

THE BULLETIN



BRITISH
ECOLOGICAL
SOCIETY

InFOCUS

Stromatolites are layered mounds resulting from the accretion of sedimentary grains by microbial mats of microorganisms, notably cyanobacteria. They are a major constituent of the early fossil record and fossil forms have been known to exist for over 3 billion years. Modern stromatolites are found mostly in hypersaline lakes where extreme conditions limit animal grazing. This group is in Lake Thetis, Western Australia.
© Alan Crowden

CONTENTS

DECEMBER 2017

OFFICERS AND COUNCIL FOR THE YEAR 2016-17

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

ORDINARY MEMBERS OF COUNCIL

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

Bulletin Editor: Alan Crowden
48 Thornton Close, Girton,
Cambridge CB3 0NG
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.

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

REGULARS

Welcome Alan Crowden.....	4
President's Piece Sue Hartley	5
The 25 Year Plan for the Environment: worth the wait? Ben Connor.....	8
The 12th INTECOL Congress John Grace.....	10
The Macroecology of Alien Species: A Successful BES Symposium in Sunny Durham	12
Special Interest Group News.....	16

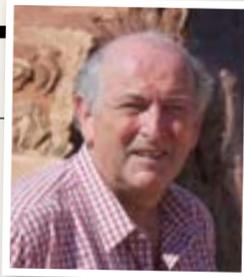
Six societies, two events, and a whole lot of coffee Jennifer Freer.....	26
Of Interest to Members	28
The Chartered Institute of Ecology and Environmental Management Sally Hayns.....	50
Peer Review: What Does it Mean to You? The Publications Team	52
Publications News The Publications Team.....	56
Book Reviews.....	58

FEATURES

Ecological Stewardship and Sloganism in the Anthropocene Peter Bridgewater.....	30
The Use of Research in the UK Parliament: lessons for conservation scientists David Christian Rose.....	32
What Happens When Opera Meets Science Outreach? Ruth Mariner.....	36
The Uplands – Onwards and Upwards Darren Evans, Camilla Morrison-Bell Davy McCracken and Des Thompson.....	44
On Wine Tasting and Ecology John Wiens.....	48

WELCOME

GOOD NEWS FROM GHENT



Alan Crowden | Editor | bulletin@britishecologicalsociety.org

You might expect me to open this issue with a plug for our forthcoming Annual Meeting in Ghent. But you've beaten me to it. As we begin production of the issue in October, the meeting is sold out, full to capacity, bursting at the seams. Obviously, we are sorry for those who left it too late and who will miss out on the fun, but please participate and follow the proceedings via Twitter with #EAB2017. And of course, you'll read all about it in the next issue of the *Bulletin*.

Let's hope this issue will be some small consolation for those members who will not be in Belgium in the run up to Christmas. As ever, we begin with our President's Piece. Ever since Sue Hartley took up the reins and instituted her routine of finding an 'I' word to use as the theme of her piece, I have been fearful that sooner or later a contribution will begin 'If that blasted Bulletin Editor gives me one more deadline...' But it looks like I've got away with it, as this contribution is her last as President (p5). In common with her predecessors, Sue has been gracious in her response to nagging emails and the Society has continued to thrive and develop under her leadership.

There is encouraging news on the policy front, with Ben Connor reporting that there are positive signs around the development of a 25-year plan for the UK environment (p8). John Grace moves the focus on to ecology across the globe, with a report on this year's International Congress of Ecology in Beijing (p10). Closer to home, there is a bumper crop of reports from the Special Interest Groups (p16 onwards) while Jennifer Freer reports from the actual home of the BES, where a meeting was held on the topic of coffee, and probably cake (p26). Sally Hayns gives us news from the CIEEM, and as we round up the 'official' section of the issue with an update on the many activities and initiatives from our Publications team (p56).

There's another fascinating batch of features; Peter Bridgewater sets us off with a thought-provoking piece on land stewardship (p30), while David Christian Rose offers key messages for the conservation science community about how to engage with the UK Parliament effectively to improve the chances of evidence-informed policy (p32). Ruth Mariner tells us about a really adventurous example of science outreach (p36) and last, but not least Darren Evans and colleagues report on a gathering of uplands specialists that clearly set them all buzzing about challenges and opportunities for the future (p44).

Ever since the venue for this year's annual meeting was announced, I've had this notion that in my long-gone schooldays we read a poem that mentioned our meeting venue. Robert Browning told *How They Brought the Good News from Ghent to Aix* – nothing whatsoever to do with ecology but it somehow brings to mind aspects of a conference night out:

**And all I remember is, friends
flocking round**

**As I sat with his head 'twixt
my knees on the ground;**

**And no voice but was praising
this Roland of mine,**

**As I poured down his throat our
last measure of wine,**

**Which (the burgesses voted by
common consent)**

**Was no more than his due who
brought good news from Ghent.**

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.

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

PRESIDENT'S PIECE

SIGNING OFF!



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

I can hardly believe I'm writing my final President's Piece – the last 2 years have flown by! I thought I should take the opportunity to reflect on my time as President and look forward to the future. That's timely in another way as the Society is just completing a similar exercise: as it is the mid-point of our 5-year strategic plan, we have been conducting a "strategic refresh", reflecting on what has been achieved so far, considering what has changed in the internal and external environment since the plan was compiled, and reviewing the plan to ensure it continues to deliver our vision. As we look to the future, some of the objectives we set in 2015 may need to be amended, or even dropped altogether and replaced with new ones. I'm sure you will be hearing more about these developments as the review is completed under the expert guidance of our next President, Professor Richard Bardgett.

To support our future ambitions with income from a wider range of sources, we have appointed the Societies' first fundraising and development manager, Paul Bower. Paul is working hard to increase our income from exhibitions and sponsorship as well as legacies, donations and funders, to finance some of the initiatives in our strategic plan. Also thinking about the future, I instigated a review of our governance structures and decision-making processes, something which the BES has not done for many years, but which is needed if we are to deliver the exciting vision in our strategic plan. As the Society expands its staff, activities and ambition, it's important to ensure that whilst procedures remained robust, they are also sufficiently nimble to allow us to respond to future challenges effectively, as well as to capitalise on

emerging opportunities. Following a lot of thinking and discussion, particularly by the members of our Governance review working group, an independent expert in governance, and Hazel Norman our Executive Director, we produced recommendations which were then discussed and approved by Council and outlined in the last *Bulletin*. We also published them on the BES website and asked members to comment on the ideas – I hope some of you were able to do this, particularly as one of the key objectives of the Governance review was to increase the engagement with the membership!

But I haven't spent all my time on strategy and governance! In my first Presidents Piece, I reflected on the BES's vision for "a world inspired, informed and influenced by ecology" and suggested that as well as these 3 i-words, we should also think about some others as a Society: internationalisation, interdisciplinarity, impact, information, and innovation. So how are we doing on the i-word challenge?

Internationalisation is particularly important in these turbulent times – joining with our sister ecological societies to have a strong voice on global issues such as climate change is something I've been keen to champion, because studying, responding and addressing these global issues needs cross-border cooperation. As ecologists, we know that species don't respect borders and this year the Society isn't either! Join us at our annual meeting 'Ecology across borders' in Ghent, held jointly with GFÖ and NecoV, in association with EEF. It promises to be a fantastic meeting – our largest ever at 1500 delegates. We even had to close registration early to avoid exceeding

the venue capacity! We have also had our largest ever submission of abstracts, so well done to our Meetings team, led by Amy Everard and Zoe Davis, who are grappling with fitting them all into the programme, but it's a nice problem to have!

But the global perspective doesn't stop at Europe of course. We need to reach out beyond that and Hazel, Erika Newton and I, together with our past Presidents Bill Sutherland and John Grace, and one of our senior editors Mark Cadotte, represented the Society at the INTECOL Congress in Beijing in August. The theme was Ecology and Civilisation in a Changing World - there was a focus on how China's rapid economic development could be made more environmentally sustainable and it was inspiring to hear how Chinese ecologists are addressing this challenge and to learn about the recent drives to tackle pollution and protect biodiversity. It was also inspiring to meet the early career ecologists from around the globe who were able to come to Intecol thanks to sponsorship from the BES (more on INTECOL from John Grace on p010).

Hazel Norman and I recently attended a meeting with the Marsh Christian Trust at which they agreed to sponsor another award for the Society. I suggested the focus should be on supporting African ecologists and Council have approved a plan for this, developed by Hazel and supported by input from the Tropical Biological Association.

We have also made good progress on **interdisciplinarity**. It can be difficult to engage with other disciplines in meaningful ways, but again the need to rise to current global challenges is an important driver and we have joined

with the Marine Biological Association to host a workshop on “The marine environment after Brexit: the future for science and policy”. I hope that such collaborations to address topics where ecological science has a key role to play in generating the evidence-base for policy will be more frequent in future. Meanwhile, for those of you working in more interdisciplinary areas, we are in the later stages of an exciting new publishing project looking at the interactions of humans with other aspects of ecosystems. Watch out for an announcement on this early next year. As with most of our other journals, this is a joint venture with our publishers Wiley, and its great news that our new contract with them has just been signed – the Publications team led by Catherine Hill and Jane Hill (you don’t have to be called Hill but it clearly helps!) has done a fantastic job securing a very beneficial deal for the Society.

Clearly both those initiatives will contribute to our **impact** agenda, but our Policy team, led by Ben Connor and Juliet Vickery have been very active in a number of other ways. Brexit is taking up a lot of time and energy (for us, never mind the UK Government!), but it does offer the opportunity to think creatively and ambitiously about what, as ecologists, we would want from new UK environmental policies for our land and sea – can we secure better protection for biodiversity, a more integrated approach to the management of terrestrial and marine habitats, evidence-based consideration of ideas like rewilding, for example? The BES took the lead in making exactly that case in our presentation to the Department for Exiting the EU. The BES Brexit Policy Working Group, chaired by Nathalie Pettorelli, has been set up to provide additional support and advice to the BES policy team in this important area and to engage with the extensive expertise within the BES membership. For example, we recently ask you all for your ideas on the priorities for the design of a new agri-environment scheme to inform our policy brief on post-Brexit sustainable land management. We still know very little about what Brexit will eventually look like, but one thing that is clear is that that it has big implications for the devolved nations of the UK, Scotland, Wales and Northern Ireland. With

that in mind, Council have agreed the appointment of a Policy Officer based in Edinburgh to support the excellent work of the Scottish Policy Working group, chaired by Ruth Mitchell, and to help develop similar work in the other devolved nations.

Of course, a key way to have impact is to provide evidence-based **information** on ecological science to a range of audiences – vital in this era of “fake news”. We have been “speaking truth to power” in the UK Parliament: my oral and the BES’s written evidence to the House of Commons Environmental Audit Committee’s inquiry into *The Future of the Natural Environment after the EU Referendum* was cited 8 times in the final report, particularly with respect to the design of agri-environment schemes needing to be focussed on outcomes and the need for an improved evidence base for rewilding.

We don’t just speak to politicians! We are increasing our media profile with the appointment of a full-time press officer, Sabrina Weiss, who joins our External Affairs team led by Karen Devine. The team have held a number of public events, including one recently to celebrate International Coffee day (see p26), held at Charles Darwin House in collaboration with our co-owner societies (another tick for **interdisciplinarity!**). Led by our Public Engagement Officer, Jessica Bays, we had another successful Chelsea flower show – our stand “Delight in the Dark” demonstrated the huge range of adaptations plants have to shady environments. Celebrity guests Bill Bailey and Chris Evans were very impressed and we even caught the attention of the new Chief Executive of UK Research and Innovation, Professor Sir Mark Walport (a different sort of celebrity!!).

But underpinning all our activities as a Society is **innovation** – original and ground breaking ecological science is vital, for providing both a fundamental understanding of the natural world around us and the solutions to environmental challenges to benefit society. I will be highlighting my own attempts in this direction in my Presidential address in Ghent! But more seriously, it is ecological science that is at the

heart of all the Society does, and will continue to do – as we state in our strategic plan, our mission is to “generate, communicate and promote ecological knowledge and solutions”.

I have only got the space here to mention some of the great things the Society has been doing over the last two years and to thank a few of the people, both staff and volunteers, who’ve made those activities happen – I could fill the whole *Bulletin* but the editor had other ideas! I hope I have left the Society in a stronger position to face the challenges and opportunities of the future: we have a more modern governance structure, a secure financial base, but most beneficial of all, a talented, dedicated and enthusiastic staff that it has been a joy and a privilege to work with. I’m immensely grateful to them for all their hard work driving forward a number of new initiatives, in what has been quite a busy period for the Society, and they have made my 2 years as President hugely enjoyable. I hope Richard enjoys his time as President as much as I have – he is a wonderful choice as our next leader and I’m confident he will continue to move the Society forward in exciting and **influential** (there had to be an i-word!) ways.

There is one asset the Society has that I haven’t said much about yet, and it is in fact our greatest asset – you, the membership! Without the membership the Society can do nothing, so many thanks to you all for your expertise, engagement and support over the last 2 years. Our membership team, led by Richard English and Helen Peri, has been very successful and we now have well over 6000 members for the first time ever, 6,400 in fact, from 123 different countries, a fantastic achievement! Under the new governance structure there will be even more opportunities for our expanding membership to participate in the work of the Society through our various committee and activities, so I encourage you to get involved – it’s one of the most rewarding things you can do as an ecologist, take it from me! I hope to see as many of you as possible in Ghent to say hello (and goodbye!) over Belgian moulles, frites, chocolate and beer – not necessarily in that order!!!



Sue met recipients of BES travel grants during the INTECOL meeting in Beijing. Jean Willy Nduwimana (back to the camera) models a t-shirt he made to celebrate his award.

POLICY

THE 25 YEAR PLAN FOR THE ENVIRONMENT: WORTH THE WAIT?



Ben Connor | Policy Manager | ben@britishecologicalsociety.org

In their 2015 Election manifesto, the Conservatives promised that in government they would introduce “a 25 Year Plan to restore the UK’s biodiversity and to ensure that both public and private investment in the environment is directed where we need it most”¹.

Two years, two elections, three Secretaries of State and a vote to leave the European Union later, no such plan has been forthcoming. In the intervening period, England’s biodiversity and natural capital (as environmental policy is a devolved matter, the plan would be for England only, not the whole UK) has continued to decline².

... THE PLAN “HAS BEEN LONGER IN GESTATION THAN A BABY ELEPHANT”.

Recent events, however, suggest that this period of inertia is coming to an end. Now reframed as “a comprehensive 25 Year Environment Plan that will chart how we will improve our environment as we leave the European Union”³, the plan has gained a new lease of life. In a recent speech outlining his vision for a “Green Brexit”, Environment Secretary Michael Gove - while acknowledging that the plan “has been longer in gestation than a baby elephant” - affirmed his commitment

to its long-awaited publication. Mr Gove indicated that the plan should be “as ambitious as possible”, adopting a “rigorous methodology” to “setting goals and reporting success or failure”⁴.

THE NATURAL CAPITAL COMMITTEE: SETTING OUT THE AMBITION

To that end, it was encouraging that the Secretary of State’s first public step towards the development of the 25 Year Environment Plan was to commission the Natural Capital Committee (NCC) – an independent advisory committee of seven experts, including former BES President Professor Georgina Mace – to produce advice on what the plan should achieve and how it should do it. The Committee published their advice at the end of September 2017.⁵

The NCC have not been shy about facing up to what they call the “sheer urgency and scale of the task” - producing a comprehensive plan that can genuinely reverse the current

declining trend in the condition of our natural capital. They recommend that the plan must be based on four sound principles if it is to succeed. It should have: a clear vision for the environment in 25 years’ time, a set of actions and investments to deliver this vision, credible and measurable milestones, and robust governance to oversee implementation.

The NCC suggest twelve draft goals for the plan, which if adopted could represent a sea change in ambition for environmental policy in the UK; from ensuring that everyone breathes air that meets international health standards; to healthy, productive, sustainable soils; and a “net positive” contribution to the global environment. Their report is clear that these goals must be specific, measurable and regularly reviewed. The Committee’s recommended actions to help meet these goals are equally ambitious, including developing a national network of conservation areas, establishing new national parks, and securing a “natural capital net gain principle” within the planning system.

THE CHALLENGE OF BREXIT

By setting out the scale of action necessary to deliver on the Government’s ambition to leave the environment in a better state than it inherited it, the NCC’s advice has put the ball firmly in the Environment Secretary’s court, outlining a way of achieving the “Green Brexit” that Mr Gove desires. To what extent will this advice be heeded? For the Government to embark on such a comprehensive undertaking would be a major challenge even in ‘normal’ political times, but with the uncertainties of Brexit looming large over every policy decision, are the proposals for the 25 Year Environment Plan likely to come to fruition?

... THE BALL [IS] FIRMLY IN THE ENVIRONMENT SECRETARY’S COURT

There are two key challenges – and opportunities – that Brexit presents to the success of the plan. The first is agriculture. Roughly 70% of the UK’s land is farmed, and unless the replacement for the EU Common Agricultural Policy is aligned with the goals and the actions of the 25 Year Environment Plan, it is difficult to see how it could succeed. The NCC recommends shifting the UK’s system of agricultural support towards the delivery of public goods, where farmers are supported to invest in natural capital assets. This aligns with the BES’s previous suggestion that future support for sustainable land management should have a strong focus on delivering enhanced biodiversity and ecosystem services under a system that pays by results, securing public goods for public money⁶.

The second challenge is legislation and governance. As our recent submission to the House of Lords Natural Environment and Rural Communities Act Committee⁷ outlined, whilst the Government’s EU Withdrawal Bill promises to transfer EU law, including the wide range of environmental legislation, onto the UK statute book, the current approach

risks opening a “governance gap” if the enforcement and supervisory role currently played by EU institutions is lost and inadequately replaced. The NCC’s approach to this challenge would be to ensure that the 25 Year Environment Plan is given a legislative basis – currently not the Government’s favoured approach – and to give statutory responsibility to an independent scrutiny body which would report annually to Parliament on the plan’s progress.

A PLAN INFORMED BY ECOLOGICAL EVIDENCE

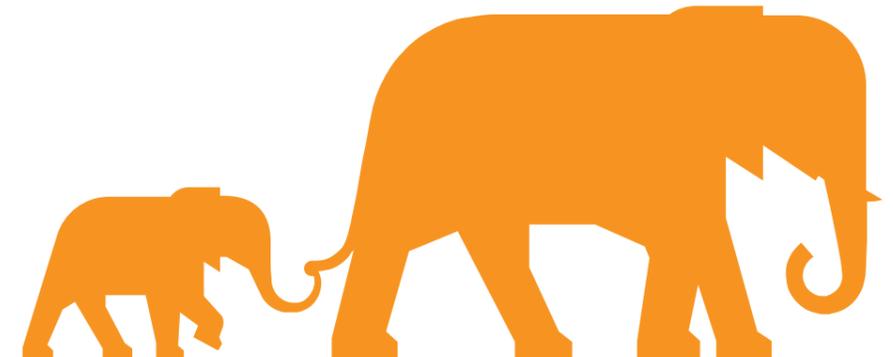
The next few months will be an important time for environmental policy in England as the 25 Year Environment Plan begins to take shape. Regardless of the course that the Government decides to take, robust scientific advice and evidence will be integral to the success of the plan, and the BES will be helping to ensure that this evidence is readily accessible.

Alongside our partners in the Natural Capital Initiative, we recently supported a workshop designed to tackle the question of what a goal for biodiversity within the 25 Year Environment Plan might need to look like in order to deliver a resilient ecological network: the conclusions and recommendations will be published soon. Similarly, as part of our aim to increase the flow of knowledge between science and policy, we recently appointed our first Policy Fellow, Deepa Senapathi, who will be working within Defra’s evidence team to help tackle some of their most pressing ecological questions.

REFERENCES

- ¹ <https://www.conservatives.com/manifesto2015>
- ² Hayhow, D.B. (2016) *State of Nature 2016*. The State of Nature partnership.
- ³ <https://www.conservatives.com/manifesto>
- ⁴ <https://www.gov.uk/government/speeches/the-unfrozen-moment-delivering-a-green-brex-it>
- ⁵ Natural Capital Committee (2017) *Advice to Government on the 25 Year Environment Plan*
- ⁶ British Ecological Society (2016) *The Future of the Natural Environment after the EU Referendum inquiry: a response from the British Ecological Society to the Environmental Audit Committee* <http://www.britishecologicalsociety.org/wp-content/uploads/2016/02/9.9.16-British-Ecological-Society-response-to-EAC-Brexit-Natural-Environment.pdf>
- ⁷ British Ecological Society (2017) *A response from the British Ecological Society to the House of Lords Select Committee on the Natural Environment and Rural Communities Act 2006*. <http://www.britishecologicalsociety.org/wp-content/uploads/2016/02/HoL-NERC-Act-Inquiry-11.9.17-Response-from-the-British-Ecological-Society.pdf>

AS WE LOOK AHEAD TO 2018, WE WILL BE ENGAGING FURTHER WITH THE DEVELOPMENT OF THE PLAN, AND PROVIDING OPPORTUNITIES FOR MEMBERS TO GET INVOLVED: WATCH THIS SPACE!



THE 12TH INTECOL CONGRESS

BEIJING, AUGUST 20-25 2017

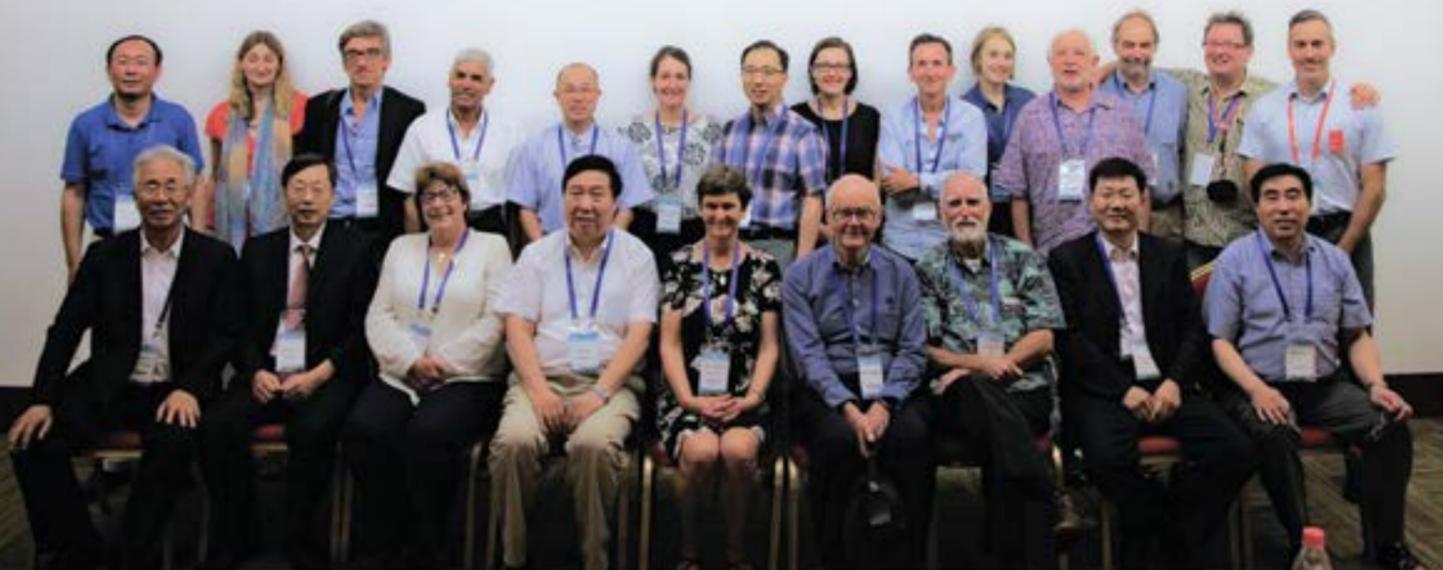
John Grace | University of Edinburgh | j.grace@ed.ac.uk

The INTECOL Congress is held but once in four years, and following the 11th Congress in London it was Beijing's turn in 2017. From all parts of the world, some 2580 participants converged on the vast complex that is the Chinese National Convention Centre, on the edge of the Olympic Park.

THE BOARD OF INTECOL

Upper row: Yonglong Lu (Co-Director, Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences), Hazel Norman (BES), Alberto Basset (President, European Ecological Federation), Azim Mallik, Shin-ichi Nakano, Amy Hahs (Vice president, Ecological Society of Australia), Jae Geun Kim (President, Ecological Society of Korea), Bek Christensen (University of Queensland, Australia), Bastiaan Ibelings (University of Geneva), Alice Hughes, Alan Covich, William Sutherland (University of Cambridge, UK), Bernd Markert, Marc Cadotte (University of Toronto-Scarborough, Executive Editor, Journal of Applied Ecology)

Front row: from left to right Eun-Shik Kim, Shirong Liu, Sue Hartley (President, BES), Bojie Fu, Shona Myers, John Grace, Eugene Turner, Chen Peng (China Green Foundation), Wenliang Wu (Vice President, ESC)



HRH the Prince of Wales addressed the opening session of the INTECOL Congress

For those who don't know, INTECOL was formed in 1967 as the international association of Ecological Societies, existing to promote ecology worldwide. Membership is open to Ecological Societies, but also to appropriate Institutions and individual ecologists.

The overall theme of the 2017 Congress was *Ecology and Civilization in a Changing World*, something that the Chinese government is taking very seriously in its current Five Year Plan. The Plan promises a move towards an eco-civilisation with emphasis on clean production, electric cars, forest cities and environmental monitoring.

The opening ceremony began with the dramatic appearance of HRH Prince Charles on the two huge screens in the auditorium. In a recorded message he spoke of the importance of ecology in a changing world, making several well-informed references to China, and wishing us well in our deliberations. For most of us, the highlights included the plenary talks. The keynote speakers came from ten countries (China, Japan, UK, Hungary, USA, South Africa, Peru, Canada, France and Switzerland), providing a truly international perspective, and assurance that ecology is alive and

well in all these countries. There were 74 scientific sessions, and with so many parallel sessions to choose from, most delegates were faced with hard decisions of where to go. Not only were there sessions with a focus on one's own discipline, but also many that were cross cutting, such as the one on 'ecology and art', and general interest sessions on topics like sustainable development, biodiversity, conservation, environmental and global change. And there were workshops on development of skills, targeting especially the younger researchers and practitioners. An important feature was the Conference Dinner, free with the Registration, which included eclectic stage performances to show Chinese culture at its very best (dance, opera, juggling, acrobatics).

There was much to see in Beijing, and many people took tours to the Great Wall, various temples, the Forbidden City or to the Beijing nightlife. Newcomers were taken aback by the ease with which one can nowadays explore Beijing, with its extensive and user-friendly Metro system. Yes, the air quality was poor on some days, but following a heavy rain the air became clean and I could

see the entire city from the top of the 440 metre Olympic tower.

The congress ended with the Beijing Declaration, prepared by the INTECOL Board. It concludes as follows:

The Earth is the only planet habitable for human life and it requires efficient, effective and wide ranging international cooperation and exchange to safeguard its ecological security and ensure sustainable development. We as ecologists, must work and engage across society to protect this planet and its ecological integrity. INTECOL as the world's network of ecology science, will strive to facilitate enhanced research collaboration and synergy with its members, and all national ecological societies at large.

The Chinese organising committee, ably led by Professor Shirong Liu for the Ecological Society of China, must be warmly congratulated for its work in bringing together so many and so much in this splendid setting. Everyone agreed the Congress had been a great success and the importance of INTECOL had been re-affirmed.

THE MACROECOLOGY OF ALIEN SPECIES: A SUCCESSFUL BES SYMPOSIUM IN SUNNY DURHAM

*Evening drinks at Durham Castle.
Sheer class.*



MEETING REPORT

Wayne Dawson | Durham University



Mixers: the starting point for any good symposium

Durham University played host to a 92-delegate strong symposium on the macroecology of alien species this July. This international symposium was organised by Wayne Dawson (Durham), Mark van Kleunen, Noëlie Maurel, Anke Stein (Konstanz), Franz Essl (Vienna), and Marten Winter (iDiv Centre, Leipzig), with invited speakers from across Europe, the USA and Canada, attracting delegates from the UK, continental Europe, South America and Australia.

The main goal of the symposium was to bring together macroecologists and invasion biologists, to synthesise and better understand the patterns, causes and consequences of moving species around the world beyond their historical ranges, across multiple taxonomic groups, regions and ecosystems. On the first day, talks included those describing global patterns and drivers of the richness of alien species and the databases we can use to explore them, with plants covered by Patrick Weigelt, birds by Ellie Dyer and Tim Blackburn, and freshwater fishes by Emili García-

Berthou. Isabella Capellini discussed her recent work exploring the role of propagule pressure and traits in explaining the global invasion success of alien vertebrates.

Hanno Seebens presented enlightening work on the spatiotemporal patterns of alien species accumulation across the globe for multiple taxa, while Dov Sax discussed the richness and homogenization of plants globally, with interesting insights from the horticultural trade. Helen Roy made a well-argued case for greater collaboration and data-sharing among invasion biologists, to better inform national and international policy and management decisions.

Further talks from delegates included using genomics to identify and quantify marine invasions (Steven Bourne, Marc Rius), studying the invasion risk of invertebrates on Sub-Antarctic islands (Melissa Houghton) and mapping global patterns of invasion and policy responses (Anna Turbelin). After a lively poster session,

delegates were treated to a sunny drinks reception in the courtyard of Durham's Castle, followed by a stunning dinner in the Great Hall and an alien species-themed quiz (won by Rob Tanner, with Zara Pattison as runner-up)!

While the first day largely covered the patterns of alien species introductions and invasions, the second was more focussed on causes and consequences of global biotic exchange. Yvonne Buckley kicked off the morning session by discussing her work on the biogeography of plant population performance, including the PlantPopNet (*Plantago lanceolata*) project. Jason Fridley gave a fascinating talk on the possibility that some regions become heavily invaded by plant species because the donor regions (like East Asia) have floras better adapted to environmental conditions in the recipient region (in this case Eastern North America), while the natives in the recipient region are maladapted due to past glaciation events. Jonathan Jeschke presented an interesting thesis of how we should best structure the plethora of hypotheses we have in invasion ecology, in order to better understand invasions, while Céline Bellard showed how she is using network analyses to identify clusters of islands globally that are most vulnerable to invasive species.

We then had a 2-hour workshop session designed to stimulate discussion around how we can fill data gaps on species introduction history, understudied taxonomic groups and regions; what does biotic homogenization mean for biodiversity conservation and evolution in the future; and how can alien species macroecology inform policy and management at local regional scales.

We wrapped up the symposium with three great talks: how we can strategically plan for invasions in the developing world, with a focus on Africa and crop pest invasions (Regan Early); strategies for controlling



The conference dinner...you gotta hope the screen at the front is displaying the menu and not more data slides

invasive alien species including pathogens, with a freshwater system focus (Alison Dunn); and Rob Colautti explored some of the remarkable ways in which invading species can undergo rapid evolution. Finally, we discussed the outcome of the workshop, and announced the winner of the poster prize (Adam Devenish, University of Bristol).

From my side, I greatly enjoyed organising and hosting this symposium – I felt that I learned a great deal about introduced and invasive species from a wide range of ecosystems and taxa that I had never really considered before. I hope all the delegates went away with a similar feeling - judging by the smiles and comments on Twitter (see #BESmas), I think at least some of them did. I look forward to catching up with some of the delegates in Ghent this December, hopefully at our social event for the newly-formed Invasion Science Special Interest Group!



Behind every successful meeting there is great organisation. Amy and Siri organise a selfie.

SPECIAL INTEREST GROUP NEWS

Announcing TWO New Special Interest Groups:

INVASION SCIENCE GROUP

Wayne Dawson and the SIG committee

We, the committee members, would like to introduce you to our brand-new Invasion Science SIG! The main goals of our SIG are to:

- 1) exchange knowledge in invasion science across taxonomic groups and ecosystems
- 2) increase interactions between research- and management-focused invasion science.

We aim to achieve these goals by hosting collaborative meetings and workshops that bring together different sectors of the invasion science community, and to establish links with other complementary SIGs. We are particularly keen to support students, early career scientists and people from diverse backgrounds. As a nascent SIG, we are very keen to talk to potential SIG members to find out what you would like the SIG to do. We are currently planning to have a launch meeting in late 2018/early 2019, but we will be organizing an informal social event on the Tuesday evening of the Ecology Across Borders Meeting in Ghent this December. So please do come along to sign up as a member, and to chat with us so we can hear your thoughts on what you would like the SIG to do!

If you would like more information about the SIG or would be interested in joining the committee, please contact the Secretary Wayne Dawson (wayne.dawson@durham.ac.uk)

We look forward to seeing you in Ghent!

The Committee Members
(Wayne Dawson, Jane Catford, Ella Mcknight, David Aldridge, Marc Rius, Elizabeth Cottier-Cook, Isabella Capellini, Olaf Booy)



TEACHING AND LEARNING GROUP

Julia Cooke

Website: besteachingandlearning.wordpress.com

Twitter: @BES_TLSIG

Email: beslearning@britishecologicalsociety.org

The establishment of the group took a step forward in May with thirteen committee members appointed and our group priorities and communication strategy set. The group aims to support the professional development and career aspirations of all teaching staff. Our mailing list already has over 100 members and our Twitter account is becoming more active. Our recently created blog will host, each month, an example of excellent practice of ecological teaching across all levels of teaching (from schools to higher education teaching and beyond).

Please join us by visiting besteachingandlearning.wordpress.com or follow links from the BES SIG page for Twitter, blog and mailing list details.

RECENT EVENTS:

The *Enhancing Fieldwork Learning Showcase* event was held at Chester University in September. The event featured a mixture of talks and practical components, with a focus on residential field courses, citizen science and using mobile technology (virtual fieldtrips, online mapping, custom mobile phone apps) to increase the breadth and efficiency of fieldwork teaching. These events are a productive opportunity to share good practice and solutions to recurrent field teaching challenges as well as being inspired by colleagues. For further details please visit: <http://enhancingfieldwork.org.uk/>

UPCOMING EVENTS:

We have two events planned for the Ecology Across Borders: Joint Annual Meeting 2017 in Ghent, Belgium. Firstly, we're planning a social event on the evening of the 12 December and we would like to invite anyone with an interest in teaching and learning in ecology to join us for a drink. Please check the conference timetable for details.

Our second event in Ghent is an Early Careers workshop: "Building A Teaching Portfolio as an Early Career Researcher" run by Lewis Bartlett (our ECR rep).

Balancing research with gaining teaching experience is often a challenge for early career research ecologists, and can be exacerbated by working at non-teaching research institutes or spending extended periods of time in the field. Increasingly, universities look for professional accreditation as a mark of teaching excellence – such requirements demand a teaching portfolio, especially for those who want to take on a lecturing career full time. Understanding how to identify or create opportunities for teaching, with the goal of building a well-developed portfolio, is crucial to managing these challenges. In this workshop, we'll be deconstructing example portfolios and outlining pathways to professional teaching accreditation in higher education. Participants will identify their current strengths and areas for further development; the goal is to leave with the outlines of a portfolio already written, and specific ideas of how to fill experience gaps. We'll discuss how to tackle the education literature, and how to begin engaging with the ongoing development of ecological pedagogy – both necessary for landing professional accreditation. This workshop does not develop teaching skills, but is about navigating professional development, taking a proactive approach to finding teaching opportunities, and building a portfolio. We'll explore the extensive roles outreach and public engagement can play in building these portfolios,

we'll also specifically explore gaining experience outside of universities. Finally, participants will be introduced to major regional initiatives which will impact their teaching now and in the future, such as the European Commission's RRI or the UK's TEF.

Research-Teaching Nexus Symposium, 27 April 2018 at Birmingham University

Ecology is taught as a subject through all levels of formal education and through many informal learning activities. Integrating current research knowledge and practice is vital to ensure that this education is kept current and relevant to today's world. Similarly, providing opportunities for students to undertake research and develop key skills is imperative to provide trained ecologists for the future. This one-day symposium will provide a novel forum for discussion and sharing innovative ways in which research scientists and educators have explored the synergies between teaching and research in ecology. Further details will be announced on our website.

TROPICAL ECOLOGY GROUP

Lindsay Banin @BES_Tropical



BES-TEG AT #EAB2017, GHENT

We are eagerly anticipating the ecologist's event of the year, which is even more exciting this year for being joint with GFÖ, NECOV and EEF in Ghent. Similarly, we have joined forces with the BES Forest Ecology Group and the GFÖ Forest Ecology Group to deliver a dynamic social event – a fantastic opportunity to meet fellow tropical & forest ecologists and discuss the cutting-edge issues in our field of science. Follow us on Twitter @BES_Tropical for updated details on the tropical events at #EAB2017.

THE TROPECOL BLOG

This year, our blog has offered a smörgåsbord of tropical delights; recent topics include a remote sensing survey of lianas in Malaysia and a discussion of the challenges of conservation in Southern Brazil, plus reviews and discussions of events in our field – catch up here if you have been missing out: <https://tropecol.wordpress.com/>. Our committee and BES-TEG members-at-large provide new blog posts typically every month, which are then summarised in our newsletter sent out to members. If you have something to share, or an idea of something you would like to see covered, please contact us via our contact form on the blog.



Chris Chandler

Committee Spotlight: Early Career Rep

Chris Chandler, PhD student at the University of Nottingham, joined the BES-TEG committee towards the end of 2016 and has since contributed to the team as Newsletter Editor* compiling the latest news from the community, our blog and the literature. Here, he tells us a bit about his experience working with the BES-TEG team to date:

"I joined the BES Tropical Ecology Group 1 year ago. Since, my role has focused on the production of our bimonthly newsletter. This role has allowed me to keep up-to-date within the field of tropical ecology through researching new articles, summarising recent blogs, as well as compiling other information such as new job opportunities, events and conferences.

One event that I recently attended on behalf of the BES-TEG was the State of the World's Plants Symposium at Kew Gardens. This was a great opportunity to observe new research within the field of plant science (including a substantial number of studies within the field of tropical ecology) as well as networking with some of the 200 delegates at the conference. The BES-TEG continues to be a hub for tropical ecology and a valuable resource for scientists within this field. I am pleased to be a part of this group and look forward to building the community in the future."

*You can sign up for our newsletter via tropical@britishecologicalsociety.org or via our blog contact form. You can also contact us here if you wish to join our committee and become more active in BES-TEG activities.

TEG in 2018 and Beyond

We are currently planning our programme of events for next year and beyond. In particular, we are excited to be working with the Society for Tropical Ecology (GTÖ) and ATBC Europe to host a European Tropical Ecology meeting in 2019 – watch this space! If you have an idea for a tropical event that you wish to host, do contact us via the email address above and we can support you.

PLANT ENVIRONMENTAL PHYSIOLOGY GROUP

Katie Field (k.field@leeds.ac.uk)

The Plant Environmental Physiology Group (PEPG) spans the British Ecological Society and the Society for Experimental Biology. We are interested in the short-term acclimation and long-term adaptation of plants to environmental change, integrating leaf and plant-level responses to biotic and abiotic stresses under field and laboratory conditions. We aim to set molecular physiology within an ecological context, providing a basis for scaling root and shoot level physiological responses to shifts in canopy, ecosystem and region as a result of changes in local and global climate.

Our remit is to:

- Advance and promote the science and practice of plant environmental physiology
- Integrate the plant environmental physiology community and research opportunities within and outside the BES and SEB
- Support, train and liaise with young plant environmental physiologists

PEPG is an informal group for physiologists of all ages and career stages, with as much emphasis on social interaction as on academic subjects. It's an excellent forum for meeting people working in similar fields, for socialising as well as general networking. Members interested in holding conferences, meetings, workshops or field meetings can apply through the Group Secretary for BES financial assistance and support for student attendance.

Dr Katie Field (k.field@leeds.ac.uk) is the BES secretary for PEPG, and Dr Saoirse Tracy (saoirse.tracy@ucd.ie) is secretary for the SEB.

PEPG has a mailing list with nearly 300 members worldwide, messages posted to the list may include research questions/methodology and information, discussion and requests,

news of future meetings and PhD/job advertisements. To sign up, or to post a message, please contact either of the group secretaries or our communications rep Dr Jen Cunniff (j.cunniff@cabi.org) or follow the instructions at: www.jiscmail.ac.uk/cgi-bin/webadmin?A0=env-physiol

SOCIAL MEDIA:

We have a popular Facebook page, with over 900 followers from around the world, like us at:

<http://www.facebook.com/PlantEnvironmentalPhysiologyGroup>

or follow us on Twitter: @PEPG_SIG

NEWS:

Our annual **Early Career Scientist Symposium** held in the incredible Snowdonia National Park was a great success earlier this year! We welcomed a diverse group of 20 early career environmental physiologists to the YHA at Pen-y-pass for 3 days of presentations, field trips and networking with plenty of opportunities for delegates to explore the stunning surroundings of Snowdonia.



The magnificent Snowdonia national park

Our keynote presentation was provided by Professor Bridget Emmett, head of CEH Bangor, who gave a fantastic overview of the background, current and future research directions

of CEH and imparted valuable advice to our delegates. Day 2 began with a trip over to the CEH Bangor site for a tour of the solardomes and ozone field release systems (: <https://www.ceh.ac.uk/our-science/research-facility/solardomes-and-ozone-field-release-system>) and to discuss how these facilities are being used to study the effects of air pollution on crops and natural plant communities.



The CEH solardomes

In the afternoon we headed over to Aber Falls for a wonderful guided walk in the foothills of the Carneddau range. Here, we were given insights into the unique flora and fauna native to the area including glimpses of some yet-to-be-classified lichens. Our day ended with a suitably raucous pub quiz!



The field trip

Our final day in Snowdonia was given over to delegate presentations, all of which were fantastic covering a range of topics from photosynthesis and acclimation, to nematodes and mycorrhizas. Congratulations to our prize-winners Grace Hoysted (University of Leeds) and Sunitha Pangala (Open University), and the runners-up Joao Pennacchi (Lancaster University) and Tom Thirkell (University of Leeds).



The prizewinning presenters: (l to r) Tom Thirkell, Sunitha Pangala, Grace Hoysted and Joao Pennacchi

UPCOMING PEPG EVENTS:

Exciting times are coming up for PEPG with lots of events in the works. Make sure to sign up to our email list and/or Facebook/Twitter feeds to stay up to date...

PEPG Early Career Scientist Symposium, 14–16 May 2018, Norfolk coast

Following the success of our Snowdonia ECR Symposium earlier this year, we're going to hold another in 2018. This time we're going coastal and will be holding the event on the beautiful Norfolk coastline. We will be covering a variety of plant environmental physiology topics, will be based at the Sheringham YHA – the perfect position to make the most of the beautiful surrounding scenery. We will be opening for registration and talk/poster abstract submission covering in all areas of plant eco-physiology from PhD students and postdocs in the near future – keep an eye on our website, Facebook and Twitter feeds for further info coming soon.

PEPG at the Ecology Across Borders Annual Meeting, Ghent. Annual Meeting, Ghent

We are looking forward to this year's Annual Meeting and are planning a variety of PEPG-themed events throughout the meeting, including a SIG meet-and-greet at the welcome mixer. We will be putting details of our other planned activities out via our Facebook and Twitter feeds so be sure to check them closer to the date as we finalise the details – keep an eye open for further details.

SAVE THE DATE! 9–15 September 2018, PEPG Ecophysiology Field Techniques Workshop 2018, Quinta de Sao Pedro, Lisbon, Portugal

We are pleased to announce that our fabulous **PEPG Ecophysiology Field Techniques Workshop** will be running again next year at the Quinta de Sao Pedro on the 9–15 September 2018.

This is a unique and unrivalled opportunity for MSc, PhD students and early career researchers to gain hands-on experience and training in plant ecophysiology techniques from leading scientists and manufacturers who will introduce their latest equipment and give hands-on training.

The intensive five day long workshop will include demonstrations of key field and lab techniques likely including:

- leaf-level processes including photosynthetic gas exchange, chlorophyll fluorescence (imaging), water status and hydraulic conductance
- canopy processes including stable isotopes, monitoring canopy development/Leaf Area Index, IR thermography and soil water/nutrient status
- theory and practice of long-term monitoring under field conditions, including micrometeorology, eddy covariance, and remote sensing methodologies

We will be opening registration soon (keep your eyes on our social media and emails) and recommend registering early as we usually sell out of workshop places very quickly.

COMMITTEE MEMBERS

Katie Field – k.field@leeds.ac.uk (BES secretary)

Saoirse Tracy – saoirse.tracy@ucd.ie (SEB secretary)

Jen Cunniff – j.cunniff@cabi.org (Communications officer)

Matt Davey – mpd39@cam.ac.uk

Colin Osborne – c.p.osborne@sheffield.ac.uk

Howard Griffiths – hg230@cam.ac.uk

Marjorie Lundgren – marjorie.lundgren@sheffield.ac.uk

Richard Webster – rcw@aber.ac.uk

Steven Driever – steven.driever@wur.nl

Amanda Rasmussen – Amanda.Rasmussen@nottingham.ac.uk

AQUATIC ECOLOGY GROUP

Pavel Kratina (p.kratina@qmul.ac.uk)

RECENT EVENTS

ECR Workshop & Annual Meeting in London (Charles Darwin House)

In September 2017 there was another successful workshop for early career researchers (ECR) and the Annual Meeting of the Group. The ECR workshop consisted of two sessions. There was a statistical training in spatial autocorrelation lead by Dr Chris Hassall from University of Leeds and a writing training session - "Getting published and getting read" - led by the BES publishing team. Our ECR events are aimed at students and early career researchers with wide-ranging interests and backgrounds in aquatic ecology and we would welcome any suggestions or recommendations for the future workshops held in 2018.

The group annual meeting brought together more than 70 researchers from across the broad spectrum of freshwater and marine ecology. There was a stellar line up of plenary speakers, presenting timely topics that ranged from "the tyranny of temperature in ecological systems", biodiversity loss, molecular changes underpinning competition, through to marine microbial biogeography. We would like to thank all keynote speakers and our first BES AG Early Research Career Award winner, Daniel Wohlgemuth, who summarised his PhD research in the presentation "Context dependency of biodiversity-ecosystem functioning relations". These excellent scientific

contributions were followed by a poster session, great conversations and discussions directly at the venue and later in the Blue Lion pub.



The plenary speakers at the BES AG Annual Meeting 2017 included (from left) China Hanson, Mary O'Connor, Julia Reiss, Anita Narwani, Daniel Wohlgemuth, Dean Jacobsen, Lloyd Peck and Anne Magurran.

FORTHCOMING EVENTS

We are currently organising a social event for aquatic researchers and students attending the Ecology Across Borders Annual Meeting in Ghent. The event will take place on the evening of Tuesday 12 December 2017. The venue and other details will be announced via BES AG mailing list, Twitter, Facebook and also during the meeting in Ghent. We hope to see many of you there.

GET INVOLVED

The BES AG is an active network of aquatic ecologists whose interests overlap with several other SIGs and we are keen to develop cross-disciplinary activities. BES AG is growing and we now have more than 2300 followers on Twitter!

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 v.r.edmonds-brown@herts.ac.uk. You can also find us on the BES website in "Membership & Community", "Special Interest Group".

We need you!





We are looking for new

- Student/Early Career Researcher (ECR) **Treasurer**
- Student /ECR **Event coordinator**
- **Annual Meeting Event coordinator**

Be part of the BESAG committee and bring together aquatic-minded individuals from all sectors, marine and freshwater, to exchange skills, knowledge and ideas!

Applications for positions should include:
Full CV + BESAG mission statement (1 pg) – what you would bring to the role

Email to: [Nessa O'Connor n.oconnor@tcd.ie](mailto:Nessa.O'Connor.n.oconnor@tcd.ie)
[Lee Brown l.brown@leeds.ac.uk](mailto:Lee.Brown.l.brown@leeds.ac.uk)

QUANTITATIVE ECOLOGY GROUP

Laura Graham
(quantitative@britishecologicalsociety.org)

The Quantitative Ecology SIG presence at the Ecology Across Borders meeting in December will include a Thematic Topic Session and a Workshop as well as our usual social event. On Monday, we will host a pre-conference workshop *Ecology Hackathon: Developing R Packages for Accessing, Synthesizing and Analysing Ecological Data* along with GFÖ Computational Ecology Working Group, NeCov Ecological Informatics SIG and sponsored by *Methods in Ecology and Evolution*. This is a really exciting opportunity to learn more about making your own R packages with lots of help and support from experienced R programmers. Our Thematic Topic Session will ask *Are we any good at simulating ecology? Success and future challenges in ecological simulation models*. This session is jointly organised by Nick Golding of the Quantitative Ecology SIG, Florian Hartig of the GFÖ Computational

Ecology Working Group and Cédric Scherer of the GFÖ Young Modellers group. Our joint social event will be on Tuesday evening and will provide an opportunity to network with quantitative ecologists from across Europe with beverages and nibbles provided.

We are currently recruiting for new committee members, in particular a student/ECR rep. Please get in touch if you are interested by emailing quantitative@britishecologicalsociety.org. We also have a mailing list which interested members are welcome to join. Send an email to listserv@jiscmail.ac.uk with a blank subject header and the following text, 'Join BESQUANTITATIVE' and your full name.

PLANTS SOILS ECOSYSTEMS

Mike Whitfield
(@mgwhitfield)

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

PLANTS-SOILS-ECOSYSTEMS AT ECOLOGY ACROSS BORDERS

We'll be at Ecology Across Borders in Ghent this December, where we'll have a social to follow a session organised by Rob Mills, Bjorn Robroek, and Lilian Ruess – 'Winter ecology: expanding the focus in a changing world'.

We look forward to seeing you there!

YOUR SIG COMMITTEE

There have been some recent changes to your SIG committee. Ellen Fry is stepping down as secretary after doing a great job in promoting the group and organising several events. On behalf of the committee and Plants-Soils-Ecosystems members – thank you very much for all your hard work Ellen!

Mike Whitfield will be stepping up to the position of group secretary.

- Mike Whitfield (Secretary) (mgwhitfield@gmail.com)
- Ellen Fry
- Jennifer Rhymes, University of Manchester (Policy Officer)
- Jessica Clayton, University of Cologne (Student Representative)
- Rosanne Broyd, Lancaster University and James Hutton Institute (Student Representative)

We are looking for committee members! If you're interested in joining the committee, please get in touch with Mike.

PLANTS-SOILS-ECOSYSTEMS BULLETIN

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

Join us!

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

Follow us on Twitter @ **BESPlantSoilEco**, like us on Facebook (fb.com/BESPlantsSoilsEcosystems) and check out our website, including the blog and journal club: besplantsoileco.wordpress.com.

PEATLANDS RESEARCH GROUP

Ian Rotherham
(peatlands@britishecologicalsociety.org)

This has been a busy time for the Peatlands group with events, activities and publications. Group membership now stands at around 200 people.

The Annual Convention and Seminar 'Responsible Management of Drained Peatlands' of the International Peatland Society in Aberdeen, was a hugely successful meeting attended by delegates from over twenty different countries. Then, in September in Sheffield, there was the researcher / practitioner conference, 'Peatlands for Birds' which brought together key stakeholders to discuss issues of peatland management and restoration or creation in both uplands and lowlands.

Other on-going activities have included collaborations by Manchester Metropolitan University with the Moors for the Future Partnership led by Simon Caporn, and the research on peat soils and carbon flux led by Andreas Heinemeyer at University of York.

In September, Simon Caporn spoke about the BES Peatlands SIG at the massive international BogFest conference held over five days at Edale in the Peak District. Ian Rotherham then presented a paper on the cultural heritage of peat bogs – often overlooked or at least unrecognised in many restoration programmes.

The final activities and events of the year have included presentations on pioneering research on the discovery of 'Shadow Woods' around the peatland fringes and across moors, heaths, and bogs. This included public demonstrations by younger researchers of the techniques of peat core sampling and pollen analysis.

In November, Cumbria BogLife held a 2-day regional conference on the 'History & Heritage of the Bogs & Peatlands of Cumbria'; with keynote speakers including Richard Lindsay, Andre Berry, Ian Rotherham, and others.

Following a call for new and younger researchers to be involved in SIG group activities we have recruited an international network of younger scholars and researchers to support our work and events. Next year we plan a major event on testate amoebae to be held in Belfast, plus a series of workshops on saproxylic insects in peatland veteran trees – an under-appreciated resource.

Finally, two major peat-related volumes have also been published too, and will be reviewed shortly. These both involve members of the Peatlands SIG:

Mires and peatlands of Europe - Status, distribution and conservation, edited by Hans Joosten, Franziska Tanneberger, & Asbjorn Moen (2017).

Peatland Restoration and Ecosystem Services: Science, Policy and Practice, edited by Aletta Bonn, Tim Allott, Martin Evans, Hans Joosten, & Rob Stoneman (2016).

MICROBIAL ECOLOGY GROUP

Rachael Antwiss
(microbial@britishecologicalsociety.org)

It's been another busy year for the Microbial Ecology SIG, with a publication in *FEMS Microbiology Ecology* (doi: 10.1093/femsec/fix044) looking at 50 important research

questions in microbial ecology, and hosting four Pint of Science events in four UK cities. In November, we held our first methods workshop *Beyond Metagenetics: Novel Tools for Microbial Ecology* at the Zoological Society of London, which assembled experts from around the UK to discuss the suite of methodological tools available to researchers in microbial ecology to quantify functional interactions between hosts and microbes.

We have also had a shuffle around in the committee. First of all, massive congratulations to our events rep Sarah Griffiths on completing her PhD! Sarah will now be our early career rep in the SIG. Our excellent comms rep Nim Kibbler took up an Erasmus placement at Wageningen in the Netherlands, and with final year of her undergraduate at SRUC following that, she decided to hand the Twitter feed and other comms responsibilities to Pasky Miranda from the University of York. We are very grateful to Nim for all her wonderful tweets over the last couple of years, as well as organising the Pint of Science event in Edinburgh. Thank you Nim! And welcome on board Pasky! We are also grateful to our outgoing student rep Andy Devaynes and our early careers rep Kris Forbes. Thank you for all your work, particularly at the inaugural workshop event last year.

Next year will be another busy one, kicking off with a cross-SIG event with the Agricultural Ecology SIG in January. Together we will be hosting a grant writing retreat at Abbey Home Farm, an award winning organic farm and shop in the heart of the Cotswolds. We will also be holding a cross-SIG speed dating event involving Parasites & Pathogens and Plants, Soils & Ecosystems SIGs, to improve communication among the SIGs for those of us working on microbial ecology across a range of taxa. We plan to use this event to identify key priorities for host-microbe research to be explored at a grant writing retreat later in 2018.

The Microbial Ecology SIG have also been asked to write a book for the British Ecological Society's Ecological Reviews series (Cambridge University Press). Rachael and Xav, together

with Michael Cox from Imperial, will be editing the book, with chapter contributions from a number of our SIG members. Expect to see *Microbiomes of Animals and Plants* on the shelves (and online!) by the end of 2018!



Pippa Gillingham
(climate-sig@
britishecologicalsociety.org)

On 15 September an international group of climate modellers and ecologists gathered together for a workshop on Monitoring, Modelling, and Managing Microclimates. Debbie Hemming from the UK Met Office started the day with a presentation on climate modelling and predicting phenology, and called for greater collaboration between ecologists and climate modellers. Next Dr Mike Kearney focussed on microclimates as species experience them, their importance in local extinctions, and presenting his own microclimate model NicheMapR. Dr Christian Körner and Dr Barbara Anderson both spoke about microclimates in montane systems, in Switzerland and New Zealand respectively. Their topics included the importance of microclimates in alpine plant phenology, and the influence of topography on microclimates, highlighting the complex diversity of microclimates within montane systems. Dr Andrew Bladon presented his research on the influence of microclimate on a South African bird with an unusually small distribution, and Owen Greenwood finished the morning session with a discussion of how microclimates can be manipulated for the conservation of species, excellently highlighting the applicability of the preceding talks. The diverse range of geographical focus gave a global perspective on this often very locally focussed topic.



The Climate change workshop

After lunch the rest of the day was focussed on small group discussions of questions important to the future of microclimate research. The topics included the definition of microclimate, the challenges facing microclimate researchers and how those challenges could be tackled, the importance of microclimate data, and the possible future priorities microclimate research. The lively discussions brought together widely varying perspectives, sparking enthusiastic debate which could have continued far longer than the allotted time. Several themes were highlighted as being widely important to microclimate researchers, and will be included in a resulting paper on considering microclimates in ecological.

The day was a great success, and hopefully delegates left with a greater understanding of microclimate ecology, inspiration and potential collaborators for their future research.



Amy Fensome
(conservation@
britishecologicalsociety.org)

First, for those of you heading to Belgium for this year's joint Annual Meeting in Ghent, please join us for a get-together with our counterparts at the GfO (Ecological Society for Germany, Austria and Switzerland) and the EEF (European Ecological Federation). All SIG socials take place on the Tuesday, so the plan is to meet

over drinks and nibbles before making our way to the Science Slam. We will be posting details, including where to meet, on our Facebook page and Twitter. See you there!

The SIG has been busy this year. In February, the first stage of a two-part consultation asked "What's the point of conservation science?". Held at the University of Brighton, the first meeting was well attended and was an opportunity for conservation practitioners to identify the evidence needed to identify research priorities. March saw the second running of the Early Careers event "Establishing a career in conservation science", organised in collaboration with ZSL, which received very positive feedback. This event will be held again in March 2018. In June, "How to engage with parliament and respond to inquiries" took place for the first time in collaboration with the BES Policy Team and ZSL. Speakers included Jonny Wentworth, scientific advisor for energy and environment at the Parliamentary Office of Science and Technology; Martin Smith, Committee Specialist at the House of Commons Science Technology Committee; as well as the Policy Team's Ben Connor and Camilla Morrison-Bell.

By the time this goes to print, the Conservation SIG will have its own webpage. One of the main purposes of the website will be to host member profiles but we also welcome blogs from members on a broad range of topics. This is a chance for members to get to know each other, to talk about our interests, and the research we do or would like to do. It might also be a useful way for us to make new connections and to keep up to date with the breadth and depth of conservation research out there and to identify opportunities for SIG events. If you would like to contribute your profile, please email a.fensome@exeter.ac.uk with up to 300 words, a big photo of yourself or something that captures the essence of your research, as well as contact details, blog sites and Twitter handles.



Michael Pocock
(citizenscience@ceh.ac.uk)

By the time this is published we will have held our penultimate event of the year – "Learning the Science with the Citizens" held in Newcastle on 19 November 2017. More on that in the next newsletter.

For now, we are looking forward to the Annual Meeting. Look out for us at the Welcome Mixer, where you can sign up to the BES Citizen Science mailing list. There will be sessions with contributed talks and a workshop about citizen science in ecology, but watch out for citizen science and use of volunteer-collected data from across the conference schedule. We are giving the challenge to the many Twitter users at the conference to tweet examples of citizen science in the talks and posters using the hashtags "#EAB2017 #citsci". This can include the use of citizen science data, and should be 'citizen science' in its widest sense, so including data collected by expert volunteers, as well as the general public. Let's together celebrate the contribution of citizen science to ecological science.

And finally, we are currently planning our SIG social at the Annual Meeting. Full details available at the meeting, but it will be a great chance to meeting other enthusiasts from "across borders" and explore part of Ghent with a short treasure hunt themed around citizen science.



Jo Lello
(parasites@britishecologicalsociety.org)

We have eight new committee members whose contact information and short introduction are presented

below. We would like also to highlight the creation of one new role, that of European Representative, which we hope will help our SIG maintain and extend its connections within Europe and beyond. We have also created a second post-graduate role to lighten the burden on each student representative and to ensure better continuity.

At this point it would be very remiss of me not to give supreme thanks to our outgoing post-grad / ECR representative, Beth Levick, who is moving on to other (better) things. She has been an invaluable source of ideas, a great organiser and an enormous and hugely positive influence on the committee throughout the varied activities of the SIG. She will be sorely missed.

NEW COMMITTEE MEMBERS:

- Emmanuel Serrano-Ferron – European Representative – Servei d' Ecopatologia de Fauna Salvatge (SEFaS) – (emmanuel.serrano.ferron@gmail.com) I'm a Research Associate interested in the causes and consequences of co-infections and the bottom-up regulation of infection dynamics in wildlife. <http://emmanuel.serrano.ferron.tumblr.com/>
- Lucinda Kirkpatrick – University of Antwerp -Early Career Representative – (Lucinda.Kirkpatrick@uantwerpen.be) I'm a first term post doc based at Universiteit Antwerpen. I research environmental and spatial drivers of host behaviour, demography and zoonotic disease transmission. <https://lucikirkpatrick.wordpress.com/> **Twitter @LuciKirkpatrick**
- Paula Tierney – Post-graduate representative -Trinity College Dublin – (tiernep1@tcd.ie) I'm a second year PhD student at Trinity College Dublin, interested in invasion and parasite ecology. I study how invasive species affect native host-parasite dynamics in freshwater fish. **Twitter: @ptierney**

■ Cassandra Raby – Post-graduate representatives – University of Liverpool – (C.Raby@liverpool.ac.uk). I'm a final year PhD student based at the Institute of Zoology, ZSL. My research interests are in disease ecology, with my current project studying the gastrointestinal parasites of primates.
Twitter: @Cassie_raby

■ Ben Ashby – Ordinary Member – UC Berkeley / University of Bath (benashbyevo@gmail.com) I'm a NERC Independent Research Fellow interested in host-parasite ecology and evolution.
benashbyevo.wordpress.com
Twitter @bnashby

■ Chris Eizaguirre – Ordinary Member – Queen Mary University of London – (c.eizaguirre@qmul.ac.uk) I am a Reader in Evolutionary and Conservation Genetics particularly interested in the genetic basis of host-parasite interactions and how those interactions fuel eco-evo dynamics.
<https://sites.google.com/site/christopheizaguirre/home>
Twitter @Eizaguirrelab

■ Anthony Wilson – Ordinary Member – Pirbright Institute -(anthony.wilson@pirbright.ac.uk) I'm a new Group Leader at the Pirbright Institute studying insect-transmitted pathogens requiring high containment. I'm interested in how environment affects epidemiology and pathogen evolution.
Twitter as @arboviral

■ Olivier Restif – Ordinary Members – University of Cambridge – (or226@cam.ac.uk) Lecturer in Epidemiology in the Department of Veterinary Medicine. Data-driven dynamic models for infectious diseases with two focus areas: within-host dynamics of bacterial infections, and ecology of zoonotic diseases in wildlife (mainly viruses in bats).
<https://www.research.vet.cam.ac.uk/research-staff-directory/principal-investigators/disease-dynamics/Olivier-Restif>
Twitter @BugsWormsNBats

They join our current team of:

■ Jo Lello – Chair – Cardiff University
lelloj@cardiff.ac.uk
tel: 02920 875885

■ Andy Fenton – Deputy Chair – Liverpool University
a.fenton@liv.ac.uk

■ Ken Wilson – Scientific Advisor – University of Lancaster
ken.wilson@lancaster.ac.uk

■ Jo Cable – British Society for Parasitology Representative
<http://bsp.uk.net> – Cardiff University
cablej@cardiff.a.c.uk

■ Giuseppe Paladini – Ordinary Member – University of Stirling
giuseppe.paladini@stir.ac.uk

■ Xav Harrison – Ordinary Member – ZSL
xav.harrison@gmail.com



REFRESHMENT BREAK

SIX SOCIETIES, TWO EVENTS, AND A WHOLE LOT OF COFFEE



The denizens of Charles Darwin House celebrated international coffee day with a two-day event. Heaven help us if there's ever an international cake day.
©Karen Devine

Jennifer Freer | Engagement Intern

What happens when six biology societies come together to celebrate International Coffee Day 2017? Well, we decided to find out as the societies of Charles Darwin House hosted "Darwin's Coffee House" over 28-29 September.

The result, we can confirm, was a two-day coffee extravaganza where science discussions mixed with cold brew coffee martinis, and a cake-filled coffee morning took a double shot of biology know-how.

Our first event was an evening discussion on "Science and the Future of Coffee". Four coffee scientists introduced their research and took questions from a packed audience of academics, society staff, coffee experts, and members of the public. The topics ranged from climate change impacts to the production, consumption and recycling of coffee. Representatives from Cafédirect, Union Hand Roasted Coffee, bio-bean, British Coffee Association (and more) were also on hand to add their expertise. Throw in some cocktails courtesy of Cafédirect and the night was a lively and engaging success!

The following day, we explored the science behind coffee in the ultimate fusion of science fair and coffee morning. As well as delicious cake and incredible Wild Forest Coffee from Union Hand Roasted Coffee, each society delivered an activity to demonstrate the biology involved in putting coffee on the menu. At the BES, we exposed the vast number of animal species that help pollinate, grow and protect the coffee we love to drink. Alongside us were the brilliant Article Number 25, a company that re-farms mushrooms in urban spaces using spent coffee waste.

Overall our coffee celebrations raised over £175 for Macmillan Cancer Support, built lasting links between science and industry, and put science at the forefront of our coffee-loving minds. These events required an immense collaborative effort from all within Charles Darwin House and would not have been possible without the generosity of our external partners. We thank everybody involved for a truly stimulating few days.

Tea, anyone?



Discussing science and the future of coffee.
©Sabrina Weiss



Coffee cocktails.
©Sabrina Weiss

Article Number 25, an Urban Farming company, are aiming to grow mushrooms using coffee waste.
© Karen Devine



OF INTEREST TO MEMBERS

BIODIVERSITY, ECOSYSTEM SERVICES, LAND DEGRADATION:

5 MAJOR IPBES ASSESSMENTS TO BE LAUNCHED IN MARCH

Register now for embargoed copies of full assessments / advance interviews; Launches to be webcast live

Major new assessments of the state of biodiversity, ecosystems and nature's contributions to people will be presented to representatives of 127 Governments for approval in March 2018. Prepared by more than 550 leading experts from more than 100 countries working with the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), the assessments cover four world regions: the Americas, Asia and the Pacific, Africa, and Europe and Central Asia. A fifth report assesses the state of land degradation and restoration at both regional and global levels.

The reports will be launched during the 6th annual session of the IPBES Plenary in Medellín, Colombia (#IPBES6), March 18-24, 2018. The reports evaluate lessons learned and progress (or the lack thereof) on the Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets, the Paris Agreement on climate change, and the implications for the United Nations Sustainable Development Goals (SDGs), as well as other global environmental agreements.

The reports will form key inputs to a new comprehensive IPBES global assessment report on biodiversity and ecosystem services, due for release in

2019, the first such evaluation since the authoritative 2005 Millennium Ecosystem Assessment. They will also provide vital information for setting biodiversity targets for the period after 2020. The aim is to arrive at conclusions about each region's land-based, freshwater and coastal biodiversity, as well as the state of ecosystem functioning and nature's contributions to people.

The reports will evaluate the status of biodiversity and nature's contributions to good quality of life in each region and their respective sub regions, describing current status and trends, as well as their links to drivers of change and threats, identifying policy-relevant issues affecting them.

STRUCTURE OF THE FIVE IPBES ASSESSMENT REPORTS

Each IPBES assessment report will begin with a concise Summary for Policymakers (SPM), highlighting the most important and policy-relevant (not prescriptive) findings and policy and governance options. The SPMs will be based on a set of six chapters (eight for the land degradation assessment report), described below, providing all the technical support for the key messages of the SPMs:

- Policy-relevant questions & themes per region and subregion as well as methods and approaches of the assessment
- Nature's contributions to people and good quality of life
- Status, trends and near future dynamics of biodiversity and ecosystems
- Direct and indirect drivers of change in nature in the context of different perspectives on quality of life
- Analysis of possible interactions between the natural world and society in the long term
- Options for governance, institutions and decision-making - especially on the SDGs, Aichi Targets and Paris Agreement

FOLLOW IPBES

- twitter.com/IPBES
- facebook.com/IPBES
- youtube.com/ipbeschanel
- linkedin.com/company/ipbes
- instagram.com/ipbes_/



OPINION

ECOLOGICAL STEWARDSHIP AND SLOGANISM IN THE ANTHROPOCENE



Peter Bridgewater | University of Canberra | peter.bridgewater@canberra.edu.au

Even if there are arguments over when it started, there is broad agreement that we are now living in a new epoch – the Anthropocene – whose main characteristic is rapid, often unpredictable, change (Ellis *et al.* 2013). The arguments for climate change as a key driver for ecosystem and landscape change are familiar and well-rehearsed. In the Anthropocene there is a broad set of biodiversity changes involving genes, species and ecosystems, with both gains and losses. Nonetheless, continued overall actual or perceived negative change in biodiversity suggests failures in current biodiversity/landscape policy and practice. Addressing these negative changes through stewardship is an innovative approach. A recent book on the topic (Bieling & Plieninger 2017) delves fully into the topic and is well-worth a read.

The idea of stewardship is by no means new, but its use in ecology and ecosystem management is. For quite a time it has been viewed as unfashionable, even quasi-religious in context. Yet it is now a serious area of research and thought, especially in landscape ecology. Folke *et al.* (2011) advocate 'planetary stewardship' in the Anthropocene, observing: "Tipping points and thresholds highlight the importance of understanding and managing resilience. New modes of flexible governance are emerging. A central challenge is to reconnect these efforts to the changing preconditions for societal development as active stewards of the Earth System."

Stewardship meets this challenge as it has, as a critical focus, the improvement of natural and cultural heritage, agriculture in the broad and biodiversity conservation – at the same time ensuring social justice and environmental health. Stewardship involves landscape scale policy, planning and management, delivered through intersectoral co-ordination at national level, local government agencies, rural community organisations, NGOs and the private sector. Because it attracts high levels of community interaction, stewardship is also a learning system, having the characteristics of being self-organised with adaptive, collaborative management. Finally, stewardship draws on many different knowledge systems without seeing these knowledges in a hierarchy, but rather as complementary. So, stewardship emphasises the role of people in landscapes, as key elements of stewardship.

In my own contribution in Bieling & Plieninger (2017) I deal with habitat conservation and restoration, and here is where sloganeering comes in. I titled the Chapter "Managed, Mended, Supported - How Habitat Conservation and Restoration Function as Elements of Landscape Stewardship". The *managed mended and supported* title came from re-examining the publication "Making Space for Nature" (Lawton *et al.* 2010) which successfully used the slogan "More, Bigger, Better, Joined." This was an excellent way to attract the attention of politicians and decision makers - but the slogan was perhaps wrongheaded.

"More" and "Bigger" habitat conservation sites are frequently advocated but often with poor arguments for why more and larger protected areas are really needed for effective nature conservation. It is easier to see the rationale for "Better" in terms of management and "Joined" in terms of habitat connectivity. Nevertheless, sloganism has its value, which is why I used Managed, Mended, Supported as the slogan for the chapter. This formulation emphasises that better management of habitat conservation areas is needed, as is mending (restoring) such areas suffering from degradation. Perhaps the critical word is supporting, by which I mean the need to curate a broader landscape matrix that allows persistence of a resilient habitat conservation network. And managing, mending and supporting can happen effectively *only* through implementing the principles of landscape stewardship.

"CLEARLY, NATURE CONSERVATION IS NOT CURRENTLY EFFECTIVE ENOUGH IN ENGLAND OR THE WIDER U.K. TO ACHIEVE EFFECTIVE STEWARDSHIP"

Lawton *et al.* (2010) argued that for wildlife sites to be capable of responding and adapting to the challenges of climate and other global change pressures a step change in nature conservation in England was needed. As they put it that step change was from; "trying to hang on to what we have, to one of largescale habitat restoration and recreation, underpinned by the re-establishment of ecological processes and ecosystem

services, for the benefits of both people and wildlife". Without using the word, this is clearly aimed at a stewardship model. Seven+ years on, the need for that step change is more urgent than ever and, clearly, nature conservation is not currently effective enough in England or the wider U.K. to achieve effective stewardship. However, simply adding new protected sites or enlarging existing sites will not deliver robust habitat (and therefore species and gene) conservation. This is true even if blue/green infrastructure (connectivity) is part of wider landscape management.

Over time landscapes become aggregations of ecosystems altered to different degrees: Landscape stewardship needs to take account of that degree of alteration to the landscape matrix, likelihood of success of stewardship actions and the overall landscape context. Intervention in landscapes that are now radically altered from historical states (for which read natural) needs to be based on their current 'values' for human cultural significance and for biodiversity. We often view and promote habitat conservation sites as living but changeless museums, instead of the highly dynamic systems they actually are. This view needs rethinking towards adaptive site management, networking of sites and a stewardship approach to habitat conservation. There exists a wider range of available options, rather than solely traditional measures for habitat conservation management.

"UNDERSTANDING THE WORLDVIEWS OF INDIGENOUS AND LOCAL PEOPLE MAY BE OF GREATER UTILITY IN LANDSCAPE STEWARDSHIP THAN TRADITIONAL SCIENTIFIC ANALYSIS"

An example is management of National Parks in Australia. Last century, National Park management focussed on fire prevention, resulting for many parks in reductions in species diversity – with some local extinctions – and the paradoxical result of increasing fire susceptibility. But burning every year caused different, mostly undesirable, ecological changes. Since Aboriginal people and their interaction with ecosystems and landscape over millennia created today's Australian landscape, the most successful fire



The interactions of Aboriginal people with their surroundings over millenia have created today's Australian landscape

management and other land use practices today emulates, builds upon, or is actually implemented by Aboriginal people themselves. The photograph above shows traditional burning, but using modern methods of ignition. Understanding the worldviews of indigenous and local people may be of greater utility in landscape stewardship than traditional scientific analysis. But both sets of worldviews taken (but not fused) together clearly give the optimum result – another feature of effective stewardship in practice.

Habitat conservation can achieve better management for threatened species. However, we currently see threatened species as 'victims' that need assistance for survival. In fact, existence of threatened species is a symptom of poor landscape stewardship and improved stewardship can reverse their status. Although often bracketed with threatened species, rare species are in a different category. If their rarity derives from habitat specificity, clearly habitat conservation can assist their conservation as well. Work within the Convention on Biological Diversity (CBD) on habitat conservation sites occurs largely through the programme on protected areas, which, *inter alia*, calls for links between protected areas and between land/seascape and the protected area network.

The CBD Ecosystem Approach is also an important set of principles on habitat conservation and the role of people. This approach has twelve principles, of which perhaps the three keys are: management objectives are a matter of societal choice; management

should be decentralised to the lowest level; and management must recognise that change is inevitable. These points are reflective of the stewardship principles, although the second principle, if taken to conclusion, might work against integrated landscape management. The third principle, emphasising the role of change, is an important qualifier of stewardship in the Anthropocene, where stewardship must take a broader and longer view of habitat conservation.

In the next decades seeing conservation and ecosystem management through a stewardship lens will be ever more critical. Using that lens implementing the slogan "Managed, mended and supported" will have stronger conservation outcomes than "More, Bigger, Better, Joined."

Peter Bridgewater is currently Adjunct professor in Terrestrial and Marine Biodiversity in the Institute of Applied Ecology at the University of Canberra in Australia. In a long and distinguished career his appointments have included terms as Chairman of the JNCC, Secretary General of the Ramsar Convention on Wetlands, Chief Scientist of the Nature Conservancy Council and Secretary of UNESCO's Man and the Biosphere Programme.

REFERENCES

- Bieling, C., Plieninger, T. (Eds.), 2017. *The Science and Practice of Landscape Stewardship*. Cambridge University Press, Cambridge.
- Ellis, E. C., Fuller, D. O., Kaplan, J. O. & Lutters, W. G. (2013). Dating the Anthropocene: Towards an empirical global history of human transformation of the terrestrial biosphere. *Elementa: Science of Anthropocene*, 1, 18.
- Folke, C., Jansson, A., Rockström, J., Olsson, P., Carpenter, S.R., Chapin, F. S., III, Crépin, A. S., Daily, G., Danell, K., Ebbesson, J., Elmqvist, T., Galaz, V., Moberg, F., Nilsson, M., Österblom, H., Ostrom, E., Persson, A., Peterson, G., Polasky, S., Steffen, W., Walker, B. & Westley, F. (2011). Reconnecting to the biosphere. *Ambio*, 40, 719–738.
- Lawton, J. H., Brotherton, P. N. M., Brown, V. K., Elphick, C., Fitter, A. H., Forshaw, J., Haddow, R. W., Hilborne, S., Leaf, R. N., Mace, G. M., Southgate, M. P., Sutherland, W. J., Tew, T. E., Varley, J. & Wynne, G. R. (2010). *Making Space for Nature: A Review of England's Wildlife Sites and Ecological Network*. Report to DEFRA.

THE USE OF RESEARCH IN THE UK PARLIAMENT

Lessons for
conservation
scientists



FEATURE

David Christian Rose | Lecturer in Human Geography, University of East Anglia | david.rose@uea.ac.uk

This article relates to the following project report: Kenny, C., Rose, D. C., Hobbs, A., Tyler, C., and Blackstock, J. 2017. The Role of Research in the UK Parliament, supported by the Houses of Parliament, the Parliamentary Office of Science and Technology, the Economic and Social Research Council, and the Department of Science, Technology, Engineering, and Public Policy at University College London.

Within the scientific community it is generally accepted that policies are most effective when they are supported by evidence. For policy-makers, the use of evidence is a good way to ensure that they don't get costly decisions wrong.

Over the course of the last decade in conservation, many studies have sought to identify barriers to the use of evidence in policy, and suggested solutions to overcome them. Major projects such as SPIRAL have introduced the conservation science community to useful literatures in the political sciences, and recently established mechanisms, such as EKLIPSE and IPBES, seek to bridge the divide between scientists and policy-makers. Many lessons have been learned about how to improve the policy impact of scientific research, but one significant type of policy venue has, thus far, been widely ignored. Research into conservation science-policy interfaces has tended to define 'policy' in vague terms, offering general advice about how to increase policy impact; or, research has looked at the use of evidence by government (executive).

Legislatures, on the other hand, have tended to be overlooked. These policy venues are distinct from executives, and host a variety of processes through which key decisions are made. Studies have illustrated that parliamentary debate and scrutiny can play an important role in shaping legislation, including in the environmental sphere.

An ESRC-funded collaboration between University College London and the Parliamentary Office of Science and Technology sought to start the necessary work to understand how evidence is used in legislatures. Using the UK Parliament as a case study, the research investigated how evidence was sourced, defined, and used in this setting, including in Select Committees and Public Bill Committees. A mixed methods approach was used, involving interviews and surveys of key actors, as well as participant observation of committee processes, and documentary analysis of submitted written and oral evidence. Overall, 157 people in Parliament contributed to this research, including MPs, Peers, and parliamentary staff. The project report can now be found online (launched November 30th, after the print deadline for this *Bulletin* issue), but here we summarise key messages for the conservation science community about how to engage with the UK Parliament effectively to improve the chances of evidence-informed policy. Heeding this advice is particularly important at the present time since Parliament is debating and scrutinising a plethora of post-Brexit legislation and policy which has implications for the environment.

Overall, we found that evidence is defined broadly in Parliament. MPs, Peers, and to a lesser extent staff, rarely distinguish between different types of evidence (e.g. peer reviewed science *versus* public opinion). Sources of evidence were diverse, but the documentary analysis of written and oral evidence submitted to Select Committees and Public Bill Committees was interesting. Proportionally, evidence submissions tended to be dominated by not-for-profit external organisations, such as charities. The proportion of evidence from the Higher Education sector, however, was much lower, suggesting that universities engage less well in parliamentary processes. There were certain types of evidence that people in Parliament

found most useful and credible – statistical evidence, for example, was selected most frequently as an option by MPs and MPs' staff, and was widely considered to be credible and robust. Parliamentary staff (e.g. Library staff) said that they used expert opinion most often.

Evidence was also used for a variety of different purposes, not just to inform policies within a linear, rational model of policy-making. Prominent purposes did include 'to enable effective scrutiny', 'to provide credibility', 'to provide background knowledge', 'to inform opinions', and 'to provide balance', but evidence was also used 'to substantiate pre-existing views', and 'to score political points'.

Several factors determined whether evidence would be used to support parliamentary work. Survey respondents ranked credibility as the most important factor, but data from interviews suggested that evidence appraisal was limited. Other important factors included relevance and clear presentation, two areas in which evidence submitted by academics did not perform strongly. Research from universities was widely considered to be complicated, hard to access, and irrelevant for much parliamentary decision-making. Other factors included constraints placed on the use of evidence by the tight parliamentary timetables (indeed lack of time was a prominent theme, particularly for MPs), the extent to which an evidence source had been recommended by colleagues, and personal traits such as attitude, background experience, and alignment with own views.

Although the research investigated the use of evidence across Parliament, and did not actively consider environmental decision-making, important lessons can nevertheless be learned by the conservation science community. We present a list of the top-ten lessons below, which should improve the way in which the conservation science community engages with the UK Parliament. High

level messages may be relevant to legislative settings around the world, but policy settings are rarely easily comparable in different contexts.

1 Recognise the difference between parliament (legislatures) and government (executive) – these are two different things. Many important decisions are made in legislatures and so it should be seen as an important site of engagement.

2 Understand how Parliament works and engage with it! – the research found that external not-for-profit organisations tend to engage with parliamentary processes better than the Higher Education sector. Universities were criticised for not always engaging effectively in calls for written and oral evidence submissions to committees, and one respondent suggested that universities were 'closed shops'. Our report outlines the different parliamentary processes of debate and scrutiny, including the mechanisms through which evidence can feed into Parliament. A better understanding of these, including what makes research timely and relevant, may improve the prospects for evidence-informed policy.

3 Be able to respond to evidence calls at short timescales – more flexible modes of scientific reporting are needed. It is not always appropriate to wait until the end of a big project to communicate; rather the ability to engage frequently is vital.

4 Build personal relationships – there was much evidence that people in Parliament used known and trusted sources and sometimes relied on peer recommendation. Key members of Select Committees, such as special advisors, also played an important role in determining evidence use. Conservation scientists (and universities) could build networks with MPs, Peers, researchers, Library staff, and committee staff, in order to establish trust and enhance awareness of their work.

5 Open access publishing – lack of open access publishing was one of the main reasons why scientific evidence was not used in

Parliament. Universities, journals, and funders could work together to ensure that open access is available and affordable to all researchers, whilst researchers could disseminate their evidence in a variety of accessible ways (e.g. blogs).

6 Present research in a user-friendly, relevant way – academic sources of evidence were criticised for being written in an overly complicated fashion. Sometimes academic witnesses to committees were challenged for being difficult to understand. Respondents suggested that scientific evidence should be communicated in a simple manner, with accessible, short abstracts, and user-friendly presentation of data (e.g. visualisation).

7 More proactive evidence synthesis, particularly of 'what works' – since Parliament is a time-pressurised environment, respondents needed to understand quickly what the evidence was saying. Evidence syntheses were generally praised, particularly if they had been proactively compiled ahead of time (e.g. POSTnotes). Respondents also said that they liked summaries of 'what works', which reminds us of the need for innovations like the Conservation Evidence project.

8 Work with knowledge brokers – it is difficult for scientists to engage fully with Parliament, and parliamentarians, because of pressures of their own! Knowledge brokers, such as POST, were praised for bridging the gap between evidence and policy.

9 Maintain scientific credibility – despite the finding that little evidence appraisal was carried out, credibility of evidence was important. In many cases, credibility of the source was considered to be most important, but people in Parliament were aware that some evidence submissions could be biased. Scientists should continue to work hard to establish credibility, and perhaps not risk compromising it by advocating too strongly

10 Stand for Parliament – as the old saying goes, if you can't beat them, join them!

FIND OUT MORE

As a result of our project's findings, POST is developing a web hub for academic researchers, which will provide guidance and information for researchers on many of the points above, as well as case studies of academics who have worked with Parliament and videoed interviews with parliamentary staff. It is expected that the pages will go live this month. You can stay up-to-date on the development of the web hub by signing up to POST's mailing list or following POST on Twitter @POST_UK.

GET INVOLVED

We hope that the conservation science community adopts a renewed interest in legislatures, and considers the ten messages above to improve the chances of evidence-informed policy. I plan to expand this research model by investigating the use of evidence for environmental decision-making in the UK Parliament and beyond; for example, looking in detail at the work of the Environmental Audit Committee, as well as other parliamentary processes with an environmental remit.





WHAT HAPPENS WHEN OPERA MEETS SCIENCE OUTREACH?

Unsung Heroes of The Planet –
The world's first fungal opera

Ruth Mariner
Gestalt Arts
ruth@gestaltarts.co.uk

Photography by Max Miechowski



OPERA AND SCIENCE MIGHT APPEAR TO BE UNLIKELY BEDFELLOWS, YET THERE HAVE BEEN AN NUMBER OF SCIENCE-INSPIRED OPERAS CREATED OVER THE LAST FEW YEARS

*A rehearsal for **Unsung Heroes of The Planet**; the main event attracted an audience of 750*

John Adams' 2005 work *Doctor Atomic* explores the stress and anxiety experienced by those at the Los Alamos test of the first Atomic Bomb; smaller works like The Opera Group's *The Lion's Face*, funded by The Wellcome Trust, explores a dementia patient's retreat into an inner world as their ability to communicate diminishes; and fringe festivals such as Tete a Tete: The Opera Festival, provide a home to many experiments, ranging from thought-provoking pieces about Artificial Intelligence to works such as 'The homosexual Necrophiliac Duck Opera', based on the research of Dutch biologist Kees Moeliker.

Opera can turn to science for inspiration, but can opera serve as science outreach? Can it communicate clear scientific facts to a non-expert, changing opinions and igniting interest? Moreover, can it go above and beyond the limits of science outreach, reaching wider audiences with more impact? These were the questions the British Ecological Society Outreach Grant Winners *Gestalt Arts* set out to answer, through a highly unusual opera project which took science out of the classroom and opera out of the concert hall at Green Man Festival 2017.

Unsung Heroes of The Planet is an opera which takes key facts about fungi and blows them up through musical storytelling and a bold artistic vision. It was piloted at Green Man Festival because of the festival's focus on ecology and consideration for the environment. (The festival leaves no trace of its existence at *Glanusk Park*, uses only reusable cups, and mobile phones are re-powered by bicycle chargers!). The opera was produced through support from Einstein's Garden, an area of the festival specifically focused on public engagement of science with a strong message of sustainability at its centre. The material for the opera was taken from two scientists, Professor of Fungal Ecology at Cardiff University, Lynne Boddy; and N8 Chair in Microbial Ecology at The University of Manchester, David Johnson.

The opera explored how fungi can help trees to communicate with one another, how different species can battle over territory and resources, how fungi can carry defence signals from plants under aphid attack, and how some fungi (*Cordyceps*) can enter the bodies of small invertebrates, zombifying them and growing fruit from their dead bodies.

These facts were brought to life through a riveting adventure, told through from the perspective of three fungal mycelia who use their entire arsenal of abilities to escape from a glass experiment they have been placed in by a dotting scientist. Theatrically, the opera was a fun and accessible experimental mash-up, mixing clown-like exaggeration and operatic drama with physical theatre and carnival. The music too, was a combination of different styles. The emotional power of opera was used to bind the audience to the mycelia's plight, whilst 60's psychedelia and folk music which embodied the spirit of Green Man Festival and connected to the issue at the heart of the production: the message that soil is precious, with ecosystems which cannot be easily replicated and which take a long time to recover when damaged by human hands.

The project was met with wide appreciation and success. The performance attracted an audience of 750 people, and from a random sample, 100% of people reported that the enhanced their enjoyment and knowledge of fungal ecology. Through these surveys we learned that the key reasons the opera achieved its aims was because the narrative element compelled people to stay and follow the story, whilst the different levels of humour and quick-paced switching of styles entertained children and adults alike. The addition of a 'scientist' character which clarified the narrative enabled audiences to feel comfortable and immersed in the science.

UNSUNG 'FACTS'

Walkabout Reach:
12,000

Performance Reach:
750

Lecture Reach:
76

Workshop Reach:
31



Fungal mycelia swirl around a tree, helping communication

In addition to the performance, *Gestalt Arts* also piloted another experiment, an 'operatic' walkabout in which the fungus performers moved around the festival singing and interacting with members of the public. This was used to communicate the key message of the opera – that forests are communicative ecosystems in which soil & fungi play a vital role – in a micro-format. Members of the public were handed 'tokens' emblazoned with element symbols such as nitrogen or phosphorus as though they were trees receiving communication signals through the fungal network. They were then invited to the project. Not only did this enable the project to reach a staggering 12,000 people, it also boosted audience numbers. 72% of people said that they came to the performance because they saw the performers walking round or a performance taking place, whilst 24% said they had been recommended to come and see it through word of mouth.

As was suspected when designing the project, bold vision, a touch of the personal and a touch of the bizarre makes enormous impact when engaging audiences. It ignites curiosity, and enables research to speak to the heart as well as the mind.

The production was accompanied by workshops where children explored fungal ecology through music and drama, and by a talk by Professor Lynne Boddy on the capabilities of different species of fungi, and why they are indeed the Unsung Heroes of the Planet.

WHAT'S NEXT?

Gestalt Arts is currently fundraising for a tour of *Unsung Heroes of The Planet* in 2018. If you would like your venue or organisation to become involved, please get in touch by emailing ruth@gestaltarts.co.uk

Fungus performers moved through the festival crowds; this one's a nematode with a bit of a Cordyceps infestation



PhD student Emma Gilmartin enjoying the experience of science outreach

FIND OUT MORE

For more information on the work of Gestalt Arts visit: www.gestaltarts.co.uk

Follow them on Twitter @GestaltArts

To see a video of *Unsung Heroes of the Planet* visit: <https://youtu.be/pCPIMC-0mJ0>

CREDITS

Written and Directed by **Ruth Mariner**
Composed by **Cameron Dodds**
Designed by **Christine Bach**
Based on research from **Lynne Boddy and David Johnson**
Science Outreach **Emma Gilmartin**
Einstein's Garden Curator **Will Hunter**
Performed by **Donna Lennard, William Davis, Claire Filer, Chiara Vinci, Richard Court**



THE
UP
LANDS
↑
ONWARDS AND UPWARDS

FEATURE

A large, eclectic group gathered in March to discuss the current state of the uplands and challenges ahead. Mindful that the land area takes in a third of Britain, this was quite a daunting undertaking.

Darren Evans | Newcastle University | darren.evans@newcastle.ac.uk

Camilla Morrison-Bell | BES | camilla@britishecologicalsociety.org

Davy McCracken | Scotland's Rural College | davy.mccracken@sruc.ac.uk

Des Thompson | Scottish Natural Heritage | des.thompson@snh.gov.uk

Thirty years ago, the BES sponsored a major conference in Edinburgh on 'Ecological change in the uplands', and the ensuing textbook (Usher and Thompson, 1988) captured the mood of the science and issues of the time. Forestry, grazing (sheep and deer prominent), recreational pressures and pollution featured strongly, yet there was not a single mention of renewable energy, wind farms, carbon storage, ecosystem services or even climate change. The social sciences were virtually absent, and there was no emphasis on resolving conflicts – but instead on stressing them. The book is still quoted, and several of the chapters have a strong resonance today.

We met in Newcastle to deliberate on the hot issues, and had a lively range of presentations from politicians, farmers, ecologists, foresters, academics and people simply passionate about the wild landscapes and wildlife many of us have grown to enjoy.

TRANSFORMATIONAL CHANGES

Shaped by centuries of deforestation, agriculture and other human interventions, the uplands are on the cusp of major change, with much of this about to be influenced by developments in and outwith the EU. In England, Scotland, Wales and Northern Ireland strategies, policies and practices differ – in some cases, radically. There are increasingly heated discussions over so-called 'rewilding', conflicts between game management, raptors and peatland conservation, and the roles of hill farming (and support mechanisms), tourism and renewable energy developments.

The upshot is that we are entering a transformational moment – not since the post-War era of the creation of National Parks, National Nature Reserves and the advent of the statutory conservation bodies will we see such opportunities for change. Arguably, the passage of the Wildlife & Countryside Act 1981, and the Birds, Habitats, and Water Framework EC directives, will all be eclipsed by what happens next across the uplands.

That is why we met, and began a conversation on the issues and thinking we need to take us forward. Mindful of previous ecological overviews (e.g. Bonn *et al.*, 2009;

Nagy *et al.*, 2003; Thompson *et al.*, 1995, 2005) we slavishly worked in groups to identify the strength of feelings on issues and drivers of change.

PERSPECTIVES ON CHANGE

The results were fascinating – no reference whatsoever to cultural issues, no mention of generational perspectives on aspirations or benefits (admittedly, the participants were predominantly post-graduate in decades rather than single years), and there was a sense of stasis in terms of what is happening regarding landscape change.

The strength of views on forthcoming issues was highest with regard to impacts of vertebrate predators, climate change, Nitrogen deposition and homogeneity of habitat responses. Farming subsidies featured strongly, with public perceptions of the impact of these, their 'downstream' benefits and food versus other gains, arousing strong views. Interestingly, the discussion on ecosystem services triggered lively exchanges. Tinged by cynicism, but coerced through politburo facilitation (arguably!), we gravitated to a strong consensus on the importance of building 'resilient and restored' ecosystems, with renewable energy, woodland expansion and habitat-burning issues featuring strongly in the discussion narratives.

LOOKING FORWARD, IF NOT UPWARD!

All of this suggests that we need to develop, deepen and broaden the conversation on ecological change in the uplands. In some ways, we took more from what was not mentioned, never mind highlighted, as indicative of what needs to be considered further. Whilst ecologists obsess on processes and intricacies, the winds of change buffet the ears of the sensitive and nervous. We do not know what lies ahead, but recognise that formidably challenging but arguably exciting opportunities lie in wait.

Several people argued strongly that we need to work together in developing an integrated land use strategy for the uplands. In Scotland, the Land Use Strategy (Scottish Government, 2016) provides important pointers, and SNH (2017) sets out proposals for scoping an upland vision.

In Wales, the Government held a 'Future of the Uplands in Wales Inquiry' in 2009, and sponsored a major conference in March 2017 on 'The future of upland farming beyond the CAP'. Natural England (2015) has produced an 'Uplands strategic Standard' for England, and in Northern Ireland the Land Matters Taskforce (2015) published 'Towards a Land Strategy for Northern Ireland'. Clearly, there is already an appetite for strategic thinking, and we need to build on this to capitalise on the evidence base and various approaches being adopted across the UK. Indeed, the range of documents points to the importance of sustaining a deep conversation that develops ideas and solutions.

The uplands, so emblematic of tradition, grand virtues, gradual change and conservatism (with a small c) may surprise us all – public attitudes, support mechanisms and ecological thinking may point to something altogether different. Many may soon view the uplands as a societal or ecological refuge – a landscape teetering on change but offering solace and steady wildness in a climate of fast-paced change. But others may see opportunities for transformational socio-economic developments hitherto barely whispered. That's why we need to agitate for more work to talk through, scope, analyse and challenge fresh ideas. As our former President, Charles H. Gimingham, wrote in the Foreword to Burt *et al* (2002) - and deliberately drawing on biblical Proverbs 29: 18 - "Where there is no vision, the people perish." *Aller de l'avant!*

REFERENCES

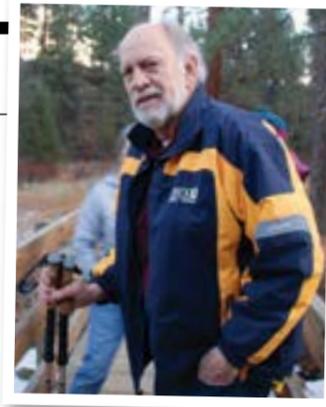
- Bonn, A., Hubacek, K., Allott, T. and Stewart, J. Eds. (2009). *Drivers of Environmental Change in Uplands*. Routledge, Oxford.
- Burt, T. P., Thompson, D.B. A. and Warburton, J. (Eds.). (2002). *The British Uplands: Dynamics of Change*. Joint Nature Conservation Committee, Peterborough.
- Land Matters Taskforce Northern Ireland (2015). *Towards a Land Strategy for Northern Ireland*. Report produced by LMT and The James Hutton Institute. Northern Ireland Link, Belfast. https://www.nienvironmentlink.org/cmsfiles/Towards-a-Land-Strategy-for-NI_2015-Main-Report.pdf
- Natural England (2015). *Natural England Uplands Strategic Standard*. Natural England, York. file:///C:/Users/apdt/Downloads/upland_std_ext_May_2015.pdf
- Nagy, L., Grabherr, G., Körner, C. and Thompson, D.B.A. (Eds.). (2003). *Alpine Biodiversity in Europe*. Ecological Studies Series, Springer Verlag, Berlin. Pp. 477.
- Scottish Government (2016). *Land Use Strategy 2016-2021*. Scottish Government, Edinburgh. <http://www.gov.scot/Topics/Environment/Countryside/Landusestrategy>
- Scottish Natural Heritage (2017). *Scoping a strategic vision for the uplands*. Report from SNH to the Scottish Government. Scottish Natural Heritage, Battleby. <http://www.snh.gov.uk/docs/A2195474.pdf>
- Thompson, D.B.A., Hester, A.J. and Usher, M.B. (Eds.). (1995). *Heaths and Moorland: cultural landscapes*. HMSO, Edinburgh. Pp. 400.
- Thompson, D. B. A., Price, M.F. and Galbraith, C.A. (Eds.). (2005). *Mountains of Northern Europe: conservation, management, nature and people*. The Stationery Office, Edinburgh. Pp. 396.
- Usher, M.B. and Thompson, D.B.A. (Eds.). (1988). *Ecological Change in the Uplands*. Blackwell Scientific Publications, Oxford. Pp. 449.



ESSAY

ON WINE TASTING AND ECOLOGY

John Wiens | jwiens300@gmail.com



We live in the Willamette Valley of western Oregon. A total solar eclipse passed through last August. We were in the path of totality, so we set up chairs on our deck, sat back, and watched the spectacle unfold. And the eclipse was indeed a mystical event—birds fell silent, crickets began chirruping, light dimmed and then turned to amber, the air suddenly got much cooler, our dogs became apprehensive and clung to us. Then, as sunlight first broke like a sparkling diamond through the moon's obstruction, everything returned to normal. Well, perhaps not quite everything—the eclipse left a subtle but deep emotional impression that continues to this day. It's easy to see why the druids viewed solar eclipses with awe, as an omen.

I had thought to use the solar eclipse in this essay as a metaphor for the eclipse of reason that seems to be plaguing many countries these days. But that's a weighty and depressing subject, about which much has already been written. As I tried to think of something more uplifting to say, I raised a glass of wine to take a sip. Light glittered, like a diamond, through the wine. I thought, "Why not write something about wine?" Some of the world's best wines, particularly pinot noirs, are produced in the Willamette Valley, so it seemed a fitting topic.

A few years ago, our neighbour down the street joined some friends to start a small winery. They now create some award-winning wines. And because they are all alumni of Hewlett-Packard, they think like scientists, and bring the joy of

experimentation to their enterprise. Who else would think of infusing a port wine with essence of hazelnut (another Willamette Valley specialty)? The challenge is to see if the taste of hazelnuts comes through (it does). Which brings me to wine tasting.

Wine tasting is as much a social as an oenological event. I once made the mistake of dragging a friend who rarely drank wine to one of my favourite local wineries for tasting. He rather liked the whites (especially the sweet ones that reminded him a bit of sodas), but things fell apart when we reached the reds. We were tasting a good cabernet sauvignon. After he'd gulped it down, I asked him what he tasted in the wine.

"You mean besides the wine?" he asked.

"Yes, what subtle tastes tingle your tongue?"

"Well, now that you mention it, it tastes rather like burnt wood."

I paused. **"That's the tannins."** I said. **"There's supposed to be a faint hint of it. It comes from aging the wine in oak barrels and adds complexity to the wine."**

"Oh. Or perhaps it tastes like bark mulch.... Can I have some more of that fizzy wine?"

I wondered how he came to know the taste of bark mulch, but I politely shrugged and enjoyed the pinot noir by myself.

Wine tasting is best done in the company of family and good friends who can appreciate the experience and the wine. And there's an ostentatious

art to it. After the wine is poured (carefully!) into the proper glass, one holds it to the light (at just the right angle), comments on its clarity or richness of colour (British spelling helps convey the seriousness of the experience), swirls it gently and thoughtfully to release its bouquet, and samples its aroma (its "nose") to prepare for the tasting. Only then is one allowed to take a sip, but not actually drink it. First you must hold it in your mouth for a bit to let all the little taste buds prepare to savor the experience, then slosh it about your mouth, all the while staring into space in a contemplative way (ideally with your head tilted to one side). Then, finally, you may swallow the wine. But you're not yet finished. Now comes the aftertaste, the part where you proclaim what you tasted (or imagined you did, if you read the tasting notes beforehand). A sampling of wine labels in my wine cellar (a storeroom, actually) suggests that one should taste "dark berries and cherries amid spices and early mushroom notes," or "aroma of apricot and pear and flavors of grapefruit," or "sweet aromas of cola berries and baking spice," or "aromas of violets, truffles and black pepper and engaging flavors of plums and currants"—and that's just the pinot noirs! Tasting by experts, of course, is far more nuanced.¹

FOOTNOTE

¹ The University of California Davis offers an advanced course in the sensory evaluation of wine as part of their Viticulture and Enology program.

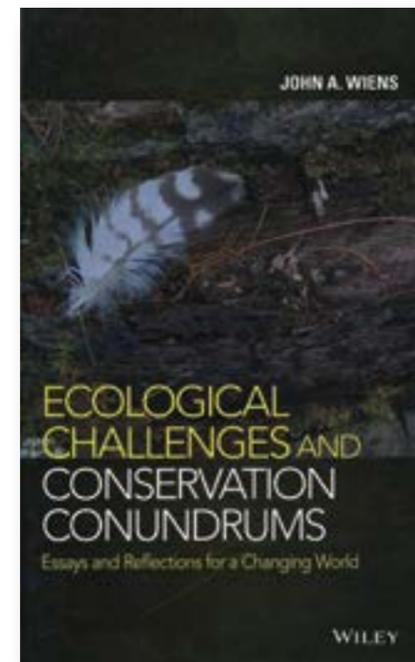
What does this have to do with ecology? One could argue that wine tasting is an ecosystem unto itself, with all the complexity, interactions, synergisms, and surprises that we associate with ecosystems. That may be a stretch. More to the point, however, viticulture is ecology. The characteristics of a wine that emerge in a tasting are consequences of a complex interplay among soils, slope, exposure, disease, the vagaries of weather at critical times, microbial actions, and generations of selection that have honed how grapes respond to these factors. These are what produce the astonishing variations in the final product, variations that lead to multi-fold differences in cost and availability.

There's an additional link to ecology. I can attest to the observation that wine fosters probing discussions among ecologists that often lead in unexpected directions. Sometimes these produce great insights.

But I can't remember what they are.



Bacchus, the Roman god of wine, wine-making, and general merry-making. From a painting by Richard Lofton in the Van Horne-Wiens collection



A review of John's book *Ecological Challenges and Conservation Conundrums*, a collection of wonderfully readable and thought-provoking essays, new as well as previously published, is on p0

CHARTERED INSTITUTE OF ECOLOGY AND ENVIRONMENTAL MANAGEMENT



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



BREXIT

So it goes on. As March 2019 becomes less of a distant rumble and more of a reality, ideas regarding the future of environmental legislation, policy and practice in the UK are starting to take shape. Like many other organisations CIEEM has published its priorities for a post-Brexit world (see www.cieem.net) and I think we should all be encouraged at the consistency of ideas and proposals emerging from environmental bodies and other stakeholders.

CIEEM has consolidated its 'asks' into four key areas:

- An overarching UK Environment Act is required to provide a coherent legislative framework that is bold, ambitious and measurable. This should incorporate some of the best ideas already put forward in recent legislation by some of the devolved UK countries. Despite the environment (and agriculture) being a devolved competence, CIEEM believes that in a post-EU member world it is vital that there is a common framework (as there is currently with EU legislation) that empowers all countries of the UK to deliver as they see fit. The Environment Act must be developed consensually by UK governments.
- The biodiversity net gain approach should be used to underpin the transformation of land (including planning and agriculture) and marine management policies. This will incorporate the principle of public payment for public

benefits, delivered by working in partnership with land managers and resource providers.

- A new hierarchical framework for protected sites and species designations that appropriately reflects their importance/vulnerability is required. This also provides the opportunity to communicate the value of protected sites and species more effectively to non-scientists.
- A new OfEnv-style body is required to independently scrutinise adherence to environmental standards and to hold public bodies, including UK government, to account.

That's not much to ask, is it?

PROFESSOR SIR JOHN LAWTON RECEIVES THE 2017 CIEEM MEDAL

At our Autumn Conference last month in Manchester we had the opportunity to honour CIEEM Patron and former BES President Professor Sir John Hartley Lawton CBE FRS who was awarded the 2017 CIEEM Medal in recognition of his outstanding, highly influential and life-long contribution to ecology and environmental management.

In his earlier career John founded the Centre for Population Biology at Imperial College London, working on experiments linking biodiversity, climate change, population dynamics and ecosystem processes. John was Chief Executive of the Natural Environment Research Council from

1999 to 2005. He was then appointed as the Chairman of the influential Royal Commission on Environmental Pollution from 2005 until it was wound up in 2011. He also led the panel of experts who undertook a review of England's protected areas which was published in 2010 as *Making Space for Nature*. This report summarised what needs to be done to enhance the resilience and coherence of ecological networks and it has been extremely effective in influencing government decision-makers. Currently he is President of the Institution of Environmental Sciences and has made major contributions to many national and local environmental NGOs including the RSPB, the British Trust for Ornithology, the World-Wide Fund for Nature-UK, Yorkshire Wildlife Trust and the York Ornithological Club.

In receiving the Medal John spoke eloquently, as always, about the challenges we currently face in championing effective environmental protection and, unsurprisingly, had some strong views on the actions UK governments need to take in the future.

APPRENTICESHIPS

A group of employers representing consultancies, statutory bodies, local authorities and NGOs has been developing two new Level 7 apprenticeships in England, one for the role of Ecologist and one for the role of Environmental Manager. It is hoped that employers will be able to start offering these apprenticeships in 2018, with the first apprentices starting in the early Autumn. Aimed



at graduates or those who have achieved an equivalent Level 6 education, individuals successfully completing their apprenticeship will have a Masters-level degree as well as a Level 7 award.

This represents a significant step forward for those seeking to enter the profession but not choosing to undertake a full-time postgraduate degree. Apprentices will spend at least 20% of their time on training as well as becoming fully immersed in work-based learning with their employer.

Hopefully the scheme can extend beyond England in the future.

STUDENT MEMBERSHIP

CIEEM's student membership is growing all the time, which is great news. Students become graduates and graduates are the lifeblood of the profession. Last month we ran a webinar for our student members on career opportunities within the profession and this is something that we hope to repeat on a regular basis.

Student membership costs £20 (£10 if you are on an accredited degree programme or pathway) and provides opportunities for you to network with professional members and potential employers at local and regional events as well as at conferences, in addition to receiving other benefits.

If you have not considered student membership of CIEEM recently why not take a look at what we can offer by visiting <https://www.cieem.net/members>. We would love to see you!

PUBLICATIONS

Functional Ecology

PEER REVIEW — WHAT DOES IT MEAN TO YOU?



The BES publications team

In September, along with many other organisations and individuals all over the world, the BES celebrated peer review week – a global event celebrating the essential role that peer review plays in maintaining scientific quality.

If you missed it, check out our roundup of the week on the BES website (<http://www.britishecologicalsociety.org/peer-review-week-2/>). Highlights include the launch of the *Methods in Ecology and Evolution* peer reviewer mentoring scheme and a series of blog posts from across the journals.

We recognise that peer review underpins the high-quality work published by BES journals and has done for over 100 years. We also recognise the enormous contribution that our reviewers make to the advancement of ecology as a discipline and the huge value that the community places on this. However, rather than us talking about the value of peer review to the BES, we wanted to ask those researchers sitting on our Editorial Boards why they think peer review is important and what they think peer review will look like in the future. Given that we only gave people a short time to consider these issues, we received many thought-provoking responses, so a huge thank you to all the Editors and Associate Editors that replied.

WHY IS PEER REVIEW IMPORTANT?

Filtering out low quality content or improving high quality science

Most respondents felt that peer review was about improving high quality science and making it better rather than filtering out science that is flawed or poor. This may vary depending on the journals that you are working on, but we are lucky within the BES to receive a high number of fantastic submissions.

“Even excellent research can be improved further when critically scrutinised by an independent mind”
Johan Du Toit, Associate Editor, *Journal of Applied Ecology*.

However, there were also those who felt that peer review is used as a validation tool in a world where more information is readily available and unchecked.

“In an era where anyone can say anything and reach a global audience, it's important that there are verified sources of information that have been independently checked for their reliability and rigour”
Pete Manning, Associate Editor, *Journal of Applied Ecology*.

Improving accessibility to science

Good peer review does not just improve the science in papers but it also improves the ways in which authors communicate their science,

leading to better understanding and even new ideas or questions to analyse. Providing researchers with feedback on their communication styles enables them *“to communicate science clearly and concisely which is one of the most challenging aspects that we face if we want to make a real translational impact from our offices, greenhouses and field sites into society.”* Rob Salguero-Gomez, Associate Editor, *Journal of Ecology*.

Many of our Board members felt that improving the impact and relevance of the science in articles was a fundamental role that peer review plays.

To encourage science as a social enterprise

On a similar note, many of our Editors felt that the scientific process should remain a *“social collective enterprise based on shared goals and ideals, good faith and trust.”* Enrico Rezendes, Associate Editor, *Functional Ecology*.

This social aspect of improving science and enabling better science through collaboration was mentioned several times in the feedback we received. It echoes the altruism demonstrated by many when asked why they participate in the review process.

Even when not all the comments are welcomed, the process is generally appreciated *“As an author, I greatly value the constructive feedback received during peer review, even if Reviewer 2 remains an annoying*

Journal of Animal Ecology

Journal of Applied Ecology

Journal of Ecology

Methods in Ecology and Evolution

torment...” Brett K.Sandercock, Associate Editor, *Functional Ecology*. (Check out #reviewer2 on Twitter!)

Our editors also value the peer review process to stimulate ideas and drive science forward.

“Peer review can lead to new ideas, revised approaches, and altogether better science” Nathalie Pettoelli, Editor, *Journal of Applied Ecology*.

“Peer review is at the core of good science. Without it, science does not evolve” Nate Sanders, Editor, *Journal of Animal Ecology*.

WHAT WILL PEER REVIEW LOOK LIKE IN THE FUTURE?

While there was broad agreement from our Editors on why peer review is important, this question provoked differing views.

Still require expert peer reviewers

Many of the Editors felt that the peer review process should remain the same with little or no change:

“My hope is that expertise continues to be the backbone of peer review, that knowledge will always be valued more than fashion or uninformed opinion” Jacqueline Frair, Associate Editor, *Journal of Applied Ecology*.

However, there was also concern raised about the increasing burden on a volunteer reviewer community and the sustainability of this model. It was also noted that early career researchers often aren't asked to review, *“early career ecologists are often times some of the most knowledgeable researchers in their specific fields, and yet they don't often get tapped into for reviewing”* – Rob Salguero-Gomez. To address this, the BES journals encourage collaborative reviewing whereby senior researchers collaborate with other more junior members of their laboratory on reviews. This can be a great way of mentoring more junior researchers but also relieving some of the burden on frequently-used referees. For more information on this please visit our journals' editorial policies page.

Some believe that advances in technology will help shape future peer review processes:

“Technology might be able to help improve the selection of peer reviewers” Margaret Stanley, Associate Editor, *Journal of Applied Ecology*.

However, many were uncertain about how this might help and indeed some concerns were raised about too many automation tools being used and reducing reliance on scientific expertise.

“Expert opinions cannot be automated or outsourced” Susan Schwinning, Associate Editor, *Journal of Ecology*.

Incentives

Given the increasing pressures on the reviewer community, unsurprisingly some Associate Editors mentioned that in future there may need to be more incentives offered for reviewers, whether in the form of cash payments or discounts on other products and events. However, some also noted a degree of caution would be required.

“We should be careful in how we incentivise peer review - there's a risk that this could lead to behaviours that distort and damage science.” Peter Manning, Associate Editor, *Journal of Applied Ecology*.

Interestingly our own author and reviewer survey in 2016 (<http://www.britishecologicalsociety.org/author-reviewer-survey-results/>) indicated that the most preferred form of reviewer reward is information on the final decision of the paper, and access to the other reviewer reports presumably so that reviewers can learn from the other reports.

Types of peer review

This was the area of most disagreement among our Editorial Boards. There are some who feel strongly that the process should become more open with referees signing their reviews; however, it was also recognised that this is easier for more established researchers and that a more open

process would do little to protect early career researchers who may feel uncomfortable criticising professors.

Many others stated a preference for double blind peer review, where the authors are anonymous as well as the referees. These conflicting views are not unique to our Editors, in our author survey conducted in 2016, 61.8% of respondents ranked double blind peer review highly, while 33.5% favoured open peer review and 41.8% rated single blind review highly.

Post-publication peer review was also cited by many as a potential future development *“perhaps papers will end up like wikis with people posting them online and then those who read them commenting on them online”* Rachel Norman, Associate Editor, *Journal of Animal Ecology*: although some had concern that there would be large amounts of unreviewed content available in that case.

One slightly different model that was suggested involves publishing reviews alongside the final article with proper DOIs, either anonymously or otherwise, with some respondents feeling that publication of reviews would lead to a more constructive process in general. *“If reviews could be cited and are eventually public, reviewers would likely be more systematic, fair and constructive.”* Enrico Rezendes, Associate Editor, *Functional Ecology*.

On a similar note, some Associate Editors would like to see a move to more dynamic reviewing in real-time, involving a “virtual” dialogue between authors and multiple reviewers.

Other innovations

There were some Editors who felt that there may be more tools and services introduced in the future, including centralised services that uncouple reviews from individual journals. While there was some support for these services in principle, there is also concern that these will over-complicate an already complex environment.

In conclusion

The wide variety of responses our editors suggested is perhaps unsurprising, given that there are many innovations being trialled at the moment. Ultimately, the responses indicate that the support for peer review, and the huge benefits it brings to the scientific enterprise overall, are unlikely to change in coming years. This suggests that changes seem likely to be incremental, rather than a radical overhaul of the system.

One of our AEs sums it up nicely *“I think we are entering an experimentation phase and who knows which process will get established as the norm in the future.”* Ignasi Bartomeus, Associate Editor, *Journal of Ecology*.

Whichever system ends up being most popular in the future, those ecologists we have heard from value the process and recognise its significance to the overall scientific enterprise. In an increasingly interconnected world, science is becoming more global and this should be reflected in our peer review processes. Disambiguation tools such as ORCID may also become more valuable when ensuring the global community is reflected in our author, editor and reviewer communities.

Within the BES, we plan to evaluate different options for peer review over the coming years and explore new tools and services as they become available – watch this space!

In the meantime though, we would like to offer a huge thank you to the many different stakeholders who contribute to the BES journals' peer review processes - reviewers, Associate Editors and Editors, and the many authors who engage in constructive dialogue with the Editors in order to improve the science that we publish.

Thank you!



PUBLICATIONS NEWS

CONTENT HIGHLIGHTS

In issue 105:6 of *Journal of Ecology*, we published a Special Feature: 'Long-term dynamics and impacts of plant invasions'. The Special Feature, organised by guest editors Luke Flory and Carla D'Antonio, includes six research papers and an editorial on the subject of community and ecosystem changes driven by invasive plants.

Issue 87:1 of *Journal of Animal Ecology* includes a Special Feature on Allee effects in ecology and evolution. Allee effects are a key, but understudied, population dynamical phenomenon. Through advancing our understanding of Allee effects and their role in the dynamics of natural populations, ongoing invasions, and ecoevolutionary dynamics, the Special Feature aims to benefit population ecology, environmental management (e.g. managing invasive species), and species conservation.

Functional Ecology's recent issues have included several new Review papers: 'Incorporating the effects of generalist seed predators into plant community theory' by Loreale Larios, Dean E. Pearson and John L. Maron (doi:10.1111/1365-2435.12905), 'Stable isotopes in tropical tree rings: theory, methods and applications' by Peter van der Slepen, Pieter A. Zuidema and Thijs L. Pons (doi:10.1111/1365-2435.12889), 'Sampling roots to capture plant and soil functions' by Grégoire T. Freschet and Catherine Roumet (doi:10.1111/1365-

2435.12883) and 'Beyond troubled waters: the influence of eutrophication on host-parasite interactions' by Alexandre Budria (doi:10.1111/1365-2435.12880). Anyone interested in writing a review paper for *Functional Ecology* can contact Emma Sayer, our Reviews Editor (e.sayer@lancaster.ac.uk).

Issue 55:4 of *Journal of Applied Ecology* features a Spotlight on Soil biota. This selection of articles, chosen by the Editors, highlights topical and high-quality research, exploring ideas such as biodiversity loss, restoration and sustainable production, all from a belowground perspective.

Journal of Applied Ecology has also published a Virtual Issue on Wildlife Management (<http://bit.ly/WildlifeVI>), bringing together articles from the past year on conservation planning, climate change, disease ecology and human-wildlife conflict.

Finally, we published a new cross-journal Virtual Issue, Aquatic Ecology (<http://bit.ly/AquaticVI>). This Virtual Issue was launched at the 2017 BES Aquatic Group science meeting to illustrate how theoretical, empirical and synthetic studies, based in aquatic ecosystems, are leading the way in many fields of ecology well beyond the scope of the particular study system.

IN THE NEWS

Severin Irl of the University of Bayreuth has been awarded the German Botanical Society's Eduard Strasburger Award for his 2015 *Journal of Ecology* paper; 'Climate vs. topography – spatial patterns of plant species diversity and endemism on a high-elevation island'. The prize is awarded every two years to a young researcher for outstanding work in the field of botany, and Severin was presented with his award at the German Botanical Society September meeting in Kiel.

Ruth Mitchell, chair of the BES Scottish Policy Group, was recently on Radio 4 to discuss her article, 'Understorey plant community composition reflects invasion history decades after invasive Rhododendron has been removed' (doi:10.1111/1365-2664.12973), published in *Journal of Applied Ecology*.

A large-scale study of the rainforests of Malaysian Borneo by University of Liverpool researchers, in collaboration with the Natural History Museum, found that ants alone were responsible for removing more than half of food resources from the rainforest floor. The rest of the waste was removed by all other animals combined, including mammals, birds and other vertebrates and invertebrates. Resources and waste which ants remove include dead animal bodies, seeds and fruits.



The Polyrhachis ant is one of many species involved in resource removal. Copyright: Dr Louise Ashton, Natural History Museum.

The study showed that in the absence of ants no other animals can compensate for this role. Therefore, if ants weren't carrying out waste removal, dead organic material would build up and decompose more slowly *in situ*, creating a more homogenous, less diverse soil environment. The study was published in *Journal of Animal Ecology* (doi:10.1111/1365-2656.12728).

Anna-Katharina Mueller of Bielefeld University, Germany, has been awarded the Watson Raptor Science Prize 2017 for her paper in *Journal of Animal Ecology* 'Intraguild predation leads to cascading effects on habitat choice, behaviour and reproductive performance'. The prize is awarded to the best scientific publication on European raptor research. The panel chose Anna-Katharina's paper because of the excellent analysis of a 25 year study of interactions between eagle owls, northern goshawks and common buzzards in three regions in Westphalia, Germany.

NEW EDITORS

Functional Ecology welcomes a new Senior Editor, Lara Ferry from Arizona State University. Lara's work looks at ecomorphology or functional morphology and is centred around questions that attempt to broadly address: 1) the evolution of novel and/or specialized forms or traits, 2) the biomechanical or performance consequence of changes in form; and; 3) how form, typically by interacting with other physiological, behavioural, or genetic variables, affects and can be used to predict functional ecological relationships. Her research focuses on traits associated with feeding and respiration, particularly in aquatic organisms. Lara will also be at the BES Annual Meeting and at SICB in San Francisco in January 2018, representing the journal.



Lara Ferry, new Senior Editor for Functional Ecology

A big thank you to everyone who applied for our cross-journal open call for Associate Editors. We'll soon be introducing the new members of each journal's Editorial board so please watch this space.

In addition to new Editors, a group of Early Career Researchers are currently taking part in a Peer Reviewer Mentoring Scheme run by *Methods in Ecology and Evolution* and the BES Quantitative Ecology Special Interest Group. The scheme pairs ECRs with experienced reviewers to help them gain experience and confidence in reviewing manuscripts. The mentees receive feedback and advice on each review that they complete and have the chance to make changes before sending it to the journal. This trial scheme will run until April 2018.



ONLINE EXTRAS

In celebration of Peer Review Week 2017, all of our journals featured blog posts exploring this year's theme, 'transparency in peer review'. A roundup of the posts is available on the BES website (<http://bit.ly/PRW2017>), where you can also find our Guide to Peer Review.

Understanding how animals perceive, learn and remember is critical for understanding both how cognition is shaped.

Unfortunately, the limited number of protocols currently available for studying insect cognition has restricted research. In a new video for *Methods in Ecology and Evolution*, Felicity Muth describes a simple method she developed with Trenton Cooper, Rene Bonilla and Anne Leonard for testing both lab- and wild-caught bees for their preferences, learning and memory. Watch the full video here: <https://youtu.be/ZJDvbcDZD9U>

Measurements of morphological features are important for ecological studies, especially on free-ranging wild animal species. Mahendiran et al. have developed a non-invasive, novel method for *in situ* estimation of individuals' morphometric measurements using digital photographs' metadata. In a new video (<https://youtu.be/XdFil2xOrZA>) two of the authors discuss the article, its relevance to animal welfare and wildlife studies, the scope and utility of digital photographic advancements, and how this method could be applicable to other disciplines.

The *Journal of Ecology* blog has recently published Yvonne Buckley's Ecological Inspirations, and a report from Marc Cadotte on INTECOL 2017. Read all these articles and more on the blog (<https://jecologyblog.wordpress.com/>).

On the *Journal of Animal Ecology* Podcast Series, multimedia Editor Ravi Palavalli Nettimi asks Animal Ecologists for their Field Reports. Former Executive Editor Tim Coulson tells Ravi

about taking a wrong boat to the wrong island; Ben Dantzer talks about squirrels, meerkats, and bear encounters and Julie Morand-Ferron talks about her work on bird and insect cognition, science communication and the need to design skinnier bird-boxes. Check them all out here: <http://bit.ly/JAEFieldReports>.

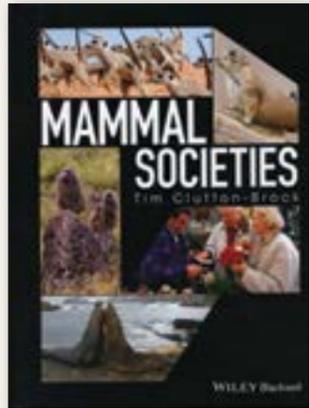
The Applied Ecologist's Blog has received a great reaction to our series of posts accompanying *Journal of Applied Ecology's* most recent Special Feature, 'Toward prediction in the restoration of biodiversity'. Read the posts here: <http://bit.ly/TowardPrediction>

BOOKS

Forthcoming *Ecological Reviews* include volumes on agricultural resilience, grasslands and climate change, wildlife disease, and rewilding. Don't forget that as a BES member you get 25% off all *Ecological Reviews* titles when you buy from the CUP website.

BOOK REVIEWS

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



Mammal Societies

Tim Clutton-Brock (2016)
Wiley Blackwell, Chichester,
760pp, £45 (hbk)
ISBN: 978-1-119-09532-3

In his seminal book on *Sociobiology*, E.O. Wilson (1975) considered previous attempts to classify animal societies. These, he felt, had never really taken off: they were either too simple to capture the full range of animal societies, or too complex to be useful. As an example of the latter, he noted that, in 1918, Deegener had proposed over 40 categories of social systems – discriminating, for example, between the amphoteromysynthesmia, a swarm of both sexes gathered for reproductive purposes, and the syncheimadium, a hibernating aggregation. Clearly, it takes a brave scientist to try to bring order to the field of animal societies!

In *Mammal Societies*, Tim Clutton-Brock sets out to do more than merely bring order to the bewildering variety of social systems observed among mammals. The book synthesises insights from both empiricism and theory, integrating research on

a range of systems (e.g., humans and non-human primates, cetaceans, and other mammalian orders) that are often the focus of quite distinct scientific literatures. By bringing these areas together, Clutton-Brock aims to provide a first comprehensive overview of the evolution of mammalian societies, emphasising the contribution that this knowledge can make to our understanding of human behaviour.

Mammal Societies begins with an overview of the development of the field of social evolution, and of the major themes within that field. The first chapter opens with the familiar Dobzhansky quote: “Nothing in biology makes sense except in the light of evolution”. Nowadays, few with an interest in animal behaviour would argue with that sentiment. However, Clutton-Brock’s romp through the history of the subject emphasises how rapidly the field has grown and changed. Strikingly, he notes that neither of Nico Tinbergen’s synthetic books on animal behaviour from the 1950s cite either Darwin or Fisher – a point that highlights how long it took for the study of behaviour to become properly linked to the fields of ecology and evolution. Thus, Clutton-Brock argues that the ‘Century of Darwin’ is still underway, having truly begun around 100 years after the publication of ‘On the Origin of Species’.

In at least five different ways, this first chapter sets the tone of things to come. First, the importance of the pioneering work of ornithologists is abundantly

clear, underlining that – whilst this is a book focused principally on mammals – there are fundamental lessons to be learned from studying both birds and invertebrates, and from contrasting their social systems with those of mammals. Second, although he is recognised for the insights derived from his field studies, Clutton-Brock writes easily on the importance of theoretical developments, distilling their key lessons for a generalist audience. Third, there is a readiness to confront important and topical debates within the field – such as the recent re-emergence of contention over the roles of group and kin selection – presenting a balance of arguments from both sides before reaching a considered conclusion. Fourth, notwithstanding some recent suggestions regarding the complex interplay between male and female distributions (notably as advanced by Harcourt & Stewart’s 2007 book on Gorilla Society), Clutton-Brock follows the orthodox line of causation, from resource distribution to female dispersion, and thence to male behaviour and mating systems. This informs the structure of the rest of the book, with earlier chapters covering aspects of female behaviour and later chapters focusing more on males. Fifth, the chapter, as with the rest of the book, is lavishly illustrated with colour photographs, graphs and explanatory boxes, many from Clutton-Brock’s own field studies of primates, ungulates and carnivores – but many obviously drawn from his extensive network of peers and

collaborators. Each chapter concludes with a succinct numbered summary and (slightly frustratingly, as there must be considerable overlap between chapters) reference list.

In the following 17 chapters, Clutton-Brock covers a wide range of aspects of mammalian social behaviour in considerable detail. Chapters 2 to 5 focus specifically on females, looking at sociality across a wide range of mammalian taxa, as well as dispersal, philopatry, mating decisions and maternal care. The chapter on maternal care is followed by two covering social development and communication, which touch on learning and teaching, social awareness, play, personality, culture and tradition, as well as signalling, honesty and deception. Chapters 8 to 10 then tackle female competition, cooperation and mating systems. In chapters 11 to 16, the focus switches to males, their associations, dispersal, competition, relationships, treatment of females, and care (or otherwise) for offspring. Chapter 17 focuses on cooperative breeding, drawing heavily on Clutton-Brock’s own study of meerkats in the Kalahari to review subjects such as division of labour and the costs and benefits of helping, as well as reproductive skew and suppression. Chapter 18 considers some of the outcomes of the differences between males and females that are emphasised throughout the book, including sexual dimorphism, aggression, ecological and life history differences between

the sexes, and the consequences of these differences for sex ratios at birth and as adults.

It is chapters 19 and 20 that, perhaps, lend this book its greatest distinction. In these chapters, Clutton-Brock addresses humans and other hominins, and what we can learn about their life histories and behaviour by reference to the evolution and behaviour of other mammals. This is a subject that most behavioural ecologists treat with considerable caution, owing both to the historical misuse of evolutionary arguments in support of prejudice and to a long-held resistance to evolutionary explanations among students of human behaviour. Nevertheless, the declared intent of these chapters is to introduce biologists studying non-human animal societies to related research on hominins. In that context, Clutton-Brock is principally presenting the outcomes of previous research and, thus, remains on safe ground. Moreover, by explicitly accepting that language, technology, culture and ethical systems have had a profound influence on, and serendipity has played its role in, human evolution, Clutton-Brock provides much to mollify those who distance the drivers of human behaviour from those at work in other mammals. In this way, Clutton-Brock describes the aspects of ecology and major behavioural innovations that appear to have led to the rise of hominins and modern humans. He then goes on to consider human behaviour in greater detail, covering mate choice,

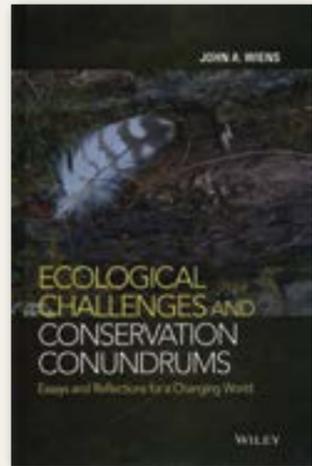
parental and allo-parental care, and cooperation. The final chapter concludes with reflections on the extent to which the study of animal behaviour can cast light on that of modern humans. Clutton-Brock sees important similarities – especially regarding the drivers and consequences of social living and reproductive behaviour – but also important differences. Perhaps surprisingly, he finishes with reflections on the global impact of modern humans, noting that only mutualistic cooperation on a global scale can counter the threats we pose to our own environment, and questioning whether this novel development is likely to be achievable.

Overall, this book represents an astonishing store of information and insight. There is little to criticise and any concerns are minor, or easily rebuffed. First, for example, some might view the focus on mammals as unnecessarily restrictive. However, for those who work on mammals and recognise the surprising lack of integration between studies of the behaviour of different orders, the effort at synthesis here is unique and potentially transformative. Moreover, although the underlying drivers of behaviour are universal, the constraints of phylogeny matter, and result in a wide range of solutions among different taxa. To do justice to the wealth of different animal societies across the full range of animal taxa would be beyond the scope of a single book. A second concern might be that, to many behavioural

ecologists, much of the content of this book will feel quite familiar. However, that itself is a testament to the pervasive influence, on this field, of the research conducted by Clutton-Brock and his collaborators. Despite the familiarity, even readers with high expertise in behavioural ecology will find plenty of novelty here – whether overlooked classics or cutting-edge studies. Third, perhaps the most awkward aspect of the book arises from its structural division between females and males. Although the point is made in the Preface that the behaviour of the two sexes coevolves, it would have been good to have seen more overt reference to these feedbacks elsewhere in the book – with, perhaps, an effort to identify those contexts within which they are most pronounced. Moreover, a less rigid distinction would also have allowed some subjects (such as reproductive skew, associations and mate choice) to be treated in a more cross-cutting way. This is a minor quibble, however, and it is hard to envisage a perfect structure for such a wide-ranging book. Fourth, it may very well be that two chapters covering all of hominin evolution and human behaviour will prove unsatisfactory to those who work on human behaviour. However, the benefit for such scientists will be in the preceding 18 chapters, whilst even the gentle introduction provided by the final two chapters will prove an invaluable entry-point for those primarily focused on the behavioural ecology of non-human mammals.

In summary, then, this book is undoubtedly a major achievement – but who should read it? Whilst it is probably too detailed and taxon-specific to compete as a textbook for biology undergraduates studying behavioural ecology, it would provide a very solid grounding for students of evolutionary anthropology seeking to put their main studies into a wider context. Postgraduates working on mammalian behaviour will benefit greatly from its clear and accessible style, and the ability to dip into chapters of particular relevance for a quick and authoritative introduction. More experienced academics will also find much to value in it. For me, the synthesis across mammalian groups and the windows opened by the final chapters into the evolution of human behaviour will not only enrich my own understanding but will be a valuable teaching aid. In particular, given the widespread undergraduate enthusiasm for primates, cetaceans and human behaviour, I welcome the wide range of undergraduate-friendly examples that this book will provide.

Phil Stephens



Ecological Challenges and Conservation Conundrums: Essays and Reflections for a Changing World

John A. Wiens (2016)
Wiley, Oxford, 324pp £54.95 (hb)
ISBN 978-1-11889510-8

A feather, of a ruffed grouse *Bonasa umbellus*, draws your eye to the cover. The bird takes its name from the tufts of black feathers on its neck, forming a ruff in males during courtship displays. I mused that this was deliberate, for John Wiens is one of my favourite ecological writers, and he certainly courts my fancy!

This is a wonderfully special book, formed of 38 essays, many of which were originally written for this *Bulletin*, with preambles to each explaining why the essay was written and giving updates on the topics. Twenty-six chapters intersperse these, delightfully developing a range of arguments and discourses. In five parts (Change, the challenge; The forces of change; Conservation conundrums; Doing conservation; and Concluding comments) the book takes us on a fascinating journey through

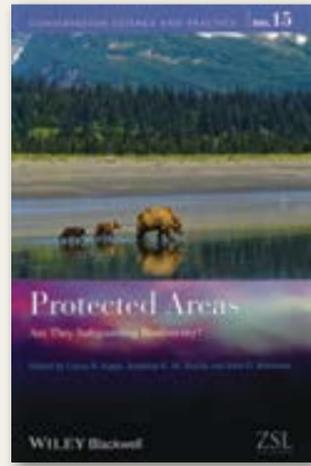
what has truly been a life-affirming adventure.

I'm not going to try and summarise this eclectic assemblage, for you simply have to get this book and devour it. It is impish, inspired, challenging, in places disturbing, and throughout beautifully written. Paradigms, footnotes, polar bears, human population growth, ecological resilience (which stimulated me to co-author a subsequent article for the *Bulletin*), novelty, triage, word processing, protected areas, ecosystem services, conservation advocacy, wildness and 'being green' all feature.

The chapters are excellent, and I suggest, offer key overviews of some topics such as climate change and sea level rise, population growth, ecological thresholds, ecosystem services, advocacy in conservation, and 'what is it we are trying to conserve?'

Frankly, it is a wonderful cornucopia of ecological facts, insights and wisdom. Controversial, humorous, articulate, sceptical, sometimes curmudgeonly, and always entertainingly forthright, John Wiens should be declared an ecological treasure!

Des Thompson



Protected Areas: Are They Safeguarding Biodiversity?

Edited by Lucas N. Joppa, Jonathan E.M. Baillie and John G. Robinson (2016)
Wiley Blackwell, Chichester, 270pp, £95.00 (hb), £45.00 (pb)
ISBN 9781118338162 (hb)
ISBN 9781118338155 (pb)

Protected areas cover 32 million km², 15.4% of the world's land area and 3.4% of the global ocean area (overall, almost 1.4 times the 1990 coverage, and a tenfold increase on the 1959 estimate). Building on the premise that 'we have only a preliminary understanding of the extent to which the portfolio of protected areas safeguards biodiversity on a global scale' the editors have assembled a team of 51 contributors (based mainly in UK, USA and Australia) to answer fundamental questions about the importance of these areas.

Published as No. 15 in the 'Conservation Science and Practice Series' in association with the Zoological Society of London, the book is divided into four sections (The global protected area portfolio; The fate of species in protected areas;

Managing protected areas at system scales; and Monitoring protected areas at system scales). The upshot is an impressive, coherent assessment of what protected areas do for biodiversity.

The global target (No. 12) in the Convention on Biological Diversity (CBD) is for 17% of the land and inland waters, and 10% of the oceans, to be protected by 2020 – on land we are close, but at sea we are not. We will not prevent the 'extinction of known threatened species' nor will we meet other aspects of preventing species decline by 2020, but as the editors point out in their introduction the numbers specified in the targets have in any case no scientific or ecological basis – they are aspirational and indicative. And this is where the book begins, for the chapters explore, analyse, cajole and determine in almost equal measure the myriad issues surrounding the effectiveness of protected areas.

There are some very useful chapters, often drawing on IUCN and UN global statistics and reports. For instance, Krueger gives us an excellent overview of the global history and extent of protected areas. So, which country in the world has the highest proportion of its land protected? Botswana; for marine areas, the Dominican Republic has the highest relative area protected. Dudley and Stolton provide an excellent overview of how systems and networks can be developed. Watson, Segan and Fuller provide a comprehensive overview of the protection afforded to the world's threatened birds, mammals and amphibians. Milan's large

team summarise statistics for CBD biomes, pointing out that whereas just over 20% of the world's forests are protected, only 12.9% of dry and sub-humid lands (the most extensive of the biomes), and only just under 21% of inland waters (proving the most important ecosystem services to us) are protected, with islands (home to 10% of the world's population) having 16.7% of their land surface protected.

Many chapters importantly focus on the impact of management – Collen's team show clearly that without effective management, statistics on extent of protected areas are indicative rather than revealing. Butchart *et al* give an excellent (if sobering) overview of the extent to which threatened species are being helped by protected areas – much remains to be done here. Case studies of particular groups of animals (large carnivores in Europe), US National Parks, and community managed enterprises add to the great wealth of material presented – much of it drawn impressively from across continents. The applications of remote sensing for monitoring protected areas are encouragingly covered by Pettorelli and colleagues, and I think they wisely point to major work needed to, as they put it, set up 'well-orchestrated biodiversity informatics infrastructures capable of supporting the needs of both communities.' (Essentially, these are the remote sensing specialists, and conservationists and environmental managers).

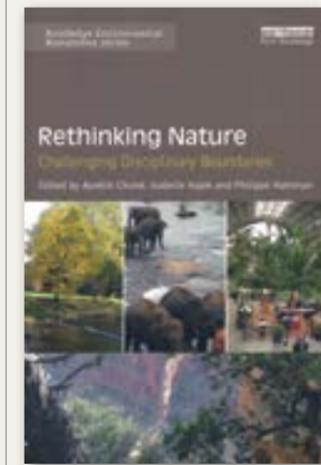
There is no concluding chapter (I have just quoted from the book's penultimate sentence), but there is

a fabulous wealth of information. Unlike many such textbooks, this book is admirably adorned with good figures and tables, and clearly a lot of work has gone into editing the contributions into a coherent whole.

My criticism is that the book does not look beyond the bounds of people adversely changing biodiversity, largely through direct and indirect anthropogenic drivers. Well, we know about the drivers, and the literature is bulging with examples, but what about turning that on its head and asking the question 'What can biodiversity do for people?' Along the oft-quoted line from John F. Kennedy's inaugural Presidential address, ask not what your world can do for biodiversity, ask what biodiversity can do for the world? This is not meant to be glib, but rather to pose the challenge that a wholly different book could be compiled to challenge society to articulate how it could function without protected areas with healthy ecosystems, without a vibrant diversity of life forms, and with human health, welfare and prosperity disconnected from this. Society needs protected areas, and the underpinning arguments on this are lacking here. In the Index, I found no reference to 'education', and no reference to 'health' (human welfare gets eight mentions, but almost entirely in the context of providing water, and supporting irrigation). In fairness, that may be where the editors go next – bagging the massive balance sheets and monitoring programmes we need to describe and understand the changes,

and moving on to a deeper analysis of public benefits of biodiversity, and the 'mainstreamed' educational, societal and business transformations we need to save ourselves as well as nature. This is a terrific book, and that's why I think this team should be encouraged to go much further.

Des Thompson



Rethinking Nature. Challenging Disciplinary Boundaries

Edited by A. Choné, A. I. Hajek, I., and P. Hamman (2017)
Earthscan from Routledge 276pp, £31.99 (pb)
ISBN 978-1-138-21493-4

Defining nature and the various ways it features in disciplines which range from theology through geography to biology is complex, and is continually developing. Such themes and trends, involving the ever-changing relationship between nature and culture, are the subject matter of this book. The 21 contributors represent a diverse array of disciplines including philosophy, literature, history, planning, sociology, environmental humanities, social/urban geography, entomology,

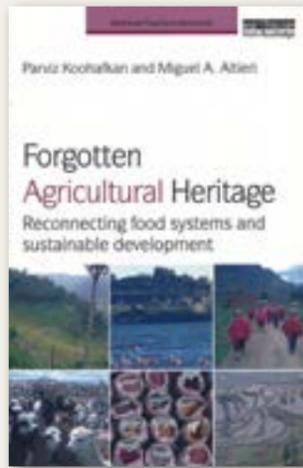
ecological economics, and anthropology. Two foci recur. First, there is the traditional divide between nature and culture in western thought which is now questioned as societies recognise the need to accommodate rather than dominate nature for mutual benefits. Second, there is the question of a new geological era, i.e. the Anthropocene, which emphasises the enduring and intensifying role of humans in determining earth surface characteristics and processes such as biogeochemical cycles. This could be defined as a form of domestication and is particularly and increasingly evident in the case of the carbon cycle (see Mannion, 2006). Changes in these approaches to nature and its portrayal are the subject matter of this book. It comprises five parts each containing between three and five chapters. The first part examines values and actions with emphasis on environmental ethics, deep ecology, ecopsychology and ecopsychology; it reflects the need for balance and avoidance of extremes with regard to environmental management. It also emphasises the increasing relevance of the environment in a variety of disciplines, which is giving rise to cross-disciplinary fields of investigation. Part II focuses on writings and representations, including the aesthetics of nature, ecocriticism and representations of nature in culture and their changes over time. Part III is concerned with movements, activism, and societies which are developments mostly since the 1950s; they include political ecology, ecofeminism, ethnoecology, all of which reflect multidisciplinary

interests and origins. Many grass roots organisations have also helped to bring environmental awareness to the general public. Part IV, with 6 chapters, is entitled 'renewed ecologies'; topics include rural nature and its survival in an era of ecocide (think urban expansion into the UK's green belt, for example, and extensive biodiversity loss worldwide), urban ecology, health and environment, sustainable urbanism, industrial ecology, and ecosystem services. The enigmatically titled Part V i.e. Human – animal, focuses on people – animal relationships and the diminishing view that the two are entirely separate with separate histories as in the case of nature and culture. Mutual benefits, survival and values need to replace exploitation, extinction and devaluation.

This book is a valuable contribution to the ecological/environmental literature. It is not an 'easy read' but constitutes a useful synthesis of recent developments in an increasingly anthropocentric world; it indicates an awakening of ideas and their emergence from separate disciplines, and represents what is an important milestone in the history of science/social science. This book could be the foundation for a new and vital branch of philosophy. It deserves a wide readership at undergraduate and postgraduate level as well as those involved in the construction and implementation of environmental policies.

Mannion, A.M. 2006. *Carbon and its Domestication*. Springer: Dordrecht.

A.M. Mannion



Forgotten Agricultural Heritage.

P. Koochafkan, and M. A. Altieri (2017)

Earthscan by Routledge, London, 276 pp. £35.99 (hb)
ISBN 978-1-138-20415-7

World agriculture may be dominated by industrialised large-scale approaches but traditional systems which are small-scale and local continue to play a significant role in food production. Indeed, many have long histories which precede mechanisation and chemical applications but which have survived to maintain not only productivity but also cultures and landscapes. Their survival and sustainability are complementary; not only do they remain viable but they also contribute to the understanding and implementation of sustainable practices. Such agricultural systems are the focus of this book and are described by the authors as Globally Important Agricultural Heritage Systems (GIAHS), now the subject of a full programme within the Food and Agriculture Organisation (FAO), and which in turn are linked to the World Heritage Convention.

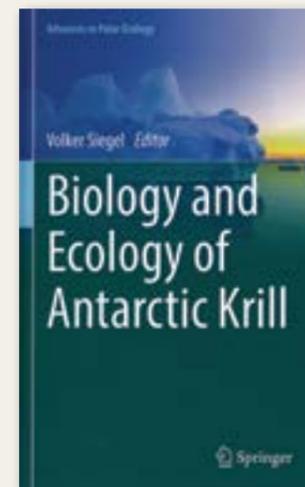
There are eight chapters. The first sets the scene with a synopsis of the past, present and future of agriculture with emphasis on the often-overlooked role of traditional agricultural systems in combatting food scarcity, social disintegration and environmental degradation. Chapter two focuses on agricultural heritage and sustainable food systems; its message is that the industrialisation of agriculture is not always the answer to social, environmental and geopolitical cohesion and/or advancement. It points out the advantage of polyculture rather than monoculture and the potential production of non- or part-domesticated plants and animals. That many traditional agricultural systems are under threat from urbanisation, industrialization etc is examined in Chapter three and focuses on the World Heritage Convention, finalised in 1971 through UNESCO. It promotes the designation of World Heritage status for traditional agricultural landscapes. This theme is further advanced in Chapter four which examines the characteristics of globally important agricultural heritage systems. These include a core of traditional knowledge, a reserve of biodiversity and hence genetic material, unique landscapes with aesthetic beauty, and organisation which reflects a cultural distinctiveness and diversity. Examples include mountain rice terrace agroecosystems in Madagascar and the Philippines, polycultural (maize and root crop) systems as occur around Lake Titicaca, understorey farming systems which comprise forestry or orchard

enterprises with ground crops as in many Pacific Islands, nomadic and semi-nomadic pastoral systems like those of Mongolia and Arctic Finland and Russia, high value crop and spice systems as in Central Asia, multi-layered home gardens which occur in the Caribbean, and many others. Such systems could benefit from the GIAHS Partnership Initiative which is designed to promote international recognition and conservation. Their conservation is examined in Chapter five; it covers designation as a GIAHS, access to alternative and fair markets, possible rewards for traditional farmers, expansion into global markets, the development of eco- and agri-tourism and the possibility of twinning partners. Chapter six considers the experiences and outcomes of several GIAHS; empowerment of local groups/farmers, promotion and links to regional, national and global markets are key factors. Chapter seven, comprising 166 pages, highlights a range of GIAHS. These include rich-fish farming systems in China, Peruvian Andean agriculture, oases in the Maghreb, floating gardens in Bangladesh, traditional crop farming and grasslands in the Carpathians, date gardens and tea gardens in China, saffron production in Kashmir, qanat irrigation systems in Iran, Maasai pastoral system in Kenya and Tanzania, and the polder systems in the Netherlands to name but a few. The diversity is striking. The final chapter presents the major messages from the preceding analyses and emphasises sustainability not only in terms of

agricultural production but also in terms of adaptability to environmental and market changes as well as social cohesion.

This book contains a valuable and unique synthesis of traditional agricultural systems. It should be an important text for undergraduate and postgraduate courses in agriculture, development, and international politics.

A M Mannion



Biology and Ecology of Antarctic Krill

Edited by Volker Siegel (2016)

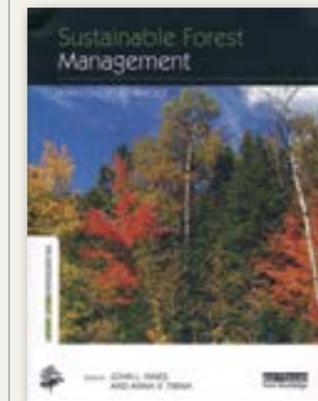
Springer International Publishing, Switzerland, 442pp, £112 (hb)
ISBN 978 3 319 29277 9

We have known for the past century that the small crustacean *Euphausia superba* was the staple food of baleen whales in the Southern Ocean and research has gradually unveiled its crucial role in the entire marine food web around Antarctica. The editor of this volume has published extensively on krill over the last 35 years and in the 11 chapters has gathered many of the leading researchers in krill

worldwide with a major emphasis on those from Germany, UK and Australia. Surprisingly there is just one US author and none from Russia or Japan. All the chapters are extensively referenced up to 2015 and the authors are to be commended at the temporal extent of their listings with the citations going back to the Discovery Reports to give the reader an overview of the history of research in each of the chapters. With chapters on distribution and demography, growth and recruitment, physiology, feeding, reproduction, genetics, behaviour, predation, and parasites and diseases the coverage is detailed and exhaustive. Krill is a major element of the present Southern Ocean fishery so it is good to see the final chapter devoted to its status and management. The literature on krill is considerable with over 3000 papers published in the last 40 years alone and continues to grow as countries like China begin to develop fisheries interests and the numbers of patents and uses for krill expands each year. This book is a very timely overview of what we know for a keystone species of the Southern Ocean. As with all good reviews the authors provide the reader with some key unanswered questions like how to accurately age krill, how to more effectively constrain standing stock estimates including estimating predation rates more accurately, how to determine the sex of krill and is there differential selection in different environments, and what effect will ocean acidification have on this key species? Given the current uncertain state of publishing, it is brave of Springer to start a new

polar series on ecology. The series editor is the Editor of Polar Biology and with two more volumes on the stocks (one on Svalbard and the other on Antarctic silverfish) this series promises to be an important and useful addition to our libraries. This is an expensive book but everyone working on Southern Ocean marine ecosystems really does need to see this as a key resource.

David Walton



Sustainable Forest Management: From Concept to Practice

Edited by John L. Innes & Anna V. Tikina (2017)

Earthscan, Routledge, Abingdon, 396pp, £135.00 (hb) £43.99 (pb)

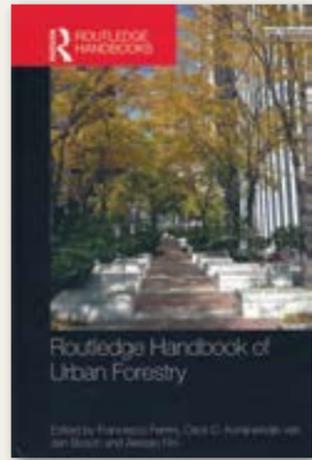
ISBN 978-1-84407-723-6 (hb)
ISBN 978-1-84407-724-3 (pb)

Given that deforestation of the world is still happening, and the many ecosystem services that forests provide (not least C storage), managing the world's forests is hugely important. It is also a complex and broad topic and so difficult to cover in one book. But in the preface, the editors do say that the book is to 'provide guidance on what needs to be considered when managing a forest' and it is "intended to show the breadth of knowledge expected of a forester". To

do this, the book does not work its way through types of management (e.g. clear-cutting vs other silvicultural systems), though elements of these are covered in different chapters. Rather, it looks at aspects of forest ecology and how these are affected by management (e.g. water and watersheds, biodiversity and carbon) and the objectives of management (social, cultural and spiritual needs, and social, economic and environmental objectives) which helps in giving an overview of the complexities.

The topic I've worked on most is forests and carbon (Chapter 8) and this gives an excellent introduction to the topic with plenty of numbers and insight into the role of forests in the global carbon budget, and a good overview of how management options can alter the direction of carbon flux. The preface suggests that since this book gives an overview that the reader is expected to go to the literature for more in-depth information. A slight niggle here is that most chapters have a very short reference list (the carbon chapter has just nine). It is, of course, easy to find publications on the web but a little more guidance on which are recommended starting places would be helpful. Nevertheless, as an overview of a complex, global topic, this book points to the things that need to be considered in sustainable forest management and will find a place in libraries and courses.

Peter Thomas



Routledge Handbook of Urban Forestry

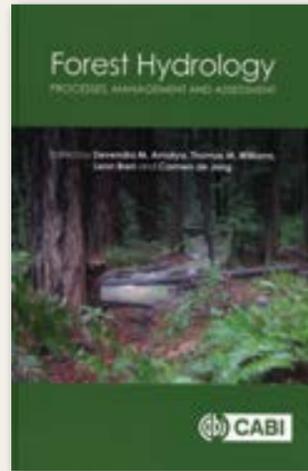
Edited by Francesco Ferrini, Cecil C. Konijnendijk van den Bosch & Alessio Fini (2017) Earthscan, Routledge, Abingdon, 574pp, £150.00 (hb) ISBN 978-1-13-864728-2

The main thrust of this book is about getting urban trees to thrive by considering site preparation, correct planting techniques, choosing the right tree for the site and technical help from fertilizers, irrigation including irrigation bags, through to the use of underground crates and grids to reduce soil compaction in high-use sites. If you want to know how specific pests will affect your tree, and what to do about it, or how to cope with salinity problems, this is a good book to turn to. But it also has a lot to offer the ecologist. There is a lot of information on soil compaction, pollution, drought and the effects of bad pruning to mention but a few topics. We are well used to thinking of ecosystem services (there's a chapter on those) but perhaps less about disservices – the problems, nuisances and costs associated with street trees (there's a chapter on that as well). There is also a chapter

on ancient and veteran trees which we normally think of in the context of old landscapes but here Chapter 33 considers how they can be helped in new environments, including the role of pollarding and judicious use of risk management. There are also an excellent couple of chapters on applied ecology covering social aspects of urban forestry and the impact of green environments on physical and mental health. Most people would, I think, envisage there being more crime against persons in areas of undergrowth and trees since it gives somewhere to lurk and to perpetrate the crime. But studies in deprived parts of Chicago show just the opposite, that with correct design of green infrastructure there is a reduction in noisy individuals and loitering strangers, and people have a greater perception of safety.

Nearly every topic I wanted to know about was covered in one of the 34 chapters written by more than 70 contributors. The price is a bit hefty as it is only available in hardback but this is an excellent book to dip into if the library can afford it.

Peter Thomas



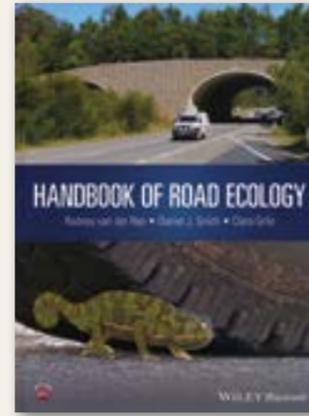
Forest Hydrology: Processes, Management and Assessment

Edited by Devendra M. Amatya, Thomas M. Williams, Leon Bren & Carmen de Jong (2016) CABI, Wallingford, 308pp, £95.00 (hb) ISBN 978-1-78064-660-2

There have been a number of books on forest hydrology before, and this one is seen as an update bringing together the latest information. And this it does very well. The 17 chapters cover a wide range of forest types (taiga to tropics), problems (changes in forest cover to wildfire) and techniques (modelling to geospatial applications).

ALSO RECEIVED

Notes by Alan Crowden

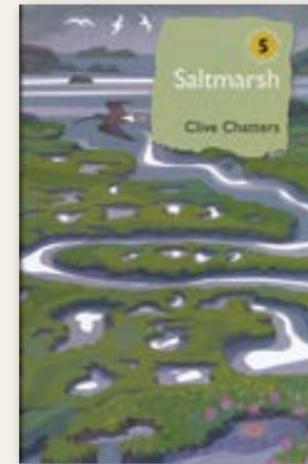


Handbook of Road Ecology

Edited by Rodney van der Ree, Daniel J. Smith and Clara Grilo (2015) Wiley-Blackwell, Oxford, 552pp, £95 (hb) ISBN: 978-1-118-56818-7

It is perfectly natural to expect that most ecologists would want to work in pristine and bucolic surroundings, preferably as far away as possible from the nearest road. Yet roads are ever-increasing in number and size, and inevitably their impact will become ever-greater unless ecologists work closely with planners and transportation engineers to develop designs and devices that mitigate impacts on wildlife, vegetation and ecosystem services. Editors Rodney van der Ree, Daniel J Smith and Clara Grilo have brought together well over 100 academics, practitioners and transport agency personnel and challenged them with the question: Imagine you are in charge of your professional world for a day, and could do anything to improve the ecological sustainability of roads; what 6 to 8 things would you change or want

people to do differently? And what's more, they gave them a fiercely tight word count and enforced it. By their own admission this might not always work, but the overall result is wide-ranging coverage but each chapter is concise, tightly focussed and can be dipped into quickly to pick up key points on each topic. A proper Handbook that deserves to be on a shelf within reach of anyone with day to day involvement in planning, maintaining and improving the environmental impact of our roads.

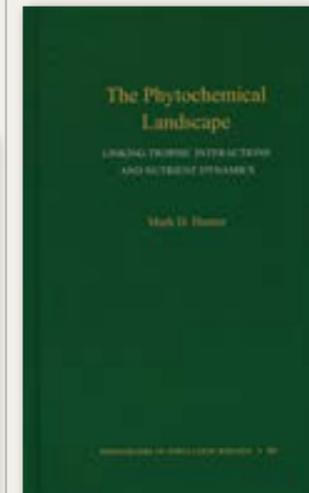


Saltmarsh

Clive Chatters (2017) Bloomsbury, London, 384pp. £35.00 (hb) ISBN: 978-1-4729-3359-1

I hate to sound like an amorous drunk, but I have to admit that I bloody love the British Wildlife Collection. The series is only slowly building up, but the five published books cover interesting topics, are beautifully produced, with a layout that complements the numerous colour photographs that authors are allowed to deploy, and reasonably priced in relation to the high production values. Clive

Chatters has maintained the standard in this excellent new book which deals with an often remote and slightly inhospitable habitat that attracts wildlife in droves. As the series names suggests, the focus is strongly on British examples but the author roams the country widely and brings the marshes he visits vividly to life. Splendid stuff. I bloody love it.

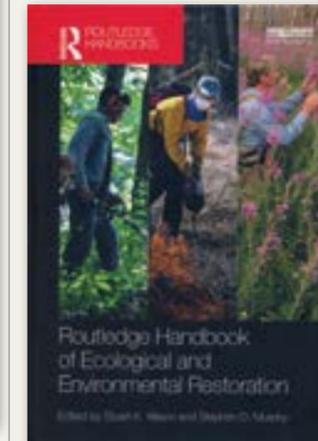


The Phytochemical Landscape

Linking Trophic Interactions and Nutrient Dynamics Mark D. Hunter Princeton University Press, Princeton, 376pp, £54.95 (hb) ISBN: 978-0-691-15845-7

An ideas book in the great tradition of the Princeton Monographs in Population Biology (this is number 56 in the series). Mark Hunter describes how variation in the chemical traits of primary producers is of fundamental importance in ecology. Hunter asserts that "...by focusing on variation in autotroph chemistry on the phytochemical landscape, we can better link studies of trophic interactions to those of

ecosystem processes". Eminently readable, supported by nearly 70 pages of references, this is a great source of inspiration and ideas for ecologists and evolutionary biologists at all stages of their career. The only regret is that publishing economics dictate that even the excellent Princeton UP can't see their way to putting this out as a cheap paperback. In the good old days books could be priced so that one could buy them on a whim and learn. Times change.

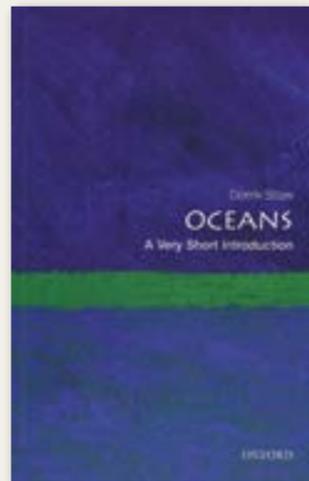


Routledge Handbook of Ecological and Environmental Restoration

Edited by Stuart K. Allison and Stephen D. Murphy Earthscan from Routledge, London, 620pp, £165 (hb) £44.99 (ebk) ISBN: 978-1-138-92212-9 (hb) ISBN: 978-1-315-68597-7 (ebk)

The editorial team at Earthscan have done a phenomenal job of commissioning a range of Routledge Handbooks across a series of major topics in ecology, biodiversity and conservation. This new book covers ecological restoration with 39

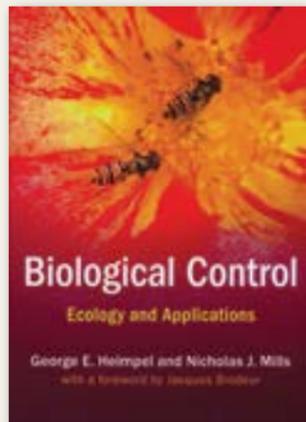
chapters divided into 4 sections: the basis for ecological restoration, restoring key ecosystems, management and policy issues and restoration for the future. This book was obviously being prepared contemporaneously with Palmer et al's *Foundations of Restoration Ecology*, another chunky multi-author volume – in my notes on that volume in the July 2017 *Bulletin* I resisted the temptation to note that a few key players were missing from the contributor list; so now we know, they were working on this Handbook. Allison and Murphy have done a great job in bringing together contributions from both leaders in the field and the next generation, and, Hurrah!, the geographic spread of authors is reflective of the global need for restoration. You will not get an instruction manual on restoring your local patch of degraded land from this book, but you will get tasters of the full range of approaches, ideas and techniques being deployed by restoration ecologists around the world. Excellent, and highly recommended for any library serving an ecological readership. We do not normally list prices for electronic versions of books reviewed here, but it is worth noting the enormous gap between the prices of the printed and electronic versions, which might help the book reach the readership among students, academics and practitioners that it undoubtedly deserves.



Oceans. A Very Short Introduction

Dorrik Stow (2017)
Oxford University Press,
216pp, £7.95 (pb)
ISBN 978-0-19-965507-6

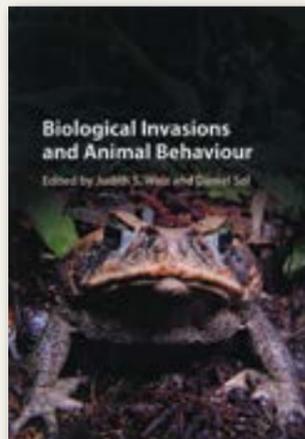
Oceans is, astonishingly, number 529 in OUP's excellent 'Very Short Introduction' collection. These little books are intended to give readers a flavour of the subject and set it in a wider context; in this case, why are oceans important and how we can protect their fragile ecosystems. A handy and affordable guide for those needing a quick update, or to recommend or give to friends and family.



Biological Control

Ecology and Applications
George E. Heimpel and
Nicholas J. Mills (2017)
Cambridge University
Press, Cambridge, 392pp,
£47.99 (hb)
ISBN: 978-0-521-84514-4

As the authors point out in their Preface, biological control is at a crossroads. Importation biological control has gone through a period when the focus was purely on the benefits, to an age where the risks were uppermost in everyone's mind. There has also been a subtle shift from an almost exclusively agricultural context to one where biological control has a role in restoring or conserving natural systems and in public health. Genomics now plays a role. The authors are clearly convinced of the value of biological control, while recognizing the risks, and present a very balanced and useful volume.



Biological Invasions and Animal Behaviour

Edited by Judith S. Weis
and Daniel Sol (2016)
Cambridge University
Press, Cambridge, 364pp,
£69.99 (hb)
ISBN: 978-1-107-07777-5

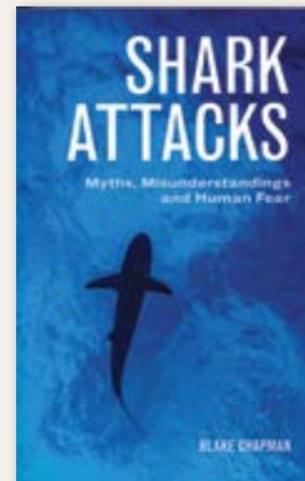
The role of behaviour in biological invasions is examined from the perspective of both the invaders and native species, using both theoretical approaches and case studies. An excellent addition to the burgeoning literature.



Urban Expansion, Land Cover and Soil Ecosystem Services

Edited by Ciro Gardi
Earthscan by Routledge,
London, 332pp, £110.00 (hb)
ISBN: 978-1-138-88509-7

Don't talk to me about urban expansion; here on the northwest edge of Cambridge I can hear it every day, as the University of Cambridge builds 3000 homes and university buildings on farmland in one direction and a private developer works on a former National Institute for Agricultural Botany testing site that will provide 1500 homes, 2 schools and a supermarket. The diggers are literally scraping, crushing and moving the earth as I type. Of course, there is a much bigger picture than my personal inconvenience, and I hope the planners of the world will take notice of books such as this when making sure they mitigate the damage to soil structure, drainage and ecosystem services.



Shark Attacks

Myths, Misunderstandings
and Human Fear
Blake Chapman (2017)
CSIRO Publishing, Clayton
Vic., 280pp, Au\$39.95 (pb)
ISBN 978-1-4863-0735-7

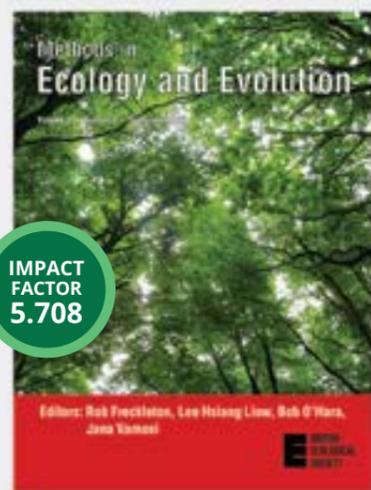
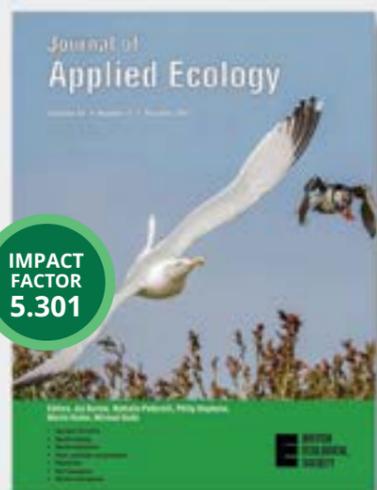
Avid readers of the *Bulletin* (are there any?) will remember that one of Richard Hobbs' excellent essays from Western Australia dealt with the conflicts between politicians, concerned to avoid the actual and reputational damage caused by shark attacks, and conservationists opposing ill-advised and potentially damaging control measures. *Shark Attacks* explores at greater length the tension between risks to humans and the need to conserve sharks. The role of fear and the influence of the media on public opinion is dealt with in some detail.



5

more reasons for you to support the British Ecological Society

WILEY



As BES members you get the following journal benefits:

- Free access to all BES journal content on Wiley Online Library
- 25% discount on open access fees when publishing as first or corresponding author in BES journals
- 10% discount when publishing in *Ecology and Evolution*



The British Ecological Society publish quality ecological science that is evidence-based, understandable, trusted and enduring.

Wiley are proud to be their publishing partners and to help world-class science drive a global agenda.

nature sustainability

COVERS ECOLOGY AND ECOSYSTEMS

JOURNAL LAUNCHING IN 2018

This new online-only journal will further understanding of the principles, forces, and systems that sustain ecological and human wellbeing. The journal is interested in holistic research and insight on socio-environmental interactions. It also considers the constraints, opportunities, and possible solutions to enhance sustainability in all its dimensions. Although some of this research will naturally dovetail with or inform the Sustainable Development Goals, we consider sustainability more broadly and consider ecological insight and perspectives central to this effort.

Submit your research today

nature.com/natsustain



SPRINGER NATURE

British Ecological Society Journals
besjournals.onlinelibrary.wiley.com



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:

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: 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.
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.
admin@journalofanimalecology

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

Functional Ecology: Edited by Charles Fox (Executive Editor), Ken Thompson, Alan Knapp, Craig White and Lara Ferry, with Andrea Baier and Jennifer Meyer.
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.
coordinator@methodsinecologyandevolution.org

Biological Flora: Anthony Davy, University of East Anglia, UK
a.davy@uea.ac.uk

The Bulletin:
Edited by Alan Crowden
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
climate-sig@britishecologicalsociety.org

Conservation Ecology: Nathalie Pettorelli
conservation@britishecologicalsociety.org

Ecological Genetics: Paul Ashton
genetics@britishecologicalsociety.org

Forest Ecology: Alan Jones
forest@britishecologicalsociety.org

Macroecology: Rich Grenyer
macro@britishecologicalsociety.org

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
parasites@britishecologicalsociety.org

Peatland Research: Ian Rotherham
peatlands@britishecologicalsociety.org

Plant Environmental Physiology: Katie Field
plant@britishecologicalsociety.org

Plants, Soils, Ecosystems: Ellen Fry
plantssoileco@britishecologicalsociety.org

Quantitative Ecology: Nick Golding
quantitative@britishecologicalsociety.org

Teaching and Learning: Lesley Batty
beslearning@britishecologicalsociety.org

Tropical Ecology: Lindsay Banin
tropical@britishecologicalsociety.org

OUR OFFICE:

British Ecological Society, Charles Darwin House,
12 Roger Street, London WC1N 2JU, UK.
Tel: +44 0207 685 2500.

hello@britishecologicalsociety.org
www.britishecologicalsociety.org
@BritishEcolSoc
www.facebook.com/BritishEcolSoc

OUR STAFF:

Executive Director: Hazel Norman
hazel@britishecologicalsociety.org

Communications Manager: Richard English
richard@britishecologicalsociety.org

Events Manager: Amy Everard
amy@britishecologicalsociety.org

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

Membership Manager: Helen Peri
helen@britishecologicalsociety.org

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

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

External Affairs Manager: Karen Devine
karen@britishecologicalsociety.org

Education Officer: Amy Padfield
amyp@britishecologicalsociety.org

Policy Manager: Ben Connor
ben@britishecologicalsociety.org

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

Press Officer: Sabrina Weiss
sabrina@britishecologicalsociety.org

Head of Publishing: Andrea Baier
andrea@britishecologicalsociety.org

Head of Publishing: Catherine Hill
(Currently on maternity leave)
catherine@britishecologicalsociety.org

Managing Editor: Emilie Aimé
emilie@britishecologicalsociety.org

Managing Editor: Erika Newton
erika@britishecologicalsociety.org

Assistant Editor, Journal of Animal Ecology: Simon Hoggart
simon@britishecologicalsociety.org

Assistant Editor, Functional Ecology: Jennifer Meyer
jennifer@britishecologicalsociety.org

Assistant Editor, Methods in Ecology and Evolution: Chris Grieves
chris@britishecologicalsociety.org

Assistant Editor, Journal of Ecology: James Ross
james@britishecologicalsociety.org

Assistant Editor, Journal of Applied Ecology: Kirsty Lucas
kirsty@britishecologicalsociety.org

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



Advancing Knowledge
Driving Change

ECOLOGY AND ENVIRONMENTAL STUDIES AT UC PRESS



Quality Cases,
Comprehensive Coverage of
Environmental Issues
cse.ucpress.edu

Call for Papers: Ecology
Editor in Chief: Donald R. Zak,
University of Michigan
elementascience.org

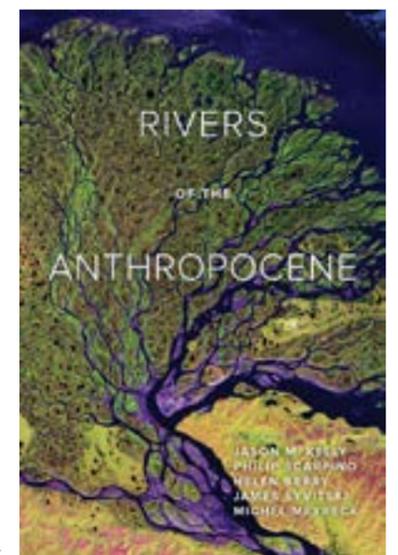


ELEMENTA
Science of the Anthropocene



Floodplains: Processes and Management for Ecosystem Services

Jeffrey J. Opperman, Peter B. Moyle, Eric W. Larsen,
Joan L. Florsheim, Amber D. Manfreek
Paperback, 272 pages



Rivers of the Anthropocene
Edited by Jason M. Kelly, Philip Scarpino,
Helen Berry, James Syvitski, Michel Meybeck
Paperback, 240 pages
Available as a free open access E-book



LOOKING BACK

This time we are looking back on Brian Hopkins climbing a rope ladder up a *Ricinodendron heudelotii* tree to take readings from the tree stratum in the forest; Olokemeji Forest Reserve, Nigeria; 27 January 1957.

No ecologists were harmed during the taking of this photograph, which was clearly taken before the invention of helmets, safety harnesses and protective boots. And let's not even think about the poor chap who went up the tree in order to put the rope ladder in place.

Just to reassure any health and safety experts watching, Brian Hopkins assures us that he climbed to a height of no more than 100 feet to take his samples.

Photo: Brian Hopkins