experiment to 2020.

Tim King clearing scrub at Aston Rowant

Securing the future of the Aston Rowant succession experiment. The ECT funded the re-fencing of this LTE (the Lena Ward Plots), which was established in 1969. This experiment investigates how burning or rotavating chalk grassland prior to enclosure has affected subsequent vegetation development. Every shrub and tree that has established on each of the plots have been catalogued, with the age of 80% of all the trees known, all plots were re-sampled in 2016 by Dr Tim King. The new fences will ensure that animals and humans are kept out of the plots for the next 25 years.

Enabling new research at Moor House LTE. Dr Althea Davies, University of St Andrews, was awarded a grant to investigate the use of dung fungal spores as a proxy for past grazing regimes at Moor House. This project will use the grazing history at Moor House LTE to quantitatively assess the relationship between experimental grazing levels and two proxy indicators of herbivory: pollen and coprophilic fungal spores.

Student project funding. PhD student, Mounir Takriti, of Lancaster University was awarded funds to undertake an investigation into seasonal variations in stable isotope signatures of methane at Moor House.

We want to see current and future generations of ecologists utilising the UK's valuable LTE resource. Go online to find out more about eligible sites and how we can support your research.

www.EcologicalContinuityTrust.org

THE ECOLOGICAL CONTINUITY TRUST

VALUING LONG-TERM EXPERIMENTS IN ECOLOGY

L to R: Karl Evans, Emma Sayer and Raj Whitlock, who form the new steering committee for the Buxton site

Raj Whitlock | **Emma Sayer** | **Karl Evans**

Long-term ecological studies are vital to ensure that scientists can detect, understand, and predict the effects of environmental changes on ecosystems.

Many such studies observe the accumulating effects of environmental change over time in non-manipulated communities and ecosystems. These longitudinal observations (including LTER networks) play a pivotal role in our understanding of environmental change at landscape scales. A catch with this approach, however, is that it is not always possible to decisively identify the causes of change (the so-called "attribution" effect). This is because multiple environmental changes occur simultaneously and LTERs lack control and treatment plots which differ only in their exposure to a single environmental variable.

Environmental-manipulation experiments can side-step the attribution effect and complement LTERs to link responses to their causes. Many experiments like this have been carried out, but only a small handful have used long-term (> 5 year) experimental manipulations applied to real ecosystems in the field. By their nature, these long-term experiments hold a twofold value for ecology. First, the consequences of environmental change may only be detectable over long periods of time, once impacts on long-lived organisms, their biotic interactions and intraspecific adaptation (including evolution) have arisen. Second, the defined starting point of the experimental manipulations means that impacts acting through different ecological or evolutionary processes can be mapped out through time. Long-term environmental manipulation experiments therefore provide a unique window on the ecological and evolutionary effects of chronic environmental change and the identity of the underpinning processes.

Jason Fridley (left) and Phil Grime. Phil established the Buxton experiment in 1993 and Jason has been a key collaborator for the last 10 years.

The Ecological Continuity Trust (ECT) manages a register of long-term experiments in the UK, and works to promote them within the academic community. A major challenge for long-term environment-manipulation experiments is to maintain the continuity of experimental manipulations through different phases of experimentation and external support. The ECT endeavours to provide support to long-term ecology experiments during challenging times. In this article, we showcase one such experiment: the Buxton Climate Change Impacts Laboratory. The ECT have recently agreed to provide bridging funds to meet the costs of climate change manipulations at BCCIL, facilitating the launch of a second phase of research and management at BCCIL.

The seasonal warming microcosms at Buxton

BUXTON CLIMATE CHANGE IMPACTS LABORATORY (BCCIL)

BCCIL is the longest running climate manipulation applied to a natural ecosystem in the UK (and the second oldest manipulation, globally). It was established in 1993 by Professor Phil Grime, with assistance from the Health and Safety Executive, who now provide access to the experimental site, and from Jason Fridley, whose research project has supported the site over the past 10 years. The treatments (including summer drought, increased rainfall and winter warming) were designed based on the best available climate change projections at the time – but remain highly relevant today. They have been applied continuously to 3 x 3 m calcareous grassland plots for 24 years in a fully randomised block design including control plots. Regular surveys of the vegetation at BCCIL have made a major contribution to our understanding of how grasslands respond to, and can resist climate changes.

Community composition and ecosystem process rates of many plant communities have been shown to respond rapidly to experimental climate manipulation. In contrast, at Buxton, there was little change in the first 13 years; the grassland ecosystem resisted the effects of chronic climate manipulations. Subsequently, observations of plant species abundance within 10 x 10 cm permanent quadrats have revealed evidence for "adaptive" changes in species abundance that are associated with plant functional traits. For instance, it was recently shown that the warming treatment at Buxton has favoured plant species with taller canopies and faster resource assimilation rates. These findings raise the possibility that the responses of grassland communities to longer growing seasons may be predictable on the basis of functional trait measurements. Furthermore, a part of the community-level resistance to climate change observed at Buxton may be explained by species sorting over soil-depth microhabitats that exist within each plot, with the heterogeneity in soil-depth providing refugia for plant species with a wide variety of climatic tolerances.

These species-level effects, observed in the plant community, are not the whole story and perhaps represent only the tip of the ecological iceberg. Intraspecific (population-level) responses to simulated climate change have also been detected at Buxton in plants, including both phenotypic and genetic changes. These tantalising responses suggest that individual species may be able to resist change through evolutionary adaptation,

A general view of the Buxton Climate Change Impacts Laboratory site

further bolstering community-level resistance. Moreover, we have also recently unearthed below-ground responses in bacterial and fungal communities to the climate manipulations. Molecular fingerprinting applied to these communities indicates that the dominant microbial taxa may be climatic generalists, with only limited response to the climate. In contrast, subordinate taxa were subject to pronounced changes in relative abundance with simulated climate change.

These exciting results set the stage for a second phase of investigations at BCCIL. Many scientific questions at BCCIL remain open, and could be addressed in "phase two". For instance, we know almost nothing regarding invertebrate responses to simulated climate change at the site, either above- or belowground. One likely component of "phase two" will be to integrate responses to climate change that occur aboveground in plants and belowground in soil microorganisms. We have recently received a research grant from the Natural Environment Research Council that will fund the first step in this work; to investigate how climate-driven evolution in soil microorganisms will influence plant-soil interactions and ecosystem processes.

The new phase of investigations at BCCIL is only possible because of the foresight of Professor Phil Grime, who established the site, and who has been responsible for the continuity of the climate treatments, and their monitoring, through almost a quarter of a century. As well as informing our understanding of ecological responses to climate change, this achievement has created scientific opportunities for a future generation of ecologists. The funds provided by the ECT enable the continuity of the manipulations at BCCIL, safeguarding Phil's legacy. The management of BCCIL has recently been passed on from Phil to a new steering committee, which will use the funds to maintain the climate treatments and co-ordinate research activities. We thank Phil for his colossal contribution in keeping the site going for 24 years and for his trust in us to look after it. We look forward to the challenge, and invite the ecological community to join us in shaping phase two at BCCIL!

If you are interested in conducting research at BCCIL please contact one of the new steering committee:

Dr Raj Whitlock
r.whitlock@liverpool.ac.uk

Dr Emma Sayer
e.sayer@lancaster.ac.uk

Dr Karl Evans
karl.evans@sheffield.ac.uk

SPECIAL INTEREST GROUP NEWS

PEATLANDS RESEARCH GROUP

RECENT EVENTS:

Peatlands for Birds: The Peatlands group ran a major 3-day conference in Sheffield in September on *'Peatlands for Birds: Fens, Mires, & Bogs - Re-constructing Peat Landscapes in Uplands & Lowlands'*. This conference, one of the 'Wilder Visions' series which is happening over the next few years, addressed key issues of how Britain's peatlands could or should be managed and restored to provide future resilient, sustainable habitats at landscape levels. Bringing together landowners, managers, practitioners and key academics, the event examined ecology and conservation in relation to the restoration of both upland and lowland peatlands specifically for birds. We are grateful to our partners such as the RSPB for their support and sponsorship.

UPCOMING ACTIVITIES:

History & Heritage of the Bogs & Peatlands of Cumbria and the surrounding areas: With the Cumbria Boglife project including Natural England, Solway Wetlands Partnership, Cumbria Wildlife Trust and others, this event will be held on November 1st and 2nd 2017. There will be a 1-day workshop / seminar and a 1-day field visit to explore the history and social or cultural heritage of the peat bogs in and around Cumbria. The events will be based at Burgh-By-Sands and we have a great line-up of speakers:

- Keeley Spate – Setting the scene with the current restoring projects
- Ian Rotherham – History and heritage in the bog – examples from Cumbria and the surrounding areas
- Andre Berry - An introduction to hand peat cutting tools and techniques and the landscapes they created
- David Harpley - A History of Foulshaw Moss
- Chris Spencer – Peat bogs of the Solway Moss
- Richard Lindsay - Land-use change on Cumbria raised bogs from 1840 to the present and the changing understanding of raised bogs and conservation
- Bill Shannon – A history of peat exploitation at Angerton Moss from the sixteenth-century dispute maps to the twentieth–century moss litter works

Check the website www.ukeconet.org and the Peatlands SIG page on the BES website for booking and as more details are announced. Email i.d.rotherham@shu.ac.uk if you want to get involved.

Our call for new blood to get involved in the Peatlands SIG has borne fruit!

We now have five new and early–career members volunteered for our committee and so look out for a lot more social media, on-line discussions and the rest.

Red Deer – the grazing mega-fauna of peatlands:

This continuing regional project, one of the longest running citizen science studies of its kind anywhere, is building to as series of community workshops and field days and two indoor public events. These will be showcasing deer-related work supported by our comprehensive on-line ID guide and survey which can be viewed on: http://www.ukeconet.org/deer-identification.html

In these studies of red deer in the Peak District moors and bogs, into Sheffield and across South Yorkshire to Thorne Moors near Doncaster, we are involving local citizen scientists in recording and monitoring work. This is supported by involvement of local newspapers, radio and other media to involve and engage local people. Sheffielders for example, are reporting roe deer, muntjac and even red deer, right into the heart of the urban catchment.

***The two major events this autumn will be on Saturday 7th October, with the National Trust at their Peak District 'Moorland Discovery Centre' at Longshaw, and the other at Sheffield Hallam University, will be in the evening of Monday 27th November.** Both events are free so just turn up. More details will, be announced as they are available and updates will be on: http://www.ukeconet.org/events.html

As always, offers of support, assistance and displays etc are all welcome, just email Ian Rotherham in the first instance: i.d.rotherham@shu.ac.uk

Shadow Woods & Ghosts on peatlands landscapes:

An exciting project involving students and the public is happening around our 'Shadow Woods' and peatlands theme; an on-going programme of activities this year with the National Trust and Eastern Moors Partnership to explore the palynological and palaeo-ecological evidence for shadow woods and for landscape transformations from woodland to heath and mire.

The website www.ukeconet.org and the Peatlands SIG page on the BES website will have more details as information comes in, and all will be presented at the two events* and this will include new developments in our research linking peat bogs to human history to uncover the forgotten use of sphagnum moss in wartime - the ***'Healing Harvest of the Peatlands'***. This is again with volunteers at the National Trust.

ACTIVITIES WITH CITIZEN SCIENCE SIG:

Citizen science project to discover 'Lost Woods' & 'Shadows':

With exciting discoveries now flowing from the community-based research we are building towards two final sharing and celebration events for this year. One, on Saturday 7th October, will be held with the National Trust at their Peak District 'Moorland Discovery Centre' at Longshaw, and the other at Sheffield Hallam University, will be in the evening of Monday 27th November. Both events are free so just turn up. More details will, be announced as they are available and updates will be on: http://www.ukeconet.org/events.html

As always, offers of support, assistance and displays etc are all welcome, just email Ian Rotherham in the first instance: i.d.rotherham@shu.ac.uk

CITIZEN SCIENCE GROUP

LEARNING WITH THE CITIZENS

Hannah Grist

We are inviting all contributions to a forthcoming BES Citizen Science Special Interest Group Meeting, *Learning with the Citizens*. Held at the Dove Marine Laboratory on the beautiful Newcastle coastline, we are turning citizen science on its head, and asking "what would the volunteers do?" The one-day meeting on 19th November will bring together citizen science participants and organisers for a fun day of activities, workshops and more to see where exploring ideas together can lead. The day aims to be relaxed, engaging and open to everyone with an interest in citizen science and how it develops in the future. There will also be an informal reception the night before, including dinner and a pub quiz, which everyone is encouraged to attend.

If you have ideas for workshops on the day or would like to be involved, please contact hannah.grist@sams.ac.uk. We would encourage people at all levels to get in touch to share your ideas and experience. Booking for the event will open shortly, and be available via the BES website. We are pleased to say that we have funding to offer free or partially funded places including travel and accommodation for a limited number of citizen science volunteers, so please get in touch if you would be interested in applying for one of these places.

FRESHWATER AND CITIZEN SCIENCE: A RESEARCH HACKATHON

Ian Thornhill

After a blisteringly hot day, on the eve of the 25th May, 18 budding freshwater researchers and practitioners met up for the Freshwater and Citizen Science Research Hackathon, at Oxford Brookes University's Harcourt Hill Campus. The event, hosted by the Earthwatch Institute with support from the BES Citizen Science SIG, sought to interrogate the FreshWater Watch project in order to meet three objectives:

- Highlight the opportunities and challenges to freshwater ecology and citizen science
- Carry out a preliminary analysis using citizen science data that could lead to a peer-reviewed publication
- Provide a networking opportunity for early to mid-career freshwater ecologists and practitioners.

FreshWater Watch (FWW) is a global citizen science project with, as the name suggests, a focus on freshwater quality. Funded through the HSBC Water Programme, FWW projects were set up across some 25 different cities. Each project subscribed to a common core methodology, to which locally specific parameters were added, depending on the local research question. This presented the Hackathon participants with the option of exploring an environmental dataset in order to consider global water quality issues, or consider FWW participant engagement dynamics. For example, what training or experimental factors lead to more or less long-term engagement?

Over the next one and a half days, four teams took to the ambitious task of outlining a piece of research fit for future publication. Along the way, fuelled by a steady flow of coffee and biscuits, the teams refined their approach and worked to overcome the challenges inherent to data generated through citizen science. The addition of two collective sessions that included all participants was important to take the edge off the competitive element which is often questioned during such events. Key challenges were identified - such as handling missing values and the need to screen for errors and omissions. However, the Hackathon also threw up some opportunities such as learning about nutrient pollution, better understanding one's ability to thrive under pressure, and sharing how other citizen science projects engage volunteers to generate data.

Much of this agrees with anticipated outcomes from a well-scoped hackathon event but there is still much to learn about the intensive workshop format. For example, feedback from participants identified several areas for improvement including a need to better balance the needs of practitioners vs. researchers, and that the event may be better served if combined with a training element such as R coding. Nevertheless, each of the four teams presented very credible studies that ranged from the influence of land-use upon turbidity, to evaluating training and sampling protocols that lend themselves to long term engagement. Crucially, the journey does not end here and it is testimony to the participant's enthusiasm that peer-reviewed publications are anticipated.

A huge thanks go to all of the Hackathon participants: Tom August, Amelia Fitch, Catherine Gutmann-Roberts, Matthew Hill, Joe Huddart, Sally Hyslop, Natalie Lamb, James Lyon, Eleonor Mackay, Kate Mathers, Chloe Orland, Hannah Robson, Phil Taylor, Sarah West and Fred Windsor.

CONNECTING WITH THE CROWD CONFERENCE

Lucy Robinson

This cross-disciplinary conference explored best practice and new perspectives on crowdsourcing citizen science.

Crowdsourcing projects and platforms abound, involving over one million citizen scientists in the analysis or interpretation of images and data online. This conference aimed to showcase the latest tools, technologies and approaches available to engage and collaborate with diverse audiences online, and to invite delegates to help shape the future of crowdsourcing.

Hosted by the Natural History Museum, the day opened with an excellent keynote from Professor Chris Lintott from the University of Oxford's Zooniverse team, who set the scene for the day by reflecting on Planets, Penguins and People: *Lessons from a decade of citizen science.*

Delegates shared their ideas on a collaborative wish-list wall.

© Natural History Museum

We were pleased to welcome speakers from the USA, France, Belgium and the UK, who delivered a varied programme of 17 presentations and speed talks. They shared their experiences of developing and running crowdsourcing projects, showcased the different platforms and technologies available, and reflected on the participant experience and strategies to maximise the impacts of crowdsourcing. We learned a huge amount and took home many lessons learned from research, technological and engagement perspectives.

The conference closed with an inspiring keynote from Professor Dan Rubenstein from Princeton University who reminded us of the importance of involving people in science, with his presentation *Power to the People: Nature and science benefit when people are engaged.*

In between the packed schedule of talks we had plenty of time for coffee, discussion, networking and two interactive formats to build capacity for crowdsourcing. Demonstrations at the *Project Showcase* gave delegates the chance to meet platform developers and project owners to discuss in detail how projects are created and view demonstrations of how different platforms work. The *Collaborative Wish-list Wall* allowed delegates to share their ideas, questions and wishes for future functionality on crowdsourcing platforms.

©Natural History Museum

Best practices and lessons learned gathered from the speakers, and from speakers at a symposium at the Citizen Science Association conference in Minnesota just three weeks before, will be collated into a best practice guide for crowdsourcing so please keep an eye out for that later this year!

Presentations are available on SlideShare http://bit.ly/2v3UVNM and a summary of the Collaborative Wish-list Wall is in a GoogleDoc http://bit.ly/2uaw10e.

The *Connecting with the Crowd* conference was organised by Kath Castillo, Lucy Robinson, John Tweddle and Evelyn Jones at The Natural History Museum London, supported by Michael Pocock at the Centre for Ecology and Hydrology. We'd like to thank the sponsors of this event for their support; the Arts and Humanities Research Council through their Constructing Scientific Communities project and the British Ecological Society through their Special Interest Group for Citizen Science.

A huge thank you also goes to the speakers and demonstrators who made this such a successful event, and we look forward to more collaborations in future!

AQUATIC ECOLOGY GROUP

BRITISH ECOLOGICAL SOCIETY AQUATIC GROUP (BESAG) EARLY CAREER RESEARCHER AWARD:

We are pleased to announce the **Winner of the 2017 BESAG Early Career Researcher's Award: Daniel Wohlgemuth**. Daniel's research aims to improve the understanding of the ecosystem consequences of biodiversity and environmental change and he recently finished his PhD at University of Southampton. Daniel was awarded the prize in September at the BESAG annual meeting and delivered a keynote lecture about his research. The award is 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. Do not forget to nominate new candidates next year.

PAST EVENT:

BESAG Temporary Rivers & Streams meeting (45 participants)
6 April 2017 Nottingham
Rachael Stubbington

Temporary rivers (including intermittent rivers and ephemeral streams) fluctuate between flowing, pool and dry states, making their instream habitats more dynamic and variable than those in equivalent rivers with year-round flow. These dynamic ecosystems have recently been recognized as common, biodiverse, and ecologically valuable. From a practical management point of view there is considerable uncertainty surrounding our understanding of temporary rivers. We held a workshop to allow UK (and international) temporary river researchers and managers to come together and share current research and practice, exchange views, and identify opportunities for collaboration. The meeting's UK focus was complemented by invited speakers and participants from other European countries.

Dr Thibault Datry (IRSTEA, Lyon, France) presented research focused 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.

Dr Petr Pařil (Masaryk University, Brno, Czech Republic) presented results from 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.

We highlighted areas requiring further discussion and debate, reviewed current scientific thinking, examined current research and identified future research priorities. Round-table discussions explored the hydrological and morphological parameters that are important for understanding temporary river ecology, which was a very useful exercise and will provide valuable UK input to a European COST Action: http://www.cost.eu/COST_Actions/ca/CA15113

GET INVOLVED

BESAG would like to invite suggestions from the ecological community for aquatic themed workshops, inter-SIG meetings and short conferences/courses, for inclusion in our next budget. For example, in the past we have provided financial support for keynote speakers, room hire and assisted with advertising. If you would like to suggest themes or topics for discussion for future meetings please contact Nessa O'Connor (n.oconnor@tcd.ie) or Lee Brown (l.brown@leeds.ac.uk).

The BESAG is an active network of aquatic ecologists whose interests tend to overlap with several 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 2000 followers on Twitter (@BES_AquaEco)!

For the latest news, future meetings and job advertisements you can follow us on Twitter: @BES_AquaEco (#Thursdayjobday, #BESaquatic), 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".

LOOKING FOR A JOB IN AQUATIC ECOLOGY

#Job, #Postdoc, #PHD, #Internship... Find the freshest job offers in marine & freshwater ecology every Thursday on Twitter.

@BES_AquaECO #Thursdayjobday

Tag us to share your job offers!

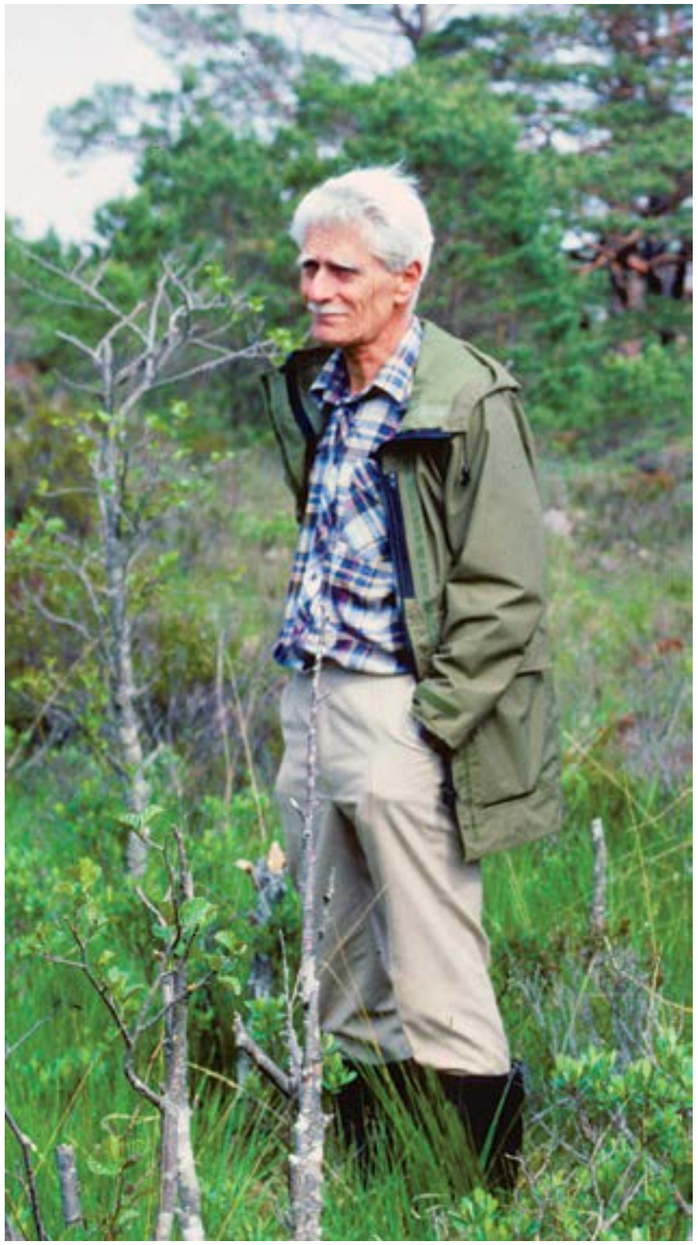
DONALD NEIL McVEAN
2 MARCH 1926 – 14 MAY 2017

Donald McVean was one of the great pioneering Scottish ecologists who began his career in 1952 with the newly formed Nature Conservancy. A brilliant field botanist, he specialised on upland vegetation studies and during the 1950s undertook surveys throughout the Highlands and as far afield as St. Kilda, North Rona and Iceland. His early collaboration with Duncan Poore and subsequently with Derek Ratcliffe on a new classification system of upland vegetation culminated in the 1962 book "Plant Communities of the Scottish Highlands" a benchmark in our understanding of vegetation communities and an early precursor to the NVC.

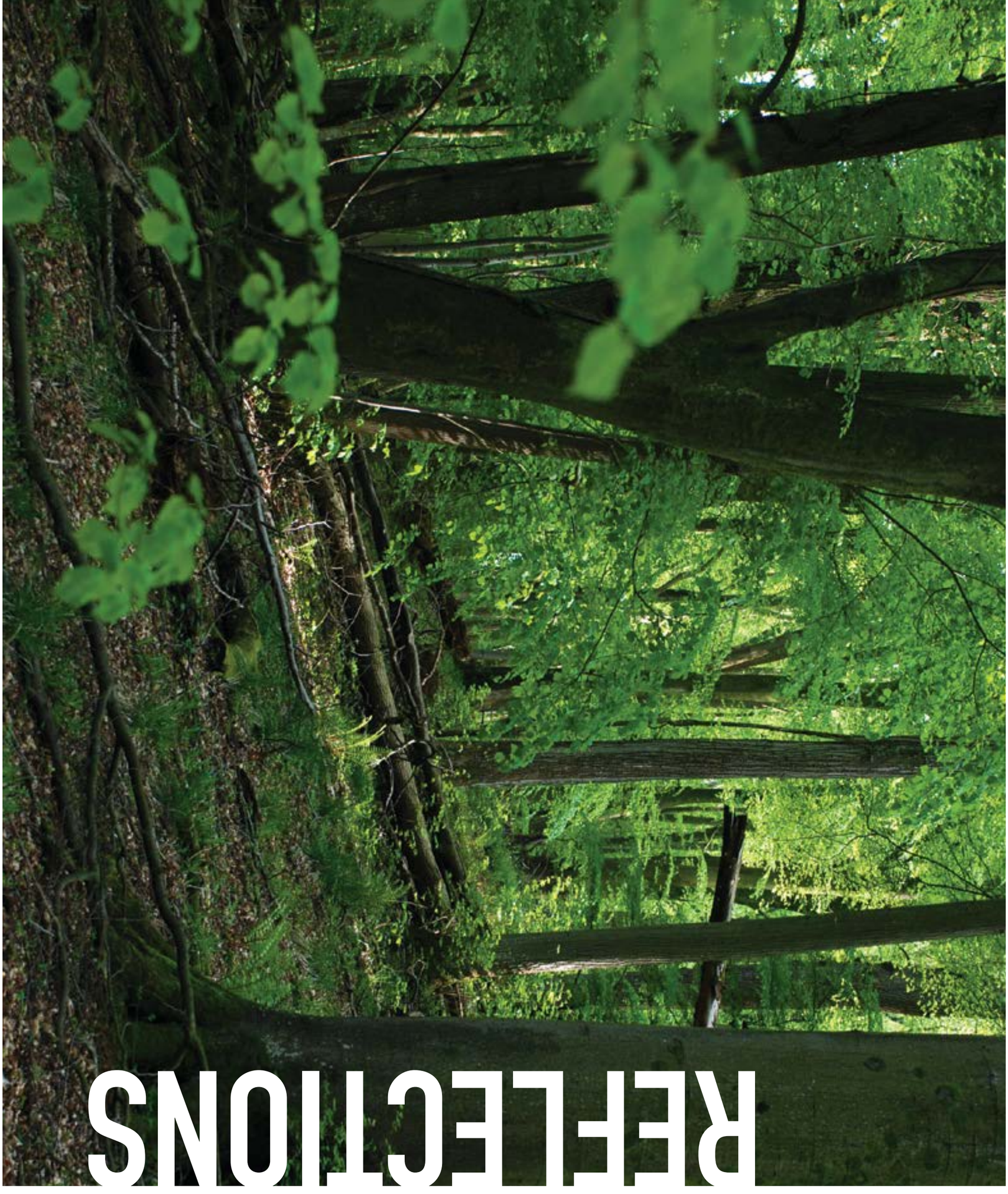
Donald graduated from Glasgow University with an agricultural degree in 1946 followed by a first class honours in Botany in 1949. He continued his studies with a PhD at Cambridge on the ecology of Alder supervised by Sir Harry Godwin and Dr. Alexander Watt, two of the most notable botanists of the time. His work on alder was published in seven classic papers in the *Journal of Ecology* and in 1953 he started a detailed study on the ecology of Scots pine. But Donald was not just a field botanist. He had a questing scientific mind and employed rigorous experimental techniques in support of his work, for example on the establishment of native tree species on highly degraded soils. His other classic book is "Ecology and Land Use in Upland Scotland". Co-authored with Jim Lockie its chapters on erosion, muirburn, hill farming, sport and forestry remain as relevant today as they were in 1969.

In the 1960s Donald became a Senior Fellow at the Australian National University in Canberra where he studied alpine vegetation in the Snowy Mountains and on expeditions to Mt. Wilhelm in Papua New Guinea. He returned to Scotland in 1970 and undertook international consultancy work, specialising in land use advice in such diverse places as Chile, Pakistan, Lesotho and the Andaman Islands. On his retirement to Argyll Donald continued his experiments with ecological restoration and was always available to fellow ecologists for advice and inspiration.

Neil MacKenzie



Donald McVean in the pinewood at Beinn Eighe National Nature Reserve, 1990



REFLECTIONS

ON LONG-TERM RECORDING AT LADY PARK WOOD

GEORGE PETERKEN

Old growth in Lady Park Wood. Photograph by George Peterken

A BEAUTIFULLY ILLUSTRATED NEW BOOK BY GEORGE PETERKEN AND EDWARD MOUNTFORD SURVEYS THE COLLECTIVE EFFORTS OF ECOLOGISTS TO RECORD THE CHANGES IN A MIXED WOODLAND IN THE WYE VALLEY THAT HAS BEEN ALLOWED TO GROW WITHOUT HUMAN INTERVENTION SINCE 1944.

George offers his own view on the key features emerging from the study:

In a report of their Nature Conservation and Nature Reserves committee, the British Ecological Society recorded 'with pleasure' that the Forestry Commission had *'already set aside two areas of old woodland, one in the High Meadow Woods by the banks of the Wye, the other in the New Forest* [which would] *be left completely undisturbed as permanent forest reserves'* (**Journal of Ecology, 1944, 32, p.55**). The Wye valley site was Lady Park Wood, which Oxford University's forest ecologist, Dr Eustace Jones, had proposed in 1938 when the Forestry Commission first offered to set aside reserves for the long-term study of ecological processes. Dr Jones established baseline transects in late 1944, along which he mapped and measured all trees and shrubs until 1960. After a hiatus lasting a decade, responsibility for recording was passed to the Nature Conservancy and its successors. Now, after seven decades of recording, and with the material help of the Forestry Commission, we have summarised how the wood has developed and the lessons we think we have learned for nature conservation, near-to-nature forestry and re-wilding. Our account offers a welter of detail leavened by frequent illustrations (Peterken and Mountford, 2017).

"If a woodland project is to become long-term it must outlast the originator"

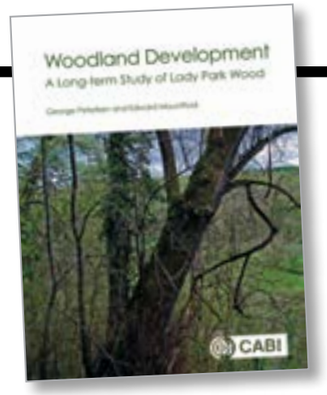
Long-term, permanent-plot woodland studies such as this are fraught with difficulties. Rothamsted and the Park Grass plots are the exception to prove the rule that institutions are unreliable partners. At Lady Park, Oxford University no longer does forestry; the British Ecological Society has shown no interest since 1945; the research priorities of the Nature Conservancy and the Forestry Commission have generally been short-term and both have been disrupted by repeated re-organisations. Projects thus survive more by the interest and enthusiasm of individuals, who may, however, lose interest, gain promotion, retire and, let's face it, die.

If a woodland project is to become long-term it must outlast the originator. Responsibility must be handed to successors like a baton in a relay, and at each pass the baton may be dropped. Even when a project does endure for decades it must face the certainty that ecological ideas and preoccupations will change and the risk that the original objectives will become irrelevant. Recording methodologies that looked thorough and comprehensive at the outset will look incomplete or worse later on. And, much of what might eventually be revealed can be, and usually has been, discovered by chronosequence or other quicker, indirect approaches. Long-term projects are also ill-adapted to official practices, which limit opportunities for financial support: the typical 'short, fat' funding arrangements are totally inappropriate to the 'long, thin' needs of long-term studies, and the open-ended, unpredictable character of long-term studies sits uneasily with the bureaucratic need for predictable outcomes by a fixed date. Small wonder, then, that such studies often die prematurely, or merely smoulder indefinitely in the undergrowth of research and nature conservation endeavour.

Nevertheless, some permanent-plot woodland studies have been pursued energetically for long enough to prove their value, e.g., the Park Grass plots in Britain and the Hubbard Brook studies in the USA; and long-term studies in general have come into their own in the face of environmental change. The wider public have increasingly been involved, either through participatory schemes, such as the butterfly transects, or through artistic projects (e.g., Brodie *et al* 2016) and science-based publications for a general audience (e.g., Foster 2014, Holmes and Likens 2016).

Lady Park has occasionally revealed something that is genuinely new, such as the tendency for wych elm to split into fast- and slow-turnover populations after the arrival of elm disease, and it may yet provide an opportunity to understand ash disease against a background of over 70 years records of individual trees. Generally, repeated tree measurements have confirmed the findings from quicker methods: that change in natural stands is a balance between predictable change resulting from competition and unpredictable change brought about by disturbances; and that trends towards dominance by long-lived, shade-bearing species are thereby restrained by the diversifying impacts of disturbances. We have refined, and will continue to refine, our understanding of these processes. Thus, disease (elm disease from 1971) and drought (1976), not wind, have so far been the main disturbing factors and, in any given period, large trees tend to live and small trees tend to die; but it will be a long time before we can say whether the disturbances of the last 70 years have been representative, or assess the long-term significance of, say, small trees that 'get lucky' and survive.

Potentially, the main research value will come when the long-term record is used as a basis for other kinds of research. This has been demonstrated at Lady Park through the dendrochronological studies of beech and oak by Liam Cavin and Alistair Jump, and the assessment of carbon sequestration by Karen Hale and Richard Bradshaw. The recorded impoverishment of ground flora in Lady Park has lessons for nature conservation, but the records have also contributed to Continent-wide meta-analyses of floristic change in temperate woodlands.



Woodland Development: a long-term study of Lady Park Wood by George Peterken and Edward Mountford is published by CABI (2017) and is available in paperback and hardback. You can order the book with a 20% discount off the retail price by visiting www.cabi.org and searching in the "bookshop" section. Simply enter the code CCBES20 at checkout to claim your discount.

So, what *is* the value of Lady Park and other long-term permanent plot studies? After 40 years, I think they may lie more in the opportunities they afford for personal enlightenment and what might broadly be called 'outreach'.

"…I realised that trees could be individuals with a known past; dead stumps had an identity; that 35 years ago a particular tree stood just there. Suddenly I could appreciate a wood as a community."

In personal terms, Lady Park was a revelation. After years of superficial contact with woods all over Britain, I had a clear and detailed picture of the geography of British woods and their many forms; and I had routinely interpreted the woods I visited in terms of their past and based my management recommendations on such interpretations. Even so, I still understood woods as collectives of trees, and I only realised this on the day when, standing in Lady Park holding the charts and measurements made by earlier recorders, I realised that trees could be individuals with a known past; dead stumps had an identity; that 35 years ago a particular tree stood just *there*. Suddenly I could appreciate a wood as a community.

This 'lightbulb moment' has been repeated many times down the years with visitors. I have shown classes of ecology and forestry students, members of nature conservation and forestry organisations, professional meetings, foreign visitors and members of the general public, as well as a sprinkling of journalists, broadcasters and a former Deputy Prime Minister round the wood, and to each I have tried to convey my understanding of the wood as dynamic community of individuals embodying both predictable change and unforeseen events by touching real life examples and waving around actual records of past conditions. Many, perhaps most, leave with their view and understanding of 'natural' woods changed in ways that would not have been possible with, say, a PowerPoint presentation of the -3/2 thinning rule and a disquisition on gap creation rates. The one visitor who vigorously challenged what I was saying was Michael Heseltine, and we debated the issue by pointing at real trees. [My only disappointment was that the film crew switched off their camera, because debate was not in the script.] Another visitor was Jaboury Ghazoul, who later explained natural woodland dynamics in his *Forestry, A Very Short Introduction* by using Lady Park as an example.

"…beech acts like the investment banking fraternity in national life."

We will be reaching out further. As I write, a group of professional artists known as *The Arborealists* are starting a project in Lady Park which will, I hope, enable us to stage exhibitions where their artistic response to 'natural' woodland will be set beside our scientific understanding. To my ecologist's eye, most artistic representations of trees and woodland reveal the impacts of people or the responses of woodland to past impacts, so it will be interesting to see what the artists make of a wood from which the influence of people has been largely removed. Lady Park has also been used as a source of ideas and inspiration for the actors and artists who will enliven the trees and woodland theme of the Wye Valley River Festival of 2018. The responses of people to and through science with long-term research sites is becoming a well-worn track.

With both artists and other visitors, I have made no apology for seeing and explaining woods in human terms. I still enjoy woods as benign and pleasant places, but also recognise that they are war zones where thinning is a slow-motion struggle to the death; individual trees 'duck and weave' in an attempt to resist the literal dying of the light; and some small trees get lucky when space is unexpectedly vacated near them. Tree species have characters. Thus, for example, beech acts like the investment banking fraternity in national life. It dominates in the sense that it expands relentlessly and controls the performance of most other species, but is prone to unpredictable accidents, without which it would take over the wood and push other species to the margins. It is such perceptions that bring a smile of understanding to visitors who do not want to be familiar with the technicalities of ecological research.

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DIVERSITY

FOCUS ON TEACHING-ONLY CONTRACTS

Zenobia Lewis | University of Liverpool | @Zen_of_Science

In recent years, UK Higher Education has seen a substantial increase in the numbers of Teaching Fellow (TF) or University Teacher contracts. According to the Higher Education Statistics Agency (HESA), in the academic year 2006-07, 9% of academics in the UK were on a teaching-only contract. In 2015-16, the year for which the most recent data are available, this figure had risen to 26%. I would suggest that part of the reason for the development of TF contracts in the first place was the rising prominence of the UK Research Excellence Framework (REF) in the last decade, which assesses the research impact of UK universities. As a result, research arguably became prioritised over teaching for academics, and thus universities began to employ more 'teaching-only' staff to relieve the perceived burden on those in research-focussed roles. Potentially the rise of the TF was further increased with the tripling of university tuition fees to £9000 in 2012; changes in student expectations as a result of the fee increase forced universities to recognise that if they wanted research 'superstars' to bring in REF success, they needed dedicated teaching staff to make up the shortfall.

The role of a TF can be extremely variable. In most cases it is an academic position, with a bias towards teaching-related activities and administration, potentially with some aspect of management and a limited amount of scientific and/or pedagogical research. For some, the rise of the TF pathway is a definite plus. If you enjoy teaching, it provides the opportunity to focus on what you love, in an HE setting. All colleagues that I discussed this article with stated that one of the main advantages of a TF role was the lack of stress associated with the pressure to obtain research funding and produce publications. For some, there is potentially increased flexibility on TF contracts, with regards to parental leave and school holidays. TF pathways can also go some way to solving the 'two-body' problem. If one member of a couple focuses on a teaching role, while the other aims for a research-focused role, it can potentially be easier for both to obtain jobs in the same place. Indeed, as one TF colleague put it, "we are both early career scientists, and ultimately I want to live with my partner in the same location, something I feel would be harder if we'd both opted for research contracts. I feel without one of us compromising a bit, it would be harder for us to be together - he loves research, I love teaching".

And herein lies one of the main problems of TF contracts. When I think of my TF colleagues across the country who are on TF contracts, overwhelmingly they tend to be female. Anecdotally, particularly for the duel-academic couples I know, it is almost always the female working in a TF-role, rather than the male. Is there a risk that we are moving towards a culture of female teachers in the UK, and male researchers? In addition, at some institutions TF contracts are more likely to be fixed-term rather than permanent, a key factor in the 'leaky pipeline' whereby women are more likely to leave academia as their career progresses and a possible contributor to the gender pay gap.

Related to this, some universities are lagging behind in providing the recognition and support their TFs deserve, compared to those on more traditional Teaching and Research (TR) contracts. A 2009 survey of the institutional policies of 104 UK institutions found that a third did not include teaching and learning criteria in their promotion policies, and almost half did not have a route for promotion to professor level, on the basis of teaching and learning (Cashmore 2009). The lack of recognition may explain why in some places, there can be a sense of isolationist 'us and them' for TR versus TF staff. Worse, in some institutions the George Bernard Shaw adage persists: 'he who can, does; he who cannot, teaches'. A qualitative study suggested that a lack of understanding of the TF role can result in TR academics viewing the work of their TF counterparts as less important or prestigious (Tierney 2016). Such views are foolhardy indeed given the continuing rise in student expectations, and the increasing importance of teaching income to institutions.

There are some practical day-to-day disadvantages to a TF contract. There tends to be less funding available for Continuing Professional Development, particularly if external to the institution, and particularly to attend research conferences. The latter has the potential to be problematic for teaching – if you are not up to date on the latest in your scientific discipline, can you reasonably be expected to be delivering up to date teaching? In a similar vein, for those who wish to maintain their research interests to a small extent, the lack of time to apply for research funding can be an obstacle. It can be harder to deliver Honours and Masters research projects without funding and research group support.

Particularly during term time, stress is commonplace for TFs, although stress is a problem across the HE sector; the University and College Union 2008 report on stress in academia makes for some frightening reading (Court and Kinman 2008). There can be a temptation for line managers to overburden TF staff with administrative tasks that need not necessarily be completed by an academic; one colleague noted that they sometimes feel like "one of the highest paid producers of spreadsheets in the university". This can be particularly problematic where universities do have clear TF promotion criteria, which require evidence of some form of scholarship. When queried, colleagues estimated that they are only able to spend approximately 10% of their time working on scholarship activities, because of their administrative burdens.

There has been improvement. Increasingly institutions are recognising teaching excellence through the introduction of teaching awards, and there are similarly national awards and fellowships, for example those provided by the Higher Education Academy. Teaching conferences at both institution and national levels are now more commonplace, allowing TFs to network and share good practice. Even at research conferences, dedicated teaching symposia are starting to make an appearance. The Professional Societies, too, are beginning to recognise the importance of teaching; the main journal of the Federation of European Biochemical Societies, FEBS Open Bio, now has an education section, and our own British Ecological Society has a Learning and Teaching Special Interest Group, and an Education Committee.

What about the elephant in the room? This year the UK government launched the Teaching Excellence Framework (TEF), a teaching-oriented counterpart to the REF which assesses universities based on a number of teaching metrics. The results of the first TEF assessment were released in June; Universities self-reported against a number of metrics, and were awarded Gold, Silver, or Bronze. One of the key aims of the TEF is to recognise and reward excellence in teaching, and academics hope that the exercise will help to elevate teaching in prestige, as REF has done for research.

In my humble opinion, although TEF does have the potential to revolutionise the way HE teaching is viewed in the UK, in its first iteration it has been a blunt and flawed instrument. The core metrics used are somewhat sweeping, not helped by the fact that awards are made at university level and therefore do not account for departmental differences. Some metrics are highly subjective, based, for example, on inappropriate measures of quality such as student evaluations of teaching. The assessment also does not take into account variation in the type and/or location of the institution. Can we really compare a post-92 university with a Russell Group Institution (I would guess the latter would do worse than the former)? Can we compare a London-based university with a Northern one in terms of their student employability data? In its current format, far from recognising and rewarding teaching quality, TEF has largely met with only disparagement from the academic community.

The role of TF can be an attractive alternative for academics who do not want the pressures of heading a research group, and having to meet grant and publication targets. Additionally, for those who enjoy teaching, it can be a fulfilling and rewarding career route. However, universities that employ TFs have a responsibility to ensure that it is just that – a fully supported career route – and not just an opportunity to employ a dogsbody to do the tasks that no one else wants to do. The Professional Societies, too, have a role to play in ensuring that TFs remain a part of the wider academic community. Otherwise we risk marginalising what is an increasingly significant and valuable proportion of the sector, at a time when the 'student experience' is more important than ever before.

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DIGGING DEEP

Left: The elkhorn coral Acropora palmata showing reduced coral cover and signs of degredation

Below: Healthy Acropora palmata

IN THE MEXICAN CARIBBEAN REEF

INTERVIEW WITH A SCIENTIST

AMERIS CONTRERAS IS TREADING NEW GROUND WITH HER RESEARCH ON THE MEXICAN CORAL REEFS. WITH VERY LITTLE INFORMATION CURRENTLY AVAILABLE ON THIS ECOSYSTEM, AMERIS HOPES TO CHANGE THIS, AND MAKE THIS INFORMATION ACCESSIBLE TO ALL.

Lauren Ratcliffe | Associate Editor of the Bulletin

Ameris' interest in the Mexican Carribean first started during her Bachelor degree studies, where she studied the wetlands in the Mexican part of the Mesoamerican biological corridor. It was here that she uncovered the true extent of the deficit in environmental information on this ecosystem and others. Not only is there very little information available, but also no strategy in place to gather new information.

"In Mexico, we don't monitor the status of our natural ecosystems. This is really important in terms of conservation and management. We really know very little. It is a big problem." Ameris explains.

"Mexico is incredibly important in terms of biodiversity."

While working on this project, Ameris also struggled to find information about the coral reefs in Mexico. And despite there being some specific instances of monitoring, the data from these monitoring efforts was inaccessible. "For me, this indicated a really specific area of research I was interested in working on" Ameris elucidates.

Ameris is continuing this research thread for her PhD at the University of Bremen, where she is now working with the aim to conserve, manage and generate science based information on the Mexican coral reef system.

DRIVERS OF CHANGE

Knowing the key factors influencing the state of the reefs, and whether these are acting regionally or locally, is a key focus of Ameris' research. Along with climate change, tourism is causing some of the biggest changes in the Mexican Carribean. The area receives more and more tourists each year, attracted by the cheap prices, white sands and sea activities. "There is much to offer, but too much pressure. The coastal vegetation is steadily being replaced by hotels and residential areas." Getting a general overview of the actual status of the coral reef is very important in order to set the baseline and identify how this status has changed over time.

Ameris explains: "Right now, I am doing a multi-temporal analysis of the benthic cover in the Mexican Caribbean. Benthic cover is really important for knowing the health of the reef. Once I know this, I can begin to understand the main drivers and how to manage them".

There is also the big question: 'Why are some reefs healthier than others?'

Some reefs within the Mexican Caribbean are super well conserved and resilient with high coral cover. Whereas, there are other reefs that are seemingly not resilient at all.

"Resilience is a huge thing in coral reef ecosystems. It is a very interesting question and one that could help uncover ways to better manage the reefs," Ameris explains.

"It's important to do something, and to do it now."

INFORMING DECISION MAKERS AND SOCIETY

It is not clear whether decisions taken to manage the coral reefs and natural protected areas in the Mexican Caribbean are based upon up-to-date and accurate information. "I would like to know if the people who are taking care of the natural resources of the reefs are using scientific information to inform their decisions." says Ameris. "There are different organisations and institutions working on coral reef monitoring, but there is not a coral reef monitoring strategy in place. So, the aim of my study would be to set the basis for a conceptually designed coral reef monitoring system. And I would like to use geomatics to inform people about the reefs, not just scientists or politicians."

By using geomatics and displaying information through maps, images or videos in order to help people understand what is going on, Ameris hopes her research will have a wider impact. "Maybe people don't see the destruction of the coral reefs, but instead see the importance of tourism to their businesses and life. However, they need to be aware that if the coral reef dies as is predicted, then everything will be over – the beautiful beaches, the tourism. It may only be a matter of a few years".

JOINING FORCES

One of the most surprising finds of Ameris' research so far was the lack of comprehensive information on the reef system. Some reefs have been heavily researched with lots of information known about their community structure and ecology, but many others have never been studied.

Ameris elucidates: 'There is information out there, but the actual data where this comes from is inaccessible. This is a huge problem, but what can you do? There is information, for example, that in the 70s the coral cover was 40%, but it is now 20%. However, what you really want are the data that show that."

"It's also important to know whether the monitoring efforts are working out. There are different projects that are working on their own, but this is a really complicated way to attack the problem. It needs a joint effort."

Building a community of researchers, working together towards a goal can be crucial to success. Fortunately for Ameris, she managed to get in contact with people in UNAM, Puerto Morelos, who were working in the same research field, and even asking the same questions. Ameris tells me: "I feel very lucky to have met these people, and that they have such nice datasets and are willing to share them and work together."

I really enjoyed speaking to Ameris about her research, and am encouraged to hear about her work digging deep to provide scientific information and ensure safe management of the seas.

If you would like to find out more about Ameris' research please take a look at the following links to her webpages:

https://www.marum.de/en/education-career/GLOMAR/Ameris-Ixchel-Contreras-Silva.html

https://www.researchgate.net/profile/Ameris_Contreras2

http://www.uni-bremen.de/de/fb2/forschung/marine-ecology.html

The role of ecological functioning and restoration in water, food and livelihood security and spiritual meaning is most obvious in arid, developing world settings where daily lives are closely connected with ecosystems. Impoundment in Alwar District, Rajasthan

WHY SHOULD WE CARE ABOUT ECOSYSTEM SERVICES?

ANSWERS TO THIS PROVOCATIVE TITLE MAY BE OBVIOUS TO THE READERSHIP OF THE BULLETIN OF THE BRITISH ECOLOGICAL SOCIETY. HOWEVER, IT IS AN IMPORTANT QUESTION TO ADDRESS IF THE VALUES OF NATURE ARE TO BE EMBEDDED INTO THE DIVERSITY OF WORLD VIEWS AND DECISIONS OF SOCIETY AS A WHOLE, FORMING THE BASIS FOR A SUSTAINABLE FUTURE.

What does 'ecosystem services' then mean and why should it matter in the context of a corporate boardroom, transport planning meeting or pretty much any other setting that ecologists rarely attend? Part of our mission is to make what we might accept as obvious equally so for those to whom it is currently not. And for that we need a language that is transferrable beyond our specific interests.

It is here that the paradigm and language of ecosystem services is so useful. In basic terms, ecosystem services are defined by the Millennium Ecosystem Assessment as *"…the benefits people obtain from ecosystems"*[1]. Various redefinitions and reclassifications have been advanced, along with periodic critique that 'ecosystem services' can mean different things to different people. However, this is as much a strength as a weakness, serving to engage formerly disconnected sectors of society in dialogue. As Bob Costanza summarises, the Millennium Ecosystem Assessment provides *"…an appropriately broad and an appropriately vague definition"* of ecosystem services spanning *"…both the benefits people perceive, and those they do not"*[2]. Ecosystem services thereby expand awareness of the multiplicity of values conferred by nature, averting the narrow approach of conventional economics or perceptions that this is all 'environmental stuff' inconsequential to other walks of life.

VALUING THE SERVICES OF NATURE

Let us at this point head off three common misunderstandings about ecosystem services and their valuation.

Firstly, recognition and valuation of the services provided by ecosystems are not about 'putting a price on nature' for trading in the market. Ecosystem services do not value nature at all, but provide a means to recognise the generally underappreciated diversity of benefits that it provides for humanity.

Secondly, valuation means more than simple accountancy. The plurality of values provided by ecosystems differ qualitatively, and are often incommensurable with narrow monetary figures (even if normalisation in monetary terms may sometimes be useful for weighting in decision-making).

Thirdly, it is a fallacy that we do not already value ecosystems in decision-making. We do so routinely, but generally with a default value of zero when their benefits are overlooked. Helping people understand that ecological systems confer real values upon them is central to embedding ecological understandings into decision-making processes, and vital for progress towards a sustainable pathway of development.

NATURAL, RESTORED AND EMULATED ECOSYSTEMS

The diverse roles that ecosystems play in supporting human wellbeing are too frequently overlooked, often leading to their incremental degradation. Whether recognised or not, our natural or semi-natural landscapes work for us 24/7 through capture, storage and purification of water resources, buffering extremes of drought and flood, sequestering carbon, cycling nutrients, and providing aesthetic and recreational opportunities amongst a host of wider benefits. Assessment of the scope and indicative values that major habitat types confer upon humanity globally was a primary purpose of the Millennium Ecosystem Assessment[3], and at national scale of the UK National Ecosystem Assessment[4]. Both studies were influential in raising awareness about the multiple values of ecosystems and the need to integrate them across policy areas.

Restoration of ecosystems and their functions underpin emerging strategies such as Natural Flood Management (NFM), founded on alteration, restoration or use of landscape features as a novel way to reduce flood risk[5]. Coastal defence is also increasingly being addressed by a managed realignment approach that, rather than fighting ecosystem processes, entails controlled re-flooding of land formerly 'reclaimed' under former agricultural intensification policies (particularly following the Second World War) to allow the regeneration of former intertidal habitat that naturally disperses and dissipates energy from stormy, tidal waters. In contrast with engineered solutions geared to narrowly focused outcomes, commonly with multiple unintended negative impacts, restoration of ecological processes tends to generate a wealth of ecosystem service co-benefits such as habitat for wildlife including fishery recruitment, carbon sequestration and nutrient cycling, with substantially reduced maintenance costs.

We also routinely emulate nature in established management solutions. For example, we exploit ecological processes and services in secondary sewage treatment systems (principally trickling filters and activated sludge), sustainable drainage systems and other urban 'green infrastructure' such as street trees that are not only aesthetically pleasing but also clean the air and slow run-off.

REINTEGRATION WITH ECOSYSTEM PROCESSES

We are walking ecosystem processes, connecting constantly and indivisibly with supporting ecosystems as we breathe, drink, eat and excrete. But so too are our economic activities, be they founded on the productivity of fertile soils, exploiting flows of energy whether current or stored for millennia in fossil reserves, making use of water for cooling or as a vital ingredient, accessing mined, fished or felled raw materials, or emitting wastes for natural processes to dissipate or reintegrate. In all of these metabolic activities, the handshake with nature can be engineered synergistically with natural regenerative capacities. Alternatively, generally through oversight rather than intent, they may degrade the resources upon which future wellbeing depends. Our focus may be narrowly framed, or else may take account of the multiple ramifications of every decision and action for the integrated socio-ecological system of which we are part.

The mission of reframing all spheres of societal policies and practices around the finite carrying capacities of ecosystems, one of the central planks of sustainable development, is daunting and requires robust frameworks to articulate the multiple interdependencies between humanity and ecosystems. Ecosystem services achieve this by providing a dialogic framework framed in intuitive terms meaningful to those outside the community of ecosystems specialists: production of fibre, climate regulation, purification of water, nutrient cycling, soil formation, habitat for wildlife, erosion regulation, or harvesting of medicinal plants. This forms a basis for cross-sectoral debate, recognition of potential conflicts and innovation of win-win solutions.

ANCHOR SERVICES AND SYSTEMIC SOLUTIONS

Virtually all decision-making is driven by an emerging need, be it a commercial aspiration, regulatory target or public policy. Historically, these needs have been treated as overriding drivers of resource use and management to achieve narrowly-framed outcomes, overlooking wider but inevitable ramifications across the inherently integrated socio-ecological system.

However, when the emerging need is instead viewed as an 'anchor service' around which consequences for other interlinked ecosystem services are assessed and where possible optimised, innovation to avert unintended conflicts and instead to contribute to ecosystem integrity and continued flows of multiple societal benefits are favoured. Innovative 'systemic solutions', generally working with natural processes to promote the driving need but explicitly aiming to optimise benefits across the full spectrum of ecosystem services and their beneficiaries, might result in rather different strategies than the generally narrowly framed solutions with which society has worked to date.

NFM, managed realignment and green infrastructure are pertinent examples, working with or emulating natural processes to promote 'anchor services' supporting driving needs, whilst contributing to a spectrum of linked beneficial ecosystem service outcomes.

Much of my work is in water and other aspects of natural resource security in the developing world, where perhaps the linkage between ecological and human regeneration is clearest. However, the challenges are no less pertinent, if often less evident, across the developed world. As one example, I was part of a research team addressing persistent flooding of a railway cutting and downstream properties, related significantly to overspill from a small river carried in a narrow metal channel over the cutting. Our solution entailed working with upstream landowners to create detention basins calculated to detain floodwater during heavy rainfall and release it slowly to buffer river flows, reducing flood peaks for both the railway cutting and downstream properties. This systemic solution, based on restoring depleted natural processes, retained the grazing value of the land, coincidentally diversifying habitat for wildlife and local amenity. Regrettably, the rail operator instead took the 'safe' established option of installing a bigger pump to supplement the one already operating 24/7, entailing higher energy costs and still suffering rail flooding and accusations of contributing to flooding of downstream properties. However, the principle was demonstrated semi-quantitatively that the values of nature, with potential generation of a range of co-benefits, are germane to management solutions across all, often non-obvious, policy areas.

Who cares about ecology, or at least who should do for their own self-benefit as much as for tackling longer term sustainability aspirations? Well, ultimately all of us. Ecosystem services provide us with a tool to understand why, and to enter debate with others sharing common resources.

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ABOUT THE AUTHOR

Dr Mark Everard is Associate Professor of Ecosystem Services at the University of the West of England (UWE Bristol), active since the 1980s in the development and application of ecosystem services internationally, and author of 22 books including the recent state-of-the-art text *Ecosystems Services: Key Issues* (Routledge, 2017).

mark.everard@uwe.ac.uk
M: +44-(0)-7747-120019

Ecosystem-based solutions can add value and produce diverse co-benefits in most policy settings, for example as a more sustainable option than this box channel carrying a river over a flood-prone railway cutting.

FROM OUR SOUTHERN CORRESPONDENT

Richard Hobbs | University of Western Australia

My life recently has been weirdly dissonant, and this piece has turned out to consist of a prelude that sketches one side of the dissonance followed by a longer rant on the other side.

Many good things are happening. I've had quite a few PhD students finish in the last year, and have been able to work with an array of wonderful colleagues in different parts of the world. I've also had the good fortune recently to be involved in organizing a special session at the Ecological Society of America meeting in Portland that celebrated the contributions to ecology made by Harold (Hal) Mooney over his long and remarkable career. Hal has been a wonderful colleague, friend and mentor for many years, and it's a great pleasure to acknowledge that. Part of what makes the job of an ecologist so enjoyable is that there are many wonderful people involved, and I've been lucky to be associated with some of the nicest people you could come across – including Hal Mooney and my PhD supervisor at Aberdeen, Charles Gimingham (who literally wrote the book on heathland ecology - two, actually). Learning how to be an ecologist from these and others - such as John Grace and Douglas Malcolm during my undergraduate degree at Edinburgh – set me up in my career in more than just one way. Having good mentors is so important, and I've tried to emulate their generosity and willingness to share their wisdom now that I too have students and postdocs to mentor.

All that stuff is why I keep going to work every day. Good colleagues, exchange of ideas, learning about species and ecosystems. Who'd be anything else other than an ecologist?! So, here's where the dissonance (and the rant) comes in. It seems that these days, there is less space in one's life for all this *nice* stuff. The reasons for going to work every day become increasingly obscured by crashing waves of *other* stuff. A lot of my time seems to be taken up with the endless flow of absurdities thrown at me or my staff and students by the soulless minions of orthodoxy that seem to lurk in the dark recesses of university administration these days. And I hear that SMOs are not unique to my institution.

The SMOs have job descriptions that match the economic rationalist managerial way in which our institutions are run these days. Their jobs are to make sure we are doing our jobs effectively, to make sure we are not embezzling the tea club money, to make sure that we have filled out the correct form (or ten) to go out in the field, or to make sure that we have completed a 4WD course (AND have the certificate) before we can even get the car keys out of the locked cupboard. The SMOs betray a need for our institutions to protect their backs to make sure that they are in the clear if anything goes wrong and the need to micromanage everything in the name of financial accountability. And if all this gets in the way of actually getting anything done, well that's just too bad. It also betrays a steady erosion of trust between administrative layers and "the coal face". And all of this seems to fly in the face of what we know about how to make organisations work well.

Our universities, in particular, aspire to be places of learning, but few seem to have cottoned on to the advantages of being *learning organisations*, as described by Senge (1990). Such organizations have people working together collectively to enhance their capacities to create results they really care about, and adhere to a series of principles that include shared visions and team learning. Rather, the modern university seems to have administrations that follow agendas that have the mantra of efficiency and cost-cutting while losing sight of the core business of learning and discovery. University staff become viewed less as valued assets central to the well-being and functioning of the institution and more as cost burdens and trouble-makers who get in the way of things working

properly. OK, sure – our institutions have to adapt to the changing world in which we find ourselves, with declining government support and harsher economic realities. But there are different ways of adapting, and not all involve focusing on bean counting above all else.

The standard modus operandi in this brave new world inevitably involves the dreaded restructure – changing structures and processes to make things work "better" or "more efficiently". I've had the dubious pleasure of being involved in several restructures – CSIRO, where I worked for 16 years, latterly changed structures so often that even the headed notepaper manufacturers couldn't keep up. The principal characteristics of the standard restructure seem to be that everything is thrown into chaos for protracted periods of time, everyone is focused on the restructure process so that key functions slow down or stop, good staff leave, and not enough staff are left to run things effectively. Frequently, the senior managers who inflicted the restructure on the university move elsewhere before the new structure is bedded down, leaving staff at lower levels to sort out the mess. The idea of a "smooth transition" is entirely illusory, and once the dust settles (if it ever does), things aren't really any better – only different. And staff carry on as best they can, probably with an increased level of grumbling into their beer and talking wistfully about the old days.

And the weird thing is that universities (and other organisations) *keep doing it*! Here in Perth we have one university that has recently amalgamated lots of smaller units into bigger units, and another that is in the process of splitting bigger units into smaller units. As far as I can see, there has never been a systematic appraisal of whether restructures end up with net positive or negative outcomes, and the belief that restructures are effective is more faith- than evidence-based. Has anyone ever actually had a good restructure experience? Has any restructured university run a benefit cost analysis to see whether any benefits that result outweigh the dis-benefits in terms of disruption, transaction costs, loss of staff morale and the like? Our university's in the midst of one now – currently in the protracted post-shuffle chaos phase – and so I'll watch with interest and add another data point to my (admittedly limited) survey. My guess is that each potential structure has good aspects and bad aspects, but that there is never one optimal structure. The most I hope for is an administrative structure that does not actively get in the way of teaching and research.

I got to thinking about what would happen if we tried to manage communities and ecosystems in the same way as we manage our institutions. So, let's, for instance, look at that mixed conifer forest – obviously the current stand structure and process flows are inefficient and could be made to work much better. Let's rearrange things so that all the pines are situated together. And let's amalgamate all the spruces with the hemlocks since they currently form groupings that are too small. The birches have always been a bit of the odd-one-out, so we either need to get rid of them entirely or shove them in with the understory shrubs. Come to think of it, do we really need all the trees? Seems like a lot of redundancy there and we're sure we could get the job done with 10% fewer. Likewise, we don't know what all those roots hiding in dark places are actually contributing, so we can make cutbacks there too. Especially if we reorganise some of the key functions. Photosynthesis doesn't need to happen at every canopy level. We can centralize that at the top. Nutrient capture should be left to the N fixers, and the other groups can concentrate on leaf production. And having stray herbivores roaming around the forest is an incredibly inefficient way of cycling nutrients. That can probably be automated, and we'll get a committee on that straight away. So, to minimize disruption to forest dwellers, we're going to enact these changes tomorrow and don't see the need for further discussion. (Oh, sorry – we've just been informed by representatives from the Forest Union for Creatures and Trees that we can't do that. So, we'll initiate a protracted and time-wasting process of consultation with everybody for the next six months about whether and how we should change, and then we'll proceed to do exactly what we were always going to do.) The new forest will be a happy and productive forest. And our new logo and motto will reflect this happiness and productivity. "Turn a New Leaf", maybe..

I'm off to find a beer and be thankful for my good friends and colleagues and try not to grumble too much about the SMOs. Structures come and go, but the good stuff carries on.

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CHARTERED INSTITUTE OF ECOLOGY AND ENVIRONMENTAL MANAGEMENT

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

THOUGHTS ON COMMUNICATION

Preparing for a recent presentation on the future of wildlife legislation in the UK, I was somewhat taken by the quote from Adlai E. Stevenson, a former Vice-President of the United States:

'LAWS ARE NEVER AS EFFECTIVE AS HABITS'.

What struck me was the distinction between obeying the law because we have to in order to avoid punishment and behaving in a lawful way because we have developed the habit of doing so, in many cases because we can readily identify the benefits to us individually or to society. I think most people would agree that the carrot is much better than the stick.

The problem is that, for many working in the ecology sector, there has been a tendency to be over-reliant on the 'stick' of wildlife legislation to protect biodiversity within the planning system with unfortunate consequences for public attitudes towards protected species. Telling homeowners that they must take account of bats, badgers, great crested newts and various other wildlife species during their development project 'because it's the law' may be true but it certainly isn't very effective in garnering public support for nature conservation. In fact, it can achieve the opposite – resentment at additional costs, time delays and perceived prioritisation of the welfare of wild animals over people.

Relying on the law to protect wildlife is the backstop. It is a risky strategy ultimately doomed to fail. Before that we should be getting much better at communicating the value of wildlife, why it matters to society and why we need to protect it. Clear, persuasive, powerful communication is surely the most effective way to safeguard nature for the future.

Valuing nature as part of the natural capital approach was the theme of our Summer conference in Southampton last month. Not everyone feels comfortable with natural capital concepts but all the evidence points towards this being a core part of UK governments' policy in the future. Researchers and practitioners alike need to be at the heart of exploring its application.

BREXIT

Thinking about the future of wildlife legislation inevitably makes thoughts turn to Brexit. I really try not to let this happen but inevitably the uncertainty about the future dominates many conversations with members and with colleagues in other organisations.

Like many other organisations, including the BES, the Institute has been thinking about what a post-Brexit environmental framework might look like. From CIEEM's perspective there are some key 'asks' that we will be pressing for. Put briefly they are:

Maintaining and enhancing protection – in the future governments must commit to, as a minimum maintaining and preferably enhancing standards of protection for the natural environment.

Science and evidence – future environmental legislation and powers must be informed by the best scientific evidence available. In addition, the UK must maintain its world-leading reputation for scientific research and practice.

Repatriation on powers – the environment is a devolved competence in the UK. Relevant powers must be repatriated to the appropriate level within the UK country governance structure to facilitate cross-border collaboration and reporting on the UK's international obligations.

Collaboration – almost all environmental issues are of international concern and importance and therefore require a continuing collaborative response across the UK countries, with the border with Ireland, with the rest of Europe and beyond.

Accountability – future changes to UK environmental legislation must be subject to appropriate parliamentary scrutiny. In addition, subsequent enforcement of legislation must be transparent and robust.

Principles – there are some well-established principles that are the foundations of environmental protection and we would wish to see this continued in the future: the 'precautionary principle', the 'preventive principle' and the 'polluter pays' principle should frame how environmental policy is developed.

International conventions and obligations – the UK is a signatory of several international conventions relating to the natural environment (e.g. RAMSAR, CITES, the Bern Convention and the UN Convention on Biological Diversity). After leaving the EU we must still meet the obligations set out within each convention.

Overseas Territories and Crown Dependencies – environmental legislation following Brexit must take full account of protecting and enhancing the natural environments of the UK Overseas Territories and Crown Dependencies which are rich in biodiversity.

Public sector resources – all levels of government, local and national and statutory nature conservation bodies, must have the resources and capacity to effectively address the substantial challenges we face.

Finally, a new Environment Act or Acts across the UK and devolved administrations will be required to guarantee the above in primary legislation.

Further information on our position can be found on the CIEEM website at www.cieem.net

AUTUMN CONFERENCE

Our two-day Autumn conference will be held this year in Manchester on the 21-22 November. The theme is Monitoring and Mitigation Effectiveness. The conference is open for bookings and further information is available on our website.

PUBLICATIONS NEWS

IN THE JOURNALS

Methods in Ecology and Evolution has published two new Virtual issues recently. The first of these was 'Evolutionary Quantitative Genetics' – edited by Michael Morrissey. It contains papers that draw on a range of new ways of characterising changes in the distribution of traits due to selection; address the issue of characterising modularity; look at the ability of typical sample sizes used studies to characterise phenotypic measures of trait covariation; and much more. Our second Virtual Issue focuses on field methods. It highlights the wealth of excellent articles on methods that can be used in the field (for both terrestrial and aquatic ecologists) published in the journal over the past two years.

Functional Ecology has a new Virtual Issue: *Future challenges in plant-microbe-insect interactions*, edited by Alison Bennett to complement the International Symposium on Insect-Plant Interactions (16th SIP, 2-6 July 2017 in Tours, France). The goal of this virtual issue, the special session at the International Symposium on Insect-Plant Interactions and the 2013 Special Feature is to highlight the importance of these interactions, and promote their study from molecular mechanisms through ecological and evolutionary consequences.

To celebrate the role that *Journal of Animal Ecology* has played in the development of the field of macroecology we have a new virtual issue by Senior Editor Nate Sanders on the subject charting the history and development of the field. Read the full virtual issue at: http://bit.ly/JAEMacroecology.

In the latest issue of *Journal of Ecology* we published a special feature titled *Plant Ecological Solutions to Global Food Security*. Edited by David Gibson and Richard Bardgett, the special feature addresses a number of important ways in which ecological plant research can inform global food security. The special feature comprises of 10 mini-reviews and an editorial, on topics such as plant community diversity and structure, plant population dynamics, plant interactions, and plant–soil interactions.

The new Special Feature from *Journal of Applied Ecology* "Toward prediction in the restoration of biodiversity" guest-edited by Lars Brudvig contains articles at the interface of ecological theory and restoration practice, helping to highlight the variation among restoration outcomes, and set a direction towards predictive restoration science. The Special Feature is available in issue 54:4, and you can also visit the Applied Ecologist's blog for a series of posts on the articles: https://jappliedecologyblog.wordpress.com/tag/toward-prediction/

IN THE NEWS

Drones used to assess health of Antarctic vegetation

A new method has been developed for assessing the health of fragile Antarctic vegetation using drones, which could be used to improve the efficiency of ecological monitoring in other environments as well. Drones equipped with sensors detected vegetation health indicators more accurately than satellite imagery. The study was published in *Methods in Ecology and Evolution* and you can find out more about it (and watch the video explaining the benefits of the method) here: http://bit.ly/2umf0iu

Juvenile salmon with short telomeres more likely to survive the trip to Atlantic spawning grounds

Biologists generally consider telomere length to be a good indicator of how healthy a cell is (as well as how healthy the individual is) and studies across different species have shown that telomere length can be used to predict lifespan. Contrary to expectations, however, juvenile salmon with the shortest telomeres at the start of their migration were more likely to return from it. Darryl McLennan, lead author on the paper, suggests that this surprising find may arise from a trade-off—juvenile salmon spend their early years in fresh water and must go through many physiological and biochemical changes in preparation for life at sea. Some of these salmon may be putting less energy into the maintenance of their telomeres in exchange for investing more of their energy reserves preparing for salt-water life. Read the paper here: http://bit.ly/2uZdN0W and the article in New Scientist here: http://bit.ly/2uXDbod

Hot dogs – is climate change impacting populations of African wild dogs?

New research by scientists at Zoological Society of London and published in the *Journal of Animal Ecology* shows climate change may be harming the future of African wild dogs *(Lycaon pictus)* by impacting the survival rates of pups. Tracking with high-tech collars showed that wild dog packs spent less time hunting on hot days. When packs tried to raise pups in hot weather, more of the pups died, potentially because they received less food from individuals returning from hunts.

African wild dogs rest in the shade in Kenya. Photograph copyright Helen O'Neill

The study's lead author, Professor Rosie Woodroffe of ZSL's Institute of Zoology, said: "Worryingly, this new threat may be affecting wild dogs deep inside wildlife areas where we would expect them to be protected from human impacts. With habitat fragmented and destroyed in cooler areas, wild dogs have literally nowhere to go. Sadly, climate change may bring extinction a step closer for this amazing species".

Although considered one of the most successful predators on Earth due to the high kill-rate their cooperative hunting achieves, African wild dog populations are declining due to pressures including habitat loss and human-wildlife conflict.

How do pine trees guard against drought?

Do young pines build up food reserves at the expense of growth to enable them to survive longer in the event of a drought? This controversial hypothesis is refuted by a new study carried out by the Swiss Federal Institute for Forest, Snow and Landscape Research and published in *Journal of Ecology*. In the experiment, the trees swiftly adapted to an artificial drought and were equipped to combat it the following year. Read more about the study here: http://bit.ly/2uFYh89

Experimental area (Valais, Switzerland) where Scots pines and black pines were subjected to different precipitation and CO_2 conditions. Photograph courtesy of Christoph Bachofen.

Know your enemy – Exposing threatened species to predators improves evasive behaviours

Burrowing bettong. Photograph courtesy of Thomas J. Hunt

A new study recently published in *Journal of Applied Ecology* on burrowing bettongs in the Australian desert has shown for the first time that exposing threatened native animals to small numbers of predators in the wild teaches them how to avoid their enemies. The research could help to successfully reintroduce this species back onto the Australian mainland. Read the full article by Rebecca West *et al* online http://bit.ly/2uIFhWB

NEW EDITORS

At the beginning of the summer, *Methods in Ecology and Evolution* welcomed Lee Hsiang Liow as a new Senior Editor. Lee Hsiang is interested in deep time evolutionary and ecological dynamics and conservation biology. Her research occupies the crossroads of the "traditional" fields of quantitative paleobiology, macroevolution, community ecology and statistical population ecology (and some others).

We are pleased to welcome Ann Tate (Vanderbilt University) and Marie Auger-Methe (Dalhousie University) to the *Journal of Animal Ecology* Associate Editor board.

In July, Jos Barlow stepped up as the Executive Editor for Journal of Applied Ecology while Marc Cadotte takes a 12-month sabbatical from the journal. We are very pleased to announce that Michael Bode has joined the Senior Editor team for the next 12 months. Mike has already been an Associate Editor for the journal for 6 years and we are all looking forward to working with him in this new capacity.

ONLINE EXTRAS

There have been some excellent new videos on the *Methods in Ecology and Evolution* YouTube channel (http://bit.ly/2doyInk) over the summer. Some of the most popular have been Hannah Specht and Henry Reich's explanation of conditional occupancy design (http://bit.ly/2tYAcHm), Pleuni Pennings' discussion of soft sweeps (http://bit.ly/2h1FPUi) and Michael Greenacre's video on multivariate proximity (http://bit.ly/2v7bnya).

On the new *Journal of Animal Ecology* Podcast Series *Field Reports* multimedia Editor Ravi Palavalli Nettimi interviews with former 'professional wrestler' and current Senior Editor Nate Sanders and discusses his first fieldwork experience, ants, plants, a skunk and why study biodiversity. In the second episode Ravi interviews Executive Editor Ken Wilson and discusses his work on armyworms, their devastating effects on the crops in Africa, and his fieldwork research about biological control of the pests. Check them all out here: http://bit.ly/JAEFieldReports.

FunctionalEcologists.com is following four different researchers into the field, in the new regular column InSite/Out: https://functionalecologists.com/category/insiteout/. In this series, we follow three ecologists from different fields in their daily work.

Journal of Ecology has published a virtual issue on *Forest Ecology in Asia* to showcase some of the recent forest ecology research from Asia published in the journal, and in particular, our Biological Flora of the British Isles (BFBI) series http://bit.ly/2uBBTyn. In addition to this, the journal celebrates the launch of our new Evolutionary Ecology section with a special virtual issue titled *Ecology in an Evolving World – The dawn of Evolutionary Ecology* http://bit.ly/2u1R00e.

Read the latest Editor's Choice from *Journal of Applied Ecology* on the identification of critical catchments for freshwater conservation. Available on the Applied Ecologist's blog http://bit.ly/2tQclgl

PUBLICATIONS

ASPIRING AUTHORS – WE WILL HELP YOU GET PUBLISHED

Kate Harrison | Assistant Editor | kate@britishecologicalsociety.org

The BES is always looking for new ways to share the excitement of ecology. Last year we ran a focus group with some members to see if there was anything more that our publishing team could do to help us achieve this. One idea that arose from the group, and has since been met with enthusiasm by everyone I've spoken to, is popular nonfiction…so here we go!

We're interested in books that are grounded in ecological research and written for a general audience. If you have an idea for a book that fits these broad criteria, please email me (kate@britishecologicalsociety.org) with a synopsis of your book, an example chapter (if you have one) and any details of past writing experience. Nonfiction takes many forms – creative, literary, general audience, journalistic, biography – as long as your book is based on ecological science we want to hear from you. We're keen to help authors traditionally overlooked by the industry so if you've never seen yourself reflected on the nonfiction shelves of bookshops, please get in touch.

We aren't a scary agent or publisher – our aim is to help you develop your idea and put you in touch with other authors, and make dealing with agents and publishers a bit less daunting. This may be in the form of a writing workshop and networking event at CDH, a buddy scheme, perhaps a social at the Annual Meeting – it all depends on what response we get.

To help inspire and encourage you, I spoke to three published authors and BES members – Rebecca Nesbit, Ken Thompson and Dani Rabaiotti. If what they have to say rings true to you, get writing and send us your ideas!

WHY DO YOU TO WRITE?

Rebecca: Because I've got something to say, because it allows me to research fields which fascinate me, and because it's addictive.

Ken: There's real satisfaction in finishing a book, and even more in meeting someone who enjoyed reading it. There's a small amount of money involved too, but I honestly can't recommend writing as a way of making a living.

Dani: I have always loved science communication and run a blog on PhD advice and a Twitter feed about environmental science and research. I was approached by a publisher through that and would have been mad to say no. I loved the whole process. Hopefully there will be more to come!

WHO DO YOU WRITE FOR?

Rebecca: I write for interested non-scientists, though I hope that scientists enjoy my work too. My mother is often my first reader, and it's pitched at people exactly like her – curious, knowledgeable but with no science background.

Ken: Anyone and everyone. There's too much interesting science that the general public never gets to hear about.

Dani: I write for a science-interested general public, but also for the scientific community on Twitter, who are fantastic. My book 'Does It Fart?' only happened thanks to that community.

WHAT IS YOUR WRITING PROCESS LIKE? DO YOU ENJOY IT?

Rebecca: I research and write simultaneously, so my process involves too many papers, websites and documents being open at once. Sometimes it's exciting, sometimes each sentence is a struggle. I always enjoy seeing what I've produced though.

Ken: When I had a full-time job, I wrote mostly in the evening and at weekends, so my first book took me ages. Now I just write when I feel enthused, which isn't all the time by any means; no good ever comes of sitting staring at a blank screen.

Dani: My writing process is very straightforward – just get on and do it! I think the most unique thing about writing 'Does It Fart?' was having a co-author, Nick, who I have never met. We did half each then swapped and Skyped a lot - all in all it worked really well.

WHAT'S THE DIFFERENCE BETWEEN BEING A 'WRITER' AND BEING A 'SCIENTIST'?

Rebecca: As a writer I get to ignore the boring bits. I rarely read materials and methods sections, and I'm not obliged to write about things which don't interest me. Sadly, if things go wrong I can't blame the weather or my equipment.

Ken: Well, you can't be a scientist without being a writer of sorts. But I'm surprised how often they overlap, when a bit of pure science comes in handy for something I'm writing.

Dani: As a writer there is much more storytelling and humour. I wish there was more of a chance for humour in scientific writing, I think it would hold peoples' interest more.

IS IT HARD WRITING ABOUT SCIENCE FOR A NON-SCIENTIFIC AUDIENCE?

Rebecca: It's the variation in the level of understanding which I find hardest – how do I give enough information for a reader who doesn't understand what DNA is, whilst not patronising a reader with a genetics PhD?

Ken: Like most things, it's hard if you don't enjoy it. I do enjoy it, but from editing the lay summaries at *Functional Ecology* I would guess that many scientists don't.

Dani: I always attempt to write my papers in a way that if a non-scientist were to read them they would hopefully understand what I was talking about. So in that respect it wasn't that different. It can be tough though, you have to be careful to explain technical terms, some of which you may not think of as technical because they are so ingrained into your vocabulary!

IS THERE A BIG DIFFERENCE BETWEEN WRITING FICTION AND NON-FICTION?

Rebecca: To me there's less of a difference than you might imagine. A well-constructed sentence is very similar in fiction and non-fiction, and I aim for popular science to be as compelling as fiction. You're not bound by the facts when writing fiction, but it still requires plenty of research to make sure your situations are plausible. I think having a go at writing fiction is a useful exercise for aspiring popular-science writers.

WHAT BENEFITS WOULD THERE BE IN PUBLISHING WITH THE HELP OF THE BES?

Rebecca: As well as the practical support, you get a vote of confidence. Imposter syndrome is common amongst new writers, and I think you're much more likely to persevere if you have people backing you up.

Ken: For a new author, the hardest part is getting started; it's difficult to get a publisher or agent to take you seriously if you have no track record. The BES should be able to help with that.

Dani: One thing I really lacked was advice on non-academic publishing, it would have been great to have a known body to reach out to and ask what I should expect.

WHAT ONE PIECE OF ADVICE WOULD YOU GIVE TO AN ASPIRING AUTHOR?

Rebecca: Ignore the voice in your head telling you that your writing is no good. If you're brave enough to share your writing with friends and colleagues they will provide much more accurate feedback than your 'this is rubbish' voice!

Ken: Can I make that two pieces? First of all, practice makes perfect, so the more you write, the better you will get. And take any opportunity to write, so there are examples out there of what you can do.

Dani: Get on Twitter!

GET INVOLVED

Email Kate (kate@britishecologicalsociety.org) with a synopsis of your book, an example chapter (if you have one) and any details of past writing experience if applicable. All nonfiction book ideas from all people welcome!

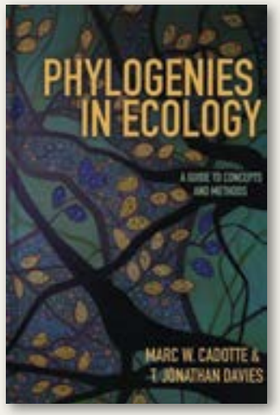
Rebecca Nesbit is an ecologist and author, writing fiction and non-fiction on the theme of science and the ethical questions it raises. Her first novel, *A Column of Smoke*, is available on Amazon and her first popular science book *Is that Fish in your Tomato?* was released this year (Ockham Publishing, 2017).

Ken Thompson has written seven books, including *Where Do Camels Belong?* and *Do We Need Pandas?* His latest book is *The Sceptical Gardener* (Icon Books, 2015) – a collection of articles from his regular gardening column in The Telegraph.

Dani Rabaiotti has co-authored a science humour book *Does It Fart?* (Quercus, 2017) – a book born from the viral success of #DoesItFart on Twitter.

BOOK REVIEWS

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



Phylogenies in Ecology: a guide to concepts and methods

Marc W. Cadotte & T. Jonathan Davies (2016)

Princeton University Press, Princeton, 264pp, £45.95 (hb)

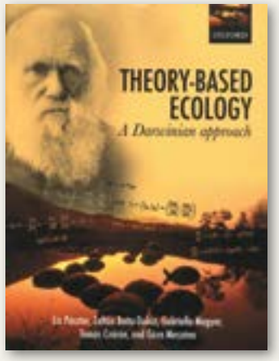
ISBN 978-069115-768-9

Periodically, new techniques arise in ecology that seem almost cultish, accessible only to initiates. To some ecologists, the very idea of an individual-based model is utterly mystifying; to others, Bayesian statistics are like a conjuror's trick. For me, phylogenetics long held a similar aura: something I ought to understand and make use of – but I felt that I must have missed class the day it was introduced. Contemplating these mysteries, I always feel that it would be great if I could just get someone patient to explain not only the theory, but also the practical details of how to make use of these techniques. In the context of using phylogenies in ecology, the new book by Cadotte & Davies does just that.

Phylogenies in Ecology is subtitled 'A guide to concepts and methods' and, in my view, fulfils that role admirably. It starts with a short introductory chapter, taking a chronological view of developments leading up to the discipline of 'ecophylogenetics' – the field that deals with the genetic diversity of ecological communities and the factors shaping that diversity. To the non-initiate, Chapter 2 is a particularly exciting contribution, describing phylogenetic trees and the (often very short) R-code needed to work with them. That chapter also guides the reader very gently through such occult practices as accessing sequence data on GenBank and aligning sequences to derive phylogenies for a specific list of species. The next seven chapters cover applications of phylogenetic analyses, from inferring mechanisms of ecological assembly and patterns of trait evolution, to informing conservation decisions. Much of this deals with the concept of phylogenetic diversity, a recurrent theme throughout these chapters. The final chapter is prospective, identifying a range of outstanding questions in the field.

It might be that good books on phylogenies are already available – but I have yet to encounter them, and the back cover assures me that this "is the first book to critically review the application of phylogenetic methods in ecology". As a result, this highly accessible book, written in an informative but conversational style, will do much for the uptake of phylogenetic methods in ecology. It will, I suspect, be an excellent resource for any postgraduate or career ecologist who is contemplating using phylogenies in their research. For those scientists and for anyone else interested in demystifying these techniques, I strongly recommend that you get hold of a copy.

Phil Stephens



Theory-Based Ecology: a Darwinian approach

Liz Pásztor, Zoltán Botta-Dukát, Gabriella Magyar, Tamás Czárán & Géza Meszéna (2016)

Oxford University Press, Oxford, 302pp, £75.00 (hb), £37.50 (pb)

ISBN 978-019957785-9 (hb)

ISBN 978-019957786-6 (pb)

Richard Feynman, the eminent theoretical physicist, took a graduate biology class in Princeton in the early 1940s. He was reportedly amazed by how quickly he caught up with the discipline-specific knowledge of biologists with much longer training – because, as he put it, "They had wasted all their time memorizing stuff … [that] could be looked up in fifteen minutes."

A preoccupation with knowledge, rather than understanding, could be a symptom of a discipline that lacks the conceptual underpinnings from which to deduce explanations for new phenomena. *Theory-Based Ecology* is intended to address this problem in ecology, by identifying and explaining the theoretical framework on which ecology is built.

The authors begin with an introductory section to set out what they see as the seven principles of ecology. They show that Darwin considered all of these principles in 'The Origin of Species' and, consequently, they refer to this backbone for ecology as the Darwinian principles. The principles include that populations grow exponentially in the absence of negative feedbacks; that populations must be regulated by density-related negative feedbacks; that replication is imprecise, leading to heritable individual differences; that populations are finite and so are subject to stochasticity; that where different varieties are limited by the same resource, the one whose growth rate is highest at the resource limit will competitively exclude the others; that the greater the differences between varieties in the way their growth is regulated, the more robust will be their coexistence; and that the different components of an organism's fitness cannot be optimised independently, so must be traded-off. Subsequent chapters consider the consequences of these principles for niches, populations, communities and evolution.

Part of the motivation for this book is the contemporary escalation of environmental problems. Whether this book will help ecologists now to deal with those problems is unclear because, as the authors note, "There is no royal road to understanding the dynamics of a complicated system: one has to work it out case by case." Nonetheless, the book is very well written, pleasingly laid out, and clearly the outcome of extensive thought about how to maximise accessibility to an undergraduate audience. As the authors note, the elements of their Darwinian principles are all well-known but seldom connected, especially in ecology text books (which, for example, tend to consider the dynamics of individual populations in isolation from the dynamics of coexistence). Consequently, it is great to see a text book that treats all of the standard components of ecology courses in a way that is accessible, coherent and synthetic. Were it not for other elements of the struggle for existence, I would begin re-writing my ecology course immediately. As it is, I hope I will absorb elements of this into my teaching. I will certainly recommend it to students because, by starting with this more synthetic approach, they will be able to focus more on understanding and less on knowledge. In turn, I hope that will equip them better to deal with the pressing environmental challenges that motivate this book.

Phil Stephens

Quantitative Ecology and Evolutionary Biology: Integrating models with data

Otso Ovaskainen, Henrik Johan de Knegt & Maria del Mar Delgado (2016)

Oxford University Press, Oxford, 304pp, £75.00 (hb), £34.99 (pb)

ISBN 978-019871486-6 (hb)

ISBN 978-019871487-3 (pb)

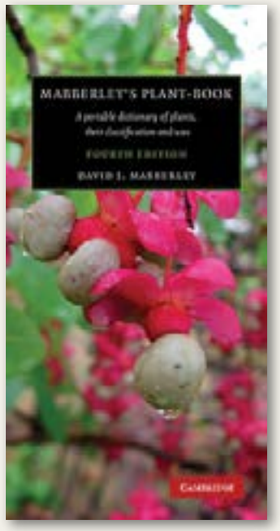
Teaching ecology to undergraduates, at least in the UK, can be a thankless task at times. Many seem to be drawn to ecology in the belief that it's a science, but not a very quantitative one. Some express horror – even a sense of betrayal – on realising that, increasingly, ecology is a highly quantitative discipline, heavily reliant on theoretical, computational and statistical modelling. However, as Otso Ovaskainen and colleagues observe in their new book, a basic knowledge of mathematics, statistics and programming is useful for anyone pursuing research in ecology and evolutionary biology, not only for their own research, but also to understand the research conducted by others.

Bringing these disciplines together and showing how they interact is the aim of *Quantitative Ecology and Evolutionary Biology*.

In this book, the authors have, I think, set themselves quite a demanding task. In the first chapter they introduce their philosophy of modelling, and the fact that systems can be modelled mathematically, analysed statistically, or analysed and modelled simultaneously. They observe that it can often be hard to know which modelling tools to bring to bear on a problem (and that, all too often, that choice is dictated only by the researcher's experience and expertise); however, they suggest that applying different modelling approaches to the same problem can, itself, be insightful. Subsequent chapters include examples of applying modelling and analytical techniques to problems in movement ecology, population ecology, community ecology and evolutionary ecology. In the course of these, they present some models likely to be familiar to many undergraduates, such as correlated random walks and diffusion models of movement, or Levins' metapopulation model. They also present some much more advanced material, such as fitting Bayesian state-space models to time series data, or modelling trait evolution using adaptive dynamics. This is a very broad remit for a reasonably compact book.

I enjoyed many aspects of this book. In particular, I liked the way the authors used their own simulations to supply data that could subsequently be analysed to identify how well the analytical approaches could recover the generating mechanisms. I also enjoyed the breadth of material; there is much in here that I need to learn! Nonetheless, the authors assume a reasonably high level of quantitative skill at the outset. Two short appendices, on mathematical and statistical theory respectively, are unlikely to bring many undergraduates up to the required level. No code is supplied, which might be a deterrent to those less familiar with programming. The book is also rather technically written, without many concessions to levity (readers looking for a more light-hearted approach to modelling, together with example code, might prefer Hannah Kokko's *Modelling for Field Biologists*). Thus, I suspect the main audience for this book will be researchers at postgraduate level and above. For those, like me, who have stumbled into modelling without any formal training, it might well be a gateway to what's required.

Phil Stephens



Mabberley's Plant-Book (4th edition)

David J. Mabberley (2017)

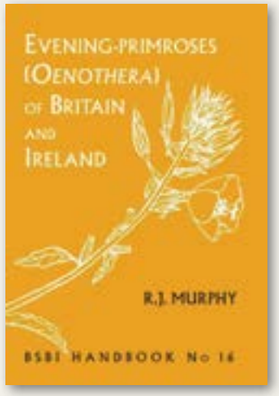
Cambridge University Press, Cambridge' 1120pp, £59.99 (hb)

ISBN 978-1-107-11502-6

The subtitle *Portable dictionary of plants, their classification and uses* is possibly more helpful than the main title. The book is shaped like an old CTW *Excursion Flora* (if you're not old enough to remember that, think of a book *c.*1 A4 sheet in height and a third that in width) so technically it is portable and should fit in a pocket but with over 1100 pages and a hard pointy-cornered cover that may be a challenge. But it certainly is a dictionary. It contains information on every family and genus of seed-bearing plant, plus ferns and clubmosses, and economically important mosses and algae. As if that's not enough there are plenty of common names for cross-reference. For example, under 'rubber' there is a long list of all the species that have the word in their name. This leads to 26,000 entries, up by 1400 on the last edition. Most genera contain details of the commonest or most important species with notes on distribution and economic uses which are impressively comprehensive.

Inevitably, given how much is squeezed in, there are lots of abbreviations (the list at the end covers more than 70 pages). While this can make it initially difficult to penetrate the entries, that obstacle is soon overcome. This excellent book may not be readily portable but it is a handy book to have on the desk so when an unknown plant is encountered in reading, it is there to help. So why not go straight to the Internet for help instead of having another book? The Introduction tells us (but I'm sure you'll know): the huge amount of information on the web on families, genera and species is often uncritical, contradictory and just plain wrong. So here is a companion that is comprehensive and you can trust. But Mabberley also points out that using a book like this is just an enjoyable experience in itself, and educational as other entries catch the eye. Just like the Internet, this book can absorb a lot of time.

Peter Thomas

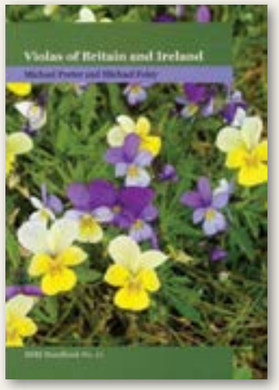


Evening-primroses *(Oenothera)* of Britain and Ireland

R.J. Murphy (2016)

BSBI Handbook No 16, Botanical Society of Britain and Ireland, Bristol, 100pp, £12.50 (pb)

ISBN 978-0-90-115849-9



Violas of Britain and Ireland

Michael Porter & Michael Foley (2017) BSBI Handbook No 17, Botanical Society of Britain and Ireland, Bristol, 156pp, £14.99 (pb)

ISBN 978-0-90-115850-5

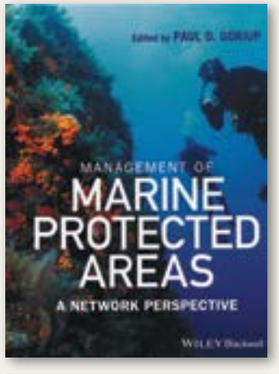
The Botanical Society of Britain and Ireland (the Botanical Society of the British Isles until 2013, but still the BSBI) has over the years produced an excellent series of handbooks that each deals with a difficult group of plants including docks, willows, dandelions, crucifers and northern hawkweeds. Plus, rather enigmatically Handbook No 10 *Sea Beans and Nickar Nuts*, a guide to fruits and seeds washed up on our beaches – probably the most thumbed of all the handbooks I have. This one aside, when faced with an uncertain plant in one of these groups, these Handbooks are worth their weight in gold. They are renowned for clear line drawings and authoritative text. So I was really pleased to see these latest two.

Hats off to Murphy for tackling the evening-primroses. The genus is alien to the British Isles and two somewhat diverging classifications have developed in Europe and America that has caused a lot of confusion, not always helped by genetics since the group does not appear to be monophyletic. Murphy has made sense of all this to produce 14 species and 4 hybrids (12 more taxa than in Stace 2010). Not all these have line drawings but they do mostly have distribution maps which should help identification, backed up by three keys.

Violas takes a new approach in being in full colour with many photographs of plants, flowers and distinctive morphological features alongside the usual excellent line drawings. The book covers all 15 species and sub-species plus 11 hybrids. The initial key has helpful photographs and there is a very useful section on differences between similar pairs of species. Amongst the species included is the garden pansy *Viola* x *wittrockiana* which has escaped into the wild and happily crossed and introgressed with native species to add a little excitement to life.

Both handbooks are worthy additions to the series.

Peter Thomas



Management of Marine Protected Areas – a network perspective

Edited by Paul D. Goriup (2017)

Wiley Blackwell, 294pp, £89.95 (hb)

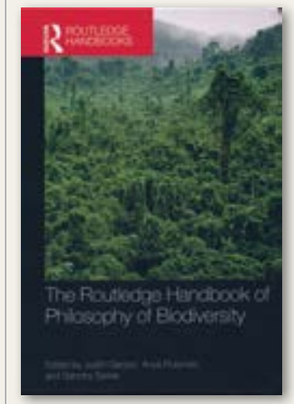
ISBN 978 1 119 07577 6

The Mediterranean and Black Seas are the alleged subjects of this recent contribution to the ever-expanding literature on marine conservation and management. Less than 1% of the Mediterranean and less than 2% of the Black Sea currently have protected status, yet these two areas probably include some of the most polluted, developed and commercially important coastlines on earth, offering particularly daunting problems. Although several important initiatives are already in place to protect fish stocks and encourage the better management of water supplies to reduce pollution, the challenge is clearly to find successful strategies to enable the twenty-one nations with coasts on the Mediterranean Sea, and the six on the Black Sea, to work together to preserve their shared resource for the future.

One interesting approach that can be identified here calls for greater emphasis to be given to improving 'ocean literacy', encouraging people to understand and appreciate the value of phenomena they are often only dimly aware of, such as currents, oceanic seasons and the three-dimensional nature of the water column itself. This, it is felt, could help those involved to accept some of the more abstract-seeming aspects of conservation and so encourage a more 'bottom-up' approach to management (rather than the traditional 'top-down' version of enforced regulations, fines and penalties). This could make the logic of networks of protected areas (as per the title) more appealing than just isolated ones resembling the concept of 'wildlife corridors' on land to enable populations to move over much larger areas and encourage outbreeding. This is the one essential idea distilled from the 14 articles contributed here by 37 authors over more than 250 pages. There is an interesting review of the increase in alien species in the Mediterranean, but there is little critical analysis of their impact and no effective strategies are suggested for dealing with the problem. As with so many of these conservation reviews, more space seems allocated to describing what has not worked or is not being done than on what has been a success. An editorial summary indicating common problems and any successes would have been useful to bring these many strands together. The most interesting contribution of all, it seemed to me, was an article on offshore wind farms – but the relevance of this chapter to the rest of the book escapes me.

Unfortunately, the worthy aims mentioned in the book's introduction seldom feature in its contents. In fact, only about half of the articles actually deal with the Mediterranean or Black Sea or their specific problems (one as a literature review), and many do not even mention the concept of 'networks'. Although undoubtedly a sincerely-meant work, this suffers from a common problem with multi-author reviews. There tends to be much repetition as each author sets the (supposedly common) scene, there is much rambling as each author then tries to make their contribution different within that theme, and there is a consequent lack of focus resulting in a much-diluted message (reflecting a lack of editorial direction towards the book's alleged aims). Equally, however important the message may be, a simple search for books on "Marine Protected Areas" on a popular internet shopping site reveals literally dozens of similar titles on this topic. Whether there is the need for yet another is, therefore, a moot point. The audience would appear to be just the many other people writing in the same field. Perhaps it is time for a single author to take control and distil the many arguments undoubtedly in favour of greater marine protection into a coherent narrative. Although academics like detailed arguments and to see their publications referenced, it must be obvious that policymakers like simple solutions and clear expression. Perhaps it is time to be more positive about what seems to work and not wring hands about what does not. Cut the references to the very many other researchers who are saying essentially the same thing (or proving what seems to many to be blindingly obvious), remove the welter of acronyms and develop a simple and user-friendly terminology. It might not work but it would make such a pleasant change and would probably win more friends to the cause (and would probably be a lot cheaper to buy).

Ian Lancaster



The Routledge Handbook of Philosophy of Biodiversity

Edited by Justin Garson, Anya Plutynski & Sahotra Sarkar (2017)

Routledge, London, 350pp, £175.00 (hb)

ISBN 13: 978-1-138-82773-8

This is a significant and valuable volume but sits rather uneasily in a series largely concerned with religion and traditional philosophy, which means it could be easily missed by those who should know

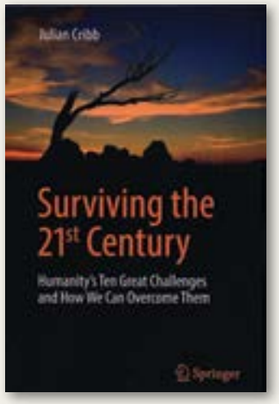
about it. Yet its approach is philosophical in examining not only the meanings attributed to terms we frequently use but also the interactions between human values and the way we portray the natural world. Its 23 chapters cover a broad canvas from the ontology of key terms like biodiversity through to examination of its putative values and the complexities of measuring biodiversity so that change can be determined.

Despite being a modern term coined only in 1986 defining biodiversity is obviously a tricky question that has engaged ecologists, lawyers and politicians ever since. Here it takes two initial chapters to set the historical context and then another eight chapters to examine the many conflicting uses of the term - without reaching any consensus. Not only does this highlight the way in which different disciplines are conceptually constrained by their objectives when searching for a definition, but also it emphasises the apparent impossibility of agreeing on a single focus when the topic is inextricably linked to values. In pursuing some of these values the authors force the reader to reconsider what is a species, do micro-organisms have the same intrinsic value as macro-organisms, is it ethical to restore biodiversity by assisted colonisation, can biodiversity be adequately valued using today's economic tools (like cost-benefit analysis) and is species biodiversity on its own an adequate basis for conservation decision-making?

Questions of how we should measure biodiversity are considered by comparing five internationally used indicators – Red List Index, Living Planet Index, Nature Index, Natural Capital Index and Wild Bird index – all of which have limitations. And as the authors note the use made of trends by policymakers is often at odds with the constraints that scientists place on the data. There are even two chapters on aspects of social justice – how community values and local culture are often disregarded and the need to measure multiple outcomes from conservation projects, not just the purely scientific.

This is a thought provoking volume with something for everyone interested in the protection of biodiversity. Quite why it has to be so ridiculously expensive, and so limited to libraries, is unclear.

David Walton



Surviving the 21st century: humanity's ten great challenges and how we can overcome them.

Julian Cribb (2017)

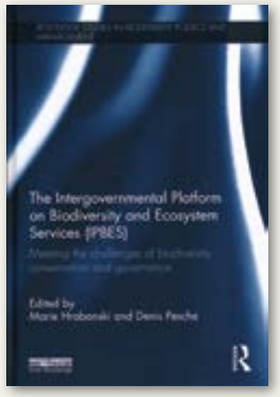
Springer International Publishing, 270pp, £19.50 (pb), £14.99 (ebook)

ISBN 978 3 319 41269 6 (pb)
ISBN 978-3-319-41270-2 (ebook)

Probably everyone can come up with their own pet list of great challenges and so why would this particular list be worth looking at? First, the author is a well-known and prolific popular science writer whose work is carefully researched and very well written. Second, he has found a novel way of linking his suggestions together so that the framework is unusual and intriguing and third everyone will have some common ground with several of his choices. His ten topics are mass extinction, weapons of mass destruction, resource depletion, climate change, toxicity, food crises, population expansion, pandemics, dangerous new technologies and finally self-delusion. Starting from the premise that *Homo sapiens* is an oxymoron given the way the human race acts he describes the ten elements under new species names such as *Homo urbanus* and *Homo exterminans*. Interestingly, each chapter concludes with a list of what society should do followed by a second list of what every individual can do to arrest the decline. Much of this is not directly ecological but his chapters on toxicity, climate change and resource usage are especially pertinent whilst the one on self-delusion shows clearly why we have gone so far down a disastrous path.

He provides extensive references for his statements and they cover a much wider reach than the usual science journals linking newspapers, web sites and non-scientific documents to hard science data. His arguments are well marshalled and well delivered and while most of his remedies have been suggested before there is every reason to repeat them. His persistent refrain that citizens can change the decisions of governments, that the accumulation of individual decisions on how to live and how to vote will make a difference is of course true in general but difficult to implement both in countries with repressive regimes and those in which democracy apparently flourishes but control does not rest with the politicians but with multinational companies. However, the recent unexpected decisions on Brexit and the election of Donald Trump show that major changes can occur. He has good news scattered amongst the bad and the way he interleaves material is masterly. His ten concerns do not stretch to biodiversity loss or conservation crises but perhaps these matter rather less if you believe that mass extinction is a real possibility. It would be wonderful to think that politicians and policy makers would heed any of this but as he points out they largely exist in a self-contained bubble and are hearing only those messages that suit the dogma of the times. Here is material to make people think, with suggestions on how they could act to save both themselves and future generations. Remarkable value for the money!

David Walton



The Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)

Meeting the challenges of biodiversity conservation and governance

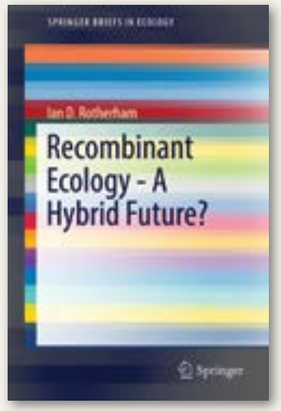
Edited by Marie Hrabanski and Denis Pesche (2017)

Earthscan from Routledge, 254pp, £90.00 (hb) £27.99 (ebook)

ISBN 13: 978-1-138-12125-6 (hb)
ISBN 13: 978-1-315-65109-5 (ebook)

The development of the IPCC as an intergovernmental platform providing advice that carried global political weight set a marker for those in other fields who felt there were other global problems besides climate change that could benefit from this treatment. The lengthy negotiations that proceeded the Convention on Biological Diversity (CBD) in 1992 and the slow progress at the Conferences of the Parties suggested to many conservationists that a new platform was needed to provide biodiversity governance and scientific advice internationally in a way that the scientific committee of the CBD could not. It took until 2012 for this idea to be realised as the IPBES and this history of its genesis and early development explains the problems in reaching a compromise that over 100 governments would accept. There are 11 narrative chapters and a final set of conclusions that provide some excellent food for thought. The IPBES aims to use three approaches to biodiversity protection: scientific, utilitarian and cultural and there are problems with all of them. It is clear from the discussions in various chapters that there is still considerable difficulty with contradictory interpretations of key concepts and this certainly hampers progress of the organisation as a whole. Overall it is rather dry material for the average ecologist and conservationist and for many people I am sure the need to know what happened and why is rather less interesting than what is going to happen and what that might mean. Since the principal activity of IPBES is assessment and it is meant to serve several different conventions, including the World Trade Organisation as well as the CBD, there are clearly considerable internal political tensions. There is some interesting material on how they used lessons learned from the IPCC to develop the new structure. For those interested in the science-policy interface or in the problems in finding agreement between diverse stakeholders with conflicting expectations then there is much of interest in this volume. For most ecologists IPBES is likely to come into view only when its assessments make international news, and even there they are competing with several other players for attention.

David Walton



Recombinant Ecology – A Hybrid Future?

Ian D. Rotherham (2017)

Springer, Switzerland, 85p, £37.99 (pb) £29.99 (ebook)

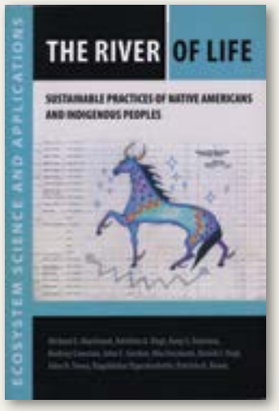
ISBN 978-3-319-49796-9 (pb)
ISBN 978-3-319-49797-6 (ebook)

Ecosystems are nothing if not dynamic, and in this time of massive global change it is no surprise that global ecology is in a state of rapid transformation. Recombinant communities and their ecology are an important aspect of this, and Ian Rotherham's excellent Springer Brief on the topic provides an insightful and authoritative overview. The book has a distinctly British flavour, reflecting both the expertise of the author and the relevance of the UK as a region that has experienced long standing land use change along with extensive ingress and egress of species. Much of the material has universal applicability however, and the discussion is not parochial.

The book begins with a rigorous and thoughtful introduction to the main ideas behind the 'recombinant' concept, charting the history of their development and linking this to the emerging 'novel ecosystems' debate. There are then short but effective chapters on urban ecosystems (as key areas for recombinant communities and the processes that lead to them), globalisation and 'cultural severance' (changing patterns and attitudes to species introduction), the implications of climate change, and the longer-term consequences of recombination.

The book is written in a readable style and there is nice use of personal reflection by the author, as well as frequent case studies and useful examples; as a result, the volume should appeal to academics, practitioners and students. The chapters are short and there are areas that could be explored in more detail, with greater marshalling of the available literature; but that is arguably beyond the scope of a Springer Brief (a series which produces concise summaries of emerging research themes), and this is an admirable introduction to the topic that should be essential reading. As Rotherham notes, 'Our future will be recombinant and there is no doubt of that.' (p.75).

Rob Francis



The River of Life

Sustainable Practices of Native Americans and Indigenous peoples

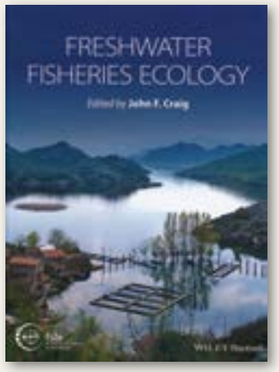
Edited by Michael E. Marchand, Kristina A. Vogt, Asep S. Suntana *et al.* (2014)

Michigan State University Press, 294pp, US $29.95 (pbk)

ISBN 978 1 61186 222 5

This book provides details on the way various tribes lived with nature in apparently sustainable ways and tries to use this to suggest that modern urban dwellers can find lessons they can adopt for 21st century living. However, the book is much more an indictment of the way native people, especially American Indian tribes, have been treated by the US Government for over a century. The authors document many examples of deceit and exploitation, from cheating tribes out of their original territories to restricting their access to subsistence hunting and banning native languages to try to obliterate native culture. And it is clear that their tribal culture was totally at odds with the drive for ownership and resource exploitation that characterised early American history. The actions of the Bureau of Indian Affairs are a terrifying tale of officialdom at its worst. There are also examples of related exploitation from elsewhere in the world but the American catalogue of determined official destruction is indeed a damning list but in parts quite repetitive. The book has little science content and many of the ecological assertions such as American Indians "managed ungulate populations" are largely anecdotal. For the authors this matters little as their basic assertion is that the stories told by the elders provide enough basis for assuming environmental concerns and management. I suspect that the emphasis on spirituality, rituals and tribal wisdom will also put off some readers. Many may have some sympathy with the more holistic view of the world proposed here but attempting to suggest that in a largely urban world drastic changes such as redefining land title and boundaries, adopting only community-based business plans, experiencing nature on a daily basis. etc will be seen as simply impractical. In a world with less than a billion people many of these landscape level management decisions were probably possible and useful. In a world of 7 billion the cultural drivers are different. Whilst for ecologists this is not a very useful book, for anyone interested in exploitation and suppression of ethnic groups this will be fascinating.

David Walton



Freshwater Fisheries Ecology

Edited by John Craig (2016)

Wiley Blackwell, 914pp, £79.50 (hb)

ISBN 978-1-118-39442-7

As a former publisher, I feel able to suggest that those who write the blurbs that appear on book covers are sometimes prone to hyperbole when they claim that the content therein represents a 'landmark publication', worth every penny of the eighty quid they want you to part with to own a printed copy. But as a thwarted fisheries ecologist, I'd happily agree with whoever made that claim for this book, and not just because at 900 pages and 2.7kg it fits both possible definitions of the term landmark, being simultaneously 'an object recognizable from a distance' as well as 'an event marking a stage or important turning point'.

Trying to provide a comprehensive account of inland fisheries worldwide is a daunting task, one that could not sensibly be tackled by a single author, or even a small group. You need a big international team, recruited and guided by someone with experience of fisheries in different climates and cultures, able to identify and bring together a diverse collection of authors, capable of encouraging them to write contributions to meet a common aim rather than to their own agenda, and someone with the ability to edit many contributions into a coherent whole. Persuading John Craig to take on the role was a masterstroke; the long-serving editor of the *Journal of Fish Biology* has the perfect meld of research experience, editorial expertise and familiarity with the writing skills of the population of fisheries scientists. The result is a book drawing together the expertise of over 100 high-calibre contributors that works as a coherent whole, and as a resource likely to stand the test of time. Contributions of varying length are grouped together in eight sections, on topics such as the basics of freshwater ecosystems; freshwater resources of fisheries by geographical region; fishing operations; fishery management; fisheries development; the effects of perturbations; and a final section on future developments.

No volume of this type is ever going to be perfect and there are doubtless a few gaps and inconsistencies in the coverage. But the flaws are utterly trivial compared to the strengths, and if I were still an aspiring young fish biologist, or an academic freshwater biologist, a fisheries manager or consultant, I wouldn't hesitate to buy my own copy. I know, I know, eighty pounds for a book makes the eyes water, but you can get a guided tour of the whole world of fisheries ecology for trivially more than the cost of renewing a UK passport. The book will last you at least as long and make much more interesting reading.

Alan Crowden

ALSO RECEIVED

Notes by Alan Crowden

Foundations of Restoration Ecology 2nd edition

Edited by Margaret A. Palmer, Joy B. Zedler and Donald A. Falk (2017)

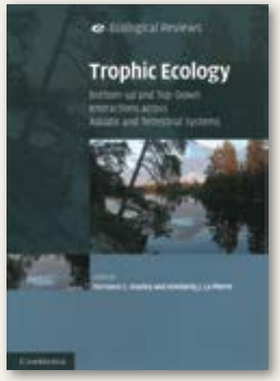
Island Press, 576pp, £67 (hb) £33.50 (pb)

ISBN 978-1-61091-696-7 (hb)

ISBN 978-1-61091-697-4 (pb)

This 2017 publication is the second edition of a 2006 book that set out theory, highlighted links between theory and practice, and identified gaps in knowledge. The new edition builds on the original and attempts to provide a more structured text at the same time as reflecting the major developments in the field. Part 1 introduces basic concepts of theory, ecological dynamics, biodiversity and landscape; where necessary these ideas are developed further in later chapters. Part 2 covers ecological theory and the restoration of populations and communities, Part 3 covers ecosystem processes, part 4 the spatial and temporal dimensions of restoration and Part 5 is, appropriately, a synthesis and future challenges chapter. Each chapter has a summary of key points, includes case histories, and ends with a full list of references to the academic literature. The emphasis is on establishing the theoretical basis of the subject and as such it provides a very solid academic text in restoration ecology.

The contributors include a healthy mix of experienced senior academics with a seasoning of younger scientists, presumably to leaven the mix with contributions from those who we all hope will be part of the next generation of restoration scientists. About 80% of the contributors are based in academic institutions in the United States; perfectly reasonable, given that the volume will be used mainly as a course text for American students, but it means those in other parts of the world wanting geographically-relevant examples, or practitioner input, will need to look elsewhere.



Trophic Ecology

Bottom-up and Top-down interactions across aquatic and terrestrial systems

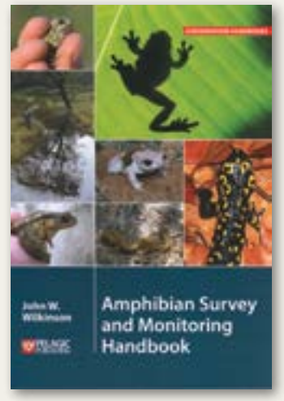
Edited by Torrance C. Hanley and Kimberly J. La Pierre (2015)

Cambridge University Press, 426pp, £62.00 (hb) £35.99 (pb)

ISBN 978-1-107-07732-4 (hb)

ISBN 978-1-107-43432-5 (pb)

An excellent review of the interaction of 'bottom-up' and 'top-down' processes across terrestrial and aquatic ecosystems, published in the BES/CUP *Ecological Reviews* series.



Amphibian Survey and Monitoring Handbook

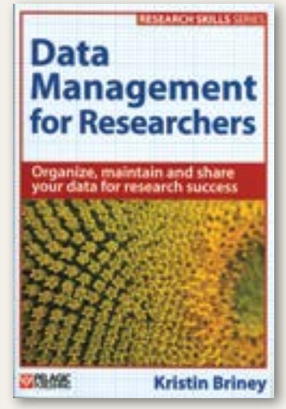
John W. Wilkinson (2015)

Pelagic Publishing, 138pp, £59.99 (hb) £29.99 (pb)

ISBN 978-1-78427-004-9 (hb)

ISBN 978-1-78427-003-2 (pb)

In my darker moments, I wonder if there is still a role for books in the modern screen-obsessed world. Then one comes across a book like this, where an expert with a lifetime's experience provides a guide to everything that someone aiming to carry out amphibian survey and monitoring needs to think about. Splendid.



Data Management for Researchers SEP 2015

Organize, maintain and share your data for research success

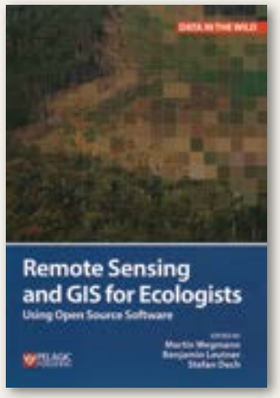
Kristin Briney (2015)

Pelagic Publishing, 200pp, £49.99 (hb) £24.99 (pb)

ISBN 978-1-78427-011-7 (hb)

ISBN 978-1-78427-012-4 (pb)

Apparently, NASA lost much of the early data from space exploration, including high quality video footage of the first moon landing. All the more reason to do as it says in the sub-title to the book.



Remote Sensing and GIS for Ecologists FEB16

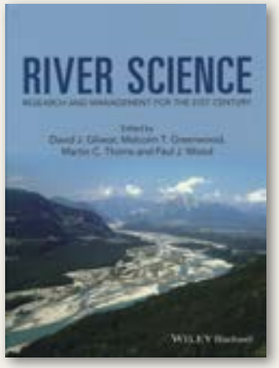
Using Open Source Software

Edited by Martin Wegman, Benjamin Leutner and Stefan Dech (2016)

Pelagic Publishing 348pp £34.99 (pbk)

ISBN 978-1-78427-022-3

The potential value of remote sensing and GIS to ecologists is obvious, but getting to grips with the tools and techniques can be more difficult. While not replacing the need for a basic textbook, this useful volume hones in on the most useful remote sensing approaches for ecologists, wisely making use of clear, relevant examples.



River Science

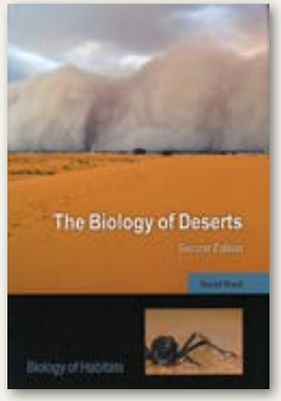
Research and Management for the 21st Century

Edited by David J. Gilvear, Malcolm T. Greenwood, Martin C. Thoms and Paul J. Wood (2016)

Wiley-Blackwell, 412pp, £85.00 (hbk)

ISBN 978-1-119-99434-3

River science is defined here as a field of study focusing on the interactions between the physical, chemical and biological components within riverine landscapes, and how they influence and are influenced by human activities. Authors were asked to address the historical development of the field of river science, identify research challenges and highlight wider societal implications of the research. Noble aims, creditably addressed and a book worth having in the library of any institution or organisation with a broad outlook on rivers and their management.



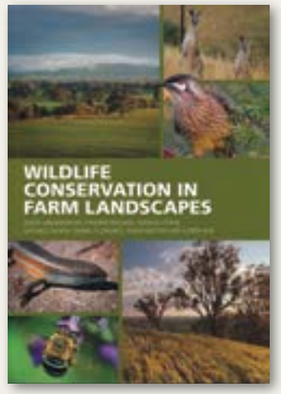
The Biology of Deserts 2nd edition

David Ward (2016)

Oxford University Press, 386pp, £80.00 (hb) £37.50 (pb)

ISBN 978-0-19-873275-4 (hb)
ISBN 978-0-19-873276-1 (pb)

Reviewers can say what they like about a book, the real test is whether readers buy it in sufficient numbers to merit the author slaving over a second edition, and renders the publisher willing to stump up for another round of production costs. This wide-ranging account of desert biology clearly found a market first time round, and continues to provide a chunky but manageable account of the subject. Excellent coverage, a lengthy reference list to use as a resource for further reading, and a useful emphasis on global change (rather than just global warming) as the key issue.



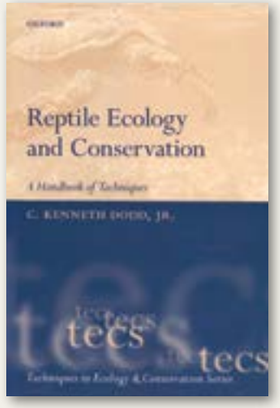
Wildlife Conservation in Farm Landscapes

David Lindenmayer, Damian Michael, Mason Crane, Sachiko Okada, Daniel Florance, Philip Barton and Karen Ikin (2016)

CSIRO Publishing, 228pp, A$49.99 (pb)

ISBN 978-1-486-30310-6

It's not clear from the title but this is quite specifically a book on the integration of conservation and agriculture in the temperate eucalypt woodland belt of eastern Australia. That being said, it is another sparkling example of the long-term ecological research of David Lindenmayer and his associates, and the publishing expertise of CSIRO Publishing. Lavishly illustrated with colour photographs, but devoid of graphs and pie charts and paraphernalia normally associated with academic writing, the book nonetheless is steeped in science and is full of advice and encouragement for land managers. I have no idea whether the ideas are taken up by the target audience, but good on the authors and publisher for giving it a go.



Reptile Ecology and Conservation

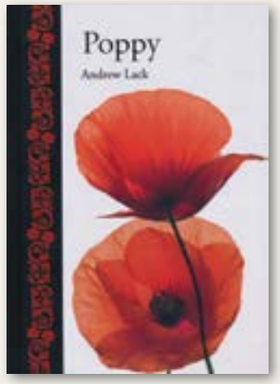
A Handbook of Techniques

Edited by C. Kenneth Dodd, JR. (2016)

Oxford University Press, 490pp, £75.00 (hb) £37.50 (pb)

ISBN 978-0-19-872613-5 (hb)
ISBN 978-0-19-872614-2 (pb)

A state of the art review of techniques for studying reptiles. Covers an international range of examples. One method is commended as 'enabling crocodilians to be captured from a greater distance and without direct physical contact with humans'. That would be my preference, too. Glib comments aside, another useful volume in OUP's excellent *Techniques in Ecology & Conservation* series.



Poppy

Andrew Lack (2016)

Reaktion Books, 200pp, £16.00

ISBN 978-1-78023-653-7

The recent anniversary of the battle of Passchendaele was a stark reminder of the symbolism associated with the poppy in the UK and elsewhere. This glossy and attractive book by biologist Andrew Lack is aimed at a far wider audience than just the readership of the *Bulletin* and achieves well its aim of integrating botanical writing with a broader account of the cultural and social impact of plants and flowers.

Managing Australia's Pest Animals

A guide to strategic planning and effective management

Mike Braysher (2017)

CSIRO Publishing, 216pp, AU $49.95 (pb)

ISBN 978-1-486-30443-1

Clearly a book that will have direct relevance to only a very small proportion of the BES membership, but even those not resident in Australia can learn from examining how other countries approach the issues around planning, prioritising and applying best practice in pest control.

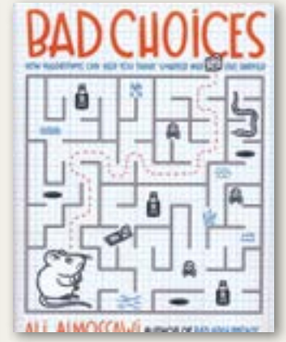
Harvesting Rainwater from Buildings

Syed Azizul Haq (2017)

Springer International Publishing Switzerland, 294pp, £86.00 (hb)

ISBN 978-3-319-46360-5

Aims to provide user-friendly methodology for the planning, design, construction and maintenance of rainwater harvesting infrastructure.



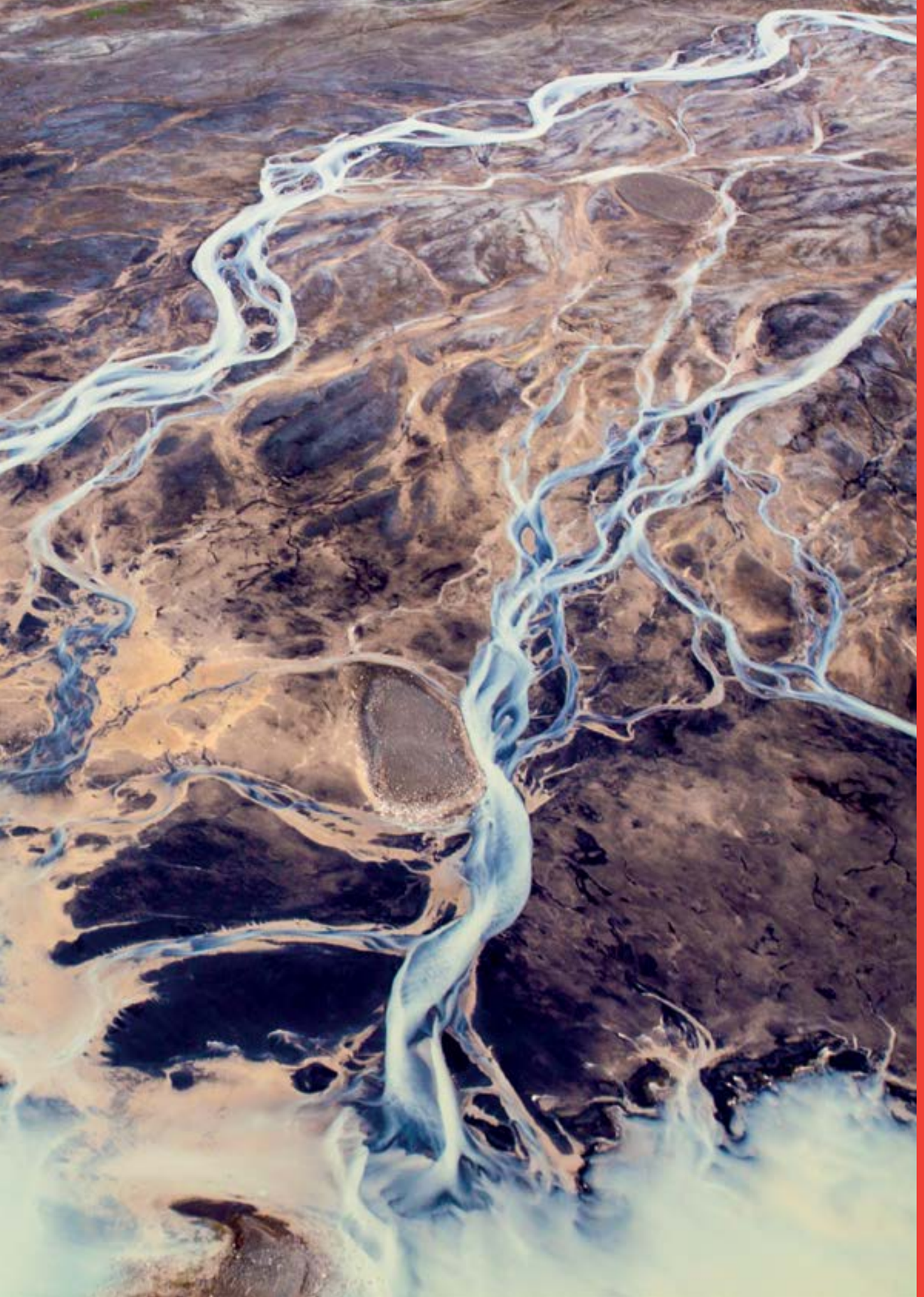
Bad Choices

How Algorithms can help you think smarter and live happier

Ali Almossawi (2017)

John Murray, London, 160pp, £14.99 (hb)

ISBN 978-1-473-65076-3



ACCOUNTS

Accounts for the year ended
31 December 2016 together with
Council's and auditor's reports

Company number: **1522897**
Charity number: **281213**

BRITISH
ECOLOGICAL
SOCIETY

CONTENTS

COUNCIL'S REPORT

For the year ended 31 December 2016

The Trustees present their report and financial statements for the year ended 31 December 2016.

1. OBJECTIVES AND STRATEGY

The objects for which the British Ecological Society (BES) is established are to advance the education of the public in the subject of ecology as a branch of natural sciences and to advance and support research in that field, and to disseminate the results of such useful research.

The vision of the BES is:
A world inspired, informed and influenced by ecology

Our mission is to:
Generate, communicate and promote ecological knowledge and solutions

In order to achieve this our major goals are to:

- Communicate world-leading ecological science
- Generate, synthesise and exchange ecological knowledge
- Share the excitement and relevance of ecology
- Inspire, engage and recognise talent
- Build a sustainable, resilient and efficient Society

Ecology is the scientific study of the distribution, abundance and dynamics of organisms, their interactions with other organisms and with their physical environment. At a time when finite natural resources are being used at increasing rates, it has never been more important for human society to understand its impact on ecological systems (which includes systems intensively managed or impacted on by humans such as arable farms, pastures and marine fisheries) and their importance in maintaining human health. The BES's many activities include the publication of a range of scientific literature, including internationally renowned journals, the organisation and sponsorship of a wide variety of meetings, the funding of numerous grant schemes, public engagement, education work and policy work. The Society has approximately 4,400 members worldwide, and membership is open to all with an interest in ecology. There is a small membership fee, with discounts for students and those from low-income countries.

2. REPORT ON PRINCIPAL ACTIVITIES

The Trustees confirm that they have complied with the duty in section 17 of the Charities Act 2011 to have due regard to the Charity Commission's general guidance on public benefit. All trustees give their time voluntarily and do not receive any private benefit. Details of Trustees' expenses and remuneration are disclosed in notes 5 and 15 respectively.

The first four of the Society's strategic goals stated in section 4 provide clear public benefits, whilst the final one defines the ways in which the Society gains greater leverage from its finite resources and ensures its long-term sustainability.

The BES portfolio of grants covers all of the Society's aims. It can be divided into several broad categories; research, training & travel, outreach and support for ecologists in Africa. The BES funds grants with the aim of promoting ecology as widely as possible and hence individual awards are generally of relatively small value, although many awards are made.

2.1 Communicate world-leading ecological science, and generate, synthesise and exchange ecological knowledge

These major goals are primarily supported by our work in publishing, meetings and grants.

Publishing – Resources Expended = £1.55M (45% of total)

In 2016, our journals grew both in terms of submissions and published papers, with more content than ever before being published. The five BES subscription journals published over 50 additional articles in 2016 compared to 2015, across almost 700 additional pages. There has also been enormous growth in our partner journal *Ecology & Evolution*, which published over 750 papers in 2016. The surplus provided by the journals continues to provide the main source of income into the Society, which in turn funds all our other activities.

The publications team are always keen to support our early career researchers and 2016 was no exception. We produced a number of activities that were designed specifically for this audience: webinars on how to get published and how to become an associate editor; a publishing workshop at the BES's annual summer school for undergraduates; and a workshop on how to get published at the Annual Meeting. We also held a fascinating debate on the future of peer review at our Annual Meeting, which was recorded and subsequently posted online.

Many of our journal articles received coverage in the international press during 2016, including the BBC, *The Telegraph, The Guardian, Science, Nature* and *The Financial Times*. One article discussing ash dieback published in *Journal of Ecology* by Peter Thomas, "Biological Flora of the British Isles: *Fraxinus excelsior*", resulted in Hazel Norman, the BES Executive Director, being interviewed by the BBC News.

In late 2016, we commissioned a survey of BES authors and reviewers, which had over 2,000 responses. We were pleased to find that overall satisfaction with the submission, publication and review process is high and over 79% of respondents stated they were likely to submit to us again. The team are producing a full report on this survey in early 2017 including any planned improvements to our services as a result of this feedback.

The BES hosted two strategic workshops focused on publications during 2016, one in London in April and one in Oxford in September. Participants included an international selection of Editors, Publications Committee members, Council members, BES President, BES Treasurer and key BES personnel. Progress was monitored on the BES's publications strategic plan and activities planned for the coming 12 months to ensure our journal portfolio continues to develop and grow.

Part of the BES's Strategic Plan is to forge better links between practitioners and academics, and the publications team took part in a number of initiatives during 2016 to help with this objective. We conducted a number of one-to-one interviews, focus groups and ran a survey (with around 600 responses) to discover more about the information needs of the practitioner community and how the BES's existing journals or any future products can best meet these needs. This work will continue into 2017.

At the 2016 Annual Meeting in Liverpool, *Methods in Ecology and Evolution* Editor Rob Freckleton, along with several experts with backgrounds in programming and ecology, ran an oversubscribed workshop providing practical discussion of writing and sharing code for research. There were various breakout sessions giving participants practical training in best practice for using code in ecology research, focusing on quality, functionality, robustness and usability. Finally, participants were given the opportunity to input into the development of new guidelines for archiving code for publication, which are currently being developed by the BES journal *Methods in Ecology and Evolution*. We hope to publish these guidelines during 2017.

Last but not least, our Annual Meeting in December also provided an opportunity for *Functional Ecology* to celebrate its 30th anniversary. The journal hosted a well-attended thematic session, ran a competition to win a mini-iPad and held a birthday party complete with cake at our traditional Associate Editor reception. As always, we had a large number of Associate Editors and Editors attending the meeting from overseas and within the UK and this meeting provided an excellent opportunity to thank them in person for their essential role on our journals and discuss future developments with them. A big Thank You to everyone who attended and Happy Anniversary to *Functional Ecology*!

Research – Resources Expended =
£0.33M (10% of total)

In 2016 the Society received 345 applications for funding across its main grants portfolio (excluding Training & Travel), and funded 49 projects totalling £308,830.

The majority of our awards went towards funding scientific ecological research projects. We supported small projects with new and innovative ideas, as well as larger projects that aim to help early career ecologists to establish an independent research career in ecology.

We supported ecologists in developing countries through the Ecologists in Africa grant scheme. This scheme recognises that ecologists in Africa face unique challenges in carrying out research and aims to provide them with support to develop their skills, experience, and knowledge base, as well as making connections with ecologists in the developed world.

Finally, funding has also contributed to Outreach grants, which support projects promoting the public engagement of ecology and/or improving skills in science communication.

Training & Travel Grants contributed just over £31,000 to enable 63 PhD students or postgraduate research assistants to present their research at meetings across the world or take part in specialist field training. This included supporting four students from countries that are classed as lower or middle-lower income, to attend and present their work at our Annual Meeting in Liverpool and we would welcome more applications from those countries in the future.

In 2013, Grants Committee recognised the importance of the Committee's activities being transparent and made the decision to make all grant success rates publically available on the BES website. Compared to the 2015 rates, there was a small decrease in the rate for Large Research (16% in 2015 to 14% in 2016) and a larger decrease in success rate for Small Research (21% to 16%), both offset by a doubling in success rate for Outreach (9% in 2015 to 18% in 2016) and an increase in Ecologists in Africa (6 to 8%). Going forward, it will be important for the BES to consider how to monitor and mitigate the impact of decreasing application success rates in the longer term.

We have awarded a number of prizes to outstanding individuals in recognition of their contribution towards the science of ecology, including our annual Anne Keymer student talk prize and Best Poster Prize at the 2017 Annual Meeting in Liverpool.

We continue to support the Gratis Book Scheme, the aim of which is to provide ecology and conservation books for free to individuals from outside Western Europe, North America, Japan, Australia, and New Zealand who would otherwise be unable to obtain them. The purpose of this scheme is to spread ecological knowledge as widely as possible. This scheme is a collaboration between the BES (who pay for the postage), the NHBS online bookstore (who co-ordinate and organise the distribution), and the publishers and authors of the books (who provide the books for free). In 2016, the BES contributed £1,400 enabling 124 books to be dispatched to over 40 countries.

2016 SUCCESS RATES

GRANT TYPE	NUMBER OF APPLICATIONS	NUMBER OF AWARDS	SUCCESS RATE
Large research	42	6	14%
Small Research	137	22	16%
Outreach	80	14	18%
Ecologists in Africa	86	7	8%

We provide an annual contribution to support scholarships for students from European institutions to attend Tropical Biology Association courses. In 2016, our contribution of £10,000 allowed 21 young biologists from 21 institutions, spanning 12 countries, to attend field courses at Kibale National Park in Uganda and Kirindy Forest in Madagascar.

Meetings – Resources Expended =
£0.74M (22% of total)

The exchange of ideas and networking that happens at scientific conferences and field trips are vital ways in which science advances and develops.

In 2016, our Annual Meeting was held at the ACC in Liverpool. It ran from 11 – 14 December and attracted 1,200 delegates from over 43 countries. There were 550 talks spread over the daily 12 parallel sessions, 16 thematic topics, 246 posters and two poster sessions. We were pleased to be able to draw renowned names to present our plenary lectures: Anne Chao gave the BES Lecture, Daniel Pauly the Tansley Lecture, Alison Hester encapsulated '12 Months in Ecology' and Hugh Possingham gave the Closing Lecture.

Workshops are now a staple of our meeting programme. We retained the popular extended lunchtime slots for sixteen community-generated workshops over the two full days; those who did not attend workshops were able to use the extra time to network. This year we also ran a popular paid-for half-day Coding workshop alongside our Early Career workshop.

We built on the successes of Edinburgh and paid special attention to the delegate experience – ensuring people felt welcomed, included and represented. It was the second year that we held an LGBT+ evening mixer and a Christian morning mixer, both of which were attended by more people than the previous year (c. 25 each). The feedback from the LGBT+ mixer was that they found the BES progressive, inclusive and welcoming, and encouraged us to continue the mixer; the Christian mixer was similarly positive, having an interesting discussion on Bible interpretation from an international mix of delegates.

After the improvement in attendance following a shift in timing last year, the AGM was programmed to run immediately after Anne Chao's plenary lecture; it was a popular lecture, so attendance figures for the AGM were healthy.

Twitter continued to be the main social media platform. This year we asked SIG secretaries to curate the threads, although this can be challenging with the sheer number of tweets. As usual, Twitter was used to accept questions for our plenary speakers, network and widen participation outside of the meeting venue. Its popularity at our Annual Meetings grows year on year, with the meeting hashtag #BES2016 trending in UK and Europe for the whole three days.

We are consistently aware of our commitment to the wider society, which is why we keep Annual Meeting registration fees competitively priced, always seeking extra revenue through sponsorship and the sale of exhibition space. We ensure the Annual Meeting is great value for everyone, but particularly students, unemployed and retired members, which is why we offer them reduced rates, and additional reductions for anyone who works as a 'helper' for part of the meeting. We continue to develop a raft of events within the Annual Meeting including practical workshops, career development, opportunities to network informally and events for the public; we ran our second BES Science Slam (hosted by local comedian Sam Avery), which was attended by about 100 people in a comedy venue close to the ACC.

We also took the opportunity to publicly thank those who helped us make such a positive impact – our numerous assistant editors, Special Interest Groups leaders and grants Review College volunteers. We thank them for their commitment and enthusiasm in helping us to attain our shared goals.

In addition to our Annual Meeting, we delivered a joint symposium with the Cambridge Conservation Initiative (CCI) on 'Making a Difference in Conservation: Improving the Links between Ecological Research, Policy and Practice', 11 – 13 April, Cambridge, UK, with the hashtag #BEScci. It was organised by Bill Sutherland (University of Cambridge), Nancy Ockendon (University of Cambridge), Stuart Butchart (Birdlife International), Zoe Davies (DICE: Durrell Institute for Conservation and Ecology), Nathalie Pettorelli (Zoological Society of London), Peter Brotherton (Natural England) and Juliet Vickery (RSPB). The RSPB, Conservation Evidence, DICE and our Conservation Ecology Special Interest Group sponsored this popular symposium, attracting about 250 delegates.

Our Special Interest Groups provide a valuable source of individual disciplinary accessibility to members and non-members, and deliver events for specific ecological areas. There are currently 17 groups, with an additional three as potential new groups. In 2016, our SIGs organised about 44 events, ranging from a conference on rewilding, a UK-India meeting in India and a Data Integration in R workshop. We subsidise these events and promote them through our various communication channels. However, in line with the desire to achieve cost neutrality, the SIGs have also been encouraged to be cost effective, or raise profit if possible. They have also been more encouraged to be aware of the importance of inclusivity when inviting speakers, which venues they choose and when communicating with their communities.

2.2 Share the excitement and relevance of ecology

This major goal is primarily supported by our work in policy.

Resources Expended =
£0.23M (7% of total)

Following our 2015 policy strategy review, in 2016 we continued to develop and grow our programme of policy engagement. We communicate the value of ecological knowledge to policymakers and promote evidence-informed solutions, whilst supporting our members to enhance the policy impact of their work.

In 2016, the political context of our work was dominated by the UK's decision to leave the European Union, creating the likelihood of the most substantial changes to our environmental policy framework in a generation and placing British science in a state of profound uncertainty. We have engaged proactively with the challenges and opportunities presented by Brexit to ensure that the voice of the ecological community is heard.

On 21 July 2016, over 400 people attended our second "People, Politics and the Planet: Any Questions?" debate; the first post-referendum opportunity for a public audience to question leading politicians on the future of UK environmental policy post-Brexit. Hosted in partnership with the Royal Geographical Society (with IBG) and the Sibthorp Trust, the debate was chaired by leading broadcaster Jonathan Dimbleby, with panellists including Agriculture Minister George Eustice MP, former Green Party leader Natalie Bennett, and former Shadow Environment Secretary Kerry McCarthy MP. The event was live-streamed to undergraduate students attending our summer school, and the video is available online (http://www.britishecologicalsociety.org/discussions-people-politics-planet-questions-event/).

In collaboration with the Zoological Society of London, Wildlife and Countryside Link, the Royal Society of Biology and the Campaign for Science and Engineering, we organised a high-profile public discussion evening on 7 September 2016 titled "Making Brexit work for Ecology and Conservation", focusing on the need to protect and use the UK's world class scientific expertise during Brexit. We were able to raise our concerns with Government when our President and Policy Manager attended a follow-up round table meeting with Robin Walker MP, Minister for Exiting the European Union. We have also ensured that ecological science informs Parliamentary debate by engaging with a number of Select Committee inquiries throughout the year. Most significantly, we submitted written evidence to the Environmental Audit Committee's inquiry on the future of the UK's natural environment outside the EU, and were subsequently called to give oral evidence. Sue Hartley, BES President, gave evidence on behalf of the Society, and the Committee's final report incorporated many of our recommendations, including on the evidence base for rewilding and the design of agri-environment schemes.

Supporting members to build their policy engagement skills, gain experience and enhance the impact of their research is central to our work. Our annual Fellowship with the Parliamentary Office of Science and Technology continues to offer early career members a unique policy experience, and our 2016 Fellow published a well-received report on environmental crime. Our Parliamentary Shadowing Scheme was extended to Scotland for the first time, with Roseanna Cunningham MSP, Cabinet Secretary for Environment, Climate Change and Land Reform, hosting a shadow. Following a successful scoping phase in 2016, we will soon be launching a new Policy Fellowship for mid-career members.

Scotland was a hive of activity in 2016, as our Scottish Policy Group (SPG) went from strength to strength. The biannual Scottish Biodiversity Science conference addressed the theme of "Connecting People and Environment", and was preceded by a sold-out policy training day for early career members. For the first time the SPG were invited to present to Scottish Government Staff at Victoria Quay on the latest ecological research, and the outputs of the latest iteration of our "Pie and a Pint" discussion evenings directly informed Scottish Natural Heritage's consultation on the future of protected areas.

Finally, a policy focus was embedded throughout a number of BES events over the course of the year, including the first policy themed day at our Annual Meeting in Liverpool. Most notably, our joint symposium with the Cambridge Conservation Initiative (see the Meetings Section above), brought together delegates from research, policy and practice, with international speakers and a public lecture by former UK Government Chief Scientific Advisor, Sir John Beddington.

2.3 Inspire, engage and recognise talent

This major goal is primarily supported by our work in education.

Resources Expended =
£0.27M (8% of total)

The Society supports the ecological education of people of all ages and aims to support ecologists at each stage of their career development through providing advice and opportunities for professional development. The BES supports our members in the development of education and public engagement activities related to their research.

In 2016, the Society continued to extend its support for researchers communicating their science to the public, school groups and others. This support is offered through free to attend training courses, guided support in developing and translating science into activities alongside up to £10,000 funding for those who are delivering regional engagement activities.

The Society delivered two national public engagement events. The RHS Chelsea Flower Show exhibit focussed on identifying a range of no- bee pollinator species gardeners could plant in their gardens, the estimated foot fall through this exhibit was 12,000. Glastonbury took a series of activities to music festival-goers and was a collaborative event with the James Hutton Institute, OPAL and the University of Lancaster. The estimated footfall through this event was almost 1,000.

The Society hosted its second Summer School, a residential school for 1st and 2nd year undergraduates from across the UK including students from Northern Ireland. A total of 49 Undergraduate students from 37 universities attended the school, which was free to attend and travel bursaries were offered.

Additionally we grew our relationship with In2Science and hosted 10 A-level students from black and other minority ethnicities or lower socio-economic status as part of the above summer school. All school, travel, and some clothing costs were covered for students attending. Students were fully integrated into the science programme and provided with in-depth support and careers mentoring throughout. These students then went onto a celebratory event with students from a broader In2Science programme.

In 2016 we expanded our training support for 30 Early Career researchers to include a grant writing workshop. The event was significantly oversubscribed and feedback from it has led to an increase in provision for 2017.

In the lead up to the Annual Meeting, the Society offered a series of 4 free webinars to support early career scientists in using social media at scientific conferences and how to network at conferences. Additional webinars targeted mid-career scientists managing interdisciplinary careers and those considering applying for associate editor roles. These events were part of a growing career development programme for the annual meeting that includes a low cost careers day, with skills development and networking opportunities.

The Society continued to collaborate with a wide range of societies to deliver careers advice and mentoring for women in science. Mentoring and careers advice is provided through a range of free to attend events and conferences. We continue to provide free, paper-based resources to schools.

During 2016, an Equality and Diversity Working Group was established following the recommendations adopted by BES Council in December 2015. Work completed in 2016 included developing and publishing the Society's equality and diversity policy, developing equality and diversity guidelines for BES Committees, and introducing unconscious bias training for staff and volunteers. The Working Group will develop a range of initiatives in 2017 including supporting those with disabilities.

2.4 Build a sustainable, resilient and efficient Society

We have a duty to ensure the long-term viability of the Society. During 2009 BES Council co-invested in Charles Darwin House to provide new office space for the Society, shared with several other organisations with complimentary aims (i.e. the Society for Experimental Biology). A second building close by was purchased in 2013 and the two buildings together diversify income streams to increase the financial resilience of the BES.

In 2016 we continued to develop and support the BES Journals to further enhance their standing so that they remain a sustainable and significant income stream for the Society in the near future, despite uncertainties over the impact of open access and economic challenges across the world.

The 2015-19 Strategic Plan included an objective to diversity the Society's income as a way of increasing the resilience of the organisation. Half way through 2016 a Fundraising and Development Manager was appointed following the implementation the sustainable fundraising strategy accepted by BES Council. The Society has developed a set of fundraising guidelines that comply with the new advice provided by the Charity Commission and has started to develop various initiatives, which will start to raise funds in 2017.

During 2016 the BES embarked on a quality assurance programme called PQASSO, which has been specifically developed for the voluntary sector. The self-assessment process is being carried out by a working group comprising trustees and staff, and covers a wide range of activities from HR and finance to governance and external communications. The work will be completed in 2017 and will ensure that the Society meets the standards of good practice across all its activities.

2.4.1 Financial Management and Control

During the year the BES Committees undertook a wide range of activities in pursuit of the Society's charitable objectives. It is therefore necessary to have budgets and clearly written policies about what activities will be funded and how, and to communicate these clearly to all involved.

The Finance Board considers quarterly management accounts at its meetings through the year, with a narrative provided by the Honorary Treasurer and Executive Director, as appropriate. The narrative focuses on reasons for variation against budget. During 2016 the Finance Board agreed to improve the format of the management accounts by introducing year to date as well as full year actual and budget figures. The quarterly management accounts are also circulated to budget holders.

Annual budgets for the following year are drawn up in the fourth quarter and are approved by Council at its meeting in December.

The BES has a set of Financial Regulations, which must be followed. These Regulations are reviewed annually by the Finance Board and a significant update occurred during 2016 including changes to the way in which payments are authorised, and placing orders for goods and services, ensuring the BES is following current good practice.

In 2016 £0.34M (10% of resources expended) was given away in grants. This substantive sum requires careful management by the Society. Applications are reviewed against specific, published criteria. A Peer Review College reviews grant applications, scoring and commenting on them. Using a Peer Review College ensures that the Society uses the most appropriately experienced reviewers for each grant application. The only exception to this is the Travel & Training Grant scheme, applications to which are reviewed by BES staff and awards are made if the applicant meets the published criteria and there are sufficient funds available.

2.4.2 Investment Policy and Performance

The listed investments held by the BES and managed by Barclays Wealth were worth £5.3M in 2016 and their performance is in-line with appropriate benchmarks. The investment managers produce a quarterly summary of performance for the Honorary Treasurer and Executive Director. The investment managers attend one meeting of the Finance Board a year to discuss performance and general strategy. Day to day investment decisions are delegated to Barclays Wealth in accordance with the agreed mandate. The BES has spread its risk as far as practicable by part owning its headquarters building and holding some of its reserves in long-term deposit accounts as well as in equities, bonds and trust funds.

We have continued to use the services of the Ethical Investment Research Service (EIRIS) to provide us with information, based on a long list of criteria and a scoring system, on the environmental performance of FTSE listed companies. This information is updated twice annually and is used to screen out companies with the worst environmental records and policies from our portfolio. This gives a more objective and consistent basis for excluding companies. Full details are available from the Honorary Treasurer or the BES Office. A policy of this sort is consistent with the ethos of the BES and is important to maintaining the support of members and the wider ecological research community.

2.4.3 Financial Performance

The accounts show a surplus of £0.48M (surplus of £0.55M in 2015) before net gains on investments of £0.51M (gains of £0.02M in 2015). Total funds of the Society were £9.6M at the end of 2016 (£8.6M at the end of 2015).

2.4.4 Reserves Policy

The Society holds reserves for three purposes.

The first is to act as a buffer against uncertainties over future journal publishing income and generate income for its operational needs. This is held as an expendable endowment and stands at £5.5M (£5.0M in 2015). Continuing concern over the stability of academic publishing pricing models suggests that there is significant insecurity over this very significant source of income for the Society. In addition, the Society has a high level of commitment to its current expenditure levels in the short and medium term. Significant uncertainty over most of the income combined with a high commitment to expenditure represents a major risk to the organisation. The Society is using the expendable endowment fund to gradually accumulate reserves so as to provide greater long-term stability without affecting its day-to-day activities. It is the Trustees' intention to build this and other designated funds for this purpose to approximately £10M. The income from this sum will help to mitigate the possible future decline in publishing income, allowing the Society to continue its work, and provide funds to invest in future income-generating projects. It also enables the Society to take a planned approach to reducing expenditure should income levels drop significantly.

The second purpose for holding reserves is to set aside funds for specific major projects. The 2015 – 2019 Strategic Plan includes significant investment in activities across the Society (e.g., an expansion of the publishing portfolio). Returns on investments held by the Society will be required to part fund a number of the new activities contained in the Strategic Plan.

The third is to ensure that the BES can meet its operational needs and working capital requirements (the free reserve). The general funds are currently £1.4M and represent approximately 5.8 months operating costs, excluding third party operating costs and grants. The Society aims to hold between 3 and 6 months operating costs as free reserves.

The designated tangible fixed asset fund comprises the net book value of fixed assets held by the Society, principally the Society's offices in London, and as such it is not available to meet the general running costs of the Society.

The level of reserves and the Society's financial strategy is regularly reviewed and monitored by the Trustees. The reserves policy is reviewed annually at the Finance Board meeting in September and any recommended changes are considered by Council in December of that year.

2.4.5 Principal Risks and Uncertainties

The BES has a risk register. It is reviewed in detail each spring by the BES Committees and then approved by Council in June. The risk register identifies areas of risk, ranks them in priority ordered according to impact multiplied by probability, states who or which Committee is responsible for each risk, states how the risk is currently mitigated and what actions remain outstanding.

Some of the major risk areas are: **A major loss in income from journals** resulting from a change in publication models or a decrease in impact factor. Income from journals is a very significant proportion of the Society's funds. There is continued uncertainty regarding publications models and the timeframe in which this might happen. This risk is being mitigated in a variety of ways. We have a reserves policy that would provide a sufficient buffer to allow a gradual scaling back of the Society's financial commitments if income dropped. The Society has a Head of Publishing to deliver effective and efficient journal management and to ensure that the Society keeps abreast of the latest developments in journal publishing. We diversified our journals' portfolio to include an Open Access journal, Ecology and Evolution, by partnering with Wiley. This brings very useful expertise and understanding into the BES on how to run an Open Access title. Each journal has a strategic plan identifying ways in which it can increase its reputation and standing. In addition, in 2014, we developed a detailed publications strategy closely aligned with the Society's overall strategic plan that provides a long term vision of growth and development for the journals' portfolio. This strategy is reviewed annually.

A failure to diversity income sources: Publications make up 83% of the Society's income. To mitigate the risk of a fall in publishing income we not only invest in our publications but we have started to take steps to diversify our income streams. In 2016 we recruited and employed a Fundraising and Development Manager to help achieve our objective of doubling non-publications between 2015 and 2019. Our investment portfolio produces a significant return each year and Charles Darwin House 2 also provides rental income.

A sustained decline in membership: The Society's Membership Committee receives regular reporting on membership numbers and trends. Council regularly discusses the role of learned societies such as the BES in the 21st century and reviews the activities of the organization to ensure we provide excellent services that are wanted and needed by the ecological community. The BES continues to work on the challenge of recruiting new members and turning them into long-term supporters of the Society. A decline in membership is important for reputation and representational reasons, not financial ones.

2.4.6 Fundraising Policy

During 2016 the BES developed its framework for fundraising by developing a fundraising policy following the Charity Commission's CC20 *"Charity Fundraising: A Guide to trustee duties"*.

Our guiding principles are that we always:

- Protect personal data and confidentiality;
- Treat donors courteously and fairly;
- Respond promptly to donor queries or complaints.

We will never:

- Share donor details with another charity for the purposes of their fundraising;
- Telephone to ask for a donation unless donors have specifically asked us to do so;
- Bombard donors with emails;
- Pass donor personal data to a third party such as a commercial partners or publishers unless we have been given explicit consent to do so.

Our full fundraising policy is available from the BES office.

3. THE SOCIETY'S ENVIRONMENTAL IMPACT

The purchase a new office for the Society in 2009 offered an unprecedented opportunity for the Society to lead the way with regards to reducing our environmental impact. Discussions with the other learned organisations lead to agreement that we should aim for a BREEAM rating of Excellent, the second highest possible rating and a tough objective for a building designed and built in 1959. BREEAM is a method of calculating the environmental impact of a building. The aim of achieving the BREEAM Excellent rating was made fundamental to the refurbishment project and had a major influence on decisions ranging from how to run recycling onsite during the demolition stage through to the choice of mechanical and engineering solutions, selection of the final fixtures and fittings, and the development of a staff transport plan. We were delighted to achieve a BREEAM Excellent rating in 2010. The refurbishment of the second building represents the same opportunity and we are again achieved a BREEAM Excellent rating.

The move to Charles Darwin House has created a new base line for resource consumption from 2010 onwards, although the increase in occupancy of the office floors to rent during 2010 and into 2011, the second phase of construction in 2010, the significant increase in the use of the conference suite over this time period and a significant increase in the number of staff working at CDH in have influenced electricity consumption. The drop in energy use in 2015 and through 2016 is most likely a result of a decrease in the number of people working in CDH1 as tenants moved to the new CDH2 building during the year.

YEAR	ENERGY CONSUMPTION AT CDH1
2010	391,352 kWh
2011	372,939 kWh
2012	394,633 kWh
2013	407,474 kWh
2014	441,169 kWh
2015	414,437 kWh
2016	383,667 kWh

4. FUTURE DEVELOPMENTS

Details of some of the wide range of activities planned for 2017 are given under the headings of the Society's principal aims. The 2015 – 2019 Strategic Plan has provided an exciting and challenging framework for our activities as the Society moves into its second century. As we approach the mid-point of that strategy we will be spending some time looking at it again to make sure that our strategic objectives are still relevant and appropriate given the changing environment we operate in. During 2017 we will continue to look at the potential for expansion of our publishing portfolio with plans to launch a new service, Applied Ecological Resources, and to develop proposals for other new titles. We will be extending our international activities with our Joint Annual Meeting in Ghent, Belgium alongside the Gesellschaft für Ökologie and NecoV in association with the European Ecological Federation. We will be developing our support for mid-career ecologists by expanding our successful grant-writing retreat. The challenges and opportunities presented by Brexit will be a significant strand of work for the policy team and we will be organising two Symposia meetings. We will continue to develop our equality and diversity work to ensure that ecology is open and welcoming to people for diverse backgrounds. In 2017 we will be reviewing our governance structures to make sure they provide the right framework for the Society's activities.

The BES is planning a range of activities and events during 2017 so that we continue to make progress towards our vision of a world inspired, informed and influenced by ecology.

5. GOVERNANCE: CONSTITUTION, STRUCTURE AND MANAGEMENT OF THE SOCIETY

The BES is a company limited by guarantee (Registration no. 1522897) and has no share capital. As a registered charity (Registration no. 281213), it is governed by its Memorandum and Articles of Association.

Council is the supreme governing body of the BES. Council comprises the President, President- Elect or Past President, two Vice Presidents, Honorary Treasurer, Honorary Secretary, Chair of the Education and Careers Committee, Chair of the Meetings Committee, Chair of the Publications Committee, Chair of the Policy Committee, and 12 Ordinary Members. Council is responsible for nominating officer and chair posts and members of the Society are able to put themselves forward for these roles. Nomination for Ordinary Members is open to the whole membership. All members of Council are elected by the membership at the AGM. All newly appointed Trustees go through a process of induction, which fully briefs them about their roles, responsibilities and the BES. During their tenure trustees have the opportunity to have ongoing training, paid for by the Society, to help them fulfil their duties.

There are nine committees that report to Council. These committees cover specific areas of work such as education, meetings, publications, finance etc., and comprise Council members and, in most cases, ordinary members drawn from the Society's members.

The Society has a governance document that details the structure, terms of reference and membership of Council and its committees. A member of staff supports the work of each committee.

The 2015 – 2019 strategic plan for the Society provides an exciting and challenging framework for the Society's activities as it moves into its second century.

Remuneration of all staff, including key management personnel, is considered on an annual basis by the Society's Personnel Committee. The Personnel Committee considers sector benchmarks when setting salaries.

6. TRUSTEES AND ADVISORS

MEMBERS OF COUNCIL

C Banks-Leite	Appointed December 2016
R Bardgett	Appointed December 2016
P Brotherton	
Y Buckley	
Z Davies	
M Eichhorn	
T Ezard	Appointed December 2016
W Gosling	
Diana Gilbert	
A Gray	Resigned December 2016
R Hails	
S Hartley	
Jane Hill	
Nina Hautekèete	
O Lewis	Resigned December 2016
M O'Callaghan	Resigned December 2016
A Pullin	
D Purves	Resigned December 2016
H Roy	Appointed December 2016
E Sayer	Resigned December 2016
Dawn Scott	
I Stott	
W Sutherland	Resigned December 2016
P Thomas	Appointed December 2016
L Turnbull	
A Vanbergen	
J Vickery	

EXECUTIVE DIRECTOR

H Norman

PRINCIPAL ADDRESS

Charles Darwin House
12 Roger Street
London WC1N 2JU

AUDITORS

haysmacintyre
26 Red Lion Square
London
WC1R 4AG

BANKERS

Barclays Bank plc
Leicester
LE87 2BB

SOLICITORS

Stone King LLP
Boundary House
91 Charterhouse Street
London, EC1M 6HR

INVESTMENT ADVISORS

Barclays Wealth
Charity Investments Team
15th Floor
1 Churchill Place
London E14 5HP

OFFICE BEARERS

President	S Hartley
President Elect	Richard Bardgett Appointed December 2016
Vice President	R Hails
Vice President	A Pullin
Hon. Secretary	A Vanbergen
Hon. Treasurer	T Ezard Appointed December 2016

CHAIRPERSONS OF STANDING COMMITTEES (AS AT DATE OF THIS REPORT)

Finance Board	T Ezard
Management Board	S Hartley
Education & Careers Committee	W Gosling
Grants Committee	R Hails
Meetings Committee	Z Davies
Membership Committee	A Pullin
Personnel Committee	A Vanbergen
Policy Committee	J Vickery
Publications Committee	J Hill

7. COUNCIL'S RESPONSIBILITIES

The Council of the BES (the Trustees and directors) are responsible for preparing the Annual Report and the financial statements in accordance with applicable law and regulations.

Company law requires the Council to prepare financial statements for each financial year. Under that law the Council have elected to prepare the financial statements in accordance with United Kingdom Generally Accepted Accounting Practice (United Kingdom Accounting Standards and applicable law). The financial statements are required by law to give a true and fair view of the state of affairs of the company and of the surplus or deficit of the company for that period. In preparing these financial statements, the Council are required to:

- select suitable accounting policies and then apply them consistently;
- observe the methods and principles in the Charities SORP';
- make judgements and estimates that are reasonable and prudent;
- state whether applicable UK Accounting Standards have been followed, subject to any material departures disclosed and explained in the financial statements;
- prepare the financial statements on the going concern basis unless it is inappropriate to presume that the Company will continue in business.

The Council is responsible for keeping proper accounting records that disclose with reasonable accuracy at any time the financial position of the British Ecological Society (BES) and enable them to ensure that the accounts comply with the Companies Act 2006. They are also responsible for safeguarding the assets of the BES and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities.

Statement of disclosure to auditors:

- so far as the directors are aware, there is no relevant audit information of which the company's auditors are unaware; and
- they have taken all the steps that they ought to have taken as directors in order to make themselves aware of any relevant audit information and to establish that the company's auditors are aware of that information.

This report has been prepared in accordance with the provisions applicable to entities subject to the small companies' regime.

8. AUDITORS

During the year the BES appointed haysmacintyre as auditors.

This report was approved by the Council on 21 June 2017.

Professor Susan Hartley
Member of the Council

INDEPENDENT AUDITOR'S REPORT

to the Members of the British Ecological Society

We have audited the financial statements of British Ecological Society for the year ended 31 December 2016, which comprise the Statement of Financial Activities, the Balance Sheet, the Cash flow Statement and the related notes. The financial reporting framework that has been applied in their preparation is applicable law and United Kingdom Accounting Standards including Financial Reporting Standard 102 *The Financial Reporting Standard applicable in the UK and Republic of Ireland* (United Kingdom Generally Accepted Accounting Practice).

This report is made solely to the charitable company's Members, as a body, in accordance with Chapter 3 of Part 16 of the Companies Act 2006. Our audit work has been undertaken so that we might state to the charitable company's members those matters we are required to state to them in an Auditor's Report and for no other purpose. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the charitable company and its Members, as a body, for our audit work, for this report, or for the opinion we have formed.

Respective responsibilities of Trustees and auditor

As explained more fully in the Trustees' Responsibilities Statement, the Trustees (who are also the directors of the charitable company for the purposes of company law) are responsible for the preparation of the financial statements and for being satisfied that they give a true and fair view.

We have been appointed auditor under the Companies Act 2006. Our responsibility is to audit and express an opinion on the financial statements in accordance with applicable law and International Standards on Auditing (UK and Ireland). Those standards require us to comply with the Auditing Practices Board's (APB's) Ethical Standards for Auditors.

Scope of the audit of the financial statements

A description of the scope of an audit of financial statements is provided on the Financial Reporting Council's website at www.frc.org.uk/auditscopeukprivate.

Opinion on financial statements

In our opinion the financial statements:

- give a true and fair view of the state of the charitable company's affairs as at 31 December 2016 and of the charitable company's net movement in funds including its income and expenditure, for the year then ended;
- have been properly prepared in accordance with United Kingdom Generally Accepted Accounting Practice; and
- have been prepared in accordance with the requirements of the Companies Act 2006.

Opinion on other matters prescribed by the Companies Act 2006

In our opinion, based on the work undertaken in the course of the audit:

- The information given in the Trustees' Annual Report (which incorporates the directors' report) for the financial year for which the financial statements are prepared is consistent with the financial statements; and
- The Trustees' Annual Report (which incorporates the directors' report) has been prepared in accordance with applicable legal requirements.

In the light of our knowledge and understanding of the charitable company and its environment obtained in the course of the audit, we have not identified material misstatements in the Trustees' Annual Report (which incorporates the directors' report).

Matters on which we are required to report by exception

We have nothing to report in respect of the following matters where the Companies Act 2006 requires us to report to you if, in our opinion:

- adequate accounting records have not been kept or returns adequate for our audit have not been received from branches not visited by us; or
- the financial statements are not in agreement with the accounting records and returns; or
- certain disclosures of Trustees' remuneration specified by law are not made; or
- we have not received all the information and explanations we require for our audit; or
- the Trustees were not entitled to prepare the financial statements in accordance with the small companies regime and to take advantage of the small companies' exemption from the requirement to prepare a Strategic Report or in preparing the Directors' Report.

Kathryn Burtonfor and on behalf of haysmacintyre
Chartered Accountants
Registered Auditors

26 Red Lion Square
London
WC1R 4AG

Date: 21 June 2017

STATEMENT OF FINANCIAL ACTIVITIES

Incorporating the income and expenditure account

For the year ended 31 December 2016

	Notes	Unrestricted £'000	Restricted £'000	Expendable Endowment	2016 £'000	Restated 2015 £'000
Income from						
Donations & Legacies		-	*5*	-	*5*	*10*
Other Trading Activities						
Investment income	2	13	-	115	128	131
Other income		53	-	-	53	10
		66	**5**	**115**	**186**	**151**
Incoming resources from charitable activities						
Publications		3,205	-	-	3,205	2,946
Income from conferences		421	-	-	421	368
Subscriptions		106	-	-	106	130
Total income		**3,798**	**5**	**115**	**3,918**	**3,595**
Expenditure						
Expenditure on raising funds						
Investment management fees		4	-	38	42	6
Expenditure on charitable activities						
Publications		1,551	-	-	1,551	1,464
Meetings		742	-	-	742	592
Research		331	-	-	331	266
Education		267	-	-	267	255
Policy		227	5	-	232	206
Bulletin and other services		279	-	-	279	256
Total expenditure	**3**	**3,401**	**5**	**38**	**3,444**	**3,045**
Net income before gains on investment		**397**	**-**	**77**	**474**	**550**
Net gains on investments	**9**	**51**	**-**	**458**	**509**	**20**
Net movement in funds in year		**448**	**-**	**535**	**983**	**570**
Fund balance brought forward		3,592	2	5,000	8,594	8,024
Fund balances carried forward	**13**	**4,040**	**2**	**5,535**	**9,577**	**8,594**

All of the above results derive from continuing activities. There are no gains and losses other than those disclosed above.
The accompanying notes form an integral part of these financial statements.

BALANCE SHEET

For the year ended 31 December 2016

	Notes	£'000	2016 £'000	£'000	2015 £'000
Fixed assets					
Tangible assets	8	2,652		2,704	
Investments	9	6,114		5,556	
			8,766		8,260
Current assets					
Debtors	11	935		665	
Cash on deposit and in hand		315		154	
		1,250		819	
Creditors: amounts falling due within one year	12	(439)		(485)	
Net current assets			811		334
Net assets			**9,577**		**8,594**
Represented by					
Unrestricted funds					
General fund			1,388		888
Designated – Tangible fixed assets fund			2,652		2,704
			4,040		3,592
Restricted fund			2		2
Expendable Endowment fund			5,535		5,000
	13		**9,577**		**8,594**

Included in the above reserves are unrealised gains of £789,842 (2015 gains £333,326).

The accompanying notes form an integral part of these financial statements.

The accounts on pages 21 to 35 were approved and authorised for issue by the Council on 21 June 2017 and signed on its behalf by

Professor Susan Hartley
Member of the Council

STATEMENT OF CASHFLOWS

For the year ended 31 December 2016

	£'000	2016 £'000	£'000	2015 £'000
Cash flow from operating activities				
Net (expenditure)/income				
	983		570	
Adjustments for:				
Interest income	(128)		(131)	
Depreciation	76		64	
(Increase)/Decrease in debtors	(270)		(24)	
(Decrease)/Increase in creditors	(46)		(5)	
Net cash provided by/(used in) operating activities		**615**		**474**
Cash flow from investing activities				
Purchase of tangible fixed assets	(24)		(306)	
Investment income – bank interest	128		131	
Purchase of investments	(2,327)		(1,359)	
Disposal of investments	2,278		713	
Gain/(Losses) on investments	(509)		(20)	
Net cash (used in) investing activities		**(454)**		**(841)**
Change in cash and cash equivalents in the year		**161**		**(367)**
Cash and cash equivalents at the beginning of the year		**154**		**521**
Cash and cash equivalents at the end of the year		**315**		**154**

The accompanying notes form an integral part of these financial statements.

NOTES TO THE ACCOUNTS

For the year ended 31 December 2016

1. ACCOUNTING POLICIES

a) Basis of accounting

The financial statements have been prepared in accordance with Accounting and Reporting by Charities: Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102) (effective 1 January 2015) – (Charities SORP (FRS 102)), the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102) and the Companies Act 2006. Assets and liabilities are initially recognised at historical cost or transaction value unless otherwise stated in the relevant accounting policy note(s).

The trustees have assessed whether the use of the going concern basis is appropriate and have considered possible events or conditions that might cast significant doubt on the ability of the charity to continue as a going concern. The trustees have made this assessment for a period of at least one year from the date of approval of the financial statements. In particular the trustees have considered the charities forecasts and projections and have taken account of pressures on donation and investment income. After making enquiries the trustees have concluded that there is a reasonable expectation that the charity has adequate resources to continue in operational existence for the foreseeable future. The charity therefore continues to adopt the going concern basis in preparing its financial statements.

b) Financial Instruments

The BES has elected to apply the provisions of Section 11 'Basic Financial Instruments' and Section 12 'Other Financial Instruments Issues' of FRS 102 to all of its financial instruments. Financial instruments are recognised in the Charity's balance sheet when the Charity becomes party to the contractual provisions of the instrument. Financial assets and liabilities are offset, with the net amounts presented in the financial statements, when there is a legally enforceable right to set off the recognised amounts and there is an intention to settle on a net basis or to realise the asset and settle the liability simultaneously. With the exceptions of prepayments and deferred income all other debtor and creditor balances are considered to be basic financial instruments under FRS 102.

c) Income

i) Subscriptions income:
All subscriptions income is accounted for in the period to which it relates. Subscriptions receipts in advance are recorded as deferred income.

ii) Other income:
All other income has been accounted for on a receivable basis.

d) Expenditure (including grants)

Expenditure is classified under the principal categories of charitable and other expenditure rather than the type of expense, in order to provide more useful information to users of the accounts.

Charitable activities comprise direct expenditure including direct staff costs attributable to the activity. Support costs have been allocated to activities based on the average staff time spent. Governance costs are those incurred in connection with the management of the Society's assets, organisational administration and compliance with constitutional and statutory requirements. Support costs are allocated on the basis of time spent on each activity.

Grants payable are charged in the year when the offer is conveyed to the recipient except in those cases where the offer is conditional, such grants being recognised as expenditure when the conditions attaching are fulfilled. Grants offered subject to conditions which have not been met at the year-end are noted as a commitment, but not accrued as expenditure.

e) Depreciation

Depreciation has been calculated to write off the cost of assets over their expected useful lives as follows:

Freehold property - 2% per annum on cost

Furniture, fixtures and equipment – 33% per annum on a straight line basis.

The Society's policy is to capitalise assets purchased over £1,000.

f) Investments

Investments are stated at market value. It is the BES's policy to keep valuations up to date such that when investments are sold there is no gain or loss arising. As a result the Statement of Financial Activities only includes those unrealised gains and losses arising from the revaluation of the investment portfolio throughout the year. Disclosure is made in note 9 of the difference between the historical cost and the sale proceeds of the investments sold during the year.

g) Foreign currencies

Monetary assets and liabilities denominated in a foreign currency are translated into sterling at the exchange rate ruling on the Balance Sheet date.

Transactions in foreign currencies are recorded at the rate of exchange prevailing at the date of transaction.

All exchange differences are taken to the statement of financial activities.

h) Operating lease

Rentals payable under operating leases are charged against income on a straight line basis over the lease term.

i) Pensions

BES operates defined contribution pension arrangements, the assets of which are held separately from those of the BES in independently administered funds. Contributions are charged to the income and expenditure account as they become payable.

j) Fund accounting

General funds comprise the accumulated surplus or deficit and are available for use at the discretion of the Council in furtherance of the general objectives of the BES.

Restricted funds are funds subject to specific restrictive covenants imposed by donors or by the purpose of the appeal.

Designated funds comprise funds which have been set aside at the discretion of the Council for specific purposes.

All income and expenditure of the BES has been included in the Statement of Financial Activities.

k) Employee benefits

The costs of short-term employee benefits are recognised as a liability and an expense, unless those costs are required to be recognised as part of the cost of stock or fixed assets.

The cost of any unused holiday entitlement is recognised in the period in which the employee's services are received.

Termination benefits are recognised immediately as an expense when the company is demonstrably committed to terminate the employment of an employee or to provide termination benefits.

l) Debtors

Trade and other debtors are recognised at the settlement amount due after any trade discount offered. Prepayments are valued at the amount prepaid net of any trade discounts due.

m) Cash at bank and in hand

Cash at bank and cash in hand includes cash and short term highly liquid investments.

n) Creditors

Creditors are recognised where the charity has a present obligation resulting from a past event that will probably result in the transfer of funds to a third party and the amount due to settle the obligation can be measured or estimated reliably. Creditors and provisions are normally recognised at their settlement amount after allowing for any trade discounts due.

o) Judgements and estimates

Judgements made by the Trustee, in the application of these accounting policies that have significant effect on the financial statements and estimates with a significant risk of material adjustment in the next year are deemed to be in relation to the valuation of investments and are discussed above.

2. INVESTMENT INCOME

	2016 £'000	2015 £'000
Income from listed investments	123	110
Interest receivable	5	21
	128	**131**

3. ANALYSIS OF TOTAL RESOURCES EXPENDED

	Direct Staff Costs £'000	Other Direct Costs £'000	Support Costs £'000	TOTAL 2016 £'000	TOTAL 2015 £'000
Cost of Generating Income	38	4	-	42	6
Bulletin & Other services	98	40	141	279	256
Publications	396	941	214	1,551	1,464
Meetings	81	599	62	742	592
Research	19	302	10	331	266
Education	101	94	72	267	255
Policy	99	67	66	232	206
	832	**2,047**	**565**	**3,444**	**3,045**

Support Costs

	2016 £'000	2015 £'000
Governance Costs		
Governance staff costs	8	8
Audit Fee	9	6
	17	**14**
Other Support Costs		
Support staff costs	53	46
Non salary staff costs	55	36
Property	63	58
IT costs	57	25
Venue Costs	9	8
Publicity	15	15
Fees / Affiliations	47	48
Office running costs	37	41
Depreciation	76	64
Bulletin	68	78
Outsourced finance & payroll	32	29
Legal & Consultancy	9	14
Website	-	2
Bank charges	27	36
	565	**514**

*Support costs are allocated on the basis of time spent on each activity.

4. GRANTS

Grant commitments are as follows:

	2016 £'000	2015 £'000
Grant commitments at 1 January	125	235
Awards made during year	343	282
Payments made during the year	(279)	(392)
Grant commitments at 31 December	**189**	**125**

Details of significant grant awards are detailed on the BES's website. The majority of grants awarded are to individuals. Grants to institutions are relatively few in number and low value.

5. NET INCOMING RESOURCES

is stated after charging:

	2016 £'000	2015 £'000
Depreciation	76	65
Auditor's remuneration		
audit services	9	6

Other than disclosed in note 15 members of Council did not receive any remuneration during the year. Expenses reimbursed to 13 (2015: 15) Members of Council in the year equalled £9,731 (2015: £10,588).

6. TAXATION

The BES is a registered charity and as such its income and gains are exempt from corporation tax to the extent that they are applied to its charitable objectives. There is no corporation tax charge for the year.

7. EMPLOYEES

The actual number of employees during the year was 21.1 (2015: 20.4)

	2016	2015
Membership	1.5	1.5
Publishing	10.2	9.6
Conferences / Meetings	2.0	2.0
Research	0.4	0.4
Education	2.5	2.5
Policy	3.2	3.5
Governance	1.3	0.9
	21.1	**20.4**

	£'000	£'000
Staff costs during the year amounted to:		
Wages and salaries	749	684
Social security costs	77	72
Employer's pension contributions	45	42
Redundancy	22	-
	893	**798**

One (2015: one) employee earned £70,000-£79,999 during the year. The employer's pension contributions in respect of this employee during the year was £5,875.

The aggregate benefits including pension contributions of the key management personnel were £262,234 (2015: £248,555), the trustees were not remunerated for services to the charity.

During the year settlement agreements were paid of £21,854 (2015: £nil).

8. TANGIBLE FIXED ASSETS

Charity	Freehold property £'000	Furniture, fixtures and equipment £'000	Total £'000
Cost			
1 January 2016	2,888	97	2,985
Additions	17	7	24
31 December 2016	**2,905**	**104**	**3,009**
Depreciation			
1 January 2016	208	73	281
Charge for the year	58	18	76
31 December 2016	**266**	**91**	**357**
Net book value			
31 December 2016	**2,639**	**13**	**2,652**
31 December 2015	2,680	24	2,704

During 2009 the charity purchased a part share (36.1%) in the freehold 12 Roger Street as its new headquarters. It shares the ownership of the building with other biological focused charities and the property is held by a nominee company on trust for the Co-owners as tenants in common.

During 2011 the charity had disposed of 6.1% of the freehold in 12 Roger Street to the Society of Biology in accordance with the original plan to share the ownership of the building with other biological focused charities. This transaction resulted in a gain on disposal of £69,498.

During 2013 the Charity completed the purchase of a part share (21.1%) in the freehold property of 107 Grays Inn Road. As part of this transaction the Charity disposed of a part share of its interest in 12 Roger Street, reducing its interest in that property from 30% to 21.1%. It shares the ownership of the buildings with other biological focused charities and the property is held by Charles Darwin House Limited on trust for the Co-owners. This transaction resulted in a gain on disposal of £95,963.

9. INVESTMENTS

	2016 £'000	2015 £'000
Market value 1 January 2016	5,556	4,890
Additions	2,327	1,359
Disposals proceeds	(1,176)	(507)
Net investment gain	509	20
Movement in deposits	(1,102)	(206)
Market value 31 December 2016	6,114	5,556
Historical cost at 31 December 2016	**5,325**	**5,223**
Accumulated unrealised gains based on historic cost at 31 December 2016	**789**	**333**
Realised gain in year based on historic cost	**456**	**31**
Represented by:		
UK equity shares	1,616	1,448
Overseas equities	2,708	1,414
UK fixed interest	318	250
Overseas fixed interest	196	182
UK Other	371	272
Overseas Other	117	100
Market value of listed investments	5,326	3,666
Investment in associated undertaking	-	-
Investment in subsidiary undertaking	-	-
Amounts held in cash	788	1,890
Total	**6,114**	**5,556**

10. SUBSIDIARY UNDERTAKINGS

The BES holds 100% of the issued share capital of BES Trading Company Limited, a company registered in England and Wales. The sole activity of BES Trading Company Limited was to organise the 11th International Congress of Ecology in August 2013. At 31 December 2016 the Share Capital and net assets of BES Trading Company Limited amounted to £2 – (2014 £2).

During 2009 the BES acquired 36.1% of Charles Darwin House Limited, a company set up to manage the building. During 2011 shares representing 6.1% were disposed of leaving a remaining interest of 30.0%. During 2013 shares representing 8.9% were disposed of leaving a remaining interest of 21.1%.

At 30 June 2016 the net assets according to the financial statements were £1,000.

	2016 £'000	2015 £'000
Income and Expenditure:		
Turnover	-	-
Cost of sales	-	-
Gross profit	-	-
Interest Received	-	-
Net result	-	-
Balance Sheet:		
Net result	-	-

11. DEBTORS

	2016 £'000	2015 £'000
Trade debtors	554	475
Other debtors	14	49
Prepayments and accrued income	326	133
VAT Refund	41	8
	935	**665**

12. CREDITORS: AMOUNTS FALLING DUE WITHIN ONE YEAR

	2016 £'000	2015 £'000
Trade creditors	151	268
Social security & other taxes	24	21
Other creditors	2	6
Accruals and deferred income	73	65
Grants payable (note 4)	189	125
	439	**485**

Movement in deferred income

	2016 £'000	2015 £'000
As at 1 January 2016	30	35
Released in year	(30)	(35)
Deferred in year	40	30
As at 31 December 2016	**40**	**30**

13. MOVEMENT IN FUNDS

2016

	Fund balances brought forward 1/1/2016 £'000	Income £'000	Expenditure £'000	Net gains on Investment Assets £'000	Transfers £'000	Fund Balances Carried Forward 31/12/2016 £'000
Restricted						
Alex S Watt Breckland Research Trust	2	-	-	-	-	2
Policy Assistant Fund	-	5	(5)	-	-	-
Total restricted funds	**2**	**5**	**(5)**	**-**	**-**	**2**
Unrestricted funds						
General	888	3,798	(3,400)	50	52	1,388
Tangible fixed asset fund	2,704	-	-	-	(52)	2,652
Total unrestricted funds	**3,592**	**3,798**	**(3,400)**	**50**	**-**	**4,040**
Expendable Endowment Funds	**5,000**	**115**	**(38)**	**458**	**-**	**5,535**
Total Funds	**8,594**	**3,918**	**(3,443)**	**508**	**-**	**9,577**

Designated

Tangible fixed asset fund

Represents the net book value of tangible fixed assets in use by the Society and therefore not available to the Council to meet future expenditure. A transfer is made each year to reflect the change in net book value.

Restricted

Restricted funds of £1,985 at 31 December 2016 are represented by cash on deposit (2015 – £1,985).

Alex S Watt Breckland Research Trust

Funds administered by the BES in the memory of Alex Watt to provide funding for small scale research projects aimed to enhance our understanding of the conservation of the Breckland Region.

Policy Assistant Fund

Restricted donation to support a staff member to work in the policy area. The staff member was appointed in February 2013.

The Society holds €33,580 (2015 €36,996) on behalf of the European Ecological Foundation. This balance does not form part of these accounts.

Endowment

Expendable endowment funds of £5,535k at 31 December 2016 are represented by investment (2015 – £5,000k).

Expendable Endowment fund

Represents the value of investments that the Trustees believe they need to hold, to protect income in the longer term, in order to ensure that the society can carry out its mission and thrive. The Trustees believe the fund should be £10,000,000 in order to provide sufficient long-term income. This is because most of the society's income is from academic publishing, the profitability of which is widely expected to begin to decline significantly within the next few years. The society has just begun formal long-term financial modelling to assess the balance of income expenditure against the risk of future income declines.

2015

	Fund balances brought forward 1/1/2015 £'000	Income £'000	Expenditure £'000	Net gains on Investment Assets £'000	Transfers £'000	Fund Balances Carried Forward 31/12/2015 £'000
Restricted						
Alex S Watt Breckland Research Trust	2	-	-	-	-	2
Policy Assistant Fund	-	10	(10)	-	-	-
Total restricted funds	**2**	**10**	**(10)**	**-**	**-**	**2**
Unrestricted funds						
General	560	3,585	(3,035)	20	(242)	888
Tangible fixed asset fund	2,462	-	-	-	242	2,704
Total unrestricted funds	**3,022**	**3,585**	**(3,035)**	**20**	**-**	**3,592**
Expendable Endowment Funds	**5,000**	**-**	**-**	**-**	**-**	**5,000**
Total Funds	**8,024**	**3,595**	**(3,045)**	**20**	**-**	**8,594**

Restricted Income in the year to 31 December 2015 of £10,000 relates to donations and legacies. Expenditure of £10,000 was in relation to Policy.

14. ANALYSIS OF NET ASSETS BETWEEN FUNDS

2016

	General £'000	Designated £'000	Restricted £'000	Endowment £'000	2016 Total £'000	2016 Total £'000
Tangible assets	-	2,652	-	-	2,652	2,704
Investments	579	-	-	5,535	6,114	5,556
Net current assets / liabilities	809	-	2	-	811	334
Net assets	**1,388**	**2,652**	**2**	**5,535**	**9,577**	**8,594**

15 RELATED PARTY TRANSACTIONS

No transactions have taken place with either Members or Senior Management Team. It is the policy of the BES that Committee members who have an interest in any grant awarding decisions must leave the room at the time the awarding decision is made.

Emma Sayer – the existing assistant editor of the *Bulletin*, was appointed as a trustee in the prior year. She continued to be paid at the fixed rate and has received £3,730 (2015 £1,513) in the year. She has received no remuneration in her capacity as a trustee.

16 THE GEORGE JACKSON ESTATE

As part of the George Jackson bequest the Society was left as residuary beneficiary of a revisionary bequest. The property passes to the Society upon the death of the life interest. Because of the uncertainty as to value and timing the value of the property is not included with these financial statements.

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: Tom Ezard
T.Ezard@soton.ac.uk

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

Journal of Applied Ecology: Edited by Jos Barlow (Executive Editor), Michael Bode, Nathalie Pettorelli, Phil Stephens and Martin Nuñez, with Erika Newton and Alice Plane
Email: admin@journalofappliedecology

Functional Ecology: 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, Jana Vamosi and Lee Hsiang Liow, 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

Movement Ecology: Luca Borger
l.borger@swansea.ac.uk

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

Teaching and Learning: Lesley Batty
beslearning@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

Events Manager: Amy Everard
Email: amy@britishecologicalsociety.org

Grants and Events Officer: Siri McDonnell
Email: siri@britishecologicalsociety.org

Membership Manager: Helen Peri
Email: helen@britishecologicalsociety.org

Membership and Support Assistant: Phoebe Johnston
Email: phoebe@@britishecologicalsociety.org

Fundraising and Development Manager: Paul Bower
Email: paul@britishecologicalsociety.org

External Affairs Manager: Karen Devine
Email: karen@britishecologicalsociety.org

Education Officer: Amy Padfield
Email: amyp@britishecologicalsociety.org

Policy Manager: Ben Connor
Email: ben@britishecologicalsociety.org

Senior Policy Officer: Camilla Morrison-Bell
Email: camilla@britishecologicalsociety.org

Press Officer: Sabrina Weiss
Email: sabrina@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: Kirsty Lucas
Email: kirsty@britishecologicalsociety.org

Assistant Editor, Ecological Reviews: Kate Harrison
Email: kate@britishecologicalsociety.org

LOOKING BACK

An example of long-term recording in Lady Park Wood…

The recording team of Jonathan Spencer and Susan Peterken measuring a small leaved lime on 6 March 1984 (left). By 15 March 2016 (right), 32 years later, the lime had grown from 97cmGBH to 140cm; developed substantial low branches from the trunk; and fractionally increased its angle of lean. The ivy died between 1986 and 1992. The recorders, of course, have hardly changed, though Jonathan has been able to afford a new anorak and boots.

The project was proposed by the Forestry Commission in 1938 and has been implemented by Oxford University and the Nature Conservancy (and successors) with Forestry Commission support. For more about Lady Park Wood, see the article by George Peterken in this issue.