



The Bulletin

YOUR MAGAZINE FROM THE BRITISH ECOLOGICAL SOCIETY



British Ecological Society



inFOCUS

Photo: Alan Crowden

*This Bulletin is going to press while the Editor is in Australia at the beginning of the austral summer, contemplating a return to the UK in time to attend the annual meeting in Scottish winter. To dispel a shiver here's an image from an Ecological Society of Australia field trip from 2014. Palm Valley, about 120 km southwest of Alice Springs in the red centre of Australia, harbours a population of Red Cabbage Palms (*Livistona mariae*) which survive in this one valley some 850 km from the nearest specimens of the species, in Queensland. The rainforest palms found in the middle of a desert might be a relict of a Gondwana past, or, as Dave Bowman and colleagues have suggested, Aboriginal people might have transported them. But why to this valley and nowhere else? So naturally a truckload of ecologists bumped for a couple of hours along a hot dusty track to take a look.*

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December 2015

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Lindsay Turnbull	

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

Associate Editor: Emma Sayer
Lancaster Environment Centre,
Lancaster University, Lancaster LA1 4YQ
Email: e.sayer@lancaster.ac.uk

Book Reviews Editor: Sarah Taylor
School of Life Sciences, Huxley
Building, Keele University, Keele,
Staffordshire ST5 5BG
Tel: 01782 733497
Email: s.l.taylor@keele.ac.uk

PUBLISHING IN THE BES BULLETIN

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

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

Books to be considered for review should be sent directly to the Book Reviews Editor Sarah Taylor.

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All photos submitted to the BES Photocompetition are potential cover images for the Bulletin!

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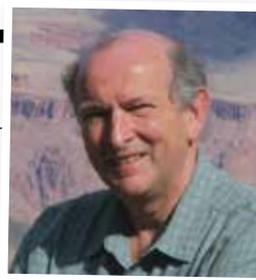
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WELCOME

Edinburgh here we come!

Autumn is always a busy time of year for the BES, with a wave of committee meetings in October when plans and budgets for 2016 are developed, but of course the big event on the horizon is the build up to the Annual Meeting in Edinburgh. Delegates heading for Edinburgh are looking forward to participating in discussions at the cutting edge of science, meeting old friends and making new ones, and enjoying the sights and sounds of a wonderful host city. The BES annual general meeting will take place during the conference, but only a relatively small number of members will attend, because most of us don't worry too much about how the BES is run, as long as it is running well. Yet the AGM is a crucial event with new Officers and Council members up for election, and a number of stalwarts standing down. I wanted to take the opportunity to acknowledge the contribution of those standing down this time. Bill Sutherland comes to the end of his term as President, a role to which he has brought his boundless good humour and the ability to think up five new ideas in the time it takes some of us to contemplate one. Andrew Beckerman and Emma Sayer are standing down as Chair and Deputy Chair of Meetings Committee. The growing attendances, the range and diversity of meetings, and the success of the Special Interest Groups, owes much to their endeavour, enthusiasm, innovation and sheer hard work. Dave Hodgson has been a diligent and long-serving Honorary Secretary and his reports to the AGM were a joy to behold, especially when presenting a report on behalf of an absent Treasurer. Greg Hurst and Paul Raven complete their terms on Council. Being an effective Officer and Council member requires time and effort reading papers, attending and contributing to committees, and coming up with the ideas that keep the Society busy and thriving. All in addition to the day job. Thanks to them all, and to those who will step into their shoes and take the Society forward.

This issue of the *Bulletin* reports on just some of the diverse activities that the Society is pursuing at the moment. There are two articles arising from the highly successful first BES Undergraduate Summer School which took place in July (pp10-13); Jackie Caine and Ben Connor set out plans for future policy work on p14; and there is a bumper set of reports from the Special Interest Groups (p15). Also looking back to the summer, Helen Roy (p46) and Emma Sayer (p44) are enthusiastic about the many benefits of taking ecology to festivals and Nathalie Pettorelli had a whale of a time in



Montpellier at the International Conference for Conservation Biology (p42). Helen includes song lyrics, a first for the *Bulletin*.

As ever we have a cluster of reports from the Special Interest Groups (p15) with the news of recent and future group activities, but several of the items are potentially of interest beyond an individual group, for example Tom Crowther's guide to interacting with the media and Isabel Jones's tips on organizing a conference.

We have two articles which look at interesting issues but over very different time scales. Phil Grime and Emma Sayer report on the Buxton Hub, a project that has been looking at long term change in multi-species communities for the last 22 years (p38). Architectural conservationist Charles Hippisley-Cox is interested in spiders as a potential means of woodworm conservation and his account provides a case study of a potential application of ecology (p40).

Both our essayists have turned up in this issue, with Richard Hobbs writing about deadlines (p52), a word I didn't realise he recognized. John Wiens includes a sonnet, a second 'first' for the *Bulletin* (p50). John's article on healthy ecosystems from a couple of issues ago (*Bulletin* June 2015, page 44) provoked Des Thompson and colleagues to send us a piece on upland ecosystem health (p33). It is always a joy when something in the *Bulletin* provokes a response; much as we enjoy commissioning articles, it is always good to have contributions offered in response to something that has gone before.

We have an extended review from Paul Adam of a book produced as a tribute to Derek Ratcliffe, a wonderful field biologist whose contributions to nature conservation, botany and science communication are perhaps not as widely recognized as they should be (p28). Paul's article has been condensed for the print version; the full version should be available on the *Bulletin* pages of the BES website in due course.

Alan Crowden / Editor

Bulletin@BritishEcologicalSociety.org

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

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

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

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

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FAREWELL...



Emma Sayer / Lancaster Environment Centre
@panemma

After 4 years, the time has come for me to bid you farewell as Assistant Editor the *Bulletin*. I could happily have continued to complicate our esteemed editor's work for at least another 4 years, but since 'settling into' a permanent job I seem to have less time than ever for the fun side of ecology.

Besides, I think the *Bulletin* benefits from fresh ideas, which are hard to come by when you're juggling research budgets and attending committee meetings. Better to quit while I'm still enjoying myself: hassling colleagues for contributions and challenging the *Bulletin's* budget by making sure that our issues regularly exceed the page-limit.

A lot has happened since I started the job in November 2011 (in what would be my final year of postdoc-hood). The *Bulletin's* appearance was revamped for a start – it may not have been to everyone's taste but personally I really like the new and colourful format, in particular as a playful contrast to the annual budget and the other serious Society matters we are obliged to print. Despite the make-over, the *Bulletin* has continued to publish the ever-popular Field-notes, From our Southern Correspondent, as well as various useful resources for early-career researchers, including articles on managing multiple supervisors, finding time to write, and how to give a better talk than your supervisor.

We've also introduced a couple of new features. When I first applied for the Assistant Editor post, I managed to extract a promise from Markus Eichhorn that I could have his back-catalogue of ecologically-themed 'rants' if I got the job. This turned into the surprisingly popular 'Rant and Reason' series, which has allowed a few people to vent their frustrations about statistical fundamentalism, buzzwords, and the death of botany in academia, amongst other things. After doing a couple of 'proper' interviews, I realised that speed

interviews would be a good way to feature different groups of BES members, because it's so much easier to get a response from very busy people if it only takes two minutes of their time to fill in a simple questionnaire. After one interview in particular, I also found out that our esteemed *Bulletin* Editor should not be left to his own devices where photo captions are concerned.

The BES has achieved a lot during the last four years, and we've tried to document as much as possible on the pages of the *Bulletin*. We've seen the birth of several new special interest groups (Climate Change, Citizen Science, Macroecology, Plants-Soils-Ecosystems) and we reported on our team effort with the Société Française d'Écologie to hold our first joint annual meeting on 'foreign' soil – and what a success that was! The *Bulletin* looks forward to more of this kind of entente cordiale in future – especially when French food and wine is involved.

Your faithful *Bulletin* reported on many of the exciting events that took place in 2013, including a reception at the House of Commons and, of course, INTECOL in London. The Centenary year was especially exciting for me because it saw the start of the Society's public engagement programme and 'Sex & Bugs & Rock 'n Roll'. I'm sure some *Bulletin* readers consider the latter a frivolous waste of time but I, like many other 'BES Roadies', actually find that doing silly ecology-related games at music festivals works wonders for my motivation to do research. Besides, it got me to Glastonbury Festival on research council funding – and how many

ecologists can make that claim?

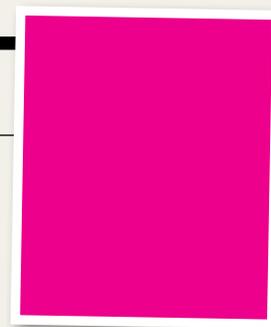
The Society does so much for its members and for the field of ecology that there are many more interesting, fun and worthy ways to get involved than I could ever have imagined. Like many BES members, I suffer from a surplus of ideas and a chronic lack of time; channelling some of those ideas into the *Bulletin* has been a really great experience. I thoroughly enjoy writing in a way that comes more naturally to me than the strict reporting and formatting rules of peer-reviewed publications. The *Bulletin* is also a great way to share ideas, reports and activities with thousands of BES members, instead of reminiscing with just a handful of close colleagues. Last but not least, being Assistant Editor of the *Bulletin* gave me the chance to work with our esteemed editor, Alan Crowden, whose witty emails have brightened many a Sunday afternoon when we're both frantically trying to assemble an issue long after the deadline has whooshed by. I shall certainly continue to contribute to the *Bulletin* as an ordinary BES member just for the pleasure of receiving more of those missives.

Finally, as I 'exit stage left', I would like to extend a warm welcome to my successor, Lauren Ratcliffe. Her journalistic and blogging experience will serve her and our readers well. I wish her all the best for her start as the new Associate Editor of the BES *Bulletin*.

And so, without further ado: dankeschön, hasta la vista *Bulletin* – je ne regret rien.

PRESIDENT'S PIECE

Restoring ecology



William J. Sutherland

We are a thriving science with exciting ideas and research and a flourishing society with healthy journals, finances, meetings, special interest groups, activities and membership. However there are serious challenges. Cuts in funding are increasingly hitting universities in the UK and elsewhere. Government expenditure is being severely reduced in many countries. I am writing this before hearing the precise funding plans for Natural England, Environment Agency and the Department of Environment, Food and Rural Affairs, but it is clear there will be further substantial cuts.

Within political circles the environment often seems considered as an irritation, as illustrated by the well-known high level hatred of great crested newts and bats delaying development with the demand for costly interventions.

A recent weekend walking with my wife in my childhood stomping grounds of the Derbyshire dales showed much of the habitat was retained, but with buzzards, ravens and peregrines that were all missing in my youth. This made me reflect on the fact that the areas I knew well in my teens – Weardale in northern England, the areas accessible by bus from Sheffield, and East Anglia with its coastal marshes, Broadland wetlands and Breckland heaths – all seem on recent revisiting to have retained much (but not all) of the diversity I remember but often also with many considerable gains.

It made me ponder whether I would rather the environment was reverted to that of twenty years ago and have since asked that question to a number of experienced naturalists who I respect and who are aware of the monitoring evidence. They usually respond with a balance sheet of losses (such as farmland

species, water voles and hay meadows) and gains (such as wetland species, otters and polecats). Surprisingly, although often stating that the 1960s and 70s seemed especially bleak with sometimes apparent wanton destruction of important habitats, they did not show a clear nostalgic desire to go back a couple of decades.

Our message often seems to be portrayed that all is hopeless, that the environment is rapidly disintegrating and that little can be done. The emphasis is on problems nor solutions. There have, however, been many clear successes, much of it resulting from a combination of ecological science and conservation action. Obvious successes are the remarkable return of birds of prey as following the identification of the problems of pesticides, determining the role of pollutants on freshwater life and then adopting policies and enforcement, understanding the principles of habitat management so resulting in better managed nature reserves, detailed understanding of individual species, such as the large blue butterfly, leading to recovery, improved understanding of how to reintroducing a wide range of

species and the science-based creation of new habitats. Such successes have benefitted society through improved quality of life, improved health, tourism and a wide range of ecosystem services.

Perhaps our message should be that we have identified and successfully tackled some major problems, and so provided benefits to society - alongside this there are other serious challenges that we have yet to resolve, such as the declines of woodland butterflies and birds, the spread of tree diseases and various serious invasive species, such as the Harlequin ladybird and New Zealand pigmyweed. I fully recognise that in some other regions, with dramatic losses of tropical forests, wetlands and coral reefs, the story may be more universally dismal.

There are currently exciting opportunities. For example, the concept of nature-based solutions seems to resonate with policy makers, especially in the EU. For many of the problems facing society, such as a lack of exercise, crime, lack of investment, air pollution, noise or increasing heat, there are sensible green solutions.

Collaboration to solve collective problems also provides many opportunities, as illustrated by the remarkable visionary collaborative project at Wallasea Island, off the Essex coast, which will surely be a wonderful nature reserve, whilst also providing solutions to problems of local flooding and the disposal of earth from the London Crossrail tunnel excavation.

Continuing to solve society's problems requires further applied science built on good fundamental research. For example, the enthusiasm for nature-based solutions must result in interventions based on science. As examples, planting trees to reduce air pollution may seem straightforward, but their effectiveness varies with the species and location, while creating green roofs can easily be unsuccessful if not well designed. There is a need for fundamental science to underpin plans that examine all the benefits and costs of different interventions in different locations to provide a sensible cost effective design. Furthermore, there are equal, but rarely discussed, challenges in restoring coastal and marine habitats. I am sure the BES community will continue to play a central role in research and implementation.

This is my last President's Piece. After seeing the Society close up I have been deeply impressed both by the staff and the innumerable people involved in a range of ways and have found it satisfying to work with such a professional and enthusiastic team. I am sure Sue Hartley will be a great president. I look forward to seeing many of you in Edinburgh.

Edinburgh 2015

EICC, Edinburgh, Scotland

13 – 16 December 2015



British Ecological Society

Plenaries:

Luigi Boitani:
BES LECTURE

Pat Monaghan:
12 MONTHS IN ECOLOGY

Josephine Pemberton:
TANSLEY LECTURE

William Sutherland:
PRESIDENTIAL ADDRESS

Workshops:

16 workshops including data archiving, digital technologies, practical tips on how to promote your research, how to connect with the public and data analysis techniques.

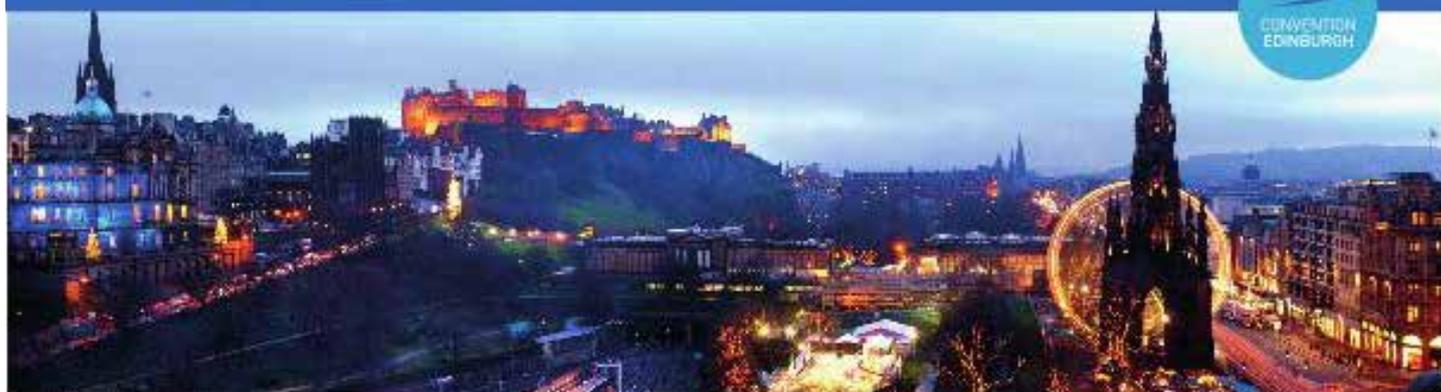
Fàilte

Oral and Poster Session:

24 diverse sessions covering a breadth of disciplines

Thematics:

- Climate change in the arctic linking ecological and biogeochemical responses
- Digging deeper – advancing our understanding of how soil biota drive and respond to plant invasions
- Dispersal processes driving plant movement: challenges for range shifts in a changing world
- Ecological and evolutionary risks to agriculture and food production
- Hidden herbivory: ecosystem consequences of soil-plant-herbivore interactions
- Integrating ecology and evolution to understand infectious disease
- Integrating ecosystem services into spatial planning decision making
- Making best use of ecological evidence
- Making the most of microbes in ecosystem science: soil microbial ecology in global change models
- Pollination services: from individuals to landscapes
- Predicting the future ecological forecasting in a changing world
- The ecology of disturbance in a conservation context
- The role of large-scale experimentation in applied ecology and conservation
- Turning the rewilding of great britain into reality
- Using ecology to guide public health policy
- 30 years of the St Kilda soay sheep project: looking ahead



#BES2015



We at the BES love social media – it’s a great way to connect with people across the world, to share ideas and create collaborations. We heartily encourage people to tweet, post and share their experiences – our Annual Meeting is all about building relationships.

However, we understand that some people will not want their research broadcast. We respect that, so have created a ‘do not share’ image for people to download and add to their poster or talk presentation. We hope that fellow attendees will also respect that request and refrain from sharing that particular talk or poster. If people do not include this image on their presentation, we will assume they are happy for their research to be shared.

NEWS FROM THE EXTERNAL AFFAIRS TEAM

The First BES Undergraduate Summer School: a user's guide

Eloise Wells / University of Sheffield

July saw the launch of the BES Undergraduate Summer School. Fifty aspiring first year ecologists from thirty one universities assembled at Malham Tarn Field Centre, North Yorkshire, to attend a demanding and rewarding week of lectures, workshops, fieldwork skills and careers mentoring.

As successor to the BES Undergraduate Fellowship Scheme the Summer School benefited from a wealth of experience provided by prestigious guest speakers. Plenary speaker and BES President-Elect Sue Hartley was joined by Simon Leather of Harper Adams University, who led an entomological workshop; Peter Welsh of the National Trust provided local knowledge and expertise, and Ken Thompson lent his considerable expertise and insight into communicating our science.

On arrival we were greeted with a plenary lecture from Professor Hartley who gave an inspirational account of her work, focusing on the effects of availability of silica on pest resistance in plants. Her talk not only set the tone for the week, but also complemented the school's main emphasis, encouraging aspiring ecologists to become actively involved in learned societies.

The next day began bright and early with a tour of the reserve from the National Trust, followed by Simon Leather's fascinating introduction to Entomology. After this we developed field skills using traditional methods as well as having the opportunity to operate a motor powered pooter. With our samples collected we began carefully identifying what we had captured. Our session concluded late into the evening upon the release of an insect we had previously doused in fluorescent powder in order to witness this fascinating method of tracking their location.



The Linnean Society kindly sponsored Professor Simon Leather to deliver an entomology workshop, seen here with Eloise Wells while hoovering up the front lawn

Surrounded by the astounding beauty of 90% of the National Trust's raised bog, we were privileged to receive an interactive lecture from Clare Trinder, featuring peatland development. Being taught about this incredible environment while we could feel it beneath our feet was a unique and thoroughly engaging experience.

The afternoon workshop focused on careers. Andrew Halcro-Johnston and Zoe Webb, representatives of Amey and Arup, offered us an insight into ecological consultancy. As part of their thought-provoking session we were presented with a real-life scenario in order to find our own solutions between conflicting factors; this interactive approach opened our minds and left us inquisitive as to the many vocational applications of our degrees.

These activities and further lectures focusing on science communication, conservation and microbiology, were punctuated throughout the week with many extra opportunities to further our interests. Our PhD mentors, the jewels in the crown of the summer school, directed bird, bat and moth identification activities and facilitated the creation and presentation of group research project proposals. We also enjoyed an introduction to the importance of outreach, and received invaluable support with CVs.



Learning field skills

For many of us this was the first, insightful step into the inner workings of organisations such as the BES and CIEEM. Aside from the enjoyment of meeting like-minded students this was an excellent opportunity to consider career options, aided by the advice and experience of professionals employed in a variety of industries. The BES Summer School has been highly informative and enormously influential on how we plan to spend our remaining years at university, especially how we will get involved with this and similar societies, in order to prepare ourselves for our lives beyond our undergraduate degrees.

Further Student Perspectives on the many benefits and opportunities received from participating in the event

**CHRIS WOODHAM
UNIVERSITY OF OXFORD**

For me one of the highlights of the week was meeting like-minded students from across the country, as we were able to spend time chatting and discussing ideas with each other and with our mentors. Universities should nominate their students to take part in the 2016 summer school not only because the BES summer school is a chance to meet other like-minded students, but also because the great depth and array of careers advice and information available during the summer school can be invaluable for students trying to make decisions about their future. When I went into the summer school I was interested in a career in ecological research but unsure of the practicalities of this career path: having been to the summer school I now know that making a career out of research may be difficult, but is definitely achievable as long as I follow the right path. My improved understanding of careers as a result of attending the summer school will help me make decisions regarding module choices and research projects in the second and third years of my undergraduate degree, this new focus for my choices in the second and third years of my course is a direct result of attending the summer school.

**LARA BATES-PRIOR
OXFORD BROOKS UNIVERSITY**

The BES summer school is not only about teaching skills for your current degree, but also provides support for your future. It provides the opportunity to gain vital information about finding a job, what skills are required and what jobs are out there. We are all aware that it is a hard road to get that dream job and this summer school helped with networking and creating a support structure.

My main aim in going to the summer school was to gain a better understanding of what jobs were out there in ecology and how I could gain employability for those jobs. The key message I gained from the course was that networking and building your skill profile are everything. Many people who choose this career path are very passionate about it, have dedicated their whole lives to it. For me, meeting people who have also always held a fascination with the natural world has made me friendships that will last through my professional life time. A great asset for the future.

This course has helped identify the most important things to focus on in my 2nd and 3rd years. I am clear which modules will help me the most to gain the skills I need. Creating mock projects helped to understand the process and gave me examples of what an effective dissertation will be. To summarise, it has given me a clearer path to follow so that I may reach my goals, and in my opinion the BES summer school has been one of the most thought provoking and useful things I could have even done to prepare me for my career.

**RON ROTBARTH
UNIVERSITY OF STIRLING**

My personal highlight has been Ken Thompson's talk about the effective communication of science to the public. As a former biologist at the University of Sheffield, columnist for The Daily Telegraph and author of several books, he engaged in both academic research and the 'translation' of scientific findings into less complex and dry terms. The insights he gave us into his work for the Telegraph and the often misleading articles in the news about science made me aware of the challenge and pitfalls that is scientific writing for the public. This further encouraged me to use my blog to write about my passion, ecology.

The variety of topics the BES covered in only five days has made us all reflect on our career aspirations and aims. But above all, it brought together bright and motivated ecology students from around the UK to share their thoughts, ideas and experiences. If the talks and presentations opened the gateway to a new rational world of ecology, the interaction with other students was the inspiration that transformed my perspective on how to build my future career. Now, the pathway for my last two years at university is much clearer than it has ever been before.

Universities should make use of the opportunities that lie within professional events like the BES summer school, as it can be a major boost to the students' motivation – an issue that universities these days struggle with more often than not. The first summer school has been a huge success and represents a valuable instrument for universities in their aim for highly educated and experienced graduates. With that in mind, institutions of higher education in the UK should be encouraged to invest in these schools in order to enable more students to take part in what I can only describe as the most influential event in my student life.

ECOLOGY EDUCATION AND CAREERS

Undergraduate Summer School: Highlights from a day in the life of a BES Mentor

Six PhD students provided day to day support and tuition for the course attendees; Rosie Blackman (University of Hull), Amy Leedale (University of Sheffield), Jill Kowal (Imperial College London), Lydia Bach (Queen's University Belfast), Jennifer Mark (Bournemouth University), and Lewis Bartlett (University of Exeter) generously volunteered their time and expertise for an exhausting but enjoyable few days.

There is a full account of the BES Mentors' daily experience on the BES *Bulletin* blog (<http://www.britishecologicalsociety.org/blog/2015/09/18/highlights-from-a-day-in-the-life-of-a-bes-mentor/>), but we offer some highlights of the Mentors' thoughts and reactions here to give *Bulletin* readers a taste of life at the summer school.

OUR DAY

6.00 AM BIRDWALK

Rosie: The bird walk was a definite highlight for me – a real treat and great way to learn a few birdcalls. The enthusiasm from the mentees was fantastic and we were soon engrossed in watching a nuthatch and listening to the alarm calls of a rather annoyed wren. Spotting a charm of goldfinches and then seeing a tawny owl fly through the trees was definitely worth the early start.

7-8.00 AM BREAKFAST

Rosie – *"Day 4, I've cracked the great breakfast dilemma – banana, weetabix and honey – boom!"*

Lydia – *"Are those sausages really vegetarian? They taste like meat. I mean who wants a veggie sausage tasting of meat?"*

9-11.00 AM PLENARY. PESTS, PATHOGENS AND UNPREDICTABLE RAINFALL: GLOBAL CHALLENGES FOR SUSTAINABLE FOOD PRODUCTION.

Amy: Professor Sue Hartley delivered the first plenary. I almost didn't make it, having locked myself in the luggage van moments before. Sue discussed challenges for sustainable food production, focussing on engineering crops to increase pest resistance and productivity. Mentor groups were tasked with devising a scientifically stimulating question – something all budding

ecologists need to master. Sue finished by stating that consumption of meat is a big problem – the vegetarian option soon ran out at dinner.

11-12AM MAKING OF A BOG

Ever wondered how a bog is formed? An interactive game about bog formation ensues involving the undergrads. Lewis sneaks away to attend to emails while other mentors engrossed in discussion about zombie apocalypse survival techniques.

12-1PM LUNCH

Having packed our lunches deliriously at breakfast time, it was always a surprise to see what morning mentor thought lunchtime mentor should eat.

1-2PM GUIDED WALK

We spot sundews, bumblebees and cotton grass along the bog boardwalk, and raptors wheeling above the limestone pavements.

2-4PM LECTURES & LABS

Jill: We went to the underworld – where microbial interactions influence the health of vegetation aboveground. I presented an introductory talk about types of mycorrhizae – that is symbioses between plants and fungus. We learned some of these evolutionary plant-fungi relationships are very specific while others partner with many plant species. After the introduction "we got dirty" looking at plant roots under dissecting and compound microscopes.

4-4.30PM TEA

Rosie – *“This cake is just too sweet, too much butter...but I will have another piece...”*

4.14PM CHANGE OF PLANS

Lydia: With only three hours left before final presentations one of my groups decided to change their topic to do something ‘more out there’. It was inspiring so see these guys challenging themselves to do something different. Knowing that my mentees felt confident enough to come up with another well designed study and present it in a succinct and engaging manner made me very proud.

5-6PM CAREERS

The mentees were exploring how to begin networking given their interests or openness. We reminded them about the importance of risk taking at all career stages.

6-7PM DINNER

Jen – *“Sponge and custard again, YES! Happy school dinner flashbacks...”*

7-9PM STUDENT PRESENTATIONS

Lewis: We assemble outside for the research proposals our mentees stitched together during the few spare moments they’d had. My internal monologue begins:

“These are impressive! – I struggle to pitch chapters with a month to prepare.”

“This undergrad presentation is better planned than my entire thesis after a year of work. I’m done.”



A mascot, apparently

9-11PM MASCOTS & BATS

Jen: An intense week has gone by – SURELY energy levels are waning. I look at my craft materials dubiously... but the room I walk into is packed and energized. The challenge is set: build an organism new to science and present in true Attenborough style. Following a spy on the local bats, a...creature...with far too many pipecleaner appendages is hailed the winner. Looking around, I’m impressed once again at the way this group has bonded in such a short time. There’s no doubt that will persist into the future.

Lewis – **receives pipecleaner DIY bumblebee from Jen* “This is the best gift I have ever received I shall treasure it always”*

Plans for policy

Jackie Caine / Policy Manager, British Ecological Society

Jackie@BritishEcologicalSociety.org

Ben Connor / Policy Officer, British Ecological Society

Ben@BritishEcologicalSociety.org

A general election year always brings with it fresh challenges and opportunities.

The Policy Review

We began this review process in the spring, guided by environmental consultant Peter Costigan, who had previously worked at the science – policy interface at Defra. A task and finish group of policy experts, scientists, representatives from NGOs was convened to discuss our current policy activities and how we can work more effectively. Interviews were also conducted with a range of stakeholders including decision-makers, representatives from other learned societies and BES members, to shed light on how we are perceived by our key audiences, and how to improve our work.

We found out that we need to make our policy work more strategic, to focus on activities and be fleet of foot when responding to policy developments. We also need to work more collaboratively with other organisations to make the most of our resources, and overall, maintain the BES's reputation as a trusted source of independent, scientific evidence.

Plans for 2016

From 2016 you'll start to see some changes in how we do policy. We'll keep offering training opportunities such as the Parliamentary Shadowing Scheme and the POST Fellowship, alongside regular policy workshops, but we'll get better at communicating them, make them more inclusive, and build on the relationships and knowledge that our members gain.

We'll set up a 'policy alumni network' to keep interested members connected, and we'll continue to support regional activity through the Scottish Policy Group, and burgeoning groups in Wales and Ireland.

We will work better with existing BES activity, such as the work of the Special Interest Groups, and the journals, and we'll work across partnership activities to provide you with more opportunities to highlight emerging issues in ecological policy and practice.

We'll also develop new ways to produce policy briefings and synthesis documents for policy makers on timely issues. This is a great opportunity to show the impact of your research; keep an eye out for more information and calls for participants.

A large part of the review process was looking at new ways to reward our members who contribute their time and expertise to our policy work. We want to give you more opportunities to showcase your research, get access to decision-makers, and influence our policy priorities.

The key to our success will be knowing our membership better; what expertise and interests they have. Our expertise database has been streamlined and improved; takes just a couple of minutes to join the database and ensure you can access relevant opportunities to extend the impact of your work, from informing consultation responses to working with the media.

We've worked on some big issues this year. As well as the review of the Birds and Habitats Directive, we also responded to a Select Committee inquiry on GM insects, where President Elect Professor Sue Hartley gave evidence in the House of Lords. We were able to ensure that BES members' research was seen by policy makers, and that ecological evidence was considered as a central part of the inquiry.

We already know some big policy issues of 2016, and we look forward to working with you on them. For example, the UK's decision on whether to remain in the European Union will have major implications for ecologists, both at the regulatory level, and for research funding and the free movement of people. We'll be working with you and other organisations in the sector to shed light on what a 'yes/ no' decision would mean for ecologists and the environment.

There will be many more complex issues where ecologists should have a say. Get in touch with us, keep informed through the website, blog and the expertise debate, and make sure your voice is heard.

Join the Interests & Expertise Database
at www.BritishEcologicalSociety.org/experts

SPECIAL INTEREST GROUP NEWS



British Ecological Society
Conservation Ecology Group

CONSERVATION ECOLOGY

Nathalie Pettorelli
nathalie.pettorelli@ioz.ac.uk

(See also Nathalie's report on ICCB on p42)

A delegation of the Conservation SIG attended the ICCB in Montpellier this summer, an international conference that gathered >2000 conservationists from >100 countries. We used this occasion to organise a social event, which saw 40 or so people joining and chatting at a local restaurant (see picture p42). Our one day conference on spatial conservation planning for the UK last September in York then kicked off the start of the 2015/2016 academic year: the event received some great feedback thanks to stimulating talks and discussions. Speakers included Bob Smith, Jenny Hodgson, Chris Thomas, Atte Moilanen and Colin Beale, who, together with Kerry Brown, organised this conference. Other news include the recruitment of a new liaison officer, Lydia Cole, who just started her position facilitating dialogue and initiatives between the SIG and other conservation groups and initiatives. The SIG is now looking forward to Edinburgh this December, with its thematic session on rewilding and a workshop for PhD students interested in pursuing a career in conservation. Interested in joining the group or receiving regular updates on our activities? Just send an email to Nathalie.Pettorelli@ioz.ac.uk



British Ecological Society
Parasites and Pathogens Group

PARASITE ECOLOGY AND EVOLUTION

Jo Lello (Lelloj@cardiff.ac.uk)

Report on the Transmission Research Retreat

Gregynog Hall – Mid-Wales 21st – 24th September 2015

We have recently completed our transmission research retreat. This event, aimed chiefly at established researchers, brought together 37 delegates (>60% with greater than 10 years post-doctoral experience) with the aim of unlocking the mysteries of parasite transmission. The idea of the retreat was to give focused, uninterrupted (no phone reception and limited internet) attention to a research topic, with the aim of gaining specific research outputs, e.g. papers and grants. The event was held at the beautiful Gregynog Hall in mid-Wales and attracted delegates from as far afield as Ottawa, Newfoundland, Australia and Pennsylvania, two of whom had no prior SIG association and heard about the event on Twitter. The structure involved

flash talk introductions from all delegates on the first evening, two plenary, overview-style talks from invited speakers and then increasingly focused discussions in whole and sub-groups. Plenty of 'free time' for informal discussion was also provided. As you might imagine, discussions were detailed and involved some good natured disagreement, but the interactions ended in excellent new insights and, importantly, in specific outputs. Delegates universally reported an extremely high level of intellectual stimulation and the number of intended outputs from the meeting is substantial (7 to 10 journal articles are in production with a later grant proposal planned). We hope to produce a journal special issue focused on these papers. Teams have been established to take these actions forward. We believe this stands as a great proof of principle of how these kinds of meetings might work and hope we have the opportunity to run similar events in the future.



Transmission wasn't the only thing broken down at the retreat



Transmission Research retreat delegates, Gregynog Hall, Mid-Wales, 21-24 September 2015

Among the topics discussed were: Breaking Beta – an examination of whether the standard Beta transmission term is enough and developing a new approach to modelling transmission, The evolution of transmission modes, Anthropogenic change as a driver of transmission mode shift in pathogens, Loss and gain of transmission traits over evolutionary history of a pathogen, generalist versus specialist transmission and Cryptic influences of global environmental change on parasite transmission.

If members were unable to attend the event but feel they would like to contribute to these actions please let me know and I will put you in touch with the group leader for the action of interest in order for you to discuss with them whether new involvement is still appropriate.

Keep an eye out for these events in the future I think everyone would agree that it was an event well worth attending.



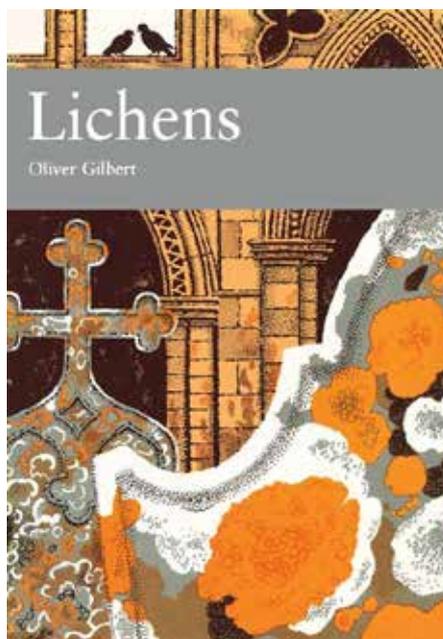
PEATLANDS RESEARCH

Ian Rotherham

The year so far has been very active with successful conferences organised by Roger Meade with the National Trust in Huddersfield, on *Molinia* management, and substantial input from group members led by Simon Caporn into the SER International Conference in Manchester.

In Sheffield, *Wild Thing* proved to be very successful with around 120 people attending from twenty countries and a public event with an additional 50 people. Look out for the post-conference books.

This year's events continue with workshops on *Sphagnum moss taxonomy and identification*, and on *Waxcap fungi identification* jointly with the Forest Ecology SIG.



The cover of Oliver Gilbert's superb contribution to the *New Naturalist* book series

On November 13th and 14th Sheffield Hallam University will host *A Life in Ecology – A Celebration of the Work and Inspiration of Dr Oliver Gilbert Pioneer Ecologist*, a conference organised jointly with the British Lichen Society and the BES. The topics under discussion encompass Oliver's many interests and celebrate his contributions to urban ecology, lichenology, exotic plants, and urban and post-industrial landscapes over a period of 50 years. Invited speakers will deliver papers on topics ranging across 'alien' species, lichens, urban woodlands, and post-industrial flora. He was one of the first academic ecologists to examine urban environments, establishing terms like 'the urban commons'. His book *The Ecology of Urban Habitats* still stands as the primary text in this field. He also challenged conventional thinking on invasive aliens such as sycamore and Japanese knotweed, pioneering academic interest in urban habitats and urban ecology. Speakers include Professor Mark Seaward, Dr Penny Anderson, Professor Nigel Dunnett, Dr Jan Woudstra, Anne Le Sage, Dr Rob Francis, Dr Peter Shaw, Professor Melvyn Jones, Dr Anna Jorgensen, Penny Anderson, Dr Peter Shepherd, and Dr John Barnatt. A celebratory volume of conference papers follows from the event. More information and a booking form are available from our website www.ukeconet.org/events/.



Oliver Gilbert searches for lichens at Stonehenge

For all the above events and activities please visit www.ukeconet.org or email info@hallamec.plus.com for more information.

Plans are already in place for 2016, with *What 'Capability' Brown did for Ecology – Capability Brown's legacy in ecology and nature conservation*; (a tercentenary event); 15th to 17th June, at Sheffield Hallam University, Sheffield; call for support and papers; details from www.ukeconet.org. With *Peatlands & Raptors*, to be held in Sheffield in early September, we will be addressing the hugely controversial issues of why Britain has lost its upland hen harriers, and much more besides.

We are also building towards a major international conference, *Reconstructing Nature – a landscape approach to a future ecology*, in 2018. Offers of interest, support, papers etc, all welcome.

Peatlands Research Network mailing list: we have had problems with the JISMAIL mailing list, so please, if you wish to be mailed the Peatland SIG Newsletters and updates or announcements, just send me your email and you will be added to our group *peatlands research network list* – i.d.rotherham@shu.ac.uk



CLIMATE CHANGE ECOLOGY

Using climate data in ecological research

Katherine Maltby / University of Exeter



In mid September ecologists and climate scientists came together at a BES workshop to discuss the role of climate data in ecological research and the problems and opportunities this presents for researchers in both disciplines. The workshop stimulated much discussion and was a great opportunity for scientists from these often separate sciences to come together and think of new ways of working together in order to make better use of the data, skills and expertise that exists across these groups.

The impact of climate change on ecosystems is a topic within ecology that has gathered much pace over recent years. As ecologists explore new methods and ways of using climatic data, it is becoming increasingly important for them to understand climate observations and projections at a deeper level.

At the same time, climate science has also made great advances. Increasing computer power has allowed projections

to be made at much finer resolutions and with increasing levels of precision, whilst models have become increasingly complex in order to better reflect reality. Additionally, as Earth System Models have moved towards incorporating more ecological functions and processes, there is a need for climate scientists to better understand developments within ecological science.

Consequently, there is a growing need for these two disciplines to better understand each other's methods, advances and data outputs. So, it seemed only natural for the relatively new Climate Change Ecology Special Interest Group, Quantitative Ecology Special Interest Group and Met Office staff to join forces in September to host a two-day workshop at the Met Office in Exeter. The aim of the gathering was to allow ecologists and climate scientists to come together to facilitate discussions on the advances that are being made in these disciplines and explore ways in which these two often separate communities can work more closely into the future.

The first day was kicked off by Professor Julia Slingo, Chief Scientist at the Met Office, who set the scene nicely by talking about the progress that has been made in climate research at the Met Office and the future challenges and opportunities that lay ahead within earth system science. Rachel Warren (Tyndall Centre) followed this by giving an overview of the uses of climate data within ecology and the mismatches that can occur between requirements for data at different temporal and spatial scales. Mike Morecroft (Natural England) then gave a summary of the new developments in understanding the impact of climate change on the UK's biodiversity based on the new Climate Change Impacts Report Card (<http://www.nerc.ac.uk/research/partnerships/lwec/products/report-cards/biodiversity/>).

After these introductory talks, the afternoon was spent hearing from Met Office climate scientists Mark McCarthy, Jason Lowe and Chris Jones who discussed climate observations and projections and their associated limitations and uncertainties. This was an interesting session, particularly appreciated by the ecologist delegates, as it provided an insight into how climate data are generated and the ways in which climate models are developed and

used to generate projection data that are so commonly used within ecological research. Discussions on the generation of climate data lasted well into the evening over a buffet and poster session.

The next day was the turn of the ecologists to give an insight into their work, by showing the range of uses and ways in which climate data generated by bodies such as the Met Office are applied to answer ecological questions. For this the audience heard from Richard Pearson (UCL), Georgina Palmer (University of York), Ally Phillimore (University of Edinburgh) and Pippa Gillingham (Bournemouth University) who talked about topics including species distribution modelling, microclimates, population dynamics and the importance of phenology. A common issue that emerged from this session was the difficulty that ecologists have with the differing spatial and temporal resolutions that are required to answer ecological questions and the mismatch with currently provided climate data.

The last session of the workshop focussed on Earth System Models, both in terms of the requirements such approaches need as well as the outputs that can be gained, and used. Andy Wiltshire, Debbie Hemming and Stephen Sitch from the Met Office and University of Exeter discussed a range of ESMs, such as the JULES land surface model, and their relevance to ecology. It was interesting to find out about the range of outputs ESMs generate and the potential of using this information in future ecological research.

Sessions throughout the two days generated a lot of discussion and the last afternoon of the workshop provided the chance for greater in-depth thinking and conversation. People split into groups to discuss what they considered to be challenges, opportunities and future working directions when it comes to using climate data in ecological research, and how to better include ecological outputs into Earth System Models. There were several challenges that emerged from this including:

- The disparity between spatial and temporal resolution of climate data and that required of ecologists – to what level can climate data be downscaled?
- How to acknowledge and quantify uncertainties associated with climate data when used within ecological studies?

- What other ecosystem functions and processes should ESMS use and how can they be incorporated?

But, we also recognised opportunities too, such as:

- Realising the wide range and availability of outputs from Earth System Models which could be of great benefit to ecologists for their research
- The potential to use the JULES land surface model (a community model available to any researcher, free of charge) independently from the Earth System Model for focussed ecological assessments and evaluation of model performance across scales
- Possibilities to use large-scale ecological data and understanding to improve the modelling of vegetation within ESMS (and their component land surface models)

All in all, the workshop provided a much-needed forum for climate scientists and ecologists to interact, think of new ways forward and, we hope, helped to set seed for generating future collaborations on research projects. It was a fantastic few days, with scientists from both disciplines benefitting from finding out about what each other does when huddled over their computer screen. Hopefully we ecologists didn't come across as too demanding regarding what was on our climate data 'wish list'... Here's to the next meeting!

If you would like to join the Climate Change Ecology SIG or be informed of our future events please contact us on: climatechange@britishecologicalsociety.org



British Ecological Society
Forest Ecology Group

FOREST ECOLOGY

Dan Bebber

For full information, please visit our blog at <http://besfeg.wordpress.com>

The FEG supported nine events this year, including scientific meetings, education

and training days, and policy discussions. I will be stepping down as FEG Secretary, and will be replaced by Dr Alan Jones of Earthwatch in Oxford.

Workshop in the woods: bringing forest ecology into secondary schools

Organized by Jen Hurst, Education Manager, Sylva Foundation, Oxfordshire

Teachers, woodland owners, and ecologists attended a half day workshop in July to help Sylva unlock the potential to use local woodlands and school grounds for ecological fieldwork. Sylva's Jen Hurst provided an overview of recent changes to the secondary school curriculum, together with opportunities for teaching and learning about British forestry and woodlands. Gabriel Hemery led an introduction to forestry field techniques including measuring tree stem diameter and height, and estimating tree canopy cover. Nadia Barsoum from Forest Research introduced a new biodiversity assessment technique. Participants then enthusiastically carried out fieldwork in Little Wittenham Woods which generated many discussions, insights and questions.

The workshop identified opportunities and constraints for secondary schools to carry out ecological field work in local woodlands. A report from the workshop will outline these in addition to recommendations for woodland owners wanting to work with schools and develop education activities. This pilot workshop will inform Sylva's ongoing education programme as well as those of other forest education providers.



British Ecological Society
Plant Environmental Physiology Group

PLANT ENVIRONMENTAL PHYSIOLOGY

Things to look out for in 2016...

International Workshop on Plant Environmental Physiology techniques 12th – 16th September 2016

Last year saw our second International Workshop on Plant Environmental

Physiology techniques in Lisbon, Portugal. It was a huge success with nearly 100 people being involved during the week. Due to the high global demand for places on this event we are going to repeat the workshop in September 2016: see the advert in this issue of the *Bulletin* (p24) – this is THE International workshop to attend if you study plant environmental physiology at any level. If you are interested in being involved in organising or sponsoring the workshop, or have any suggestions then please email either Dr. Steven Driever (steven.driever@wur.nl), Dr. Richard Webster (rcw@aber.ac.uk), Dr Tracy Lawson (tlawson@essex.ac.uk) or Dr Matt Davey (mpd39@cam.ac.uk).

Unfortunately we had to cancel our 2015 Annual PEPG Young Career Scientist Mini Symposium in the New Forest, but we are planning on holding the next symposium in the Spring 2016 – either in the Peak District or Wales...join our email/social media for details!

Matt Davey
mpd39@cam.ac.uk

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

Howard Griffiths
hg230@cam.ac.uk

Lucy Rowland
Postdoc rep lucy.rowland@ed.ac.uk

Marjorie Lundgren
marjorie.lundgren@sheffield.ac.uk

Richard Webster
rcw@aber.ac.uk

Jen Cuniff – Communications Officer – please contact Jen with news and events you would like advertising on our website, email list, Facebook page and twitter @pepg_sig j.cuniff@cabi.org



British Ecological Society
Plants, Soils, Ecosystems

PLANTS-SOILS-ECOSYSTEMS

Mike Whitfield (@mgwhitfield)
mgwhitfield@gmail.com

Plants-Soils-Ecosystems is a special interest group for people interested in plant-soil interactions, soil ecology and biogeochemistry. In this issue of the *Bulletin* and fresh off the back of a global tree-counting exercise, Tom Crowther provides some tips for interacting with the media from a plants-soils-ecosystems perspective, based on some of his recent experiences.

INTERACTING WITH THE MEDIA

Tom Crowther (@tomcrowthersoil)

Here I've listed a few tips I've learned from speaking with the media. I've included some examples from my own experience in italics.

- Try to speak like a human, not a robot. For my first interviews, I just listed facts in a boring, rehearsed manner. But once I started to loosen up and realised that I was just chatting with an interested person, the conversations became far more rewarding for both of us.
- You will only have a short conversation so make sure you make, and reinforce, the main points. Make a list of five main points to focus on, and if the questions get too strange, bring it back to one of those points.
- They are not trying to catch you out! Speak honestly and if you make a mistake, just explain clearly what you meant.
- If you fear that they might interpret something in a way that you do not believe to be true, try to pre-empt that by discussing it honestly. For example, I was scared that people might say 'Oh, so there are three trillion trees left, so we have nothing to worry about'. So I specifically brought this concern up with reporters, asserting that we had not discovered new trees or carbon storage – we had just described their populations. The annual losses of trees, and the reduction since the start of human civilization highlight the concerning impact that humans have had on natural ecosystems worldwide.
- It can be tempting to mention things that are beyond the scope of the study. But do not over-reach. It is important not to drift into conversations that are outside of your field of expertise. For example, following a PNAS paper

(which was about invertebrates feeding on soil microbes), I was asked by a reporter if I thought that we should fly around and drop worms into the soil. I said that I did not think that was the best course of action, because allowing complex, natural communities to establish themselves will be a far better option. The reporter then wrote that I said 'dropping worms from the sky would be one approach, but allowing communities to naturally re-generate would be a better one. All subsequent reports focused on the crazy option of dropping worms into the soil when my paper didn't even involve worms. I should have just said, 'No that is a complicated idea and the answer to the question is beyond the scope of the study. What I can say is that natural regeneration is the best option'.

- You are the expert! Be careful about the words you use because everything you say can (and may well) be taken literally.
- If you are thrown a curve ball, don't worry about it. Sometimes they might ask a valid question which you had not considered previously. Acknowledge their important point and highlight that this requires further consideration. Reporters will only be complimented by this, and they might like you more for it. For example, all global models have the limitation of slight inaccuracies at the fine scale. The satellite information that we used suggested that there was a large patch of trees on the Faroe Islands (a small patch of rock covered by grass). We had not noticed this because we had not checked the model predictions for every pixel on Earth. Also, tiny areas like this have no major influence on the global numbers in a meaningful way. So I was completely thrown when a reporter from USA today asked why we had predicted trees on the Faroe Islands. I was worried that this would completely undermine the study. But after a few moments of thought, I explained how and why we had this tiny discrepancy, and she was very understanding. There was no mention of the Faroe Islands in her report.
- It is a nerve-wracking experience. I was completely overwhelmed at the start of the media onslaught for the tree paper. But it is important to remember that this is the fun part of science. Contributing knowledge to the world is why we all do it all.

It can be an extremely rewarding experience, so enjoy your time in the limelight (because it will not last long).

Gerlinde De Deyn becomes new Deputy Editor-in-Chief at Oikos

Congratulations to plant-soil interactions scientist Gerlinde De Deyn, who recently started as the new Deputy Editor in Chief at the journal *Oikos*. Read more at:

oikosjournal.org/blog/welcome-gerlinde-de-deyn-new-deputy-eic

PLANTS-SOILS-ECOSYSTEMS BULLETIN

Plants-Soils-Ecosystems sends interesting emails about job opportunities, studentships and meetings to those signed up to our mailing list. We also compile a bi-monthly *Bulletin*, which includes plenty of items of interest to ecologists interested in plant-soil interactions, and is compiled by committee members Relena Ribbons and Mike van Nuland. The success of Plants-Soils-Ecosystems depends on you, so keep sending us your jobs, studentships and interesting facts! You can find the archive of previous *Bulletins* on our website: besplantsoileco.wordpress.com.

Get involved!

We are looking for contributors to our online journal club, #psejclub. We're always looking out for enthusiastic people with ideas for organising meetings, training events, field trips, socials or other interesting activities within the spheres of plant-soil interactions and soil ecology. Email us at besplantsoileco@gmail.com if you are interested and have ideas about how to make your special interest group work for you!

Join us!

Sign up for our email list by sending an email to listserv@jiscmail.ac.uk; Subject: BLANK; Message: SUBSCRIBE PLANT-SOIL-ECO Firstname Lastname. Follow us on Twitter @BESPlantSoilEco, and like us on Facebook: [fb.com/BESPlantsSoilsEcosystems](https://www.facebook.com/BESPlantsSoilsEcosystems). Finally, don't forget to check out the blog and journal club at besplantsoileco.wordpress.com.



British Ecological Society
Tropical Ecology Group

TROPICAL ECOLOGY

Lindsay F. Banin

BES-TEG supported two exciting events earlier in the year. The first was a special session at the Biennial Systematics Association in Oxford on 'The value of long-term monitoring plots for plant systematic and ecology in the tropics' led by Tim Baker and Toby Pennington. The second was our 8th Annual Early Career Researcher Meeting in Stirling. You can read more about these events in the reports below. We look forward to welcoming tropicologists to the Annual Meeting – our final event of the year will be a joint social with FEG – keep an eye on the meeting programme and Twitter for further details!

In 2016, we look forward to joint activities at the GTO meeting in Göttingen, Germany in February and the European ATBC meeting in Montpellier, France in June, as well as TEG's own annual meeting.

As usual, we welcome any ideas you may have for future events or other ways TEG can support the tropical ecology community via our email: tropical@britishecologicalsociety.org. You can also use this email address to sign up for our newsletter; alternatively, keep up to date with our news via twitter @BES_Tropical, our Facebook page or our blog <https://tropecol.wordpress.com/>.

Systematics Association Biennial Meeting, Oxford, 26-28th August 2015

Maria Kaye, University of Aberdeen

On the 26th to the 28th of August 2015 I attended and spoke at the Systematics Association biennial meeting in Oxford. I was able to attend largely due to a grant from the BES Tropical Ecology group and I am really grateful to them for what turned out to be an amazingly valuable experience, as diverse as it was

fascinating. The meeting was held in Oxford's Natural History Museum and it was definitely something special to be hearing about biodiversity and evolution while surrounded by the taxidermy, skeletons and fossils of the museum which documents those very processes.

The theme for the meeting was 'Systematics- the science that underpins biology', and throughout the three days we heard from people at all career stages working in an incredible breadth of biological fields, but all using the relationships between and within organisms to discover more about their particular area. The tone for the meeting was set by the first keynote speech from Michael Donoghue who took us on a fascinating journey centred around the genus *Viburnum*. Drawing on research from throughout his career, Michael explained how through exploring the systematics of just this one genus, his group have been able to make new discoveries about coevolution, leaf anatomy, biogeography, diversification, speciation and relationships between leaf form, phenology and biome shifting. On the second day, the keynote speaker was Peter Holland, who used his talk to focus deeper on systematics in genome evolution. Turning the classic evo-devo model on its head, he showed that by first comparing genomes of organisms and linking molecular differences to phenotypic changes, we can begin to understand how genetic change contributes to organismal diversity. The rest of the meeting was structured around four symposia which focused respectively on long term tropical forest plots, palaeontological systematics, using systematics to accelerate taxonomy, and the origins of biodiversity. Each of these sessions told a story as the speakers presented work complementary to each other but offering different perspectives within that field. Running parallel to the symposia were sessions of contributed talks and posters from people working internationally in a huge range of fields and at every career stage from new graduates to group leaders. There were ample opportunities to network with everyone during coffee breaks, a wine reception and the very grand conference dinner, held in the dining hall of Christ Church College.

For me the conference has really given me a new appreciation of the breadth of the systematics field and community,

and it has highlighted yet again just how valuable it is to collaborate with groups working in different fields. Thank you once again to the BES-TEG for the opportunity to attend.

Maria Kaye is a PhD student in the School of Biological Sciences at the University of Aberdeen. She studies community ecology on a tropical forest plot in Malaysia using plant functional traits and DNA barcoding. Maria recently received a student grant from the BES-TEG to attend and present work at the Systematics Association meeting.

BES Tropical Ecology Group Annual Meeting for Early Career Researchers 2015

Isabel Jones, University of Stirling

The Tropical Ecology Group provides a forum for 'tropicologists' to get together, whether it's via social media or through the annual BES-TEG meeting for early career researchers. This annual meeting is generally organised by PhD students and hosted at their university. A fellow PhD student – Rebekah Mayhew – and I organised this year's BES-TEG meeting at the University of Stirling.

We were asked to organise the meeting whilst in Panama, when we were both coming to the end of our respective field seasons. "Sure!" we said "absolutely no problem," as we sat in the tropical sunshine feeling a rather colder sort of sweat spreading over us than we were used to. Neither of us had even been to a conference at this point, so we just jumped head first into organising this one and hoped for the best.

Being given the opportunity to organise an event like this is one that doesn't come around very often, and provides experiences you can't get in many other ways: we were able to contact and interact with some eminent scientists in a bid to find our wonderful keynote speakers, we got to know members of the BES-TEG committee really well, and to do our favourite thing, plan a big party! There's a lot of freedom too: we'd had a meeting amongst the T.E.A.C (Tropical Ecology And Conservation) group up in Stirling, and come up with the meeting theme 'Tropical Ecology and Land-use Change' with four focal sessions. Then we basically had a blank slate to do what we wanted in terms of venue, structure of the meeting, how to publicise, and

most importantly how many tea breaks to schedule in.

From blank slate to two-day conference

We thought it might be useful to give a timeline of how we structured organising the event, as allowing plenty of time for everything was vital given the number of different things to organise and people involved.

April 2015 – accept the 2015 BES-TEG challenge. Promptly ignore most conference-related things and carry on with field season.

May 2015 – realise you probably should do something about that conference you said you'd organise. Book venue and work out how much essential things will cost e.g. catering for two days and establish who can provide this. Work out a basic budget, and see how much travel you can cover for keynote speakers (local vs international for example). Start contacting keynote speakers.

June 2015 – Finalise budget and work out how much delegate registration will cost. Create event 'save the date' for peoples' diaries and get the keynote speakers finalised. Book venue for conference dinner with an estimate of how many people will come along.

July 2015 – Create webpage for registration and publicise widely.

August 2015 – Panic that nobody has registered yet and start frantic Twitter, Facebook, email bombardment, and

begging campaign. Sort out any last-minute glitches (minimal if you've been organised and started a few months ago!). Get documents ready for delegates and make sure there's enough wine coming for the poster and nibbles session.

September 2015 – realise you haven't written a talk or done a poster for your own conference. Stay up all night before the conference doing this. Then be prepared for two days of high adrenaline as you constantly worry if people are OK and things are going well. Realise everything is fine and enjoy some great science chat and meeting new 'tropicologists.'

How we structured BES-TEG 2015

We split the meeting into four sessions: 'Function and value of secondary forests', 'Current drivers of land-use change in tropical ecosystems', 'Quantifying land-use change' and 'Implications for biodiversity and ecosystem processes'. We're lucky to have a really active bunch of tropical ecologists here in Stirling, working from the Neotropics to Africa to S.E. Asia. It made sense to get as many as we could involved in the conference, and so each session had a chair person (from T.E.A.C.) as well as a keynote speaker from elsewhere: Dr Cristina Banks-Leite (Imperial College London), Dr Edward Mitchard (University of Edinburgh), Dr Nicola Anthony (University of New Orleans) and Dr Emma Sayer (University of Lancaster).

We invited our delegates to present a talk (15minutes including question time) in

one of our four sessions, and / or a poster which was on display throughout the meeting and showcased during a drinks and networking session.

Because there were differing numbers of people presenting in each session, we were able to use some of the time for discussion groups and a Q&A session with our chairs and speakers: delegates were invited to quiz the chairs and speakers about anything, and ranged from how to build capacity in countries where your fieldwork is taking place through to questions about individual career paths.

All in all we had 27 delegates giving 13 talks and 10 posters. We had a couple of prizes for the best talk and the best poster, won this year by Claire Wordley (talk) and Hsiao-Hang Tao (poster) with Maria Kaye and Wallace Beiroz highly commended.

Take-home messages for would-be conference organisers

- Have at least two of you organising: it keeps everyone sane and is more fun. You can also schedule in gin and tonics as a 'conference catch-up and planning session'
- Get started on planning early, but be flexible, as things never go exactly the way you want them to
- Be prepared for last-minute registrations (and even requests for attending a few days after the registration deadline)
- Don't underestimate how many emails you need to send asking for help e.g. when asking people to publicise your event to their lab groups...sending gentle reminders is OK too!

Our thanks

We couldn't have created the 2015 BES-TEG meeting without our keynote speakers Cris Banks-Leite, Ed Mitchard, Emma Sayer and Nicola Anthony, our session chairs from Stirling, Nils Bunnefeld, Daisy Dent, Al Jump and Kate Abernethy, and all the support from the BES and Tropical Ecology Group with special thanks to Lindsay Banin. Lastly, our thanks go to all the early career researchers who ventured up to Stirling and made the meeting so enjoyable and sparkling with interesting tropical ecology...already looking forward to next year and handing over the BES-TEG annual meeting baton!



The Tropical Ecology Group Early Career Researchers' meeting has been hugely successful and has now been running long enough that at least one former delegate is now back as a keynote speaker

This year's early-career researcher meeting was organised by Isabel Jones and Rebekah Mayhew.

Isabel Jones is a PhD candidate at the University of Stirling, investigating the biodiversity and carbon impacts of hydroelectric megadams on tropical forests; she works with tropical forest tree communities and soils within fragmented landscapes in the Brazilian Amazon and Panama. Isabel is also the Communications Rep. for the BES Scottish Policy Group.

Rebekah Mayhew is a PhD student in the School of Biological and Environmental Sciences at the University of Stirling. She studies the species and functional composition of bird communities in regenerating tropical forests in Central Panama.



MACROECOLOGY

Six honest serving men (and women): EUMacro 2015

Adam Kane, Thomas Guillaume and Deirdre McClean

What is the link between colorful maps, boiling insects, the spread of disease, and hashtag-killing equations? Macroecology obviously!

What is macroecology? The #EUMacro meeting was an excellent answer to that question (a full run down of the conference can be found here: <https://storify.com/nhcooper123/eumacro-part-1&-part-2>). On the 14th June, along with people from 17 countries and three ecological societies (BES, GfÖ and CMEC), we met in Copenhagen for an excellent meeting to discuss all the exciting things macroecology.

Aside from the brilliant talks that were replete with all the right phrases from macroecology bingo we realized that maps are the ties that bind macroecology talks whereas maths remains the

easiest way to lose your audience. The conference also provided an occasion for acquiring much advice and thoughts for early career macroecologists as well as for not so early career types. We began with a nice opening description of macroecology by Carsten Rahbek as a science that asks 'Kipling questions':

I keep six honest serving men

They taught me all I knew;

Their names are What and Why and When

And How and Where and Who.

We were implored to realise we're not in science for the publication game, instead we're there to find out how nature works. As a group perhaps we're lacking in ambition, the physicists of the world have no problem asking for many millions of euros to ask their questions, so why don't ecologists do the same? Should we receive such an amount we'd need to collaborate on an even greater scale, and that could put us in danger of going against Nate Sanders' advice ("don't work with assholes").

The debate over the publication circus showed no signs of abating as a panel of experts gave a variety of views on the value of journals and publishers. There were concerns over the exponential rise in the number of manuscripts being submitted to journals and the impossibility of the current model to effectively deal with these rises especially when it comes to proper peer review. And the ancient issue of the profit margins associated with publications rose up again.

During our workshop on critical innovation in ecology which was organised by the International Network of Next-Generation Ecologists (INNGE) we were discussing how best to ensure macroecology has an impact on society for the next decade and beyond when it comes to effective decision-making. One problem as we saw it is that the public doesn't know what it needs to worry about when it comes to ecological problems. By contrast in economics, a subject just as complicated as macroecology, the public hang onto key issues like GDP and unemployment rates as things to fret over.

To wrap up the conference Carsten Dormann gave the entire subject a good

grilling and told us all to leave our half-baked ideas in the shower.

To finish up the meeting we were treated to dinner in the wonderful surroundings of the Zoological Museum at the university where two-tusked narwhals and feathered dinosaurs watched over us as we ate.

CITIZEN SCIENCE- ACTIVITIES IN 2015

It has been another busy year for the Citizen Science Special Interest Group with a range of exciting events.

The BES provided sponsorship for the inaugural conference of the Citizen Science Association at San José in California (<http://citizenscienceassociation.org/conference/citizen-science-2015/>). Jonathan Silvertown attended on behalf of the group and reported that it was a huge success with over 700 delegates present from all over the world. Ecology was very well represented in spoken and poster presentations. It was also great to be able to support The Centre for Environmental Data and Recording (CEDaR) in their 20th anniversary celebrations which provided the opportunity for many organisations and individuals (87 in total) to highlight their important work in conservation and wildlife recording.

In May, Michael Pocock, Hilary Geoghegan, Alison Dyke and Rachel Pateman hosted two days of citizen science at Charles Darwin House.

The first day was a citizen science training day. One participant described it as "advanced topics" in citizen science, or "what is helpful to know, but no one's told you about". An audience of 50 people considered topics presented by a range of experts, each of which support excellence in citizen science projects. We considered very practical subjects such as project evaluation, working with children and schools, working with communities to co-create projects, engaging the media, and best practice in data management and data protection. We also considered broader (and arguably trickier) topics such as privacy, intellectual property and ethics. Watch out for the briefing note summarising the day coming out soon.

The second day focused on the 'human' element of citizen science – specifically

the volunteers, professional scientists, practitioners and policymakers that make up this ever-growing field. The event attracted over 40 researchers and practitioners interested in the social dimensions of citizen science. A widely accepted definition of citizen science is the participation of non-professionals in professional science projects. However, more work needs to be done to reflect on participation in citizen science – a research approach that is developing at a breakneck pace. Dr Geoghegan said: “My research area of enthusiasm, namely the emotional affiliation we have towards things and activities we care about, is of significant interest to professional scientists, research councils and policymakers as they establish the ways in which they will engage with citizen science in the future. Without an understanding of why people do and do not participate, citizen science projects may fail.” You can find tweets on the subject via the hashtags #BESCitSci and #CitSciPeople

The festival Latitude <http://www.latitudefestival.com/> provided the perfect setting for three days of citizen science on (and below) the ground! Marc Botham (ecologist at the Centre for Ecology & Hydrology) stated “All the activities on the Big Biology Bus worked well, visitors went away enthused by ecology and the collaboration with other organisations was great. It would be good to contribute to activities of this kind in the future.” Read more in the excellent blog by Victoria Burton <http://www.imperial.ac.uk/blog/studentblogs/victoria14/2015/07/28/my-first-music-festival-with-science/> and in Helen Roy’s article elsewhere in this issue (p46)

So from the rural setting of Latitude to Urban Ecology in Glasgow – Hannah Grist (RSPB) organised a one day event “Science in the City” on 3rd September 2015. The event included invited speakers Caron Cooper (North Carolina Museum of Natural Sciences), Jonathan Silvertown (Edinburgh University) and Sarah West (York University) alongside a number of other contributors and including citizen science in action over lunch:



You can find out more on Twitter #urbancitsci

We are extremely grateful to the British Ecological Society for all the support, guidance and enthusiasm that comes our way and we are looking forward to an equally eventful 2016.



Environmental and Eco Physiology Field Techniques From Molecular Physiology to the Canopy

Lisbon, Portugal 12th - 16th September 2016

The Plant Environmental Physiology Group (PEPg, special interest group of SEB & BES) will, once again, provide a unique opportunity for MSc, PhD students and early career researchers to gain training in plant ecophysiology techniques from leading scientists and manufacturers.



The intensive, five day long workshop will cover:

- leaf-level processes including **photosynthetic gas exchange, chlorophyll fluorescence, 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**



This comprehensive five day workshop will provide an unrivalled opportunity for manufacturers to introduce their latest equipment and provide hands-on training.

The successful format includes a daily programme of lectures introducing the theory of techniques, with a demonstration of the equipment, followed by hands on sessions for participants to collect data. Evening sessions allow group discussions of techniques and data analysis, as well as a research poster session.



Internationally renowned scientists will explain and demonstrate key techniques:

Prof. Susanne von Caemmerer (ANU); **Prof. Steve Long** FRS (Illinois, USA); **Dr. Bernard Genty** (CNRS, France); **Dr. Xinguang Zhu** (PICB, China); **Prof. Howard Griffiths** (Cambridge, UK); **Dr. Andrew Leakey** (Illinois, USA); **Dr. Wanne Kromdijk** (Illinois, USA); **Prof. Lawren Sack** (UCLA, USA); **Dr. Colin Campbell** (Decagon Instruments, USA); **Dr. Katie Field** (Sheffield, UK); **Prof. Carl Bernacchi** (Illinois, USA); **Dr. Gary Lanigan** (Teagasc, Ireland); **Dr. Saoirse Tracy** (Leeds, UK); **Dr. Craig Yendrek** (Illinois, USA); **Dr. Tracy Lawson** (Essex, UK); **Dr. Steven Driever** (Wageningen); **Dr. Richard Webster** (Aberystwyth, UK); **Dr. Colin Osborne** (Sheffield, UK); **Dr. Justin McGrath** (Illinois, USA); **Dr. Matthew Davey** (Cambridge, UK).



The workshop (limited places) will run for five days at the Quinta da São Pedro, Lisbon in September 2016 <http://www.quintasaopedro.pt/> For information on registration, costs, travel, accommodation, programme visit http://www.essex.ac.uk/bs/conferences/pepg_workshop.aspx



For further information contact:

Dr. Steven Driever (steven.driever@wur.nl) or Dr. Richard Webster (rcw@aber.ac.uk).



Follow PEPG at: www.facebook.com/PlantEnvironmentalPhysiologyGroup twitter.com/PEPG_SIG
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OF INTEREST TO MEMBERS

AMYAN MACFADYEN AND NORMAN MOORE

We are very sad to report the deaths in October of two very eminent and much-loved ecologists.

Amyan Macfadyen was a former President of the BES, an honorary member, and was one of our longest-serving members having joined the Society in 1941.

Norman Moore was a hugely influential figure in nature conservation and author of several superb books. We hope to have obituaries in tribute to these two wonderful people in the next issue.

FIRST INTERNATIONAL CONFERENCE OF THE COLLABORATION FOR ENVIRONMENTAL EVIDENCE:

Better Evidence, Better Decisions, Better Environment

This conference will take place August 25-27th 2016 at the Swedish Museum of Natural History, Stockholm, Sweden. A call for special sessions and abstracts for presentations and posters will follow. For further announcements follow us on Twitter @EnvEvidence, join us on LinkedIn (Collaboration for Environmental Evidence) or go to the CEE website www.environmentalevidence.org. To express interest please pre-register by emailing info@environmentalevidence.org using the title 'CEE Conference'.

www.BritishEcologicalSociety.org/2016

Liverpool 2016

British Ecological Society

save the date • 11 – 14 December • ACC, Liverpool



*Announcing the
BES Annual Symposium for 2016*

*Making a difference in
conservation: improving the
links between ecological
research, policy and practice*

11- 13 April 2015

David Attenborough Building, Cambridge

Organised by William Sutherland, Peter Brotherton, Stuart Butchart,
Jackie Caine, Ben Connor, Zoe Davies, Nancy Ockendon, Nathalie
Pettorelli, Amelia Simpson, Juliet Vickery and Bhaskar Vira.

This meeting brings together the ecological research community and those involved in policy and government. Its aim is to assess the value and applicability of a range of techniques for improving the decision making process including a range of practical workshops. This should lead to greater impact of research and improved policies and practice. The meeting will be hosted by the Cambridge Conservation Initiative (CCI) at the David Attenborough Building in Cambridge, as part of its launch in April 2015.

Speakers include William Sutherland, Andy Clements, Bonnie Wintle, Mahlon Kennicutt, Malcolm Ausden, EJ Milner-Gulland, John Altringham, Andrew Pullin, Lynn Dicks, Hugh Possingham, Ian Bateman, Fiona Fox, Mark Burgmann, Nebedita Mukherjee, Nathalie Pettorelli, Julian Huppert, Serah Munguti, Lynn Frewer, Pemilla Malmer, Lucy Bastin, Charles Godfray, Angela McLean, Rob Freckleton, Juliette Young, Andy Stirling, Elisabeth Costa, Nicola Crockford, Bob Smith.

John Beddington will deliver the BES/CCI Public Lecture: Emergencies, Evidence and Policy

For further information please see: www.BritishEcologicalSociety.org/AS2016

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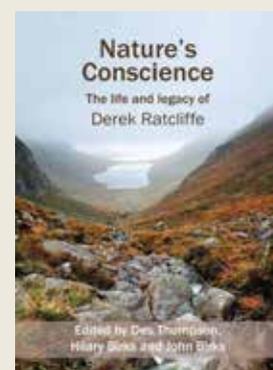


Nature's Conscience: the Life and Legacy of Derek Ratcliffe (1929 -2005)



Paul Adam / University of New South Wales

There are relatively few biographies and histories of ecologists, and ecologists are often uninformed about the history of their discipline. In this extended review of a fine new book, Paul Adam looks back on the life and career of a wonderfully skilled field biologist whose contributions to nature conservation and science communication were many and varied. What lessons are there for future generations?



Friends and colleagues of Derek Ratcliffe have performed a great service in assembling this history and tribute to the work of Derek, and have produced a book of interest and relevance to all those concerned with the natural history of the British Isles. The book also has relevance to a wider international audience.

The book is a substantial volume, copiously illustrated; not only are there numerous photographs of high quality, but there are also paintings by two landscape artists, Will Williams and David Bellamy, which capture the environments which for so many years inspired Derek's life and work. The publishers are to be congratulated on producing a work of such high quality at a relatively low price. It is a book to be dipped into and savoured.

Derek was appropriately honoured by awards from a number of societies, including the British Ecological Society, but did not become a member of the scientific establishment or receive national honours. He deserved greater recognition during his lifetime.

Ratcliffe's career demonstrates that the basis of all good ecological science is natural history, and Derek was an outstanding natural historian. Converting natural history into ecology requires careful observation and documentation



*Derek Ratcliffe scaling a Birch (*Betula*) tree to inspect a brood of two 3–4 day old Merlin (*Falco columbarius*) chicks in an old Carrion Crow's (*Corvus corone*) nest, Skiddaw area of the Lake District. Taken on 9 June 1989, a month before Derek's retirement. Photograph: Des Thompson*

but also the curiosity and intuition to recognise issues that could reward further and deeper investigation. Above all it requires time in the field. Derek was blessed by opportunities for prolonged periods in the field, in circumstances unlikely to be available today. His interests were broad – birds, Lepidoptera, dragonflies, botany and the landscape. As a schoolboy in Carlisle, he spent long days in the hills, when his lifelong love for upland birds was kindled. Throughout his career Derek was to spend many days in the field, frequently working alone, and often in remote locations.

His studies involved climbing ravines, cliffs and trees (figure 11.1, figure 11.2) – viewing these images would be a risk to the health of a modern day departmental safety officer! Fortunately his were the years before formal risk assessment and the mandatory wearing of personal protective equipment – the signature beret, yes, but no sign of a hard hat! Certainly the need for safe working practices is essential, but current requirements make fieldwork logistically difficult and expensive. Thompson *et al.* express concern that both at schools and in universities, opportunities for fieldwork are now greatly diminished. The reasons for this are complex, including pressure for space in the curriculum, cost, perceptions of risk and the reluctance of students to give up other activities, (including necessary part-time jobs) for field experience. Whatever the reasons, opportunities for prolonged concentrated fieldwork are unlikely to be present today, and, with this loss, the knowledge, experience and intuition arising from fieldwork will not develop. Derek was also fortunate in being before the era of mobile phones, so that he was out of reach of bureaucratic managers while in the field.

Derek went to the University of Sheffield intending to read zoology, but found the botany course more stimulating and under the influence of Roy Clapham developed his latent interest in botany and particularly the ecology of bogs and mires. He went to Bangor for his Ph.D. on the montane vegetation of North Wales under the supervision of Paul Richards. It was at Bangor that his interest and knowledge of bryophytes developed.

After National Service, where he took advantage of opportunities for fieldwork in the Pennines, Derek was employed by the Nature Conservancy, the body

responsible for nature conservation in England, Scotland and Wales. The Nature Conservancy was a very British institution, reflecting the reality of long-established land tenure patterns and the primacy of private ownership. The Nature Conservancy could establish and manage National Nature Reserves, but these could be either owned or leased, a contrast to the situation in most other countries where national conservation reserves managed by the relevant state agency are public land owned by the nation. The Nature Conservancy was also required to designate Sites of Special Scientific Interest (SSSIs) – sites of high conservation value that were not necessarily owned or managed by the state. The SSSI was an important mechanism for giving statutory recognition to biologically or geologically important sites, but there was little effective protection for their values. Much of Derek's career was to involve working to secure conservation of sites within the constraints of limited powers.

In 1972 the government of the day adopted a policy of separating 'customers' from 'contractors'. The Nature Conservancy was split into a Nature Conservation Council responsible for conservation both in and outside reserves, while the research activities fell into the Institute for Terrestrial Ecology. Whatever the merits of the customer-contractor model in general, the particular importance of the day-to-day nexus between researchers and land managers in nature conservation was not given much attention. The new customer bodies were to have chief scientists whose purpose was to ensure that the bodies had a senior staff member sufficiently knowledgeable about both science and the customer agency's needs to oversee the commissioning of research. While Derek became the first Chief Scientist of NCC, the split was a matter of great regret and the loss of the cohesion and drive of the former Nature Conservancy was felt until his retirement. The split itself did not reflect any particular animus against the Nature Conservancy, it was merely collateral damage arising from the adoption of a new, and then fashionable, management model.

To return to the 1950s – his first role at the Nature Conservancy was in the Highland Vegetation Survey. For three field seasons Derek and Donald McVean carried out the first large-scale phytosociological study in Britain.

Although there had been a long history of botanical exploration in Scotland (discussed by David Rae) much of the north-west Highlands was still poorly explored from a botanical perspective. Many new records of both vascular plants and bryophytes were made in the course of the fieldwork. The resulting monograph, McVean and Ratcliffe (1962) was a landmark publication and still of great value today. The very successful demonstration of the value of detailed vegetation survey was not however widely followed by similar activity elsewhere in Britain and it was not until the mid-1970s that the National Vegetation Classification (NVC) project was initiated and more than 20 years after that before the complete publication of the NVC in the 5 volumes of *British Plant Communities*. Despite much criticism from some quarters of the value of the phytosociological approach, the NVC has become part of the background for much ecological work in Britain today.



One of Derek Ratcliffe's favourite plants – the rare and elusive Marsh Saxifrage (*Saxifraga hirculus*) in the Northern Pennines. Photographs: Jeremy Roberts

Chris Preston points out in his chapter that British naturalists have long displayed an inferiority complex regarding the islands' flora and fauna, which are considered depauperate compared to those of mainland Europe. A major outcome of Derek's work was a challenge to this view. The small size of Britain, limited topographic variation and the consequences of recent ice age history are all reasons which explain why the vertebrate fauna and the vascular flora are smaller than those of the rest of Europe. However, particularly since the adoption of conservation of biodiversity as the foundation of conservation policy, there are grounds for arguing that the British Isles are of much greater value for conservation at a continental and indeed global scale than was previously assessed.

Chris Preston focuses on Atlantic bryophytes in the British Isles and Derek's contribution to the recognition of their significance. The chapter, and also those of Birks and Birks and Long and Rothero, are illustrated by numerous photographs of Atlantic bryophytes – and the beauty of these may inspire others to investigate these plants which are often neglected, even by botanists, in favour of the larger vascular plants. Derek authored the major paper on the Atlantic bryophytes (Ratcliffe 1968) – a classic synthesis. The future of many of the best sites remains uncertain with substantial decline since Ratcliffe's records and continuing threats from overgrazing, rhododendron invasion and various forms of development (as discussed by Preston).

After completion of the Highland Vegetation Survey, Derek was able to return to ornithology leading a survey of peregrine falcon populations. It became apparent that the number of breeding pairs of peregrines in Britain was in rapid decline. Ratcliffe (1963) pointed out that the start of the decline in the late 1940s and early 1950s coincided with the increasing use of organic pesticides in agriculture. Derek had observed instances of broken eggs in or near nests of peregrines, and considered that this might have been a consequence of the use of agricultural chemicals. In 1963 Derek relocated from Scotland to Monks Wood where the Nature Conservancy had established a Toxic Chemicals and Wildlife Section, in response to findings of dead birds on farms. This was a world leading facility, led by Norman Moore, and Derek was assigned to this group.

Derek was able to show that the thickness of eggshells of a number of bird species in the British Isles declined abruptly at a time coincident with the introduction of widespread use of DDT in agriculture, a relationship conclusively demonstrated in two classic papers (Ratcliffe 1967, 1970). Internationally, this is the research for which he is best known – it rapidly became a key case study in ecology and environmental courses around the world, and the papers are still standard inclusions in lecture reference lists.

In 1965 Derek was appointed by the Nature Conservancy as Scientific Assessor for what became known as

the Nature Conservation Review, the publication of which in 1977 as the two-volume *A Nature Conservation Review* (Ratcliffe 1977) was a landmark in conservation, both nationally and internationally. While a list of potential nature reserves had existed since 1947, there had been no new systematic data collection or assessment and the UK countryside had changed dramatically in the post-war years. Derek harnessed the great specialist knowledge of the staff of the Nature Conservancy and the wider ecological community, but he himself carried out the major tasks of synthesising and evaluating the data, visiting many of the sites, and editing the material for publication.



One of Derek Ratcliffe's favourite habitats – a steep, near-inaccessible wooded ravine rich in Atlantic bryophytes and ferns, North Wales, June 1976. Photograph: John Birks

A major achievement of the NCR was the development of a set of criteria for evaluation of sites in order to identify those which were priorities for protection. The criteria and their rationale are explained in Ratcliffe (1976, 1977). These represented at that time the most clearly articulated justification for a reserve network, and they were applied on a national scale. Subsequently, in other countries, algorithms for reserve selection were developed and applied, but the clear exposition, in Ratcliffe (1976) and

chapters 2 and 3 of Ratcliffe (1977), of the approach to reserve selection remains highly relevant.

The published NCR was illustrated by photographs taken by Derek – it is a matter of personal taste and opinion, but to me they demonstrate that, for conveying the essence of landscape and vegetation, well printed, high-quality black-and-white images are far superior to coloured renditions.

Many undergraduates choose to specialise in ecology or environmental science with the ambition of embarking upon a career in conservation; not to make their fortunes, but to contribute to saving the world's environments. For all with these intentions I would strongly recommend the section of the book (chapters 19 – 26) entitled 'The conservationist – protecting nature', not to deflect them from their ambition, but so that they recognise the magnitude of the task that will face them. The stories told, although concentrating on Britain, raise issues which are global, and shine a light on policies and practices which not merely have historical interest but which still prevail.

One of the issues which conservation scientists must face is the view commonly expressed that it is not the role of scientists to be advocates for the conservation cause. It is, however, apparently in order for industry-related interests to advocate their case, but the same latitude is not granted to their opponents.

One of Derek's concerns was that frequently the conservation agency was too diffident in the behind the scenes interdepartmental discussions about conservation issues. In order to counter threats to conservation values Derek was strongly of the view that maintaining scientific integrity was essential, and that arguments had to be firmly based on data.



The Scottish endemic liverwort Herbertus borealis in its original Scottish site on Beinn



Forestry deep ploughing of wet blanket bog in Caithness, looking north towards Lochan Croc nan Lair, 1987. Derek Ratcliffe spearheaded the opposition to this massive drainage and afforestation of the Flow Country. It was one of the most significant conservation battles in the UK. Photograph: Steve Moore

The particular issue that is the focus of the conservation section of the book is the Flow Country, the extensive area of mires in the far north of Scotland where in the 1980s massive afforestation, principally by private forestry interests, was proposed. The first brief mention of the unique landscape in the scientific literature had been by Ratcliffe (1964), but it was not until the 1980s that the area achieved a high profile. The application of machinery to drain peatlands and plant trees, and favourable conditions for investors combined to create a forestry boom. A very large landholding was acquired by a single company and then marketed to investors. Some naive investors may have thought that forestry was an environmental benefit, but I doubt that anyone could have argued that forestry in the Flow Country could, over any timescale, result in sustainable harvests and make a contribution to meeting the UK's timber requirements.

The harvest was purely in terms of tax concessions and government grants, and any proclaimed economic and social benefits were likely to be illusory. During the 1980s there was a desperate race between the Chief Scientist Directorate staff conducting surveys to document the values of the mires and the advance of draining and planting.

The object of the surveys was to collect data and then evaluate the case for declaring as much as possible of the land as an SSSI. The evidence was clear, and received strong endorsement from international peatland experts. However, while the Chief Scientist and his staff were building a stronger and stronger case, there was opposition to taking steps to curtail forestry and expand habitat protection from amongst senior staff at the Scottish headquarters of the NCC. Fortunately, Derek had a very strong supporter in William Wilkinson, the then chair of the NCC, who considered that the NCC could not only present a case for conservation but that it had to, the charter of the Council gave it a statutory obligation to present to government the strongest justifiable arguments for nature conservation. In January 1988, the Secretary of State for Scotland made a decision to create a large SSSI of 430,000 acres, to protect about half the Flow Country. Indeed, given the language of the legislation, and having been presented with the Council's recommendations and supporting evidence he had little option. In the event, when the final statutory boundaries were drawn, the area of peatlands notified was about 92% of that included in the Minister's announcement.

The year after the conclusion of the Flow Country battles, in July 1989, the Secretaries of State for the Environment and for Scotland announced, without prior consultation or public discussion, the disestablishment of the NCC and its replacement with three separate country agencies (England, Wales and Scotland).

While the split of the Nature Conservancy in 1972 was not motivated by any antagonism towards conservation in particular, the breakup of the NCC was widely seen as an act of revenge for its success in opposing the vested forestry interests in the Flow Country, and for forcing the government to abide by its obligations. The authors of a number of chapters support this interpretation, and it is not one which the politicians concerned have subsequently chosen to deny.

New graduates seeking a career in conservation need to do so with open eyes, and to be aware that inevitably decisions will be determined by politics, both within agencies and by elected representatives, and that often those ultimately responsible for decisions are not necessarily aware of the scientific arguments, nor particularly anxious to be informed about them.

I would also remind young scientists that we do not know all the questions, let alone all the answers. Particularly when it comes to policy and management there may be a range of possibilities. As readers of the *Bulletin* would expect, Keith Kirby in his contribution on woodlands suggests a number of thought-provoking options for future management, as well as pointing to potential new threats.

One of the glories of British natural history has been the involvement of non-professionals (a clumsy term, but preferable to amateur which to some carries adverse connotations), and ready collaboration between professionals and non-professionals. This is not always the case internationally.

I have doubts that this non-professional involvement will be as strong in the future. The decline in field biology in schools reduces the potential pool of natural historians. There is currently an international enthusiasm for 'citizen science', and certainly there are great opportunities for involvement of the general public in a variety of monitoring exercises and this is to be encouraged. However, this is far removed from being a recognised expert in some particular taxonomic group. With the decline in the number of taxonomists in universities and institutions, expertise in many elements of biodiversity is likely to disappear, and non-professionals are unlikely to be available in sufficient number and diversity to fill the gaps.

Derek was well aware of the knowledge outside that of the professionals and actively engaged with a range of members of the public. His research on eggshell thinning could not have been possible without access to historic sequences of collected eggs. Given that by the 1960s egg collectors were an underground culture, Derek's achievement in gaining their confidence was remarkable. While not condoning illegal activities he nevertheless recognised the wealth of knowledge and experience and indeed passion possessed by oologists and on a confidential basis was able to secure their collaboration and access to their collections.

Several contributors indicate that Derek did not consider himself a good operator in committees (but it is clear that he was well able to develop and implement strategies to navigate the bureaucratic maze). However, he was an effective communicator in other ways. To friends and colleagues he was a regular and informative letter writer, and Lindsay describes how, when he was Chief Scientist, Derek was a regular participant in tearoom conversations at the NCC head office in Belgrave Square where he sat with the 'other ranks'. Marren suggests that he was not the greatest fan of large landholders and farmers, but Lynne Farrell describes an occasion when Derek spend hours gently educating a landholder on the natural features of his land and winning him over to considering management agreement. He also had good relations with the shepherds who manage the uplands where he worked.

Derek's commitment to communication was best expressed in his writing, the range of his publications demonstrating his skills as an author. He was a prolific author in the scientific literature; his papers are a joy to read, but would not find favour with modern editors, who favour formulaic structure and content.

Derek also wrote broadly accessible books. He contributed two volumes to the classic New Naturalist series, celebrating two of his favourite regions, the Lake District and Galloway and the Borders, and was one of the series editors for more than a decade. He also contributed to the Poyser series of monographs. Some of the Poyser monographs, while worthy, are not the most inspiring of reads, indeed Lawton suggests that some have the features of a telephone directory. Such criticism

certainly cannot be levelled at Derek's contributions. The book ends with the introduction from the *Peregrine Falcon*; writing which demonstrates his love for the subject and the inspiration gained from its study, and is part of what must be regarded as a classic of English natural history writing.

Derek was a public servant in the very best sense. He believed in serving the public, and that the well-being of the British public was served by conserving nature. By providing evidence to support the proposition he was, in the words of the title to the book, acting as 'Nature's Conscience'—without his lifetime efforts the environment, and our lives, would have been lessened, and it is for us and future generations to continue to apply good science for the greater good, to build on his substantial legacy.

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An incubating Dotterel (*Charadrius morinellus*) on a nest in northern Norway, July 1995. Finding Dotterel nests was a major challenge for Derek, and he found the first authenticated post-war Dotterel nest in England in 1959. Photograph: Derek Ratcliffe

An extended version of this review should appear on the *Bulletin* pages of the BES website shortly.

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Upland ecosystem health: defining the indefinable

Tim P. Burt, Penny Anderson, Andrew Coupar, Alistair Crowle, Alan Fielding, John E. Gordon, Rob Marrs, Bill Slee, Davy McCracken, Jeff Warburton, Alan Werritty and Des B.A. Thompson

*“Great things are done when men and mountains meet;
This is not done by jostling in the street.”*

From the ‘Notebooks’ (1792-94) of William Blake

Good health, rude health or just metaphors?

In his engaging paper in the June 2015 issue of the *Bulletin*, John Wiens asks if the concept of ecosystem health is useful? (Wiens 2015). He answers that: “Scientifically, it is distracting and unnecessary... ‘Ecosystem’ is a useful abstraction for things that actually do exist and that can be measured and managed, and ‘health’ is a useful metaphor for conditions that we deem desirable, whether for utilitarian or idealistic reasons.” Stimulated by Wiens’ critique, we accept that the term health when applied to ecosystems can be ambiguous (as we explain below), but we continue to view the concept of ecosystem health as both coherent and useful. In this article we outline the context underpinning the term ecosystem health. We unpack its diverse meanings and usage and provide suggestions on how it should be used. Finally, we offer criteria for its use in determining the current ecosystem health of Britain’s uplands.



Figure 1. The walk in to Sandwood Bay, NW Sutherland, Scotland. Photograph: Des Thompson.

Why does this matter? At the international governmental level, the UN meeting in October 2010, in Nagoya, Japan, adopted a revised and updated Strategic Plan for Biodiversity, including the so-called Aichi Biodiversity Targets for 2011-2020 (Convention on Biological Diversity, 2010). At least two of these targets deal with ecosystem health, the first indirectly: Target 14 (By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable); and the second directly: Target 15 (By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification). Although both of these targets emphasise the benefits arising from healthy ecosystems, the primary focus for both is ensuring the restoration of the biological and biophysical processes normally associated with supporting ecosystems and their many functions.

Inevitably, globally, nationally and indeed locally, an immense effort is being devoted to crystallising an understanding of these targets and how they can be met and measured – to say nothing of doing anything to meet them. In the EU (EC

2011) and UK (e.g. Defra 2011, Scottish Government 2015), policy papers set out the ambition and work planned to meet these Aichi targets, with significant scientific resources being put into this.

Hence, whilst we concur with much of Wiens’ commentary on the metaphors of health, and indeed the reasoning of Kolb *et al.* (1994), Costanza & Mageau (1999), and Lackey (2001) referred to by Wiens, we do see a scientific need to tease out what is meant by ‘ecosystem health’. But it goes much deeper than that. In their excellent new book *Protecting the Wild*, Reed *et al.* (2015) argue in favour of helping nature in ways that go beyond such targets and articulations to seize the chance to be far bolder about our ambitions for nature.

This still begs questions about health, condition, state or whatever metaphor we wish to use. The term health comes from the Old English *hælp*, meaning wholeness, being whole, sound or well. It can also have meanings straying into prosperity, happiness, welfare, preservation, and safety. When it comes to valuing these elements, we can think of attributes in terms of their vigour, organisation and resilience. In any discussion about ‘health’ it is easy to conflate a focus on the health of ecosystems (in terms of how well they function) with their impacts on the health of people who benefit from supporting ecosystems. Here we focus solely on the health of ecosystems and set aside their impact on human health.

Clearly, quantitative and qualitative measures of ecosystem health are important, and draw on the natural and social sciences. The 'value' of such health is a linguistic minefield. Positive values can be attributed to ecosystems in terms of the services they provide. But the actual valuation of these services is socially constructed – especially the value attributed to provisioning, regulating and supporting services. The privileging of one service over another depends on societal priorities, which shift and change over time (e.g. Hajer 1997).

In search of a healthy upland

Looking across the uplands of Britain, covering a third of the land surface, a pronouncement on the health of the uplands will elicit the full gamut of emotive responses. And no wonder, for what is good health to one onlooker can be poor for another. A moor teeming with red grouse, a hill top with spinning wind turbines, or a birch wood reaching up to a natural treeline are examples of healthy moors to some eyes, but not others. Much depends on the 'value' of the services being provided.

Let's take an upland vista in NW Scotland (Figure 1). This footpath leads you to one of Britain's most beautiful beaches – Sandwood Bay. Yet, the path has been heavily 'repaired', the surrounding blanket bog is eroded (and eroding, with consequent losses of carbon), the absence of any woodland regeneration is palpable, and when you examine the vegetation and assess it against 'condition' criteria (JNCC 2009), several habitats miss targets for species richness attributable to heavy grazing by sheep and red deer. Washed-out Scots pine stumps are remnants of a forest (which may have been overwhelmed naturally by blanket bog, or cut and burnt creating conditions that favoured bog development). To some, the path is an intrusion in a wild landscape (there used to be vehicular access, but that stopped), a possible barrier for less mobile invertebrates, a source of disturbance for some breeding birds and, leaving aside the active erosion of the path, the vegetation fringes are heavily modified.

But for each of these assessments we can provide a counter. Peat erosion is a dynamic process; the presence of woodland would be regarded as an incursion by some people; and vegetation

varies spatially and structurally, and what is of conservation interest to some is not to others. The presence of pine stumps is a cultural and palaeo-environmental phenomenon, and, given present-day climatic conditions, it is impossible to return to the conditions of their origins. The modified path vegetation and bare soils add to the structural diversity of habitat important for some invertebrates. These are examples of why the term 'health' is so heavily contested.

How then can we pronounce on the 'health' of such a landscape? Essentially, we can only do so once there is a view on objectives for the land. And here, we have to think of social, economic and environmental factors in shaping these. Pronouncements on health are often intermixed with those regarding 're-wilding' (e.g. Monbiot 2013, Wuetherer *et al.* 2015), a mooted return to nature, and the expression – or presumed expression – of natural processes. 'Re-wilding' initiatives can actually involve a greater intensity of management than adopted in land uses being replaced. Whilst some people are seeking to make space for nature others assert a need to manage the food-water-energy nexus to better meet other pressing contemporary societal needs (FAO 2014).



What constitutes a healthy uplands depends on the perspective of the viewer. Photograph in Northumberland by TP Burt

Breaking out of the straightjacket

What can we say about the health of an upland ecosystem? The conundrum is really no different from the challenge of defining the importance of nature for conservation purposes. Ratcliffe (1977) took eleven years to craft the framework for nature conservation evaluation in the UK, and contributing to that were seminal writings by Arthur Tansley, Julian Huxley, Cyril Diver, Norman Moore and other extraordinarily talented pre- and post-War environmentalists (Thompson *et al.* 2015). By devising terms which captured

the essence of nature conservation value, the so-called 'Ratcliffe criteria', it was possible to contrast features and areas in a systematic way. This helped set the standard for wider international evaluations (e.g. Griffiths & Vogiatzakis 2011). Diversity, richness, naturalness, rarity and even 'intrinsic appeal' were terms which could be used to place in rank order sites of nature conservation importance. Interestingly, intrinsic appeal might now be equated with human physical and mental health derived from nature, but then was a construct for what Ratcliffe referred to as the "awkward philosophical point that different kinds of organism do not rate equally in value because of bias in human interest."

Unless we have a comparable framework for ecosystem health we will not be able to meet targets set in the EU and national policies. What is more, much time and energy will be dissipated in trying to work round and through all of this.

Criteria for ecosystem health

We propose three courses of action. First, if the term 'ecosystem health' is to be used, it should be recognised that the 'health' element is no more than a metaphor for what some people deem to be desirable. Its scientific basis is limited to the quantitative measurements of attributes, and contrasting these spatially and temporally. Second, there are some terms that can be used to embrace what we think of as 'health', at least as applied to the uplands, and we propose these in Table 1. In the way that Ratcliffe's (1977) criteria could be used to assess nature conservation value, we suggest that these could be applied to help us assess the ecosystem health of a range of upland landscapes. We suggest criteria and associated descriptions that reflect the current scientific consensus and are accessible to the non-specialist. We are not concerned here with societal values or intrinsic appeal; rather we are restricting ourselves to ways of measuring the health of the 'patient'. We could group the criteria under three headings:

- a) Condition – defined by *complement* and *diversity* (determined by the condition of a habitat or designated site, soil carbon stocks, species diversity, water quality, etc.);

CRITERIA	DESCRIPTION
Condition	
Complement	Number of communities and species, and range of variation, in an ecosystem type
Diversity	Representation of abundance of populations, communities and physical conditions (geology, soils, geomorphology) characteristic of a site
Processes	
Function	The range and robustness of the geophysical and biophysical processes underpinning the ecosystem
Productivity	The productivity of biota (e.g. animal, plant, fungi etc.) and viability and growth relative to natural environmental constraints
Durability	
Resistance	The ability to withstand and adapt to change physically and biologically
Resilience	The ability to recover from a substantive disturbance

Table 1. Summary descriptions of upland ecosystem ‘health’ criteria, grouped according to condition (complement and diversity), processes (function and productivity) and durability (resistance and resilience).

b) Process – defined by *function* and *productivity* (more difficult to find data sets for but includes connectivity/ fragmentation and critical load exceedance); and

c) Durability – a measure of the projected lifespan of the ecosystem given the prevailing conditions defined by the *resistance* and the *resilience* of the ecosystems (equally difficult to find datasets for, but includes changes in extent of restored habitat and extent of invasive non-native species).

Third, we would welcome any attempts to test this framework on a range of upland landscapes. There may be some long-term datasets that could be used to help with this. We offer this approach as a pragmatic means of trying to define the indefinable rather than as a contribution to what could, and shows signs of becoming, scientific sophistry in pursuit of international targets which simply seek nature in a “better” state.



Photograph by Des Thompson

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Tim Burt is Master of Hatfield College and Professor of Geography at Durham University; Penny Anderson established Penny Anderson Associates Ltd, and has been given a Life Achievement award from CIEEM partly for her upland management/ restoration work (2015); Andrew Coupar manages the Uplands, Peatlands and Earth Sciences Group in SNH; Alistair Crowle is an Upland Specialist with Natural England; Alan Fielding is a Director of the charity Highland Renewal, and Scientific Advisory Committee (SAC) Expert Adviser to Scottish Natural Heritage (SNH); John Gordon is an Honorary Professor in the School of Geography and Geosciences, University of St Andrews; Rob Marrs is Bulley Professor of Applied Plant Biology at the University of Liverpool; Bill Slee researches in rural development and is an Emeritus Fellow at the James Hutton Institute; Davy McCracken is Professor of Agricultural Ecology and Head of Hill & Mountain Research Centre at SRUC; Scotland’s Rural College; Jeff Warburton is a Reader in the Department of Geography at Durham University; Alan Werritty is Emeritus Professor of Physical Geography, University of Dundee, and member of SNH’s SAC; and Des Thompson is Principal Adviser on Biodiversity with SNH, and a Senior Research Fellow at Hatfield College.

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How do you capture a natural asset?

Improving monitoring for Natural Capital valuation

Daija Angeli / Project Officer Natural Capital Initiative

secretariat@naturalcapitalinitiative.org.uk / @NCI_NatCap / www.naturalcapitalinitiative.org.uk

James Borrell / Queen Mary University of London

@james_borrell

Natural capital encompasses all the elements of nature that directly and indirectly produce value or benefits to people, including ecosystems, species, freshwater, land, minerals, the air and oceans, as well as natural processes and functions.

There is increasing recognition that natural capital underpins all economic activity, as well as our health and wellbeing. Safeguarding our natural assets is therefore paramount to ensure a flow of benefits in the future, and Government has recently committed to develop a long-term plan to invest in nature¹. But how do we measure our progress when it comes to the state of our natural capital assets?

Systematic monitoring of natural assets has been identified as a major challenge^{1,2}. However, measuring natural capital and monitoring changes over time is a critical building block in developing a long-term plan to protect and enhance our natural environment². The UK has a long history of biological recording and our environment is generally well studied. However, this information is not necessarily organised in a way that can easily be used to assess the state of natural capital assets, determine ecological thresholds, and set limits of acceptable targets for maintenance and restoration. When data sets are readily available there is still much work to be done to identify which are most suitable to report on particular attributes of natural capital assets³.

Despite the rise of natural capital accounting and ecosystem service assessments, little has been done

nationally or internationally to make existing environmental survey programmes fit for underpinning accounting schemes with scientific data. Existing schemes are based on spend analysis and oftentimes fairly crude metrics that do not do justice to the complex ways in which natural capital assets come together to support the provision of benefits.

Suitable metrics might be lacking because requirements of such monitoring programmes are still ill-defined. In addition, it is a real challenge to disentangle the contribution of natural capital assets to a flow of benefits. In most cases, additional input of human and produced capital is needed for natural capital to contribute to human welfare. Mace *et al.* (2015) used food as an example, which is the product of soils, land, water, species and ecological communities (e.g. for pollination and pest control) as well as other types of capital inputs such as labour, machinery, additives, and transport. How do you identify the contribution of the natural assets to an end-product as apparently simple as a potato, and its price?

In the absence of a well-developed monitoring scheme across the UK, the Natural Capital Committee has worked on a simple approach to highlight natural assets, the condition of which

places benefits at risk, using broad habitat types from the UK National Ecosystem Assessment. The Committee's recommendation is to focus financial and time resources on monitoring those assets identified in a risk register⁴. At the same time, substantial gaps in knowledge about asset-benefit relationships limit the scope and rigour of such assessment; this is especially true for marine and urban habitats.

Currently, the state of natural capital is being assessed across major land use categories or similar. Assets such as soils or freshwater are distributed across these classes, and may possibly be measured in different ways within them. For monitoring to be effective, the current array of indicators, methods and their compatibility will need to be addressed. At present, various datasets may report different values for the same assets as a result of the use of different indicators or metrics. Further research is needed to establish the relationships between assets and the benefits they provide; this will help us to predict changes in natural capital in the future. Methods underlying monitoring programmes and data analysis need to be peer reviewed and published to ensure both quality and accessibility.

Natural capital valuation has the potential to lead to better decisions but valuation methods should not only be based on the needs of accounting. The valuation must have a sound scientific basis to be widely accepted and to ensure that the complexity and essential connectivity of the natural world is not unduly compromised⁵.

Natural capital monitoring and data will be a focus for the work of the Natural Capital Initiative (NCI) over the coming year. NCI will initiate and facilitate on-going dialogue between key academic, policy and business decision-makers to find shared solutions and innovative approaches to monitoring natural capital.

Daija Angeli is Project Officer for the Natural Capital Initiative (NCI), a partnership between the British Ecological Society, the Royal Society of Biology, the Centre for Ecology and Hydrology and the James Hutton Institute.

James Borrell is a conservation scientist and science communicator. He was a NERC Policy Fellow with the Royal Society of Biology and worked with the Natural Capital Initiative this summer.

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Photograph by Des Thompson

The Buxton hub

Phil Grime / Buxton Climate Change Impacts Laboratory

Emma J. Sayer / University of Lancaster



Across the world, science faces major challenges arising from the need to assess the impacts of a changing global climate. Many ecologists have devised models and experiments that allow predictions of the fate of particular plant or animal populations.

This “one species at a time” approach has obvious benefits for the conservation of vulnerable species and has attracted widespread support. However, in order to obtain a more comprehensive perspective, research should also be directed at larger scales including multi-species communities of organisms and, where possible, whole ecosystems. Twenty-two years ago, with some trepidation, a group of plant ecologists based at Sheffield University elected to follow this second path involving engagement with an entire ecosystem.

Buxton and Wytham

Early research developed and tested techniques by which to carry out controlled manipulations of temperature, rainfall interception, and supplementation. This work provided the basis for a five-year comparative experiment in which identical sets of climate manipulations (five combinations of winter warming, summer drought and supplementary watering) were applied simultaneously to two grasslands. The first, at Wytham near Oxford, was an ex-arable field colonised by robust perennials. The second site was an ancient unfertilised sheep pasture at Harpur Hill near Buxton in North Derbyshire. The two sites differed greatly in their rates of response to five years of continuous climate treatments: at Wytham, warming and alterations of water supply induced rapid shifts in functional composition of the vegetation, whereas in marked contrast, few changes were detected at Buxton¹. These results were in strong agreement with theoretical predictions of how plants with different potential growth rates, reproductive biology and length of life history are expected to differ in their responses to climate change according to

the productivity and disturbance regime of each ecosystem.

Despite the technical and theoretical progress achieved at Buxton and Wytham, financial support was withdrawn first at Wytham and later at Buxton. However, we recognized that in the unprecedented conditions of change in the global climate it would be unwise to abandon the Buxton experiment. An immediate issue was our concern to explain why this site was so resistant to climate manipulation. A further consideration related to forecasting the exceptional and accelerating rate of climate change: future model outputs would need to be validated and refined by comparison against the results of field experiments, but there are remarkably few surviving long-term ecological experiments in the UK. Hence, if we are interested in the long-term consequences of climate change, experiments such as the Buxton Climate Change Impacts Study are a resource that will become ever more valuable with the passage of time.



Andrew Askew, Engineer and Site Manager at the Buxton Hub

Buxton 2002-2014

Despite a few difficult years in which the future of Buxton was uncertain, a number of organisations and individuals have made it possible for the experiments not only to continue, but also to expand into an

international network of collaborating scientists. Without doubt the events most crucial to the development of the research programme were two successive awards from the National Science Foundation (USA) coinciding with the appointment of Jason Fridley (Syracuse University, USA) as Principal Investigator. And the determination of the researchers at Buxton to keep the climate manipulations going has paid off: Buxton is now one of the longest-running climate experiments in the world and, importantly, two decades of research have revealed changes in the grassland vegetation that were not apparent after 10 or even 15 years of climate treatments.



Ambient + 3 degrees centigrade in February in the winter-warmed treatment

Mechanisms of resistance

A number of studies have investigated various mechanisms to explain the resistance of the grassland at Buxton to climate change treatments. A very revealing publication showed that fine-scale variation in soil depth at fine spatial scales within the Buxton experimental plots buffers community responses to the climate manipulations by allowing local relocation of species². Some of this lateral movement is achieved by vegetative shoots but we suspect that seedling regeneration is also important,

particularly where bare soil is created by drought. As a first step towards assessing this, researchers at Sheffield University completed an exhaustive survey of the timing, intensity and duration of flowering in sixteen species after 20 years of climate treatments.

Three seminal publications³⁻⁵ exposed the extraordinary amount of genetic variation in ancient calcareous grassland in North Derbyshire and pioneered techniques for its investigation. These pointed the way to characterise the nature and extent of genetic changes arising from the sustained manipulations of climate at Buxton. In 2014, a study of genetic variation in *Plantago lanceolata* provided convincing evidence that a trade-off between drought avoidance and competitive ability is driving genetic divergence between populations in drought and control plots at Buxton⁶. Several more studies of this kind are in progress.

Southern invaders and changes belowground

The Buxton facilities have also been used to examine the effects of climate manipulation on the ability of southern species to expand northwards. First experiments showed only minor benefits of warming and drought treatments to the performance of southern species, most of which failed to establish. This suggested a need for additional work with a wider range of grassland species and climate treatments. More recent experiments using *Brachypodium pinnatum* and *Bromus erectus* showed that both species are relatively insensitive to climate treatments⁷ and concluded that in the fragmented landscapes occupied by these species, slow dispersal rather than climate limitation is restricting progress northwards⁸.

Last but not least, the manipulations applied at Buxton provide an excellent basis for assessment of the impact of future climates on soil processes and function and work conducted at Buxton highlights the importance of considering both above- and belowground responses to climate change. Seven years of climate treatments altered the abundance of mycorrhizal fungi, which was partly attributed to changes in the relative abundance of particular plant species⁹. A more recent study (in review) demonstrated that shifts in soil microbial communities in response to the climate treatments are mediated by specific plant traits. Current projects include incubations to determine soil

carbon stability, patterns of variation in soil microbial activity, and the release of soluble organic matter and mineral nutrients during the recovery phase after summer drought.

The future is bright

A landmark was reached in 2013 when we celebrated the 20th birthday of the main experiment and much has happened since. An increasing number of climate change researchers have sought access to the Buxton data or requested samples that have been subjected to climate manipulations for extended periods of time. Despite our need to limit damage to the plots, discussion has resulted in exciting new research involving scientists from ten institutions in seven countries, creating a 'hub' of climate change research centred on the Buxton plots.

The Buxton Site Manager, Andrew Askew has made major improvements to the site: the watering system is now fully automated and all rain-shelters have been upgraded. Staff from the Peak Park Authority are installing new gates, fencing and paths to ensure safe access within the experimental areas.

If the work now in progress at Buxton is to be useful for the future management of climate change impacts on the UK countryside, it is necessary to establish connections with the current processes of change that are already affecting Derbyshire grasslands. In the summer of 2013, North Derbyshire sites from an extensive survey in 1965 were revisited to collect new records and assess changes over almost 40 years. We suspect that, later this century, further surveys will allow comparisons with trajectories of floristic change currently detected in some of the Buxton plots. We are also learning from scientists working at warmer sites in Europe and continue to compare notes with our collaborators based in the slightly warmer conditions of Northern Italy.



Automatic retractable rain-shelters in position over fifteen drought treatment plots in July

Conclusions

Continuous application of modified climatic conditions in well-replicated large plots over a period of more than twenty years has created the basis for testing predictions of the relative susceptibility of ecosystems to global climate change. The presence of this unique research platform has attracted the attention of an international community of scientists and is providing exciting research opportunities for ecologists, geneticists, and soil scientists. Even after 22 years, continuing work at BCCIL has the potential to substantially advance our understanding of ecosystem function under long-term climate change. As the results of more climate change experiments become available it may eventually be possible to use sets of particular plant, animal and microbial traits to predict the rate and trajectory of response to climate change in each ecosystem¹⁰ and to recognize priorities for conservation and management.

Acknowledgements

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For further info, details and publications, please see <http://bccil.group.shef.ac.uk>

Traditional buildings as ecosystems with spiders as biocontrol for woodworm



Charles Hippisley-Cox / Huddersfield University

Most professionals working with the built environment are now committed to using fewer potentially dangerous chemicals whenever possible.

A recent case study presents the intriguing possibility of using spiders to control woodworm populations rather than sprays. The life cycle of the woodworm *Anobium punctatum* can involve a long spell in the wood as the larvae derive energy for pupation before emerging as adult beetles. The introduction of a healthy population of hungry spiders at the time the beetles leave the timber can form a significant break in the *Anobium punctatum* life-cycle by predated the adult beetles before they mate and lay eggs.

A five-year trial of informal observations followed a population of the spider *Pholcus phalangioides* devouring a variety of prey during repairs to a building. The property had been comprehensively treated for woodworm with permethrin in 2005. All signs of life were eradicated, or so it seemed, but the following year it was clear that the woodworm (*Anobium punctatum*) had survived, with plenty of fresh sawdust from beetles emerging in large numbers during the spring. After spraying there was also a conspicuous absence of spiders with the exception of one or two ghostly *Pholcus* apparently missed by the killer-spray.



Pholcus phalangioides

This species of spider misleadingly shares the common name "Daddy Long Legs" with the crane fly and the harvestman neither of which are actually true spiders. "Cellar Spider" is a slightly better vernacular name but *Pholcus* is by no means restricted to cellar-living, being happy to live under furniture, in cupboards or, most conspicuously, in top corners of living spaces where they like to hang in a characteristic upside-down position. Another popular name for *Pholcus* is the "vibrating" spider, as they seem to oscillate when startled. The vibrating also forms part of their mating rituals after which the males usually die. Males rarely live for more than a year, but females can live for three years and usually have a considerable number of mates.

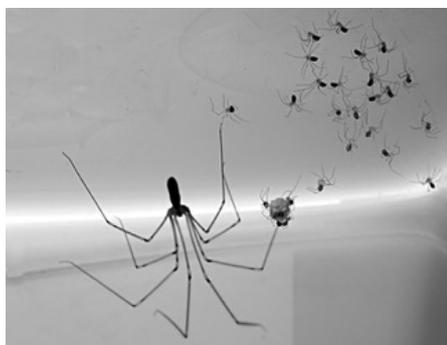
It is believed that these spiders are not native of Northern Europe where they are generally restricted to living indoors. They dislike cold draughts and rapid temperature fluctuations, preferring average temperatures in the region of 8-10°C. In the UK they are more common in southern counties but are happy to prosper further north wherever conditions are suitable. They have relatively small bodies: females have a body length of about 9 mm and males are slightly smaller. However, their legs are 5 or 6 times the length of the body, reaching up to 7 cm leg-span in mature females.

Their webs are untidy and lack the regular geometry or "funnels" associated with other species and the webs do not normally act as effective traps, as *Pholcus* prefers to actively seek out their prey.

Their webs are essentially a base from which to hunt and a place for the eggs to hatch into juveniles. The silk also comes in useful when they encounter a potential victim by flicking it from their spinnerets before closing in and injecting venom; fresh catches are bundled up and dropped after being sucked dry. Despite their tantalisingly slow and graceful movements, these spiders are actually very efficient carnivores. They are harmless to humans as their fangs are much too small to penetrate our skin. Their effective hunting method is even used against other species of spiders including the large house spiders (*Teneargia*), which can be up to ten times their weight.



Pholcus phalangioides female with eggs



Pholcus phalangioides with juveniles

The spider population can grow very rapidly when prey is abundant. The availability of a good food supply stimulates egg production and mating which can take place at any time of year. The female initially holds as many as 30 eggs in a silk net between her *chelicerae* (jaws). When hatched, the young transparent spiderlings share the mother's web and eventually establish new territory away from the mother. If food is in short supply, the mother will re-ingest the young and spiderlings also sometimes eat each other, with the slightly smaller males being particularly vulnerable. The spider population is therefore self-

regulating and will decline when food becomes scarce.

The case-study

Four unoccupied rooms in a traditional building were monitored over a five-year period. In 2006, the main prey of the small population of *Pholcus* was the large number of emerging woodworm beetles that had been untouched by the chemical treatment of 2005. In response to this abundant food source, the few spiders reproduced rapidly, resulting in around 75 adults by the following spring. The spiders decimated the woodworm population: approximately 400 beetles were observed caught and wrapped in silk bundles. The subsequent decline in woodworm during 2008 and 2009 confirmed that they were being eaten, if not before mating then certainly before they were able to lay eggs.

Once the rich food supply of beetles started to wane, the *Pholcus* population began to decline, despite the reappearance of house spiders as an alternative prey. By 2011, only 10 adults remained and most spiderlings were being ingested by their mothers.

This case study presents an intriguing question – whether it is possible to produce spider colonies that can be supplied to home-owners wishing to use a more environmentally friendly way to eradicate woodworm. Formal studies would be able to confirm the effectiveness of introducing juvenile spiders into buildings with woodworm infestation. There may also be scope for designing 'nesting places' to protect spiders from day-to-day cleaning.



The venue for the initial study

We may need to overcome some perception-related obstacles, as spiders are often wrongly associated with untidy or even unclean domestic environments. It is a myth that they like dirty or dusty places and *Pholcus* will

create a new web if the old one gets too dusty. Arachnophobia is another potential disadvantage for introducing spiders as bio-predators, but their slow, graceful movements are actually not as threatening as the rapid movements of the "big hairy ones"... and they may even help remove the latter.

About the Author

Charles Hippisley-Cox, BSc (Hons), BA Hons, IHBC, MCABE, FHEA, MCIAT studied Geology before working as a Historic Building Surveyor. He undertook architectural training as a mature student and worked in the Department of Conservation Science at Bournemouth University. He is currently Senior Lecturer in Building Conservation in the Department of Architecture & 3d Design at Huddersfield University where he is also course director for Architectural Technology. His current research explores the relationship between historic buildings and their wider ecological context.

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Montpellier: the place to be for conservation biologists this summer

Nathalie Pettorelli / Institute of Zoology
@Pettorelli

Ahhh, the summer holidays – the heat, the flip flops, the sun glasses, the fun of wandering the narrow streets aimlessly searching for an ice cream, or a bar, or both...

This year, I actually enjoyed the taste of what summer holidays used to be, years ago, before summer became to be known as international conference season, grant application season, summerschool season, etc., etc., – and this was great fun.

Admittedly, there are some pretty fundamental differences between attending the International Conference for Conservation Biology (ICCB) in Montpellier and spending a week of

holidays in this lovely French city: for a start, a typical day wouldn't start at 7am, and I guess I wouldn't really choose to gather with >2,000 colleagues to talk conservation science all day, every day. Importantly, I would come home feeling relaxed and rested, instead of feeling shattered and daunted by the number of things I was reminded needed to be done. But all in all, this was probably the closest I came to enjoying an international conference for a long time.

So what was so special about ICCB this year? For a start, it was in the south of France, which meant that this was a great occasion to catch-up with friends and colleagues while enjoying some hot weather, great food and fine wine. Our day-to-day job can be quite lonely and isolating, especially so as you grow to spend more and more time in front of a computer or in administrative meetings. So, from time to time, it's actually quite uplifting to witness the human side of science and to feel part of a community. Conferences such as the ICCB do that to you: they bring back fun memories and connections you thought were lost; they boost your enthusiasm for the discipline and the work you do; they make you meet new people, hear about research topics outside your immediate interest; they broaden your perspectives. Conference attendance was actually at a record high this year (none of the previous ICCBs ever rallied that many people), so catching up with everyone was a challenge at times; in general, though, networking opportunities were simply excellent due to the chilled atmosphere and high diversity of research groups present (I read somewhere that attendees came from over 109 different countries this year).



Twitter feed: A spontaneous gathering of conservation biologists organised by tweets to the BES SIG membership



A packed gathering for one of the sessions at ICCB in Montpellier

Organization was pretty remarkable: I very much appreciated finding child care services on offer for attendees bringing their children to Montpellier, as the practical help that such an infrastructure provides to the community is constantly underestimated. I was also pleased to see a code of conduct being introduced at the start of the conference and implemented during the week: the simple existence of such a code makes it clear that conference organisers (a) recognize that behaviours such as harassment and bullying can happen in events such as this one and (b) are keen for these behaviours to be monitored and reported, and for the perpetrators to be confronted. It was moreover refreshing to be able to trade the typically giant abstract book for an app, which greatly facilitated the whole decision process in terms of what to attend when and where.

As a social media fan, I was of course pretty chuffed to witness the success of the #ICCB2015 hashtag, which was so popular it started attract spambots and porn tweets within days. Without doubt, Twitter played a key role in broadening the set of opportunities to publicise our work inside and outside the conference and meet new people, and this is especially true for students and early career scientists. Let's just talk numbers: it was estimated that >6,500 original tweets with the #ICCB2015 hashtag were posted by >2,000 users between July 22nd and August 10th (and this hashtag continues to be used).

Another small example of what was achieved with Twitter that week: the BES Conservation Special Interest Group organised an impromptu dinner during the week at the conference, and this was all done on Twitter; over 40 people joined us that evening, with many meeting each other for the first time.

The highlight of the conference was for many, however, the plenary that brought together Clive Spash and Peter Kareiva to debate nature valuation approaches and their necessity in conservation. By far the best plenary I ever attended, mostly because I didn't expect what I saw. You see it all started with Peter giving a talk, in a very TED lecture style. The guy is well known in conservation biology and obviously at ease with oral presentations: he was standing in his trainers in front of the crowd, microphone in his hand, big black slides with very few words in bold at his back, telling us all about the wonders that can be achieved when scientists, multinational corporations and political forces work together. A very witty presentation, framed as being realistic and the way forward for conservation. And then Clive Spash stood up, looking in his tweed jacket behind the podium like a typical older generation type of academic, armed with slides that have way too many words. At that point, most of the audience has never heard of Clive Spash (it was for example quite funny to see many tweets with #CliveSplash during the debate) and many aren't exactly looking forward to his 30 minute talk. And this is where we all went in for a surprise, as his passionate, interdisciplinary and well-researched presentation got a majority of the audience on its feet for a standing ovation. Spash's talk resonated with many of us who have never felt quite comfortable using dollars or euros to put a value on nature, and the opposing visions of the two speakers definitively got the audience thinking about how conservation should progress in the future. I have rarely witnessed a scientific debate as engaging and stimulating as this one; sadly, this debate wasn't recorded, which is to be deplored given the quality of the exchanges.



Another packed poster session

It is difficult to isolate the elements that make a good international conference: my pick would be diversity of speakers; diversity of topics; access to services that facilitate attendance by a diversity of researchers and practitioners; loads of time for networking; open discussion sessions at lunch breaks; and plenaries that are built as a debate, as this format definitively is more likely to get the audience engaged and attentive. Admittedly, this list prioritizes exchanges, discussions and exposure to a diversity of viewpoints and research topics, and some may argue that conferences should be about presenting the best science (with best generally defined as being performed by someone famous or someone who has published in a high impact journal). I would happily disagree. Conferences are far much more than a succession of very short lectures: they tell the story of who our community is, what that community values, how that community works. I believe ICCB 2015 led the way in terms of building conference formats that start addressing the current needs of our community: the need for dialogue and exchange; the need for access to a diversity of views, personal stories, role models; the need for interdisciplinarity. I can only hope that progress towards meeting these needs will be achieved at future international conferences – this would certainly get me to attend more of these events.

Bringing the Beetles to Glastonbury

A mutual interview by Ali Birkett and Emma Sayer.

Ali: You've already done several festivals with Sex & Bugs, why was Glastonbury so important?

Emma: Glastonbury isn't just any festival, for many festival-goers it's THE festival. It's the biggest greenfield festival in the world, the modern-day Woodstock, the one you have to go to at least once in your lifetime. It's also a very special place to do public engagement with ecology, not least because the festival attracts more than 200,000 people, but also because a lot of them are environmentally-minded and keen to find out more about ecology.

Ali: So was it different running the stall at Glastonbury, compared to other festivals?

Emma: It was harder work with so many visitors and a smaller team, but despite that it was even more motivating. At other festivals, people dropped by, tried a game or two, asked a couple of questions, and left after a few minutes. At Glastonbury, we had quite a few visitors every day who hung around for half an hour or more because they really wanted to talk to us and find out about ecology and our research. Oddly, Glasto is the only festival where people have asked us "What's the point of this?" and they were always very pleased to hear that we just sharing our passion for ecology, not recruiting or petitioning.

Emma: How about you? After watching us running around like headless chickens for two years, why did you decide to join us?

Ali: Overall I think this is a great initiative, particularly because it's led by researchers and gives them a chance to share their science. I really enjoyed the whole experience and I hope that I managed to share my passion for the natural world with others whilst also gaining so much myself. The BES is streets ahead of other learned societies in enabling their members to do this kind of thing and it makes you feel more valued as an early-career researcher.

Emma: Why is that?



Ali: Keynotes, plenaries, books, science on TV etc.: we mostly pay attention to big names and scientists with years of experience. When you're doing this (*Sex & Bugs*), you also feel that your research is fascinating enough to draw a big audience and that the Society values your work and your input.



Emma, Catherine, and Ali (l to r) apply fashion sense to solving the practical problem of staying dry

Emma: So do you think the experience has benefitted you as a researcher?

Ali: As an early career researcher not long out of PhD, being a Roadie this summer came at a brilliant time for me. Just when I needed fresh inspiration after finishing my thesis corrections, I had the chance to meet and work alongside a team of amazing researchers from all sorts of academic areas from paleoecology to fish behaviour. After spending so long focused on my own project, it was great to be reminded of all the other things to be discovered in the big wide world! More than this, to rediscover my enthusiasm for my own research by sharing it with completely new audiences felt like a new lease of life.

Emma: So how did you rediscover your research subject?

Ali: *Sex & Bugs* gave me the opportunity to bring the beetles to Glastonbury Festival – literally! And that's not something many people can say. In my PhD I studied the distribution and function of UK dung beetles, and to be able to talk about this with a completely new group of people was brilliant. It was wonderful watching the faces of children and adults alike change when they found out that dung beetles aren't just a tropical or African thing; that we have them here in the UK too, working away in our grazing pastures. I mean, the engagement started on the very first day when the security guards at the entrance to the site looked at us in disbelief as we showed them the tank of beetles in the back of the van and the box of live bumblebees balanced on my knee in the front! To engage a soggy and sad festival-goer on a damp day with a simple game in the tent entrance and for that to lead to them staying in the tent for half an hour

chatting about my research, and many other aspects of the natural world, was a truly reinvigorating thing.

Emma: What about more immediate so-called transferrable skills?

Ali: Yes, being a Roadie has definitely given me the opportunity to learn new and useful skills. These ranged from the ability to summarise my own research in a one minute jargon-free 'elevator pitch'; through some appreciation of the logistics involved in organising outreach and engagement events; to how to evaluate the success of such events using informal interview techniques. All of these skills will prove to be very useful to me in the future as I look to build my research career and profile, especially as I believe strongly in the importance of good science communication. One day I might even find a use for my new-found talent for attracting attention to the stall whilst wearing a cockroach costume!

Ali: What about you? You're no longer a spring chicken – do you still think this a good way to spend your time?

Emma (ignoring spring chicken comment): Are you kidding? Of course it is! The more paperwork and management I do, the more important it is for me to do something different. As a researcher, your work is constantly being scrutinised and often criticised; everything is peer-reviewed, and many things get rejected. This can sometimes get a bit demoralising, so seeing people's enthusiasm and fascination for ecology reminds me of why I got into research in the first place.

Emma: What was the best bit about Glastonbury in particular?

Ali: The balance of spending the day sharing my excitement about the natural world, and the evening fulfilling a personal ambition to listen to music at and generally experience Glastonbury Festival was an amazing thing! And I don't think I need to say much about having the chance to watch *The Who* play the Pyramid Stage in front of the sunset on the last night of Glastonbury Festival, do I...?*



The Pyramid stage (with *The Who*, honest)

Ali: What about you? What was your highlight of our mad and amazing week?

Emma: When I first had the idea for '*Sex & Bugs*', it was to take ecology to Glastonbury. It's fantastic that it has grown and we've been able to go to so many events but actually seeing that initial completely crazy idea become reality was pretty much the highlight of the year! The atmosphere of the festival was perfect and I felt privileged to be engaging people with research there – especially when one of our visitors told us that we were the best thing at Glastonbury!!! As for all the stuff going on at Glasto, it would have to be joint 1st place between *The Who* and the Dalai Lama.

Ali: What happens now? Now we've done Glastonbury, where does '*Sex & Bugs*' go from here?

Emma: Festivals are not everyone's cup of tea, so the BES has some great plans for ways to support more members in developing their own public engagement activities. For me, the next thing is making sure we can go back to Glasto and do it again...



The Glasto Roadies (l to r: Catherine, Ali, Emma, Nick and Max) relax after closing up the stall for the day

Ali Birkett (@thatali_ecol) finished her PhD on dung beetle distribution and function at Lancaster University last year. She loves music and being outdoors, so doing ecology at music festivals was a no-brainer!

Emma Sayer is Associate Editor of the *Bulletin* and Lecturer at the University of Lancaster.

*By way of explanation: Emma and Ali were very, very excited about "It's THE WHO... at GLASTONBURY"

If you want to know more about how public engagement can help your research, be sure to join the workshop at the BES Annual Meeting 2015 in Edinburgh and attend Ali's talk in the Ecology and Society session.

Ecology with Latitude

Helen Roy / Centre for Ecology and Hydrology

The diversity of habitats in and around Henham Park (Suffolk) provide an amazing backdrop to the Latitude Festival (<http://www.latitudefestival.com/>). The festival goers would find it difficult to escape some of the species diversity associated with these habitats (not least the biting insects!) but in 2015 the BES Citizen Science Special Interest Group collaborated with the Royal Society of Biology to put the wildlife on centre stage (well alright not quite centre stage but in the idyllic setting of the Enchanted Garden just near the family camping zone!).

The Big Biology Bus (developed by Penny Fletcher, Royal Society of Biology) provided a base for a range of ecology activities: moth trapping, pitfall trapping, worm surveys, counts of insects visiting flowers, tree beating and much more*. A total of 241 species was recorded (all within iRecord and ready to share through the NBN Gateway).

Perhaps the ultimate highlight for me was working with David Urry (Royal Society of Biology) on a ladybird activity including a song – Not a fair fight, against a parasite (written by David based on peer-reviewed literature!) – about ladybirds and one particular parasite *Dinocampus coccinellae*. Each day I gave a short talk on ladybirds to provide the necessary background information before David's fantastic performance including parasite emergence, backing vocals from the audience and dancing by all (see <https://vine.co/u/1081390773997592576>). The discussions inspired by the song were thought-provoking – I'm not sure we achieved our aim of enthusing people with a love of parasites (the pleading cries "please tell us the parasitized ladybird

will get better" are slightly haunting!) but certainly there seemed to be an appreciation of the complex interactions between parasites and their hosts.

Latitude provided an excellent opportunity to engage with hundreds of people on the work of BES and the Royal Society of Biology – many of the visitors to the Big Biology Bus stayed for 30 minutes or more (some for the entire morning!). It was great to work alongside other BES members and the Royal Society of Biology – a valuable partnership. I am extremely grateful to Penny Fletcher for leading the event, to all the participating ecologists (Sara Ball (beetles), Richard Bashford (birds), Marc Botham (moths and more), Kieron Brown (worms and other soil invertebrates), Victoria Burton (many invertebrates), Caroline Fletcher (art), Jon Kudlick, Katie Murray (ladybirds), David Roy (iRecord), David Urry), Suffolk Wildlife Trust for hosting one of the Ladybird sessions, the organisers of Latitude for making us all so welcome and to the BES for providing support and funds for bug hunting resources and much more.

Identification guide

All Photos: Penny Fletcher



Bird Song with Richard Bashford



Creating a song and dance about ladybirds



Uncovering soil invertebrates at the Big Biology Bus



Not a fair fight, against a parasite

(words and music by David Urry)

1st verse

*Life is full of hurt...oo when you're an invertebrate
If you ain't being squished squashed or trodden,
sometimes you're plain forgotten*

*But we have our defences, oooo, and our reflexes
So you better come prepared, cos you know hey we ain't scared.*

*Yeah I was a super duper ladybird pupa
My mother would be proud, although I barely knew her
Cos with fifteen hundred sisters and brothers,
It's hard to tell one from the other.*

*Yeah I'm red and black so don't you dare attack,
No you wouldn't want a piece of this ladybird meat
You should stop look and listen
To my Aposematism (warning colouration)*

Bridge

*So let's go out, yeah let's go out, let's go out and count
Cos some ladybirds have got it bad, you gotta help us out...*

Chorus

*hey hey hey haven't you heard
Everybody's counting ladybirds
It's alright, it's ok.*

*hey hey hey haven't you heard
Everybody's doing the ladybird.
The lay lay
Lay lay lay, Ladybird.*

2nd verse

*But I'm frustrated, ooo feeling paralysed.
If I had to take a guess, I'd say I've been parasitized*

*SO I'm pretty angry, oooo, yea really annoyed,
Cos I just can't shake, shake shake shake shake,
shake this parasitoid.*

*Is it a fly or worm, or even worse,
What's that coming out my belly, somebody call the nurse.
Cos it ain't a fair fight, against a parasite.*

*Don't want to count this larvae before it's hatched
But I checked my ID guide, and it sure looks bad,
It's my arch enemy
Dinocampus Coccinellae.*

Repeat – bridge and chorus (Parasite emergence)

Parasite

Slow acoustic

*Just because I'm a parasite, doesn't mean that I don't have rights.
Don't believe all that you've heard, from our friend the ladybird.*

*I'm just trying to get by; I'm a little intrusive but not a bad guy.
Not everyone can be a pretty beetle, it's a tough old world
and we ain't all born equal.*

*I only know one way to live my life, so excuse me for being
a parasite.....*

Sinister Polka esque

*While I take you down
From the inside out
You're Like a Trojan horse,
yeah a living corpse.*

*My mum left me behind, and controlled your mind,
Life must be hard, as my body guard*

*But I'm very grateful, and you do a great job
We tried the harlequin, but they wouldn't let us in.*

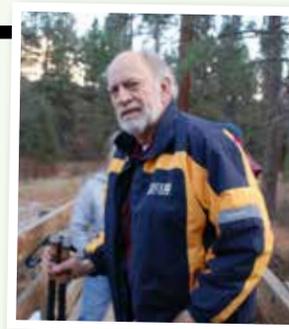
*But I'll leave you soon, emerge from my cocoon,
I don't pay no rent, and you've a 25 percent....*

*Chance of survival, so we might meet again
If I'm looking for a home, for my own children...*

Repeat – bridge and chorus x 2



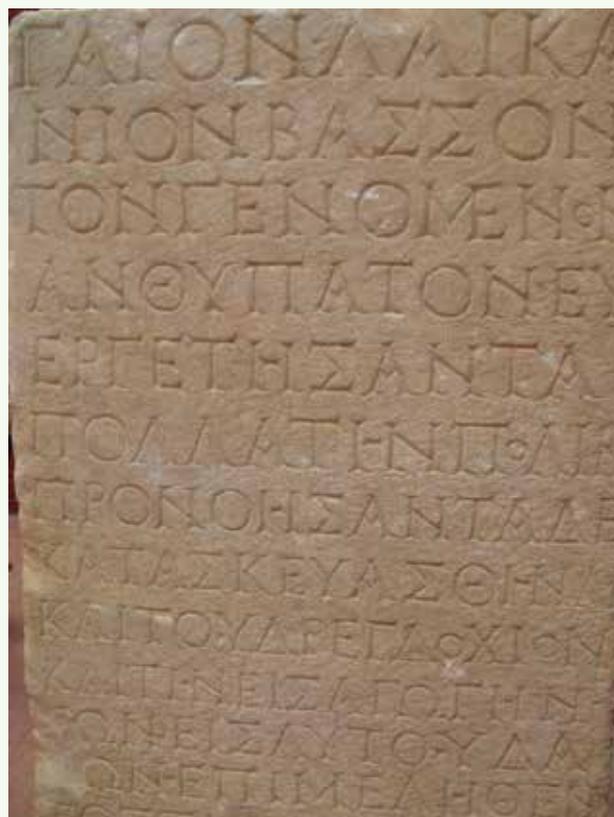
Ozymandias and Science Citations



John Wiens / Oregon State University
jwiens300@gmail.com

Shelley's sonnet, *Ozymandias*, has long been one of my favorites. It is perhaps Shelley's most famous work:

*I met a traveller from an antique land
Who said: 'Two vast and trunkless legs of stone
Stand in the desert. Near them on the sand,
Half sunk, a shattered visage lies, whose frown,
And wrinkled lip, and sneer of cold command,
Tell that its sculptor well those passions read
Which yet survive, stamped on these lifeless things,
The hand that mocked them and the heart that fed.
And on the pedestal these words appear:
"My name is Ozymandias, King of Kings."
Look on my works ye Mighty, and despair!
Nothing beside remains. Round the decay
Of that Colossal Wreck, boundless and bare,
The lone and level sands stretch far away.'*



These words speak to the impermanence of human works. Reading this again some time ago, it struck me as a parable for scientific publication. We labor long and hard to do the research and the writing that may lead to a scientific paper, hoping that our work will have lasting impact. Yet how much of it really matters? Judging by citations, perhaps not as much as we would like. An analysis a few years ago suggested that a distressing number of papers are cited only once, if at all – published and then, by this measure, forgotten.

Academic advancement in the sciences, however, is tied to publication. Numbers alone used to be the metric. I once asked my Department Chair whether he (back then it was always a he) had actually read any of my papers. His reply was, in essence, that he didn't need to read them—he could count. A colleague once proclaimed (proudly, as I recall) that he would not consider for a faculty position any candidate who had not published at least three papers per year, no matter the content, length, journal, or anything else. Counting publications was quantitative, easy, and objective.

Then computers came along. People realized that it might be better to determine whether a paper had not just been published, but was actually read. Citations became the metric – surely if someone cited a paper they must have read it! Initial tallies of citation frequencies gave way to more complex algorithms. Now, in addition to number of citations, calculations are weighted by such things as who cited a paper, the type of paper, and the impact factor of the journal in which it appeared. The impact factor, in turn, is determined by the average number of citations of papers published in that journal during a previous period. So there is a positive feedback loop: authors seek high-impact journals in which to publish their work, assuring that (on average) the paper will be more highly cited, thus enhancing both the career of the author and the impact factor of the journal. It is an interesting symbiosis.

Big Data – the capacity to probe massive data sets for information—is also part of the picture. Search engines can tell you not only the number of citations your paper has received, but its citation history since publication and which papers cited it. Google Scholar calculates an 'h-index' for an author (the largest number of *h* publications having at least *h* citations, e.g., 50 papers with at least 50 citations). ResearchGate provides an 'RG Score' based on the publications in an author's profile and how other researchers respond (e.g., views, downloads, requests), calling it a 'source of reputation.' Such indices are often used in personnel evaluations, so the pressure to enhance one's citation metric is great.

But what about all those papers that don't figure in such metrics, the neglected, low-impact papers? I know from looking at my own profile in Google Scholar that many of these are book reviews, commentaries, obscure technical reports, or essays (such as this one). But there may be wheat among the chaff, papers one takes great pride in but seem not to have been noticed.

This is my cue for another anecdote. In the early 1970s, I published the results of studies of the effects of early experience on habitat selection in two species of *Rana* frogs.¹ I found that exposure to different patterned substrates during early tadpole development affected subsequent substrate choices, but did so differently in the two species. What they learned was related to the habitat they occupied in nature. Moreover, in one species the effects of early experience were retained through metamorphosis to froglets.

I'm proud of this work: it was my sole venture into laboratory experimentation, the design was simple and (I thought) clever, the results were clear, and they required an explanation based on the natural history of the two species. Although both papers have been cited several times, the citations have been few and far between.² Why didn't the citations match my esteem for the

papers? Perhaps the experiments and my explanation of the results were not as nifty as I thought. Perhaps the design was flawed. Interest in habitat imprinting, which had prompted the study in the first place, was already waning and soon fell out of fashion. Or it simply may be that no one was interested in what tadpoles learn.

There are many reasons why a paper might suffer the fate of Ozymandias – published, perhaps briefly noticed, but then forgotten. One can increase the likelihood of a paper being noticed (and cited) by using a catchy title, dangling an interesting question in the abstract, or addressing a trendy topic that is on the upswing. Papers describing a new method or synthesizing an area of research tend to be cited more often than strictly empirical papers. In the end, however, the point of a scientific paper is to advance knowledge, resolve nagging questions, reduce uncertainty, or foster innovations, and in the process prompt new questions, new research, new insights, or new thinking. Citations alone do not capture the worth of a paper.

FOOTNOTES

¹ Wiens, J.A. 1970. Effects of early experience on substrate pattern selection in *Rana aurora* tadpoles. *Copeia* (1970): 543-548; Wiens, J.A. 1972. Anuran habitat selection: early experience and substrate selection in *Rana cascadae* tadpoles. *Animal Behaviour* 20: 218-220.

² Browsing through journals in the university library several years later, however, I was astounded to find the 1972 paper published essentially verbatim, but by a different author, in the *Journal of the Bombay Natural History Society*. I suppose that plagiarism is a perverse form of flattery and I should take credit for the citation.

FROM OUR SOUTHERN CORRESPONDENT



Richard Hobbs / University of Western Australia

Alan Crowden, our illustrious *BES Bulletin* editor, usually starts sending reminders that another *Bulletin* deadline is approaching a few weeks before said deadline. He does this in the forlorn hope that this Southern Correspondent will immediately leap into action and produce an article in time for the copy to be included in the production process. He knows, however, that the Southern Correspondent is a fan of the late author Douglas Adams, of *Hitchhiker's Guide to the Galaxy* fame and that his favourite Douglas Adams quote is "I love deadlines. I like the whooshing sound they make as they fly by." Alan recently admitted that he, too, has the propensity to engage in numerous diversionary activities when he's supposed to be editing the *Bulletin* – hence, I feel less guilty about my lack of ability to focus on the obviously arbitrary deadlines he sets.

His admission did, however, set me thinking about how ecologists deal with deadlines of all sorts. Our lives are pretty much ruled by deadlines throughout our careers. During undergraduate studies, there are endless requirements to submit assignments on time and non-negotiable deadlines to turn up and be ready for exams. For PhDs, things vary greatly depending on where you are in the world – different programmes have differing requirements for interim reports, confirmation of candidature, qualifying exams and the like. However, the unifying characteristic of all programmes is the need to get stuff done by specified times, with failure to do so likely to end up at best with grumpy supervisors and at worst a cessation of enrolment and/or scholarship. Then there is the final requirement to get a thesis together and submitted for examination. The deadline for this may be loose, as long as the student doesn't mind not having any money once their scholarship runs out. But sometimes, continuation of visas (for overseas students) or important things like not having to pay back scholarship monies are tied to strict and precise submission deadlines.

In life after the PhD, deadlines continue to be important during postdoc years, although there may be fewer actual deadlines imposed by the system. For both PhDs and postdocs, deadlines start to be more self-imposed, with the well-organized early career person recognising the benefit of doing a lot of good work and getting it published before it's time to look for that increasingly hard-to-find "real job". And once you're in a real job, be it in academia, an agency or anywhere, the deadlines multiply again: lectures to be written and delivered, grants to be applied for, committee meetings to be on time for. The list is endless. And all this is on top of the deadlines nature imposes on ecological research: getting to field sites before they are covered in snow, recording plant community data before the plants dry up and become unidentifiable, recording bird abundances before they fly off somewhere warm for the winter, applying experimental treatments at the right time of year. Not to mention getting fieldwork finished in time for a trip to the pub on the way home.

So, deadlines are a part of life. The system imposes many, and the individual adds more. So, how best to deal with these? Is there a magic formula for efficiently dealing with multiple deadlines and not ending up a frazzled mess? Probably not. However, some people seem to make a better job of it than others. Simple things like trying to work efficiently and imposing a modicum of organization on one's efforts are a good start. Learning how to be effective rather than just busy is essential. People like Steven Covey have written a lot about how to categorize activities according to whether they are urgent and/or important, and to focus on the important ones wherever possible. Realizing that someone else's urgent priority isn't necessarily your urgent priority is also useful. It's always amazing when you come back from holiday to find that many "urgent" emails (mostly from the Dean) have passed unanswered and no longer matter.

So, working effectively is the key, but what does this mean? One mistake is assuming that time spent sitting at a desk equates to getting lots done.

One of my first summer jobs, early in my undergraduate career (sometime in the late Pleistocene) was working on reserve records in the Nature Conservancy Council's (now Scottish Natural Heritage) Edinburgh office. There, you had to start by 9 and bells rang at the beginning and end of morning tea, lunch and afternoon tea, and at the end of the working day – much like being at high school. In between the bells, I had to sit at a desk writing on record cards. I was employed for 3 weeks and plodded through records until the 3 weeks were over and then I stopped. It was unremittingly boring and the only things I can remember about it were having to sign the Official Secrets Act before I began (well, you don't want nature reserve records getting into the wrong hands, I guess), the multitudes of men (only men involved back then) in tweed jackets that inhabited the building, and the curious fact that each sheet of the scratchy non-wettable toilet paper in the loos had "Government Property" stamped on it.

I suppose the idea of the bells was that the amount of time you were at your desk was proscribed and maximised. However, I learned then that the amount of time spent at a desk is completely uncorrelated with the amount of work you get done. Even the completely mechanical stuff I was doing with the records was open to all sorts of distraction, and a lot of time could be spent daydreaming about girls, music, being anywhere else but there, or virtually anything else.

Today, the opportunities for distraction while appearing to be at a desk working have been multiplied hugely. The wonders of the internet await whenever a lapse of concentration happens. There's always email to check and deal with. And Facebook to keep up with. And so on. Many younger people seem to be able to do all these things simultaneously, but it's questionable whether it engenders peak performance at anything. Anyway, the upshot is that one can sit at a desk all day and achieve virtually nothing of substance. Or you can have a brilliant couple of hours where great things happen. Outcomes are not correlated with time spent, especially where what you're doing involves thinking and/or any form of creativity.

So, I've always made a point with my staff and students of focusing on the outcomes rather than whether they're at their desk all day. Half the time I don't know where most of them are. I've read that some research groups have the feel of indentured servitude, with a silent expectation that if you're not at your desk/lab bench all hours of the day or night, you're not performing adequately. There's competition to be the first one in in the morning and a reluctance to be the first one to leave at night. And this is often behaviour modelled on the research leader who lives for the work, doesn't have a life outside work, and thinks that no one else should either. Impressing the boss is important, but not at the expense of other things in life.

Sometimes long hours are self-imposed though, and there are different ways in which people condemn themselves to long hours of what can be wasted effort. Unrealistic expectations of what is achievable are often to blame. Over-estimating the amount of sampling, insect identification, plant grinding or other essential research activities that is physically possible can chain students to lab benches 24/7. Not being satisfied until the data at hand are squeezed through every size, shape and type of statistics (the more complex the better!) is another way of chewing up weeks or months. Pathological perfectionism is another trap, and is seemingly all too common in academia. Ongoing anguish over getting a sentence or graph right, continuous re-writing and rearranging of words, sentences and paragraphs: all these things lead to a diminishing return of improvement gained in relation to effort put in. Spending 4 days on a job application letter is likely to produce a result not very different from spending 4 hours on it. The inability to draw a line under a piece of work and be happy that it is "good enough" is one of the biggest brakes I've seen on people getting things done. A non-perfect paper submitted to a journal has a bigger chance of success than a near-perfect one that never gets submitted because the author thinks it still needs improvement.

Of course, there's always a fine balance to be sought – doing enough to get the job done and knowing when enough is enough are skills that take time to develop. And supervisors and mentors have an important role in fostering this. Fresh brains work better than exhausted ones, and overworked staff and students are likely to be less effective as well as more grumpy. Exhausting days in the field and long hours at the computer may be necessary now and again, but not all the time.

Dealing with deadlines can be hard work, but managing them effectively (through managing yourself) makes for a more enjoyable existence, both at work and elsewhere. Some people get the hang of it, but many don't. Quoting Douglas Adams again, "You live and learn. At any rate, you live." I'm sure Alan said something about a deadline sometime soon..... but I'm off to watch the rerun of Australia sealing England's fate in the Rugby World Cup.



Hobbs keeping a not-very-sharp look out in case any Bulletin deadlines float by

The Chartered Institute of Ecology and Environmental Management



Sally Hayns MCIEEM / Chief Executive Officer, Chartered Institute of Ecology and Environmental Management

T: 01962 868626 / Enquiries @cieem.net / www.cieem.net

A New President

At our 2015 AGM in November members were pleased to welcome a new President, Dr Stephanie Wray. Dr Wray has been a member of the Institute since 1994 and a Fellow since 2007. She is currently a Partner at Peter Brett Associates LLP where she is responsible for the strategic direction of PBA's growing environment team of 40.



Stephanie has a PhD in Ecology, and has completed post-doctoral research posts in the UK (a review of the conservation status of British mammals) and overseas (the ecology and conservation of Livingstone's bat, *Pteropus livingstonii*). She summarises her background as an ecologist, environmental planner and sustainability specialist. Although she has worked in consultancy for the last 20 years, she has continued to carry out research and to publish, and has taught on two MSc courses for ecologists and environmental managers.

Our new President is passionate about ecology as a numerate scientific discipline and will be a powerful advocate for the role of ecologists and environmental managers in society.

Reconnecting People and Nature Conference

Our Autumn Conference last month in Sheffield was a reflective, challenging and inspiring two days examining how we can reconnect people and nature in order to benefit society. Over 20 speakers presented their thoughts on the issue, providing case studies, summarising evidence of the benefits of nature and

arguing for a new narrative in reaching out to people disengaged with the natural world.

Our first keynote speaker Stuart Brooks, CEO of The John Muir Trust, spoke of a returning theme around the 'lack of connection' between people and nature. Stuart argued that if this is reflected beyond the individual to societal values it underpins decision making by governments. Stuart was able to point towards some positive trends, especially in the attitudes of younger generations towards nature and the wider environment. He argued that this is an essential part of a democratisation of nature conservation.

Our second keynote speaker was CIEEM Patron Professor Sir John Lawton. Sir John described how, in the nearly 30 years since the Chernobyl nuclear disaster, the huge exclusion zone round the site (the size of the Lake District in Belarus alone) has turned into the largest, albeit accidental, re-wilding project in the world. He drew lessons about rewinding from this and other examples to argue how we can make more space for nature even in an overcrowded island like Britain. He suggested that the problem is not just one of identifying large enough sites to set aside as protected areas but, probably more importantly, it is one of human attitudes to nature within and adjacent to areas of rewilding and the political will to make it happen.

Delegates agreed that it had been a thought-provoking and at times inspiring conference but that there are significant challenges to be faced.

One Hundred Chartered Ecologists

An important milestone was reached in October when the 100th Chartered

Ecologist (CEcol) Dr Will Trehwella, Senior Ecologist for Arcadis Consulting Ltd, was admitted to the Register. One element of the assessment process is a Professional Review Interview which includes a requirement for applicants to talk confidently about what they see as one of the biggest challenges to maintaining and enhancing biodiversity and the natural environment and to describe the emerging tools and techniques that they think will help to meet those challenges. The December issue of In Practice includes a review of the first 100 topics covered by applicants which makes interesting reading. I won't spoil too much of the surprise for those of you who are members but climate change, human population growth and non-native invasive species are among the most frequent issues raised.

2016 Awards

Nominations are now open for the 2016 CIEEM Awards. Included amongst the categories is the Institute's most prestigious individual award, the CIEEM Medal, awarded in recognition of an outstanding single or life-long contribution to the field of ecology and environmental management. Unusually there were 2 recipients in 2015, Professor Penny Anderson, well known to BES members for her work on upland moorland restoration, and Professor David Goode, equally well known for his expertise in urban ecology and nature conservation.

CIEEM Spring Conference

Our one day Spring Conference will be held in London in March on the theme of assessing ecosystems services and ecosystem health. Bookings will be open shortly. For more details please visit our website www.cieem.net



British Ecological Society
13 – 16 December
Edinburgh #BES2015

Fàilte

16 Thematic Topics
24 General Sessions
16 Workshops
1 cracker of an event

BES journals at the BES Annual Meeting

At the Annual Meeting in Edinburgh, our Publications team will be running two workshops. Check out their BES journals Twitter feeds (@AnimalEcology, @JAppliedEcology, @MethodsEcolEvol, @JEcology and @FunEcology) to get the latest details on the events. We hope to see you there!

The future of Data Archiving – Any Questions?

Do you have questions about data archiving? Do you routinely share your data or do you fear that sharing will lead to being scooped or that you won't receive credit for your work? Do you have concerns about confidentiality issues? Do you want to use someone's data but unsure about the ethics or etiquette? If so, this workshop is for you!

This "BBC Question Time" style debate will provide you with the opportunity to debate the issues surrounding data archiving with our panel of experts in an open format. Ecology journals are increasingly encouraging or mandating the archiving of data associated with published papers. Join our panel debate to share your thoughts on the impact of data archiving and how this is likely to shape the future of research.

We are accepting questions in advance and on the day. Questions can be submitted in advance through Twitter using the hashtag #BESDataQA or by email to Simon@BritishEcologicalSociety.org

Maximising the Exposure of Your Research: Search Engine Optimisation and why it matters

In recent years there has been a significant increase in the number of academic articles published. At the same time, readers are changing how they find content, tending towards a point of entry at article level as opposed to journal level. These two factors mean that it is increasingly necessary for authors to make their articles easy for relevant readers to find. One of the best ways to do this is Search Engine Optimisation (SEO).

In this interactive workshop, attendees will acquire the practical skills necessary to make their articles stand out from the crowd. Using real world examples taken from the five BES journals, participants will learn how to:

- Choose the best keywords
- Write an optimised abstract
- Create a discoverable title

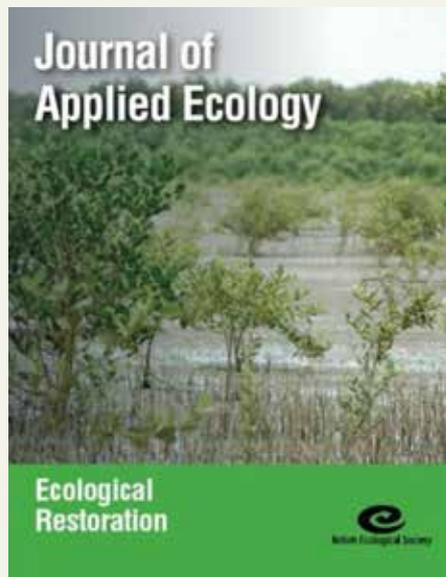
Applying these skills to your research will help to make your articles visible and discoverable online and maximise the exposure of your work. With an introduction to SEO for those unfamiliar with it and a Q&A session with a panel of experts, this workshop will be helpful for researchers at every career stage.

JOURNALS NEWS

Journal of Applied Ecology

Virtual Issue: Ecological Restoration

In recognition of the Society for Ecological Restoration's 2015 World Conference and in support of shared goals that ultimately aim to slow and reverse ecosystem degradation across the globe, the *Journal of Applied Ecology* compiled a Virtual Issue, edited by Associate Editor Jeremy James, of 20 key papers published in the journal over the last three years on the subject of ecological restoration. Specifically, the papers focus on testing and advancing ecological theory to improve restoration outcomes, integrating knowledge into practice, prioritizing management efforts and the effects of restoration on ecosystem services. The Virtual Issue can be accessed through the *Journal* homepage.



Journal of Applied Ecology in the news

Over the past few months several *Journal of Applied Ecology* articles have appeared in the news. A paper by Tim Reid and colleagues on using spatial analyses of bearded vulture movements in southern Africa to inform wind turbine placement was featured in the Guardian and the Conversation, and one of the authors, Arjun Amar, gave an interview on BBC World Service. Joachim Offenberg's Review article covering the use of ants as tools in sustainable agriculture

was highlighted in Science and The Independent. An image from this study was also used as the *Journal* cover for Issue 52:5.



Weaver ants *Oecophylla smaragdina* cooperating in subduing a large prey in Thailand. Photograph by Rasmus Lundegaard Nielsen.

For Issue 52:5, the Editor's Choice by Andrew Salisbury and colleagues about enhancing gardens as pollinator habitats by using mostly native, but also some exotic plants to extend the flowering season and provide extra resources for more specialist insect groups was featured in The Daily Telegraph. The Editor's Choice commentary for this paper can be accessed through the *Journal* homepage.



Plants for Bugs trial site, RHS Garden Wisley. Photo credit: RHS/ Helen Bostock.

Changes to the Editorial Board

Andy Sheppard recently stepped down as Associate Editor after 9 years with the *Journal* and we would like to take this opportunity to thank him for his service

and wish him all the best for the future.

Alice Plane
Assistant Editor
Alice@britishecologicalsociety.org

Methods in Ecology and Evolution

Virtual Issue

Monitoring wildlife is incredibly important for many fields of ecology and evolutionary biology. Choosing the right methods for monitoring is essential to these fields. In October, *Methods in Ecology and Evolution* published a joint Virtual Issue on Monitoring Wildlife with the *Journal of Animal Ecology* and the *Journal of Applied Ecology* <http://bit.ly/1Lebrvi>

There are eight *Methods* articles in this Virtual Issue, covering a wide-range of techniques for monitoring wildlife. From electronic tags and camera traps to acoustic monitoring and metabarcoding, the papers cover significant advances from the past two years. One of the articles, 'MotionMeerkat: integrating motion video detection and ecological monitoring' by Ben Weinstein, is an Applications article. This type of paper describes new software, equipment, or other practical tools, in an attempt to maximise the uptake of these approaches. In his article, Weinstein introduces a new program that identifies motion events from a video stream. After running a video, the user reviews candidate motion frames for the target organism. This tool reduces the time needed to review videos and accommodates a variety of inputs.

You can find out more about Applications articles and access more of them here: <http://bit.ly/OxS9bc> All Applications articles are free to access for everyone.

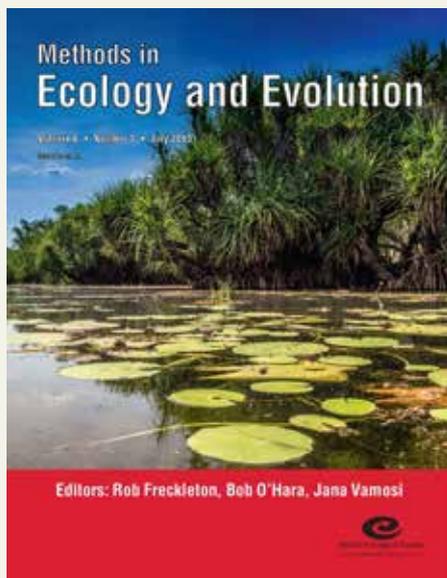
Editorial Board Changes

Over the past few months, we have made some great additions to our Associate Editor Board. In early October, we welcomed Susan Johnston of the University of Edinburgh to *Methods*. Susan's research interests centre on using genomic information to understand selection and evolution in wild populations.

Shortly after Susan joined, we added Natalie Cooper to the Board. Natalie is currently based at the Natural History Museum in London and was one of the speakers at our 5th Anniversary Symposium (you can see her presentation here: <http://bit.ly/1PNxGZZ>). Her research interests include phylogenetic comparative methods, morphological evolution and using museum specimens in research.

The most recent addition to the Board was Luísa Carvalheiro of the University of Brasília. Luísa mainly works in community ecology and conservation. She has a particular interest in the dynamics of biodiversity through time and space and how biotic changes affect ecosystem functioning and services. We look forward to working with all of our new Associate Editors.

As well as new additions, we have also had to say farewell to a number of Associate Editors. Shinichi Nakagawa (University of Otago), Brian O'Meara (University of Tennessee, Knoxville), Olivier Pybus (University of Oxford), Liam Revell (University of Massachusetts, Boston), Matthew Spencer (University of Liverpool) and Andy Tatem (University of Florida) have all stepped down from the Board. Helene Muller-Landau (Smithsonian Tropical Research Institute) will also be leaving us at the end of the year. We would like to thank all of them for their hard work on the journal over the past few years and we wish them all the best for the future.



Methods in the News

It may sound counter-intuitive, but crushing up bees into a 'DNA soup' could help conservationists understand and even reverse their decline. According to a *Methods* article from Min Tang *et al.* (<http://bit.ly/1HaIn5Z>) collecting wild bees, extracting their DNA, and directly reading the DNA of the resultant 'soup' could finally make large-scale bee monitoring programmes feasible. This would allow conservationists to detect where and when bee species are being lost, and importantly, whether conservation interventions are working. This technique has the potential to reduce the time needed for programmes monitoring bees (and other pollinators) drastically, while also reducing the cost. The article received some wonderful press coverage and you can read the press release about it here: <http://bit.ly/1LSuCWV>. It was also included in the Virtual Issue on Wildlife Monitoring.

Have you ever wondered how animals see the world? Well, now you can find out! New camera technology, developed at the University of Exeter and explained in the *Methods* article 'Image calibration and analysis toolbox – a free software suite for objectively measuring reflectance, colour and pattern' (<http://bit.ly/1hmUHYC>) by Troscianko and Stevens, converts digital photos to animal vision. The open access software has already been used in a range of studies and will be incredibly useful for researchers studying pollination, camouflage, plant and animal signally and much more.

Chris Grieves
Assistant Editor
chris@britishecologicalsociety.org



Congratulations!

Huge congratulations to Senior Editor Amy Austin who was awarded the LÓreal-UNESCO prize for Women in Science for Argentina in September. Amy has written a blog post about what inspired her ecological career, which is available on the *Journal* blog <https://jecologyblog.wordpress.com/>.

Special Feature in issue 103:6

In issue 103:6 Amy Austin and Amy Zanne have guest edited a Special Feature on biogeochemical cycling in aquatic and terrestrial ecosystems. Author Courtney Stepien has provided a great photo for the front cover that illustrates this dual focus of the Special Feature on both aquatic and terrestrial ecosystems, see below.



Harper Review

The *Journal* is pleased to announce the launch of a new annual review paper. In issue 104:1 the *Journal* has published the first Harper Review, which aims to highlight a hot topic in plant ecology. The first Harper Review is written by Yvonne Buckley and Jane Catford on the biogeographic origin of non-native species and its relevance for management.

Virtual Issues

Marine Ecology

By definition *Journal of Ecology* publishes novel, plant ecological research, in both terrestrial and aquatic ecosystems. As the year draws to a close we have decided to champion the marine ecological research that we have published in the *Journal* since we turned 100 back in 2012. David Gibson, Amy Austin & Carol Thornber have edited a Virtual Issue on marine ecology, which is available on our homepage (www.journalofecology.org). All of the papers are free to access.

Charismatic Orchids

In most issues we publish a new account focussed on a different species in the Biological Flora of the British Isles series. All of the papers in this series are also free to access and to date we have published well over 300. Partly to celebrate this eminent series of papers and partly to celebrate how charismatic orchids are,

BFBI Editor Tony Davy and Executive Editor David Gibson have put together as a Virtual Issue, a collection of 30 papers published in the *Journal* that all focus on orchids. Our orchid's Virtual Issue is also available on the *Journal's* homepage (www.journalofecology.org) along with an accompanying blog post by Hans Jacquemyn (<https://jecologyblog.wordpress.com/>).

Podcasts

Executive Editor David Gibson went to ESA in Baltimore back in August 2015. At the meeting David interviewed Scott Collins and Carol Thornber. Both of these interviews are available as podcasts on the *Journal* blog.

New Editorial Board appointments

We would like to warmly welcome Meghan Avolio, David Edwards, Jacquelyn Gill, Andrew Hector, Laura Huenneke, Amy Iler, Nicole van Dam and Amy Zanne to the *Journal's* Editorial Board.

Journal of Ecology at #BES2015

The *Journal of Ecology* editorial team will be at the BES Annual Meeting in Edinburgh this month. Visit the BES stand to find out more about the *Journal* and follow @Jecology on Twitter if you can't make the meeting to see what we get up to.

Lauren Sandhu
Assistant Editor
lauren@britishecologicalsociety.org



Editorial Board

We have had a number of changes to our editorial board. In August, we welcomed our new Senior Editor, Craig White (*University of Queensland, Australia*) to the board. Craig's research focusses on describing and understanding the causes and consequences of physiological variation in animals. His group studies a range of traits, with an emphasis on metabolic rate, water loss, and breathing patterns, and employs a variety of approaches, including manipulative experiments, comparative studies, experimental evolution, and quantitative genetic analyses.



New Senior Editor of Functional Ecology, Craig White

Emma Sayer has taken on the role of Review Editor for *Functional Ecology*, so if you are interested in submitting a review and wish to discuss it with Emma, you can email her a short description of the proposed topic with a brief statement on why it is relevant to readers of *Functional Ecology* (max. 350 words) at e.sayer@lancaster.ac.uk

As ever, we also have several new Associate Editors to the board; Brett Sandercock (*Kansas State University, USA*), a population biologist with research interests in the evolutionary biology and behavioural ecology of terrestrial vertebrates; Janne Alahuhta (*University of Oulu, Finland*) whose research integrates macrosystem ecology, community ecology, spatial ecology and conservation ecology to study patterns and processes structuring aquatic plants at various spatial scales; Becky Ostertag (*University of Hawaii at Hilo, USA*), a tropical forest ecologist who examines questions relating to biological invasions, nutrient cycling, forest dynamics, and restoration; Enrico Rezende, (*University of Roehampton, UK*) whose interests lie in the interface between physiology, ecology and evolution; Sally Power (*University of Western Sydney, Australia*), an ecosystem ecologist with a particular interest in how climate change and air pollution affect plant communities, nutrient cycling and plant-soil feedbacks; and Laura Llorens (*University of Girona, Spain*), a plant ecophysiologicalist whose main research focusses on the study of response mechanisms of plant species and their communities to climate change. Currently, Laura is particularly interested in the role of ultraviolet radiation, and its interaction with water availability, in the regulation of plant and ecosystem functioning.

Perspective

Our latest Perspective "Do plant- and soil-mediated legacy effects impact future biotic interactions?" by Susanne Wurst and Takayasu Ohgushi is out in Issue 11 and highlights the need for a community approach to understanding the consequences of indirect plant trait- and soil characteristic-mediated interactions on community assembly, biodiversity and function in terrestrial ecosystems. We published several Perspective papers this year, on topics ranging from root depth in grassland and savannas to the loss of ecological interaction in a changing world. All of them can be found on our website here <http://www.functionalecology.org/view/0/perspectivepapers.html>

Jennifer Meyer
Jennifer@BritishEcologicalSociety.org



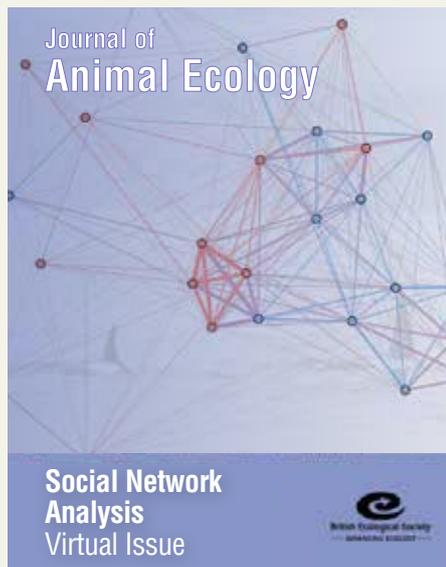
www.journalofanimalecology.org
[@AnimalEcology](https://twitter.com/AnimalEcology)

Goodbye Tim, Welcome Nate

Journal of Animal Ecology sadly says goodbye to Tim Coulson, after serving for nearly nine years as a Senior Editor. During this time, Tim was Executive Editor for 3 years, guiding the journal into the era of freely accessible data – an issue he has been passionate about for many years. Tim was responsible for the introduction of our highly successful "How to..." papers, which have proved to be a valuable resource for many of our readers, as well as editing a number of the *Journal's* Virtual Issues, including a recent Virtual Issue on Bio-demography. Tim has also been keen contributor to our new *Animal Ecology* in Focus blog, writing some of our most provocative posts and generating discussion in such diverse areas as the UK badger cull, gender equality in science and data archiving. We will miss Tim's great enthusiasm and dedication to the *Journal* and wish him well for the future. We are pleased, however, to welcome Nate Sanders (*University of Copenhagen, Denmark*) to the team of Senior Editors. Nate is interested in macroecology, global change ecology and community ecology, often focussing on ants as study organisms. We look forward to a new era for the *Journal*.

**Social Network Analysis
Virtual Issue**

Journal of Animal Ecology has been at the forefront of a recent surge of papers applying social network analysis in animal populations. To celebrate the publication of an open access “How to...” guide to social network analysis by Damien Farine and Hal Whitehead, Senior Editor Ben Sheldon has compiled a new Virtual Issue highlighting recent papers on social network analysis (available via the Journal homepage). Farine & Whitehead’s comprehensive “How to...” guide deals not only with the methods involved, but also emphasises the need to think carefully about the way that data collection and observation constrain the types of social processes that can be studied, and also looks forward to the use of social network analysis as a way to test and quantify many poorly understood processes in animal populations.



Stuck In Motion? Reconnecting Questions And Tools In Movement Ecology – Special Feature

In the current Issue 85(1) we have a Special Feature focusing on movement ecology titled “Stuck In Motion? Reconnecting Questions And Tools In Movement Ecology”. The Special Feature contains a paper on quantifying barrier permeability and proximity avoidance by animals, a review focusing on how habitat selection models can be linked to population, a paper on tools for exploring behavioural structure in animal movements, a paper on how movement is the glue connecting home ranges and habitat selection and a paper comparing

methods to assess and characterise migration. On the blog we have posted some great videos and photos that bring the papers to life.

Associate Editors

In the summer Alexandre Roulin, Brett Sandercock, Sonia Altizer and James Jones stepped down from the Associate Editor Board. We would like to thank Alexandre, Brett, Sonia and James for all their hard work for the journal. After serving *Journal of Animal Ecology* for nine years, Brett has now joined the Board for *Functional Ecology*.

We are pleased to welcome Julie Morand-Ferron (*University of Ottawa, Canada*) and Celine Teplitsky (*CNRS, Centre d’Ecologie et des Sciences de la Conservation*) to the Associate Editor Board. Julie’s research aims at understanding how cognitive processes are shaped by natural selection. Julie uses an integrated approach drawing from behavioural ecology, evolutionary ecology and cognitive ecology. Her research is focused on avian foraging and social behaviour, using experiments in the field and in aviaries. Celine is interested in adaptation in the context of global change, through rapid evolution or phenotypic plasticity. Her current research focuses on evolutionary potential and constraints in wild populations, using quantitative genetics tools to analyze long-term studies in birds.

Simon Hoggart
Assistant Editor
Simon@BritishEcologicalSociety.org



‘Selfie’ taken by a camera mounted on a GPS collar tracking the movements of reindeer in Norway. Photo credit: NINA, Norwegian Institute for Nature Research.

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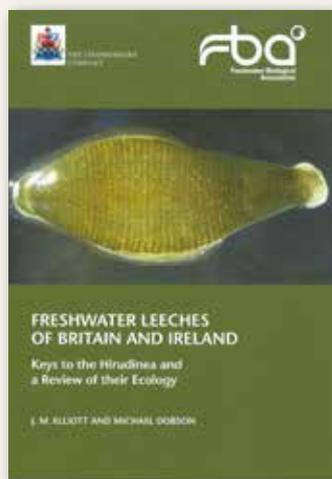
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BOOK REVIEWS

The book reviews editor is Sarah Taylor, who is currently on leave of absence. Reviews in this issue have been collected and edited by **Alan Crowden**.



Freshwater Leeches of Britain and Ireland

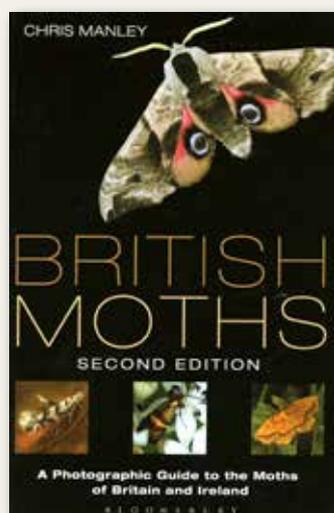
J M Elliott and M Dobson
(2015) Freshwater Biological Association (Scientific Publication No 69) £27.00 (pbk) (£20.25 to FBA members)
ISBN 978 0 900386 82 4 (pbk)

This great little volume is in the splendid tradition of British natural history. It is an updated version of the very well established field key to leeches, which has served freshwater biologists so well for so many years. All the best features have been retained, including many of the clear and useful illustrations, but since the previous edition much has been discovered about leeches, including a major revision of the nomenclature and the discovery of new species. These have been incorporated into the keys and species accounts but the major added feature is a great deal of important information on the ecology, life cycles and natural history of the leeches. This is very much to be welcomed and helps to make the volume important to freshwater ecologists.

Overall this is a useful and important booklet and I have only one major comment, about a feature which this shares with so many other field keys. Although the paper is

slightly glossy, it is not really sufficiently tough for use in field conditions and the 'perfect binding' is guaranteed to fail eventually, as the booklet is opened forcibly in field conditions. I wish that field keys were prepared so as to be used freely in the field. Surely this is how it should be! Nevertheless, I thoroughly recommend this.

Mark Young



British Moths: A Photographic Guide to the Moths of Britain and Ireland 2nd Edition

Chris Manley (2015)
Bloomsbury Publishing £40 (hbk) £35.99 (ebook)
ISBN 978-14729-0770-7 (hbk)
ISBN 978-14729-0771-4 (ebook)

Interest in moths has grown enormously over the past ten years. This can be largely attributed to the advent of the digital camera and to the publication of two illustrated field guides and this book, all of which illustrate the moths in their natural resting positions rather than spread-eagled with a pin through them.

This second edition dispenses with the butterflies and, in so doing, permits the addition of nearly 800 extra species.

Using over 3200 high quality photographs, it now illustrates 871 macro-moths and 1276 micros. The addition of more micros is particularly welcome as these have been neglected in the past.

Half the battle of identification is knowing where to start looking and the book begins with an illustrated index to moth families which I find particularly useful for the micros. There are introductory chapters covering the format of the species accounts; how to see moths (including various methods of attraction); how to photograph moths; classification and distinguishing features; anatomy and typical lifecycle.

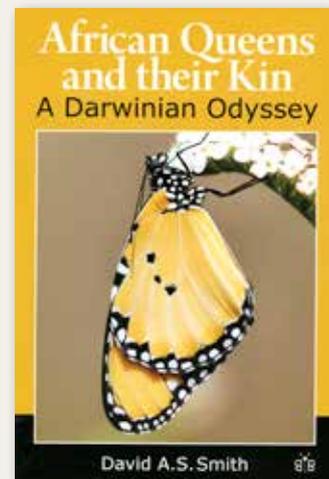
The species accounts are divided into families. There is a brief paragraph describing the family as a whole with a note when dissection is needed for identification. There is at least one photograph per species and often more; especially in variable ones. Where applicable leaf mines and larval cases are also illustrated. All photographs show the moth in its normal resting pose. Cleverly, all are shown facing the same direction which may sound trivial, but does make it far easier to compare species. It is often not easy to judge the size of a species from a photograph or drawing so beneath each photograph is a scale-bar representing the actual length of the forewing from base to apex. The text gives details of flight period, habitat preference and food plant and, when necessary, tips on separation from similar species. The author also warns when it is not possible to separate species on photographs alone. An important addition is a distribution map – people all too often claim a rare moth without first checking to see if it is likely to be found in their area.

There has recently been a major

revision of the taxonomy of the lepidoptera which this book encompasses. It results in a very different layout of species from familiar older books and may take a bit of getting used to. Each account includes the latest checklist number as well as that used in the older system for reference.

Drawings and paintings of moths are indispensable but the photographs in Chris's book complement these admirably and give the user more a "feel" for the moth. I have nothing but praise for this book and am constantly flicking through it. If you are at all interested in moths then buy it! It is also available as an e-book from the App Store.

Dave Emley, County Moth Recorder for Staffordshire



African Queens and their Kin. A Darwinian Odyssey

David A. S. Smith (2014)
Brambleby Books £90.00 (hbk)
ISBN 978 1908241 153

David Smith has devoted much of his life-long leisure time, as well as having spent some extended research periods, studying the African butterflies within the genus *Danaus*, known generally as 'Queens'. If this makes it sound as if he is a knowledgeable amateur,

then this is certainly not what I intended. His work is scholarly, authoritative and very extensive and this is an outstandingly interesting book. Sufficient is now known about danaid butterflies that they can be used to illuminate many ecological fields of study, as well as related topics, such as evolutionary biology, modern advances in taxonomy or molecular genetics.

To say that there is a wealth of important detail here is a gross under-statement. There are nearly 800 pages of excellent material, well presented, clearly written and with many relevant tables, diagrams and photographs. This makes it challenging to read sequentially but the arrangement and clarity of headings and chapters means that it can be read by topic. The volume starts with life history details and morphology, leading on to basic ecology, parasitology and migration. There is a section setting out the classification of the 'Danaans', where there are many puzzles and problems which are reviewed. African queens are renowned for including examples of mimicry and much is known about the genetics of wing colour and pattern, leading on to mating systems and inheritance and these subjects are explored in detail. The same applies to chemical ecology and to all the ways in which the butterflies use chemicals in their lives. This doesn't do justice to range of topics included but does give a sense of the scale of the whole work. Perhaps it might seem that a book about butterflies should not have general relevance to ecologists but I guarantee that there is something for everyone. It might be that the precise detail is not of immediate application but most ecological fields will find much of importance here. This book can be well recommended and is a remarkable achievement.

Mark Young

The Choanoflagellates: Evolution, Biology and Ecology

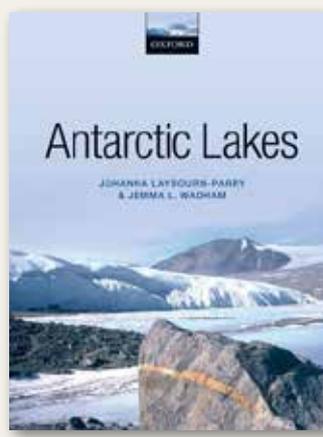
Barry S. C. Leadbeater (2015)
Cambridge University Press,
Cambridge. £80 (hbk)

ISBN: 978-0-521-88444-0

The main claim to fame for the Choanoflagellates is that they are the closest relatives of the Metazoa among the unicellular protists, and may be ancestral to the sponges. They are unicellular flagellates that are characterised by an outer shell and have a distinct constriction or collar near their tip. This collar is believed to entrap food particles that are then ingested by means of pseudopodia. They are sedentary, being attached to the substrate by a stalk. Some species are colonial, and this feature is reminiscent of sponges, leading to the proposal that the Metazoa originated from these or similar organisms. Much of this book is concerned with the structure and functional morphology of the group, with particular emphasis on the structure of the outer shell, or lorica, and its significance for taxonomy. One chapter, however, is devoted to the ecology of these organisms. They are ubiquitous in aquatic habitats, both fresh and marine, and are heterotrophic, feeding upon bacteria and detritus particles. They are thus contributors to the mineralization of organic compounds, and thus play a role in nutrient cycling, particularly of nitrogen and phosphorus. They are likely to form the basis of food webs, and their remains have been found in the faecal pellets of krill, so their importance as a component of the trophic structure of aquatic ecosystems may be considerable. As a group, their ecological tolerances are wide, some species being found in hypoxic environments, and others in conditions of elevated salinity. Thus the importance of the Choanoflagellates may well have been overlooked

by many ecologists, and this book provides a rich source of information that will provide ecologists with a deeper insight into their role. Their evolutionary significance, which is already widely appreciated, is superbly documented in this well-produced and detailed survey.

Peter Moore



Antarctic Lakes

Johanna Laybourn-Parry and
Jemma L Wadhams (2014)

Oxford University Press.
£75.00 (hbk), £34.99 (pbk)

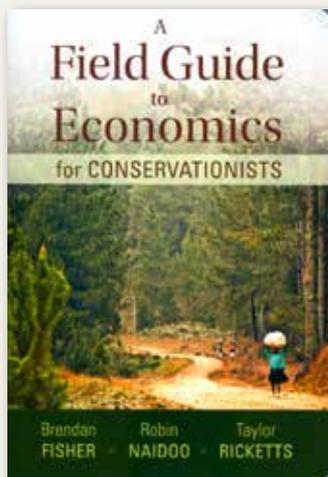
ISBN 978-0-19-967049-9 (hbk)

ISBN 978-0-19-967050-5 (pbk)

Although for many ecologists Antarctic lakes may seem an obscure corner of limnology, interest in them began over 100 years ago. Recognition of their real scientific value came around 50 years ago as the International Geophysical Year gave a push to Antarctic limnology as it did to many other areas of Antarctic science. The substantial bibliography of over 20 pages in this book is only a small part of the literature which the authors have surveyed and, with a well organised text and accessible style, this volume should provide a useful up to date reference for any existing limnologist as well as a good introduction to this field for any other ecologists. Since Antarctic lakes and ponds have been covered in many other books (such as Polar Lakes and Rivers, Ecosystem Processes in

Antarctic Icefree Landscapes, Physical and Biogeochemical Processes in Antarctic Lakes, etc) one might ask what is the justification for the present volume? The authors maintain that this is the first book to provide a continent-wide synthesis and in that they have largely succeeded, given the limits publishers normally put on book length (although there are inexplicably 12 blank pages at the end). Their seven chapters provide an introduction to types of lakes and habitats, with specific chapters on freshwater, saline, epishelf, supraglacial and subglacial types, and a final chapter of conclusions and future directions. Whilst Laybourn-Parry has been at the forefront of Antarctic limnology for many years, Wadhams is a glaciologist yet it is clear that this coupling has been especially beneficial for the chapters on epishelf, supraglacial and especially subglacial lakes. Whilst there are some comments scattered through the text one element I felt that was missing was a focussed consideration of human impacts – for example at Lake Vanda and the Larseman Hills – and both the need and the bases for better conservation treatment by the Antarctic Treaty. One might hope that the fascinating descriptions of the unique nature of many of these species poor lakes and their interdisciplinary contributions to ecology, glaciology, palaeoclimates etc might enthuse some young scientists with new challenges!

David Walton



A Field Guide to Economics for Conservationists

Brendan Fisher, Robin Naidoo & Taylor Ricketts (2014) Roberts and Company Publishers, Greenwood, Colorado. £27.00 (pbk)

ISBN 978-1936221509 (pbk)

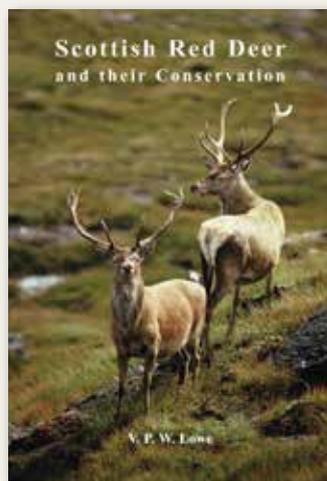
This book is a really brilliant introduction to ecological economics. Work with economists has been a prominent part of my career but much of my economics knowledge has been garnered out of rather turgid texts aimed at main-stream economists. How I wish I had a copy of this book twenty years ago.

The style of writing is informal, even humorous, but this is a very skilful piece of interdisciplinary communication in a book small enough to fit in a jacket pocket. Using everyday experience, the fictional landscape of Arden and very well picked examples from the literature, most of the key concepts an ecologist needs to know to work alongside economists are explained. What is more, this is not a hard sell of economics and the reader is encouraged to think critically about the subject. Topics covered include opportunity costs, cost-benefit analysis, supply and demand, valuation techniques and ecosystem services. This litany might seem a bit dull but I assure each topic is really brought to life

and made relevant to the real world, not least in the last two overview chapters. I don't know about you but I am increasingly sceptical about economic neo-liberalism and the chapter on institutions, which essentially deals with the choice between markets and regulations, to my mind covers especially important ground.

Increasingly, economics data are becoming a key part of environmental decision making. I don't know of another primer on the subject which is even half as good as this one. This is a must read for every ecologist who wants to stay informed about the development of our field. It is such a shame there is not a companion volume explaining ecology to economists.

John Hopkins



Scottish Red Deer and their Conservation

V.P.W. Lowe (2014) Hayloft Publishing Ltd, Cumbria, UK.

£25 (hbk)

ISBN 978-190-452-4939 (hbk)

I open this review with an apology to the author and publisher for its tardiness, which was regrettably a consequence of my ongoing chronic illness.

In 1957, Lowe set up a red deer research programme on the Isle of Rum, Inner Hebrides, to better understand the lot of Britain's largest surviving

wild terrestrial mammal. The project was expected to run for 20 years, but in 1967 was disbanded and much of the accumulated data never made it into the public domain. Although more recent scientific studies of deer on Rum have been published, they are largely confined to specialist academic journals that are outside the reach of those working with deer. Moreover, there is no blueprint for the management of red deer, instead individual land managers tend to it in their own way. So Lowe has decided to venture where no person has been before; to present a comprehensive picture of the Scottish Red Deer and the ideals of their management with an aim to maintaining healthy stocks in balance with their environment.

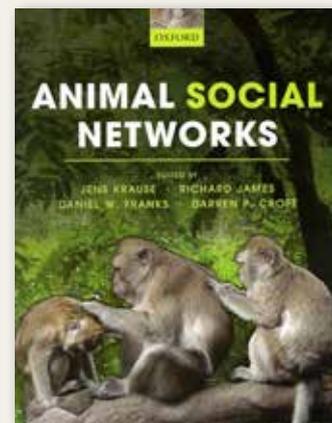
The book is divided into 16 chapters. The first five chapters introduce the study, the deer and the Isle of Rum. This is followed by 8 chapters that deal with the nitty gritty of deer population dynamics, including: how to count and age deer, natural mortality and life tables, and determining carrying capacity and population density. The book closes with three chapters dedicated to enhancing deer forest habitat and management planning. This is greatly informed by lessons learned from removing sheep and cattle, and abandoning moor-burning during the study at Rum. Such an evidence-based approach is crucial to making the practice of management scientific in its application.

As you would expect given the author's mission, the book is very data-rich. It is impossible not to be impressed by how the weight of the testes changes through the year, achieving just 33.5g in May and a whopping 150g in September! To find out why you will need to read the chapter on fecundity and reproduction – it must have made for interesting discussions over a pint in the pub! To make

the text accessible to the lay person, footnotes are included to describe technical terms and more technical information appears in boxes for those who want to tackle it. The text is also accompanied by colour plates, and in the appendix there is a chronological sequence of black and white plates of aged mandibles to show the diagnostic features as teeth develop.

I think I can safely say that Lowe has achieved his aim, and the 'lot of the hill deer' will be improved as a consequence of this book. It will be of use to land managers and researchers, and anyone with an interest in this majestic creature.

Sarah Taylor



Animal Social Networks

Edited by Jens Krause, Richard James, Daniel W. Franks & Darren P. Croft (2014)

Oxford University Press, Oxford. £75.00 (hbk) £37.50 (pbk)

ISBN 978-0-967904-1 (hbk)

ISBN 978-0-967905-8 (pbk)

Studying animal social networks is not new but the last ten years have seen an explosion in the application of quantitative approaches in the field. Technologies that enable researchers to track the movements of many individuals simultaneously, as well as novel analytical approaches and increased processing power, have transformed the ease with which information

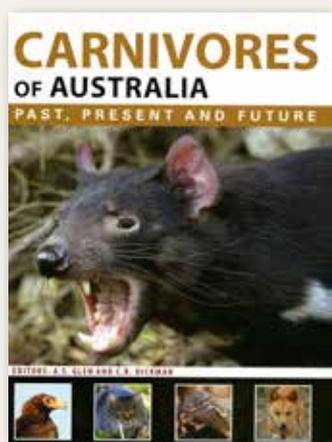
about social networks can be collected and interpreted. This, in turn, has exposed the value of social network analysis in ecology and behaviour. Reviewing the insights gained so far, and considering areas for potential development, provides the material for the new edited volume by Jens Krause and colleagues.

Animal Social Networks is a substantial contribution to the literature on social interactions in animal behaviour. Incorporating 19 chapters from 34 authors, the book is arranged in 3 slightly unbalanced sections. The first includes only a very brief introduction, and an impressively succinct primer on the vocabulary of network analyses. This, alone however, is a handy guide for the budding network analyst. The second, rather weightier section covers patterns and processes in animal social networks, and gives a great insight into the range of behavioural and ecological processes that can benefit from network analyses. Contributions include more methodological approaches (such as Bayesian approaches to quantifying diffusion through networks, and ways to measure temporal change in networks), treatments of fundamental scientific questions (such as the role of networks in the evolution of cooperation, and how personality research can be integrated with network analysis), and chapters with a more applied focus (for instance, disease transmission or animal welfare). The third section is a 'taxonomic overview' and has chapters for various taxa within which social networks have been studied extensively.

I was initially disappointed not to see more on the nuts and bolts of conducting network analyses – but that, I gather, was covered in an earlier book by some members of this group (Croft *et al.* 2008. *Exploring Animal Social*

Networks. Princeton University Press). Those looking to ease themselves in to conducting network analyses might do better to start with that book. However, anyone working on network analyses should certainly read the newer book also, in order to get an overview of the cutting edge of the field. In addition, there's a strong argument that behavioural ecologists who don't tend to consider networks should also read this book. It would, undoubtedly, add a new dimension to the way that animal behaviour is viewed – and would almost certainly lead to new research directions within familiar systems.

Phil Stephens



Carnivores of Australia: Past, Present and Future

Edited by Alistair S. Glen & Chris R. Dickman (2014) CSIRO Publishing, Collingwood, VIC, Australia. £65.50 (hbk)

ISBN 978-0-64310310-8

Australia is one of the 17 (out of the world's nearly 200) countries that together hold approximately two-thirds of its biodiversity. Even within that set of 'megadiverse' countries, Australia is unique in many ways: it is the only country to occupy an entire continent; the diversity and make up of its now extinct megafauna was extraordinary; it currently contains a wealth of endemic species and higher taxa; but it is also host to an array of

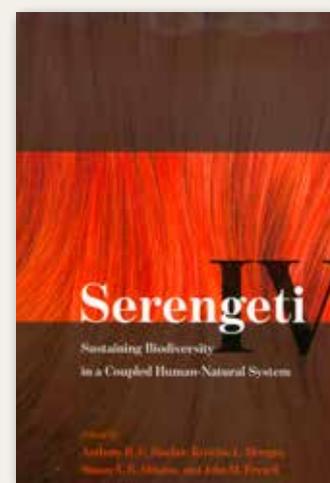
non-native invasives that have devastating impacts on native biodiversity. Some of the most striking examples of both the extinct megafauna and the alien invasives are predators. As Glen & Dickman remind us in the introductory chapter of their new book, the importance of predators for shaping the biota around them, and for ecosystem function more generally, is increasingly recognised. It is that recognition that has driven the production of their new edited volume, on *Carnivores of Australia*.

Following a treatment of the importance of predators for Australian ecology, initial chapters cover the historical predatory biota and the impacts of past introductions of predators. Focus then moves to monitoring and managing existing predators, as well as more purely ecological questions. Rather than a focus on the Carnivora, this is a book covering all major predators of vertebrate prey. This is a pleasing focus, because the roles and impacts of reptilian and avian predators are often overlooked relative to those of their mammalian equivalents. In that respect, I found particularly intriguing the chapter on 'reptilian predators: the forgotten majority', by Sutherland and Bryant. In it, they remind us that, although reptilian predators have relatively low mass-specific energy demands, their impacts on prey can be substantial, simply because they can be orders of magnitude more abundant than mammalian predators.

Overall, the book is a major undertaking and the editors are to be congratulated for assembling a strong set of contributors, including individuals whose research often reaches different conclusions about some of the more contentious issues in Australian biodiversity management. The material is largely review-

based, but collecting it in a single volume will represent an important resource for those interested in Australian ecology and management. Above all, there is much in the book that reminds us of the unique and precarious nature of Australia's biodiversity – a sobering thought in light of the apparent indifference to natural heritage of Australia's current administration.

Phil Stephens



Serengeti IV: Sustaining Biodiversity in a Coupled Human-Natural System

Edited by Anthony R.E. Sinclair, Kristine L. Metzger, Simon A. R. Mduma and John M. Fryxell (2015) The University of Chicago Press \$150 (hbk) and \$65 (pbk)

ISBN: 978-0-226-19583-4 (hbk)

ISBN: 978-0-226-19616-9 (pbk)

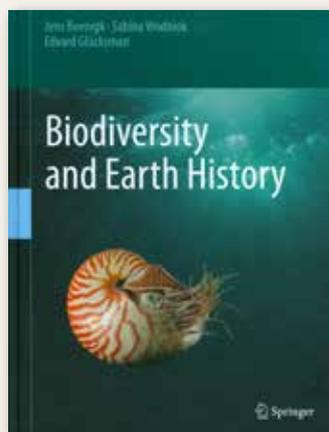
ISBN: 978-0-226-19633-6 (ebook)

One hopes few would disagree with the idea that long-term ecological research is an important, nay crucial, requirement if we are to understand what is happening in the natural world and how we can help shape self-sustaining natural ecosystems. Unfortunately the attention span of funding bodies rarely supports research of the necessary time scale, and to maintain research in the same area for decades requires

extraordinary dedication to maintain funding, develop the infrastructure and pursue effective capacity-building. No doubt Tony Sinclair would demand that his many colleagues and associates share the credit for many years of research in the Serengeti, but the work he has pursued since first visiting the Serengeti as an undergraduate in 1965 is monumental. If you want a short and anecdote-filled account read Tony's hugely entertaining *Serengeti Story* (Oxford University Press 2012), if you want a more detailed account of the development of scientific understanding read *Serengeti IV* and its three predecessors. The first in what has become a series was *Serengeti: Dynamics of an Ecosystem* which came out in 1979 and reflects the ecological themes of the times and allows itself a degree of optimism. The Preface begins 'The Serengeti is by good fortune one of the few areas that has not suffered the ravages of modern man.' While the presence of local people is not ignored, the index entry 'human settlement' lists just two single page references. Fast forward to 2015 and the entries under 'humans' in *Serengeti IV* run to a full page of the index, and the first line of the Preface is now 'The future of the Serengeti as a self-sustaining natural ecosystem has come into question as a result of political, economic, and social pressures developing in Tanzania in the late 2000s.' This thumping great book of over 800 pages is organised into sections covering Natural sources of Heterogeneity and Disturbance, Response of Biodiversity to Disturbance, the Human Ecosystem and its Response to Disturbance, Coupled Human-Natural Interactions, Consequences of Disturbance for Policy, Management, and Conservation; the final section is two chapters of Synthesis. 91 authors are involved in this volume, but it has a degree of internal

coherence and consistency that belies the number of contributors; encouragingly a quarter of the authors are Tanzanians and Kenyans. Only Tony Sinclair appears in both the 1979 and 2015 books, but sadly the books have another factor in common; both conclude that the money is running out and monitoring is about to come to an end. Can it really be the case that nobody has the imagination to continue funding this vital work, which has produced such excellent scientific outputs? I confess to unalloyed admiration for the scientists who have produced this fund of knowledge and great respect to The University of Chicago Press for their steadfast support for the resulting books. Available from internet booksellers for £40 or less the book is a bargain.

Alan Crowden



Biodiversity and Earth History

Jens Boenigk, Sabina Wodniok, and Edvard Glucksman (2015) Springer, Heidelberg. £53.99 (hbk), £42.99 (ebook)

ISBN 978-3-662-46393-2 ((hbk)

ISBN 978-3-662-46394-9 (ebook)

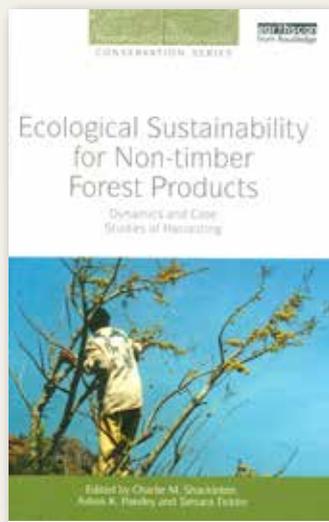
It is a rare event for a book review to begin with words like innovative and original, but they are appropriate for this unusual and exceptional textbook. It is essentially a book about biogeography, but its content, order, and presentation are

quite different from any other in this field. Its emphasis, as the title implies, is the evolution of biodiversity during the course of Earth history and it begins with a thorough documentation of the geological and chemical development of the planet. Plate tectonics, continental drift, rock-forming processes, erosion, and biogeochemical cycling are outlined, followed by a very detailed account of the succession of geological eons, eras, and periods. Within each of these, the fossil record and its implications for biological evolution is considered alongside the atmospheric and climatic conditions prevailing at the time. This brings the reader right up to the present day, including the evolution and social development of humans. The second major section of the book covers current patterns of biodiversity and their causes. Of necessity this includes a discussion of the species concept, diversity indices, and the contribution of molecular studies to the development of both of these topics.

The traditional subjects of biodiversity hotspots, the niche concept, speciation mechanisms, islands, and latitudinal gradients of diversity are covered here. Global climatic systems and the classification of biomes are illustrated, including, I am pleased to say, the use of Walter climate diagrams, which remain the most informative and biologically relevant means of presenting climate summaries. So far, so good, but then comes an unexpected and highly detailed summary of the taxonomic organisation of the living world. Undoubtedly this is entirely relevant to the objective of presenting a picture of biodiversity, but never has it been attempted previously in conjunction with more traditional biogeographic coverage. What is even more remarkable, and fully justified, is the emphasis on what we might rather patronisingly call 'lower'

organisms. Of the 112 pages in this section of the book, just 4 pages are devoted to vertebrates. And this is precisely what they deserve! Perhaps it is even a little generous. Students encountering this section of the book will undoubtedly be shocked to find that their vertebrate kin, who often dominate their thinking about the living world, actually represent such a small section of Earth's diversity. One must ask whether this detailed survey of biological systematics is relevant to the study of biodiversity. I think it is an important component of the subject, but sadly there are very few studies available that document any biogeographic patterns of unicellular organisms, or indeed the contribution of these microscopic creatures to the overall biodiversity of any given ecosystem. Research is still thus needed to provide a satisfactory link between the second and the third sections of the book. A final comment must be made on the overall presentation of material in this volume. The entire arrangement of information follows a spread system in which individual topics (e.g. the Devonian Period, biodiversity gradients, tundra, Ascomycota, etc.) are given their individual spreads with text on the left hand side and a series of excellent colour diagrams and photographs on the right. Not only does this facilitate the assimilation of information, it also permits easy access to the required topic. The publishers deserve congratulations on the very high standards of production that greatly enhance the value of the book. In conclusion, this is a reference textbook that should be available to all students of Earth Sciences, Biology, and Biogeography.

Peter Moore



Ecological Sustainability for Non-timber Forest Products.

Edited by C. M. Shackleton, A.K. Pandey and T. Ticktin (2015) Earthscan from Routledge, London. £85.00 (hbk)

ISBN 978-0-415-72859-1

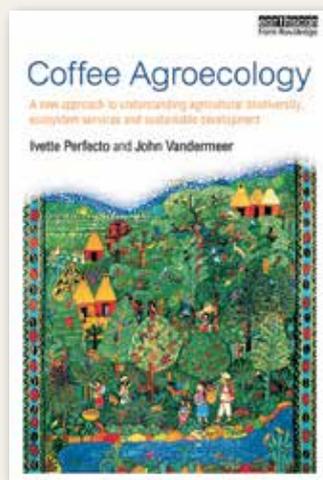
Forests and sustainability are, unsurprisingly, watchwords for survival in the twenty first century and beyond. Both are inextricably linked not only because of carbon cycling and storage but also in terms of the often vital goods derived from forests. The latter include obvious wood and wood products but there are many additional products extracted from forests such as fruits, bark and honey; these are the focus of this edited text in Earthscan's 'People and Plants Conservation Series'. The opening section defines non-timber forest products (NTFPs), their harvesting and how ecological sustainability is measured with specific reference to well-established local ecological knowledge (LEK) and related management. Other chapters focus on the contribution of environmental history to this assessment and to the significance of NTFPs to local livelihoods which underlines the relationship between ecology and community. Each of the nine chapters of Part

II documents a case study; the range presented reflects a broad spectrum of NTFP uses. Some of the NTFPs described are fruits. One example is the palm fruit known as buriti (*Mauritia flexuosa*) from central Brazil which provides juice and contributes to the production of ice cream, sweets, oils, cosmetics, medicines and fodder. Another example is the soapberry (*Sapindus laurifolia Vahl*) fruit from South India; this is used as a substitute for soap/detergent. Others comprise a range of products from an individual species e.g. baobab (*Adansonia digitata L*) leaves, fruits, and bark products from South Africa and Malawi. Three chapters focus on the harvesting of medicinal plants e.g. the leaves, latex and bark of janaguba (*Himatanthus drasticus*) in northeastern Brazil, and bark from a range of medicinal tree species from central India. Four further chapters detail wild honey collection from the Western Ghats of India, small-scale surf clam harvests in northern Chile, cork oak (*Quercus suber L*) bark harvesting in southern Europe (the only example of a NTFP from the developed world), and the collection of golden grass (*Syngonanthus nitens*) stalk from the savanna of Brazil for handicrafts, notably basket weaving.

The three chapters of the final section examine issues and relationships which are vital for sustainable management. Management and governance are prime factors in these production systems and both contribute to the attainment of compatibility between commercialisation and sustainability; as ever such factors remain specific to the task/product and in general it is a question of balance. Finally, it is important to remember that sustainability maintains both the ecology and the commerce; without the appropriate balance in each context, forest, crop and community will be

destroyed or degraded and there are no winners. Each chapter is illustrated with diagrams and black and white photographs; there are useful reference lists. This book is a useful contribution to the conservation and sustainability debate insofar as it draws attention to often neglected or overlooked NTFPs. However, it is surprising that there are no case studies from S.E. Asia. This text is especially relevant to advanced undergraduate and postgraduate courses in agriculture, development and environmental science but it is expensive even for libraries.

A M Mannion



Coffee Agroecology

Ivette Perfecto & John Vandermeer (2015) Earthscan from Routledge, Abingdon.

£90.00 (hbk) £34.99 (pbk)

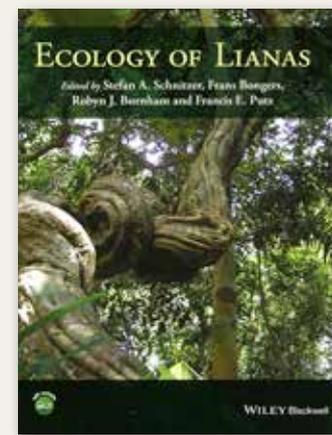
ISBN 978-0-451-82680-8 (hbk)

ISBN 978-0-451-82681-5 (pbk)

Coffee is an extremely valuable crop of global importance yet most is produced on millions of small farms in the Global South, particularly in Brazil. As such it is here that the biggest differences can be made to improve farming with an eye to ecosystem services including biodiversity. This is not a 'how to' manual but a detailed look at the ecological principles behind growing coffee sustainably. This includes consideration of sun coffee (used primarily by

the relatively few large-scale industrial farmers) and shade coffee (much more common on small-scale farms). The authors also look at pests of coffee and how these can be controlled biologically, and how 'good insects' such as pollinators can be encouraged. The last part of the book attempts a synthesis based on ecological principles and modelling. Even if you are not particularly interested in coffee this book makes a nice applied ecological study looking at ecological interactions in producing a product that most of us simply take for granted.

Peter Thomas



Ecology of Lianas

Edited by Stefan A. Schnitzer, Frans Bongers, Robyn J. Burnham & Francis E. Putz (2015) Wiley Blackwell, Chichester. £95.00 (hbk)

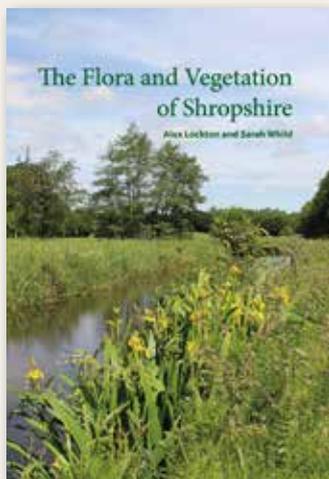
ISBN 978-1-118-39249-2

Over the past three decades there has been increasing interest in these woody vines: they hitch a ride to the top of the tree canopy without growing their own thick stems and are very competitive for light, water and nutrients, and can be aggressive invaders. They are also becoming worryingly abundant in tropical forests.

The editors have selected a range of topics that they consider representative of the most important current research going on around the world. But in reality, this is

as comprehensive a review of what makes lianas tick that you'll find between any two covers. This ranges across liana evolution, anatomy, physiology and biomechanics, through to their interactions with animals (insects to primates) and competition with other plants, and their role in forest succession and biodiversity. You will also find a series of detailed chapters on lianas in eight different tropical locations and one on temperate lianas (mostly in warmer climates than the UK although ivy gets a short mention). To top this off, there is information on carbon storage (they store a small fraction of the carbon of the trees they displace), and the role of lianas in forest management and conservation. Pretty comprehensive. Each chapter starts with an overview and finishes with a 'Conclusions and Future Directions', and the text has been well-edited to give a fairly uniform voice across the 84 contributors. The subject might be a bit of a narrow niche, but it's a very impressive collection of information should you want to know about lianas – just right for top end undergraduates and beyond.

Peter Thomas



The Flora and Vegetation of Shropshire

Alex Lockton & Sarah Whild (2015) Shropshire Botanical Society, Shrewsbury.

£35.00 (hbk)

ISBN 978-0-9530937-2-4

(Available from Sue Townsend – sue.t@field-studies-council.org; £4.95 p&p.)

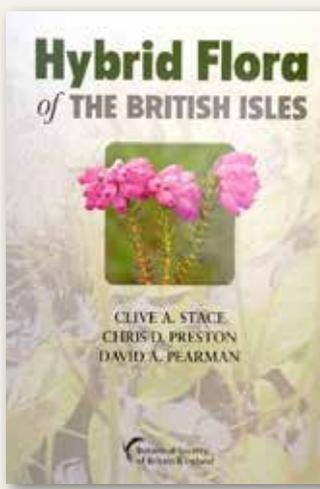
This is the next instalment in a long and illustrious line of county floras, and the fifth produced for Shropshire. The last of these Shropshire floras (Sinker *et al.* 1985) was a blueprint for a useable, helpful local flora; so what's new here? It's not just an update in presence and loss because for the first time it includes bryophytes and stoneworts, and there is a chapter on plant communities (based on the National Vegetation Classification) to be found in the county, and these spill over into the species descriptions and associated habitats – very useful. The other advance is to produce the maps on a monad scale (1 x 1 km squares) rather than the usual tetrads (2 x 2 km) – you'll either love that since it gives a finer grain to the distribution maps or hate it because it makes the maps too 'bitty' and harder to see the patterns in distribution. In my view it adds an extra layer of information and is to be applauded. The traditional chapters on soils and geology have been omitted since they can be found in Sinker *et al.* (1985), which means you'll need both books but it does save space, keeping the cost down. I have a few small gripes: there is an excellent list of good botanical sites in the county but not all seem to be shown on the map inside the front cover and you'll need to resort to Google to see if any are near your holiday-retreat. The distribution maps are a little small to easily see the three shades of symbol, and you have to search to find what the three symbols refer to (it's at the bottom of page 10). But these are very small gripes; overall this is a superbly researched and produced flora that provides a wealth of local information, and gives insight into changes happening to the

flora of this important county.

Peter Thomas

REFERENCE:

Sinker, C.A., Packham, J.R., Trueman, I.C., Oswald, P.H., Perring, F.H. & Prestwood, W.V. (1985) *Ecological Flora of the Shropshire Region*. Shropshire Trust for Nature Conservation, Shrewsbury.



Hybrid Flora of the British Isles

Clive A. Stace, Chris D. Preston & David A. Pearman (2015). Botanical Society of the British and Ireland, Bristol. £45.00 (hbk)

ISBN 978-0-901158-48-2

I can remember as a green postgraduate student being amazed at the lack of decent, comprehensive floras of the places I ended up working, so spoilt was I by the detailed knowledge of the British flora built up over centuries. Even today, it is so easy to take our understanding of our native and introduced flora for granted. We have an accepted, detailed flora by Clive Stace (2010) and excellent distribution maps of our flora produced by Chris Preston *et al.* (2002). Now, we have a third tome of 500 large-size pages to go beside these, listing the hybrid flora of the British Isles, a level of detail unknown anywhere else in the world. The book describes 909 hybrids (from

trees to grasses), 82% of which are thought to have arisen here by hybridization in the wild, and another 17% introduced as hybrids. This is undoubtedly not complete (in fact the authors found another 5 during publication) but it represents a huge advance in our collective knowledge. Each entry contains information on the accepted names, features distinguishing the hybrids from the parents, distribution and habitat, chromosome numbers and information on fertility. Many taxa also have high quality colour maps showing the distribution of the hybrid in relation to the parents. Occasionally books come along that are instant classics; this is one of them.

A good overview of the wealth of information contained in this book can be found in Preston & Pearman (2015)

Peter Thomas

REFERENCES:

Preston, C.D. & Pearman, D.A. (2015) Plant hybrids in the wild: evidence from biological recording. *Biological Journal of the Linnean Society*, 115, 555-572.

Preston, C.D., Pearman, D.A. & Dines, T.D. (2002) *New Atlas of the British and Irish Flora*. Oxford University Press, Oxford.

Stace, C. (2010) *New Flora of the British Isles* (3rd ed.). Cambridge University Press, Cambridge.

ALSO RECEIVED

Conservation Education and Outreach Techniques Second Edition

Susan K. Jacobson, Mallory D. Macduff and Martha C. Munro (2015) Oxford University Press. £75.00 (hbk) £37.50 (pbk)

ISBN: 978-0-19-871668-6 (hbk)

ISBN: 978-0-19-871669-3 (pbk)

The first edition of this book was the second volume to appear in the Techniques in Ecology and Conservation series, and its appearance so early in the publishing cycle was welcome recognition of the importance of conservation education. It is easy to fall into the trap of thinking everyone shares the same values and respect for biodiversity, whereas in practice changing attitudes and behaviour requires careful thought, planning and effort, and still might not succeed. It is good to see that this book, first published in 2006, has attracted sufficient interest to warrant a second edition. It is tempting to suggest that anyone seeking a career in ecology or conservation should have a book like this or at least be offered training in these techniques. Read this or any other issue of the *Bulletin* for examples of the ways in which education and outreach benefits both recipient and donor.

Marine Anthropogenic Litter

Edited by Melanie Bergmann, Lars Gutow and Michael Klages (2015) Springer. £44.99 (hbk)
ISBN: 978-3-319-16509-7

The issue of plastics in the environment has attracted renewed interest in England in recent weeks as legislation requiring shops to charge for the supply of plastic bags comes into effect. An indignant letter to the Times newspaper indicated that the writer felt that the fact that he used his excess plastic bags to wrap other waste which he then sent to landfill exonerated him from any blame for the bags fluttering in local hedgerows, which suggests the whole process has some way to go to achieve comprehensive public understanding of the issues. The Times's correspondent is not going to be reading this book, but in an ideal world the sort of information it provides will trickle down

somehow into the public consciousness. For the time being it sets out the current knowledge base resulting from decades of marine pollution research, covering approaches that range from beach litter surveys through the most modern technologies available for assessing the chemical, biological and microbiological impact of the waste products of human activity on the marine environment.

Community Seed Banks: Origins, Evolution and Prospects

Edited by Ronnie Vernooij, Pitambar Shrestha and Bhuwon Sthapit (2015) Earthscan from Routledge. £90.00 (hbk) £29.99 (pbk)
ISBN: 978-0-415-70805-0 (hbk)
ISBN: 978-0-415-70806-7 (pbk)

Community seed banks have been around for about 30 years and seek to conserve strengthen and improve local seed systems. Part one of this book deals with operational aspects, part 2 provides 35 case studies from around the world. Among the ecological community this book is only really going to appeal to those concerned with the conservation of genetic resources.

Guardians of the Brazilian Amazon Rainforest: Environmental organizations and development

Luiz C. Barbosa (2015) Earthscan from Routledge. £85.00 (hbk).
ISBN: 978-1-138-82582-6

Luiz Barbosa is a Professor in the Department of Sociology at San Francisco State University and in this compact hardback he sets out to examine the contributions of environmental organisations to the preservation of Brazilian Amazonia. The author uses a combination of theoretical tools, statistical information

and historical accounts and narrative. Barbosa recognises in the preface that some will believe that the use of theoretical models in the social sciences is ideological, but argues that they help establish how environmental organisations have become more efficient in deterring perpetrators of environmental destruction by using their knowledge of the system – for instance by finding out how commodity chains work and threatening corporations' profits with boycotts. Worrying to think that force of argument does not enter into it.

Water Ecosystem Services: A Global Perspective

Edited by Julia Martin-Ortega, Robert C. Ferrier, Iain J. Gordon and Shahbaz Khan (2015) Cambridge University Press. £70.00 (hbk)
ISBN: 978-1-107-10037-4

Part of the International Hydrology Series, this large format hardback describes how ecosystem services-based approaches can assist in addressing major global and regional water challenges. The book adopts the sort of multi-disciplinary approach that many advocate but rather fewer pursue, and uses national and regional case studies from around the world.

The Biology of Mangroves and Seagrasses Third Edition

Peter J. Hogarth (2015) Oxford University Press. £75.00 (hbk) £34.99 (pbk)
ISBN: 978-0-19-871654-9 (hbk)
ISBN: 978-0-19-871655 (pbk)

OUP's Biology of Habitats series has over the years built up into a very nice collection of books which assumes no previous knowledge of the subject of each volume, making the books suitable for senior undergraduate and graduate students as textbooks, and ideal for more senior biologists who

have areas where they need to catch up on a field outside their own. This is the third edition of a book first published in 1999 and includes a new chapter on global climate change and significant updating of the further reading and reference list. If you need an accessible and up to date overview of mangroves and seagrasses, this is it.

Advances in Reintroduction Biology of Australian and New Zealand Fauna

Edited by Doug P. Armstrong, Matthew W. Hayward, Dorian Moro and Philip J. Seddon (2015) CSIRO Publishing, Collingwood, VIC, Australia AU \$89.95 (pbk)
ISBN: 978-1-486-30301-4 (pbk)
ISBN: 978-1-486-30303-8 (ebook)

Reintroduction and translocation are potentially useful tools for conservation practitioners, but the science underpinning when, why and how to use such methods to enhance or restore populations is still being developed. Great work is being done in Australia and New Zealand and this fine new book covers a wide range of topics that have to be taken into account when considering conservation translocation. Armstrong and Seddon in a TREE article in 2008 identified 10 key questions in reintroduction biology and this book attempts to address these questions at population, metapopulation and ecosystem levels. Clearly the book centres on Australasian examples, but there is much excellent work described in the book which deserves to be read by all those involved in reintroduction programmes wherever they are based.

DIARY

THE SOCIETY'S MEETINGS

2015

DEC 13-16

2015 British Ecological Society Annual Meeting. EICC, Edinburgh. Details http://www.britishecologicalsociety.org/events/current_future_meetings/2015-annual-meeting/

The Society's Committee Meetings 2015

DEC 13

Council

Other Meetings 2015

NOV 29 - DEC 3

2015 Annual Conference of the Ecological Society of Australia. Adelaide Hilton, South Australia. Website: <https://kaigi.eventsair.com/QuickEventWebsitePortal/esa2015/esa2015>

Other Meetings 2016

JAN 19-21

9th International Conference on Marine Bio-invasions. Sydney, Australia. Website: <http://www.marinebioinvasions.info>

FEB 1-16

MARES Conference on Marine Ecosystem Health and Conservation. Olhao, Portugal. Website: <http://www.maresconference.eu/>

FEB 8-11

2016 Annual Meeting Weed Science Society of America. Puerto Rico. Details from: <http://wssa.net/meeting/2016-meeting/>

FEB 9-12

Species on the Move – Detection, Impacts, Prediction & Adaptation. Hobart, Tasmania. Website: <http://www.speciesonthemove.com/>

FEB 14-19

Second International Whitefly Symposia. Arusha, Tanzania. Website: <http://www.iita.org/iws2016>

FEB 23-26

European Conference of Tropical Ecology. Gottingen, Netherlands. Full details from: <http://www.gtoe-conference.de/>

MAR 2-4

The 3rd Conference on Botany. Beijing, China. Details from: <http://www.engii.org/ws2016/>

MAR 7-8

Tackling emerging fungal threats to animal health, food security and ecosystem resilience. The Royal Society. Website: <https://royalsociety.org/events/2016/03/emerging-fungal-threats/>

MAR 7-10

27th Vertebrate Pest Conference. Newport Beach, California, USA. Website: http://www.vpconference.org/Future_Conferences_-_Events/

MAR 20-24

63rd Annual Meeting of the Ecological Society of Japan. Sendai, Miyagi. Website: <http://www.esj.ne.jp/meeting/63/english.html>

APR 5

2nd Annual Meeting of the Forest Insect Group, Royal Entomological Society. Peterborough, UK. Website: <http://www.royensoc.co.uk/meetings>

APR 10-14

19th International Conference on Aquatic Invasive Species. Winnipeg, Manitoba, Canada. Details from: <http://www.icaais.org/>

APR 26-29

European Networks Conference on Algal and Plant Photosynthesis. Malta. Website: <http://encapp2016.eu/home/>

APR 26-MAY 1

7th International Conference on Fossil Insects, Arthropods and Amber. Edinburgh, UK. Details from: <http://steppe.org/event/7th-intl-conference-on-fossil-insects-arthropods-amber/>

MAY 8-12

The International Society for Ecological Modelling Global Conference 2016. ISEM. Towson, University, MD, USA. Further details: <http://www.isemconference.com/>

JUN 6-7

18th International Conference on Biodiversity. New York, USA. Website: <http://www.waset.org/conference/2016/06/new-york/ICB>

JUN 27-01

9th International Symposium on Phlebotomine Sandflies – ISOPS. Reims, France. Further details from: <http://www.univ-reims.eu/site/event/isops-ix/home>

JUN 13-16

14th International Symposium on Scale Insect Studies, Catania, Italy. Details: <http://www.issis2016.org.spazioweb.it/>

JUN 19-23

Annual Meeting of the Association for Tropical Biology and Conservation. Le Corum, Montpellier, France. Website: <http://www.atbc2016.org/>

JUN 26-30

Plant Biology Europe, EPSO/FESPB 2016. Prague, Czech Republic. Details from: <http://www.europlantbiology2016.org/>

JUL 4-7

The Society of Experimental Biology Annual Meeting. Brighton, UK. Website: <http://www.sebiology.org/meetings/index.php>

JUL 6-8

Society for Conservation Biology – 4th Oceania Conference (OCCB). Brisbane, Australia. Details from: <http://brisbane2016.scoceania.org/>

JUL 24-29

Unifying Ecology Across Scales. Gordon Research Conference, University of New England, Biddeford, Maine, USA. Website: www.grc.org/programs.aspx?id=13261

AUG 7-12

101st Ecological Society of America Annual Meeting. Fort Lauderdale, Florida. Website: <http://esa.org/ftlauderdale/>

AUG 15-19

15th International Peat Congress. Kuching, Sarawak, Malaysia. Website: <http://ipc2016.com>

SEP 1-10

IUCN World Conservation Congress. Hawaii, USA. Details from: <http://www.iucnworldconservationcongress.org/>

SEP 5-8

Ento'16 Annual National Science Meeting. Shropshire, UK. Further details: <http://www.royensoc.co.uk/content/scottish-regional-meeting-12th-november-2015>

SEP 25-30

Entomological Society of America. Orlando, Florida. Website: <http://ice2016orlando.org/>



SEP 25-30

ICE 2016. International Congress of Entomology. Orlando, Florida, USA. Website: <http://ice2016orlando.org/>.

NOV 7-11

World Lake Conference 2016: Lake Ecosystem Health and its Resilience: Diversity and the Risks of Extinction. Bali, Indonesia. Details from:

Training Workshops

NOV 14 – DEC 14

Tropical Biology Association Course 15/3 – Tropical Forest Ecosystems in Madagascar. Details from: http://www.tropical-biology.org/training/courses/future_courses.htm

JAN 18-22

Multivariate Data Analysis for Ecology and Evolution in R. The Institut Català de Paleontologia (Barcelona, Spain). 20% discount for BES members. Details from: <http://www.transmittingscience.org/courses/stats/multi-ecol-evol-in-r/>

22 FEB-4 MAR

Mathematical Models for Infectious Disease Dynamics. Hinxton, Cambridge, UK. Further details from: <https://registration.hinxton.wellcome.ac.uk/Courses.wt>.

The Chartered Institute for Ecology and Environmental Management runs a wide variety of workshops for professional development. For further information and availability see www.cieem.net or e-mail workshops@cieem.net.

The Centre for Research into Ecological and Environmental Modelling runs a variety of workshops on a regular basis. For further information and availability see www.creem.st-and.ac.uk/conferences.php

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'Selfie' taken by a camera mounted on a GPS collar tracking the movements of reindeer in Norway.

Photo credit: NINA, Norwegian Institute for Nature Research.



CONTACT DETAILS

OFFICERS:

President: William Sutherland
(wjs32@cam.ac.uk)

President Elect: Sue Hartley
(Sue.Hartley@York.ac.uk)

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

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(a.s.pullin@bangor.ac.uk)

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(W.D.Gosling@uva.nl)

Grants: Rosie Hails (rha@ceh.ac.uk)

Membership Services: Andrew Pullin
(a.s.pullin@bangor.ac.uk)

EDITORS:

Journal of Ecology: Edited by David Gibson (Executive Editor), Richard Bardgett, Mark Rees and Amy Austin, with Andrea Baier and Lauren Sandhu.

Editorial office: Journal of Ecology, British Ecological Society, Charles Darwin House, 12 Roger Street, London WC1N 2JU.

Email: admin@journalofecology.org

Journal of Animal Ecology: Edited by Ken Wilson (Executive Editor), Ben Sheldon, Jean-Michel Gaillard and Nate Saunders, with Erika Newton and Simon Hoggart.

Editorial office: Journal of Animal Ecology, British Ecological Society, Charles Darwin House, 12 Roger Street, London WC1N 2JU.
Email: admin@journalofanimalecology

Journal of Applied Ecology: Edited by Marc Cadotte (Executive Editor), Mark Whittingham, Jos Barlow, Nathalie Pettorelli and Phil Stephens, with Erika Newton and Alice Plane

Editorial office: Journal of Applied Ecology, British Ecological Society, Charles Darwin House, 12 Roger Street, London WC1N 2JU.
Email: admin@journalofappliedecology

Functional Ecology: Edited by Edited by Charles Fox (Executive Editor), Duncan Irschick, Ken Thompson and Alan Knapp, with Andrea Baier and Jennifer Meyer.

Editorial office: Functional Ecology, British Ecological Society, Charles Darwin House, 12 Roger Street, London WC1N 2JU.

Email: admin@functionalecology.org

Methods in Ecology and Evolution: Edited by Rob Freckleton (Executive Editor), Bob O'Hara and Jana Vamosi, with Andrea Bauer and Chris Grieves (Assistant Editor)

Editorial office: Methods in Ecology and Evolution, British Ecological Society, Charles Darwin House, 12 Roger Street, London WC1N 2JU.

Email: coordinator@methodsinecologyandevolution.org

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

The Bulletin:
Edited by Alan Crowden
Email: Bulletin@BritishEcologicalSociety.org
Book Reviews Editor: Sarah Taylor

ECOLOGICAL REVIEWS:

Series Editor: Phil H. Warren
(p.warren@sheffield.ac.uk)

Editorial Office: Kate Harrison
(Kate@BritishEcologicalSociety.org)

SECRETARIES OF SPECIAL INTEREST GROUPS:

Agricultural Ecology: Barbara Smith
(agricultural@BritishEcologicalSociety.org)

Aquatic Ecology: Guy Woodward and Mel Fletcher
(aquatic@BritishEcologicalSociety.org)

Citizen Science: Helen Roy and Michael Pocock
(citizenscience@ceh.ac.uk)

Climate Change Ecology: Mike Morecroft
(mike.morecroft@naturalengland.org.uk)

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(Quantitative@BritishEcologicalSociety)

Conservation Ecology: Nathalie Pettorelli
(nathalie.pettorelli@ioz.ac.uk)

Ecological Genetics: Paul Ashton
(ashtonp@edgehill.ac.uk)

Forest Ecology: Alan Jones
(forest@BritishEcologicalSociety.org)

Macroecology: Rich Grenyer
(besmacroecol@me.com)

Parasite and Pathogen Ecology and Evolution:
Jo Lello (Lello@cardiff.ac.uk)

Peatland Research: Ian Rotherham
(peatlands@BritishEcologicalSociety.org)

Plant Environmental Physiology: Matt Davey
(Matt.Davey@plantsci.cam.ac.uk)

Plants, Soils, Ecosystems: Franciska de Vries
(franciska.devries@manchester.ac.uk)

Tropical Ecology: Jake Snaddon
(j.l.snaddon@soton.ac.uk)

ADMINISTRATIVE OFFICE:

The British Ecological Society, Charles Darwin House, 12 Roger Street, London WC1N 2JU.
Tel: +44 2027 685 2500. Fax: +44 2027 685 2501.

General email: Info@BritishEcologicalSociety.org
www.BritishEcologicalSociety.org
@BritishEcolSoc, www.facebook.com/BritishEcolSoc

BES STAFF:

Executive Director: Hazel Norman
Email: Hazel@BritishEcologicalSociety.org

Communications Manager: Richard English
Email: Richard@BritishEcologicalSociety.org

Membership Officer: Bill Bewes
Email: Membership@BritishEcologicalSociety.org

Events Manager: Amelia Simpson
Email: Amelia@BritishEcologicalSociety.org

Grants and Events Officer: Amy Everard
Email: Amy@BritishEcologicalSociety.org

Membership and Support Assistant: Georgina Laing
Georgina@BritishEcologicalSociety.org

External Affairs Manager: Karen Devine
Email: Karen@BritishEcologicalSociety.org

Policy Manager: Jackie Caine
Email: Jackie@BritishEcologicalSociety.org

Policy Officer: Ben Connor
Email: Ben@BritishEcologicalSociety.org

Education Officer: Samina Zaman
Email: Samina@BritishEcologicalSociety.org

Public Engagement Officer: Jessica Bays
Email: Jessica@BritishEcologicalSociety.org

Head of Publications: Catherine Hill
Email: Catherine@BritishEcologicalSociety.org

Senior Managing Editor: Emilie Aime
Email: Emilie@BritishEcologicalSociety.org
(Andrea Baier is currently on maternity leave)

Managing Editor: Erika Newton
Email: Erika@BritishEcologicalSociety.org

Assistant Editor, Journal of Animal Ecology:
Simon Hoggart
Email: Simon@BritishEcologicalSociety.org

Assistant Editor, Functional Ecology: Jennifer Meyer
Email: Jennifer@BritishEcologicalSociety.org

Assistant Editor, Methods in Ecology and Evolution: Chris Grieves
Email: Chris@BritishEcologicalSociety.org

Assistant Editor, Journal of Ecology: Lauren Sandhu
Email: Lauren@BritishEcologicalSociety.org

Assistant Editor, Journal of Applied Ecology:
Alice Plane
Email: Alice@BritishEcologicalSociety.org

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

Press Contact: Becky Allen
Tel: 01223 570016
Email: Press@BritishEcologicalSociety.org



Derek Ratcliffe (1929-2005) was an outstanding natural historian and field biologist who applied his knowledge and expertise to the field of nature conservation throughout his life. He left a legacy of book publications, including the two volume *Nature Conservation Review* (1977), New Naturalist volumes on *Lakeland* and *Galloway and the Borders*, and bird monographs in the Poyser book series. Derek Ratcliffe was heavily involved in opposing the commercial afforestation of the Flow Country and was instrumental in encouraging the decision to give nearly half of the Flow Country SSSI status.

Internationally, Ratcliffe is probably best known for his work on eggshell thinning in the Peregrine Falcon associated with the use of organochlorine pesticides, a discovery that led to the ban on these chemicals and the subsequent recovery in Peregrine numbers. His 1980 book *The Peregrine Falcon* is a model for making science accessible to a wider readership.

A book marking the life and legacy of Derek Ratcliffe, *Nature's Conscience*, was published earlier this year. An extended review by Paul Adam appears on p00 of this issue.

In our picture Derek is examining a peregrine nest with three eggs, at an easily accessible site in Galloway, 2003. Photograph by Chris Rollie.

