The Bulletin

YOUR MAGAZINE FROM THE BRITISH ECOLOGICAL SOCIETY

British Ecological Society

*in*FOCUS

Photo: Nicola Jenner

Yearling blackbacked jackal (Canis mesomelas) watches as its faecal sample is collected for genetic analysis. Image taken as dusk on Namibia's desert coast.

Contents March 2014

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

Associate Editor: Emma Sayer
Department of Environment, Earth and Ecosystems, The Open University, Walton Hall, Milton Keynes MK7 6AA
Email: emma.sayer@open.ac.uk

Book Reviews Editor: Peter Thomas
School of Life Sciences, Huxley Building, Keele University, Keele, Staffordshire ST5 5B
Tel: 01782 733497
Email: p.a.thomas@biol.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 Peter Thomas.

Cover: Black-browed albatross (Thalassarche melanophrys) in the winning entry for the BES Photo Competition 2013. The photograph is by Zoe Davies of the University of Kent. For more information see p36.

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

REGULARS

FEATURES

WELCOME

Ecology makes a splash

Not so long ago water supplies in parts of the UK were at worryingly low levels. In early 2014 western and southern parts of the UK are suffering flood levels rarely encountered before. The arguments about who's at fault and what needs to be done have already started. I do hope a few policymakers kept their copy of the BES Ecological Issues publication 'The Impact of Extreme Events on Freshwater Ecosystems'. Iwan Jones and his co-authors pointed out that extreme weather events are occurring with greater frequency and intensity and advocated the ecosystem approach as a key principle of sustainable management. When the waters recede no doubt the first response will be to dredge rivers and build flood barriers, since politicians must be seen to be doing something, but let's hope science can be allowed to guide the longer-term mitigation efforts.

The challenge of injecting science into policy affects BES members everywhere. Richard Hobbs has a state government that pursues an evidence-free policy for discouraging sharks from Western Australian beaches (p50) and John Wiens gives a couple of examples of how successful conservation efforts in the USA have had unexpected consequences (p53).

In his President's Piece (p5) Bill Sutherland emphasizes the need for collaborations of all sorts to meet the challenges for ecology and conservation in the modern world. You'll see evidence that this is happening in this issue. There's a strong thread of articles on the theme of agricultural ecology (p13, 24, 26) that show how ecologists can contribute to the multi-disciplinary teams needed to get the right balance of productivity and sustainability for feeding a growing population. Good legislative frameworks are essential and in this issue we have the fourth in our annual scans of forthcoming legislation of relevance to ecologists (p32). Katherine Maltby reports on the progress of an example of Europe-wide legislation: the Marine Strategy Framework Directive (p11).

With all this urging for collaborative and multi-disciplinary work, does it make sense for the BES to be supporting a set of 'Special Interest' Groups? Isn't that the antithesis of what is needed? In practice, SIGs are providing an exciting way of developing interactions within the membership. SIG events are open to all; young and old, student and professor, practitioner and academic. It is possible to belong to a SIG without being a BES member (though of course the poor saps that do not belong are depriving themselves of their own copy of the *Bulletin*) and the meetings are small, informal and friendly, ideal for networking. There are increasing numbers of meetings organised jointly between two or more Groups, and offering opportunities for newer members to present their work or learn new skills. Events manager Amelia Simpson has prepared a summary of the events already set for this year (p15) and look through the SIG news (p16 onwards) and you'll learn of a plethora of talk-based events, workshops, field trips and training sessions. To give a flavour of the range on offer there are reports on forest restoration (p24), rethinking agriculture (p26), deciding whether to pursue PhD research (p38) and applying for grants and fellowships (p40).

There is no rant from Markus Eichhorn (or anyone else) this time, but there are ripples still from past issues raised. Jonathan Mitchley refuses to let botany die (p42) and Ian Rotherham reflects on the issues of wilding (p47). Markus claims no monopoly on authorship of the Rant column (though, like one of the Vogons from The Hitchhiker's Guide to the Galaxy, he is rather fond of shouting) so if others have a topic they want to get off their chest do please try your ideas out on us at Bulletin@BritishEcologicalSociety.org.

Claire Wansbury and Rupert Haines address the need for ecologists to find the right language to use when speaking with non-ecologists. When dealing with policy makers or academics from other disciplines it is easy to assume (wrongly) that our jargon means as much to them as it does to us (p44). Haseeb Irfanulla writes from Bangladesh on the contrasting approaches of the 'academic' and 'practitioner' and the difficulties in moving between the two communities (p45). Haseeb has the particular perspective of an ecologist working in development, but I'm thinking there's a similar gulf in, say, UK freshwater biology, where an ecologist based in a university will usually speak about issues in relation to previous knowledge and the published literature, while a Environment Agency ecologist will constantly refer to the Water Framework Directive. We want BES members in both camps.

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 3700, 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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PRESIDENT'S PIECE

The Symbiotic Society

William J Sutherland / President of the British Ecological Society
@Bill_Sutherland

As ecologists we concentrate upon predation, parasitism and competition. Mutualism has attracted less interest, partly because it is less conspicuous but also because the simple theoretical models, such as the Lotka-Volterra equations, give peculiar results. We need to thrive within this challenging and fast changing world and ensure we are neither swallowed up by the various predatory forces nor squeezed aside by competition; I believe collaboration at a range of scales is important and likely to play an increasing role.

Last year's annual meeting was combined with Intecol –we took responsibility for bringing together the global community. Although it has raised a few eyebrows, this year's meeting will be held in Lille in northern France. It is not just for the architecture (the Austrian cannonballs still embedded in the façade of the architecture Grand Place show life there has not always been entirely collaborative) or the famous Christmas market, but because our equivalent in France, the Société Française d'Ecologie, have invited us to collaborate on a joint meeting. We are taking this opportunity to share experiences.

Last year we were part of a group buying the building adjacent to Charles Darwin House. In addition to being a sound financial investment the new space will enable us to hold more workshops and larger meetings. We can also expand the number of biology-centric organisations based at CDH and so enhance our collective strength. We currently have five organisations present: The Biochemical Society, Society of Biology, British Ecological Society, Society of Experimental Biology and the Society for General Microbiology (with BS, SoB, BES, SEB and SGM in one building I think we should insist any new participants do not have a B or S in their initials). This gives us greater combined strength and it impresses politicians and others visiting the building. More importantly, it allows us to collaborate by sharing facilities and, especially, by sharing expertise over the innumerable issues involved in running biological societies.

Last autumn I gave a plenary lecture at the Ecological Society of Germany, Austria and Switzerland. As well as their President, Volkmar Wolters, other participants included Hiroyuki Matsuda, the President of the Ecological Society of Japan, and David Inouye, the President-Elect of the Ecological Society of America. We decided that for most areas that concern us we do not really compete – membership, education, policy, meetings etc. Perhaps the main area where we do compete is over journals so we will probably rarely discuss this. The four of us decided to set up an Ecological Societies Forum of the various national ecological societies. The plan is for presidents and chief executives to have the option of meeting together whenever there happens to be at least four societies represented. We will welcome all societies to a meeting at Lille to share experiences. Please get in touch with any of us if you represent a society which has not yet been invited.

We are looking more towards collaborative projects. Increasingly it seems that the standard academic model of having a trickle of PhD studentships and the occasional research council grant providing a postdoc and some expenses is being replaced by larger collaborative programmes with ambitious aims. We need to find more ways of establishing collaboration and reaching out to other communities.

The Natural Environmental Research Council is changing some of its funding streams. It has moved away from the Theme Leader approach and instead has a Strategic Programme Advisory Group (SPAG) to identify the environmentally relevant challenges facing society and to "fund strategic research that helps business, government and society to benefit from natural resources and ecosystem services, build resilience to environmental hazards and manage environmental change". They plan to fund Strategic Research Programmes (large and complex strategic research activities) and Strategic Highlight Topics (a new more agile process to support medium-scale strategic research activities in specific priority areas). To benefit UK ecologists and the subject of ecology the BES is about to run (at the time of writing) a one day workshop at Charles Darwin House to generate ideas for possible submission to the SPAG.

The Festival of Ecology showed how we could work with other organisations to mutual gain and we have decided to increase some of this activity into the future.

Ecology has shifted in recent decades so that symbiosis is accepted as a key component of ecology especially following the remarkable discoveries of mycorrhizal networks, with hyphae connecting individual plants, sometimes of different species, and exchanging water, carbon, and nutrients. Similarly our increasing provision of networks exchanging ideas and lessons learnt will surely increase our capacity to survive and flourish.

SOCIETY NEWS

100 INFLUENTIAL PAPERS BRITISH ECOLOGICAL CENTENARY 1913 – 2013

In early 2012, the working group planning our Centenary asked Peter Grubb and John Whittaker to prepare the scientific content of a booklet bringing together a selection of the most influential papers published in our journals. We are incredibly proud to announce this unique book is now available online: www.BritishEcologicalSociety.org/100papers

113 respected ecologists around the world were invited to suggest papers that they thought should be included. Peter and John used a mixture of criteria (including numbers of citations) when reviewing the suggestions submitted, and when selecting papers in fields and periods that had attracted few suggestions. The selected papers represent a great spread over the ten decades, with an average of six per decade in the first 50 years and 13 per decade in the last 50 years. We encourage you to log in and leave comments on each section – as well as suggestions for our next anniversary book!

THE 2013 MEMBERSHIP COMPETITION WINNERS

We are delighted to announce the winners of the 2013 membership competition.

As part of the Centenary year efforts to increase the membership of the Society, we offered a glittering prize to encourage existing members to recommend the Society to their colleagues and friends. Over 350 members qualified for the draw.

The winning names have now been drawn: existing member Dr Nick Isaac and his colleague and new BES member Miss S Mason, who are both at the Centre for Ecology and Hydrology in Wallingford. Our congratulations to both members who have won free BES membership for life!

Finally we'd like to say a big thank you to all members who took part in the competition and helped us reach our target of 4500 members.

Bill Bewes, Membership Officer

JOIN OUR BES REVIEW COLLEGE

The aim of our Review College is to build a community of individuals who have knowledge, experience, and expertise within ecology and utilise their skills by being involved in the assessment stages of BES grant applications.

We call upon members of the Review College to read, comment and score applications according to their remit of expertise and ultimately aid the Grants Committee's decision of which applications are awarded funding.

Peer review is an extremely important process; it not only influences which projects and individuals receive funding impacting on their individual research career, but also the ecological community as a whole.

Being a member of our Review College will provide you with experience of reviewing grant applications, which looks great on your CV and our reviewers are likely to have their profile raised via our website, the *Bulletin* and at our Annual Meeting.

For more information on how to join the Review College please visit our website:www.BritishEcologicalSociety.org/grants-awards/bes-review-college/

CONSIDERING THE FUTURE OF CONSERVATION

BES and DICE Joint Symposium
25 – 27 June 2014
University of Kent,
Canterbury, Kent

Conference organiser:
Dr. Zoe Davies, Senior Lecturer in Biodiversity Conservation

We are pleased to announce our joint Annual Symposium with DICE (Durrell Institute of Conservation and Ecology).

This conference will bring together applied natural and social scientists, from both academic and NGO sectors, who are interested in high quality research that supports conservation policy/management decision making.

Our meeting will be symposium-style held over two and a half days, featuring world class plenary speakers and sessions grouped by key conservation themes. Our plenary speakers are inspirational individuals who will present their thoughts on the future of conservation.

Present Confirmed Speakers:

Peter Kareiva
EJ Milner-Gulland
Luigi Boitani
Dan Brockington
Andrew Balmford
James Watson

There will be the usual high quality science, stimulating exchanges of ideas and friendly networking opportunities that you have come to expect from our events – as well as some innovative surprises

Booking will open at the beginning of March.

www.BritishEcologicalSociety.org/AS14

ECOLOGY EDUCATION AND CAREERS

Making Ecology for All: Equality & Diversity in Ecological Education and Careers

Christina Ravinet / BES Education Intern
@C_Ravinet

Now that the 100th year of the BES has drawn to a close, it is only natural to look ahead to what the next 100 years and beyond may hold for the Society. Last year saw a host of centenary activities being held in deserved celebration of excellent ecological science but now comes the time to pay greater attention to who the science is coming from; the diversity of science taking place needs to be reflected in the diversity of the scientists themselves.

Whilst there is no doubt that exceptional science occurs within the field of ecology, concerns have been raised over the accessibility of ecology for particular groups of people. Until recently, these concerns have mostly come from anecdotes with data specific to ecology largely absent. To better address any issues, the BES launched a project in October last year to investigate equality and diversity in ecological education and career pathways. An overwhelming response to a specially designed diversity survey has allowed the BES to develop recommendations for inclusiveness based on data rather than anecdotes.

Although open to the wider ecological community, the majority of survey responses came from the BES membership. The results of the diversity survey (see facing page), combined with membership data and information from the INTECOL survey, suggest that the current make-up of ecologists and ecological students is largely homogeneous.

Following the collection of data, a focus group was held to pull-apart the information and consider further who faces barriers and why. Members of the focus group, representing a range of perspectives, worked together to prioritise the issues that are of greatest concern and relevant to ecology and the BES. Although it is often gender imbalance that receives the most attention from existing diversity initiatives, it was socio-economic status (SES) and ethnicity that were identified as the areas in which the most troubling problems lie.

Qualitative information suggests that children of a low SES and/or an ethnic minority group face barriers to accessing ecology in the first place, possibly due to a lack of exposure and a resulting misunderstanding of what it is and what it can offer. From very early on, potential talent is being lost. Further down the line, barriers will often continue to persist for those who overcame earlier ones. Now becoming increasingly common is the need for experience, which is often only possible to achieve through an unpaid placement or internship. People of a low SES, who are unable to support themselves financially, will immediately be at a disadvantage and more likely to be lost to ecology.

A number of recommendations have been formulated and developed in response to the findings of this investigation. Socio-economic status and ethnicity are the main focuses of these proposals, which are currently under consideration by the BES Council. Of course, the BES remains very much aware of the other diversity issues that exist and is committed to ensuring that these also receive attention. However, only by prioritising diversity issues will it be possible to make a positive impact.

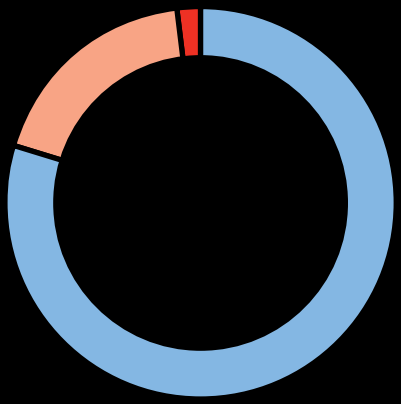
For ecology to advance and count over the next 100 years and beyond, there needs to be an abundance of ecologists with a variety of talents and viewpoints. This will be realised only by ensuring that ecology becomes more accessible and, ultimately, for all.

591

people responded to the survey

471

were members



109

were non-members

10

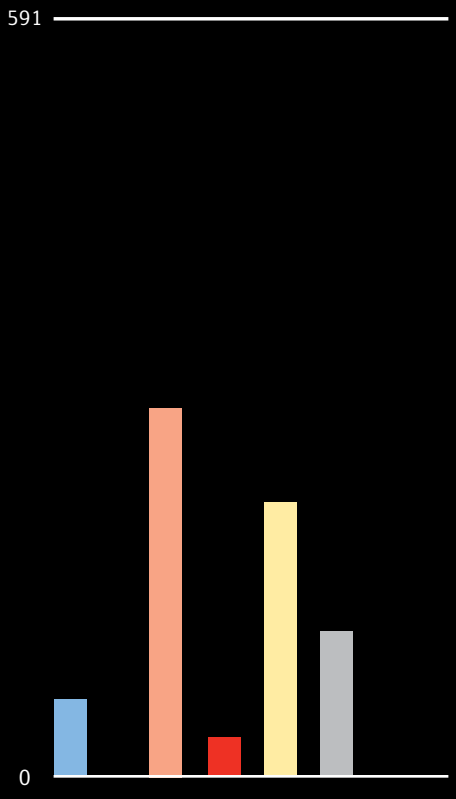
did not specify

9.4%

Black and Minority Ethnic groups made up 9.4% of respondents.

0%

There were no respondents in the category Black or Black British – Caribbean.



56.4%

of the respondents were women

5%

of respondents declared that they had a disability.

36.2%

attended university and were the first person in their family to do so.

18.9%

of respondents attended an independent secondary school

THERE IS IMBALANCE IN GENDER REPRESENTATION OF BES MEMBERS IN THE FAVOUR OF MEN.

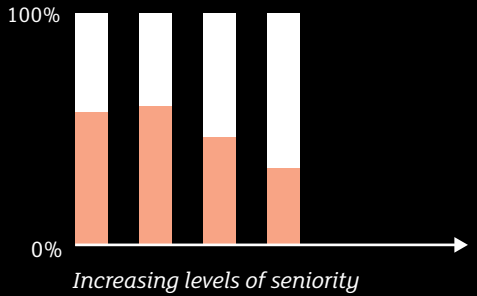
39.9%

Women

60.1%

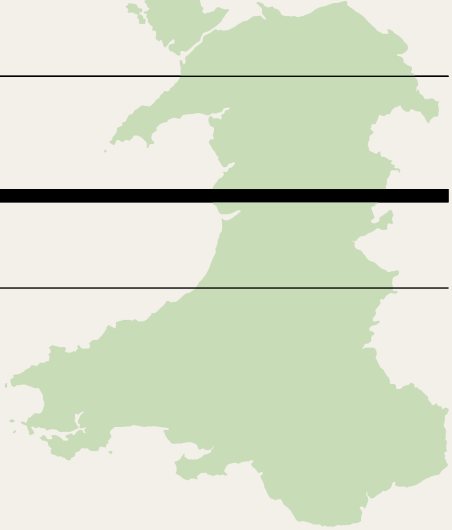
Men

UNDERREPRESENTATION OF FEMALE MEMBERS INCREASES IN MORE SENIOR EMPLOYMENT TYPES.



SCIENCE POLICY

Wales Policy Group: an invitation to members



Tim Graham / Yorkshire Wildlife Trust
tim.graham@ywt.org.uk

A central tenet of the BES mission of advancing ecology and making it count is to make science available to help inform those involved in the formation of evidence-based policy.

While the Policy staff in the BES office work hard to open channels to politicians and the public, the membership represents a repository of knowledge and expertise that can make a huge difference to efforts to inform policy on everything from climate change issues to funding for ecological research. The engagement of BES members in events and consultations across the UK has been hugely beneficial.

Engaging with environmental policy in the Devolved Administrations has presented challenges as well as opportunities. Areas of legislation that are directly relevant to the interests of the Society, such as biodiversity policy, have now been devolved from Westminster to the Scottish, Welsh and Northern Irish administrations. The formation of networks or 'BES Policy Groups' local to the Devolved Administrations can have the dual benefit of helping scientists engage with policy, which in turn helps the BES Policy Team to deliver the Society's business plan. Scotland provides an excellent model, as the establishment of a Scottish Policy Group (SPG) is now enabling the Society to engage more actively with the Scottish Parliament and policy makers.

The experience of the Scottish Policy Group is that communication with local policy makers is less complex and more direct than dealing with Westminster, and that – as mentioned in the recent report on the SPG's visit to Holyrood (see the December *Bulletin*) – policy events can be simpler to arrange. This makes it easier for the Society's members to engage directly with policy makers and to see how their research, and ecological research in general, can be used to contribute to the policy-making process.

The success and accumulated experience of the Scottish Policy Group so far suggests that a similar group for Wales is a logical step and we now invite BES members to join us in the venture. Interested members are invited to contact Kathryn Monk at Natural Resources Wales in the first instance (contact details below).

The overall aim of forming networks of members in Scotland and Wales engaged in policy in these countries is:

To improve the capacity of the BES and its members to respond in an appropriate and timely manner to policy developments within Scotland and Wales, thereby ameliorating the risk, (identified by the Public and Policy Committee), that the Society may be insufficiently informed about and engaged with such developments.

- To improve the awareness of the Policy Team regarding policy developments in Scotland and Wales.
- To improve the Policy Team's ability to respond to policy developments outside England.
- To assist policy-makers through the provision of appropriate, timely and evidence-based advice.
- To develop capacity amongst members in Scotland and Wales to respond to policy developments.

NEXT STEPS TOWARDS A WALES POLICY GROUP

The first step towards a group in Wales is to get the members who are interested connected together. Some members and relevant staff from Natural Resources Wales have already been in touch, but we urge all interested members to get involved.

The legislative horizon scan in this issue (p35) offers insight into what imminent activities there may be for a policy group, and no doubt members in Wales will also have their own ideas to bring to the group. Events to examine how devolution has impacted conservation strategy and delivery have been suggested, and the BES Policy Team and Special Interest Groups could help facilitate or organize events with the group that could include:

a) Facilitating BES responses to relevant consultations;

b) Meetings and workshops bringing together scientists, policy-makers and others to consider regionally-relevant issues of mutual concern;

c) Receptions for politicians and policy-makers;

d) The production of briefing notes;

e) Policy Training Workshops for members based in Wales.

CONTACTS:

To express interest in the proposed Wales Policy Group please contact: Kathryn Monk. Kathryn is Science Strategy Manager for Natural Resources Wales, and is one of the authors of the 2014 Legislation scan published in this issue.
kathryn.monk@naturalresourceswales.gov.uk

For more general enquiries about BES Policy matters, contact Cheryl Pilbeam, Acting BES Policy Manager, based at Charles Darwin House
Cheryl@britishecologicalsociety.org

Those interest in the existing Scottish Policy Group contact Rob Brooker, Plant Ecologist at the James Hutton Institute, and also Chair of the Science and Technical Group of the Scottish Biodiversity Forum.
rob.brooker@hutton.ac.uk

Tim Graham runs the Conservation Ecology SIG and is Programme Manager for Humberhead Levels NIA at Yorkshire Wildlife Trust,
tim.graham@ywt.org.uk or conservation@britishecologicalsociety.org

Will 2014 be a step towards healthy seas?

Katherine Maltby / Policy and Education Assistant
Katherine@BritishEcologicalSociety.org / @BESPolicy / @BES_Careers

2008
Adoption of Marine Strategy Framework Directive (MSFD)

2010
MSFD transposed into UK Marine Strategy

2012
UK Initial Assessment & targets and indicators determined.

2014
Monitoring programmes established

2015/16
Programme of measures developed and implemented

2020
All EU seas achieved GES

Fig. 1: MSFD timeline and key objectives.

2014 is an important year for the EU marine environment; reforms of the Common Fisheries Policy have already been put into effect and by July all member states must have put in place a monitoring scheme as part of the Marine Strategy Framework Directive. So how is the UK doing in meeting this July deadline?

As the world's largest maritime territory, the EU marine environment provides a bounty of ecological resources that make important economic and social contributions to both member and non-member states. However, the impact of human activities is degrading and damaging marine biodiversity and ecosystems and in the process impacting the resources that we are all reliant upon. In order to address these problems, the Marine Strategy Framework Directive (MSFD) was adopted in 2008 to ensure that EU marine systems are maintained, or restored, to healthy and sustaining ecosystems. 2014 marks a significant year in the Directive's timeline as it requires all member states to have established a monitoring programme that will track progress towards the directive's overall objective of 'Good Environmental Status' (GES) by 2020 (Fig. 1).

BOX 1: WHAT DOES GOOD ENVIRONMENTAL STATUS ACTUALLY MEAN?

GES, as stated by the MSFD (2008) is: "The environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive".

This includes recognising that ecosystems, including their chemical, physical and hydro- morphological features are fully functioning and resilient, biodiversity is protected, pollution is prevented and noise is limited.

11 descriptors are laid out to help describe what GES should 'look like'. These include biodiversity, marine litter, eutrophication and non-indigenous species.

At a UK level, GES and the underpinning 11 descriptors have been adapted to identify what GES should mean for UK seas. This has involved work with Cefas, JNCC and the UK Marine Monitoring and Assessment Strategy agency, as well as many others. More information on this can be found in the UK Marine Strategy's Initial Assessment.

BOX 2: THE UK MARINE STRATEGY PART ONE.

The first part of the marine strategy covered three main areas, with the outputs reported in the document 'UK Initial Assessment and Good Environmental Status'. The report included:

- An initial assessment of UK seas including socio-economic analysis, current and future status and cost-benefit analysis of achieving GES.
- Characteristics of what GES means in relation to the UK marine environment.
- Targets and indicators for how progression to GES can be measured.

Despite criticisms over what Good Environmental Status (Box 1) actually is and the ambitious nature of the Directive, so far it has been very useful in making nations recognise the importance of the marine environment and ensuring they implement actions to protect it. The MSFD officially became transposed into UK law through the Marine Strategy in 2010. As part of the first phase of this strategy, one of the most comprehensive reviews of the state of the UK's seas was published in 2012 (Box 2). The waters that the UK government is responsible for are part of the North East Atlantic Marine Region. Within this region, a coordinated effort between all member and non-member states is required in order to develop and implement actions to protect their marine ecosystems. This coordination is mainly developed through the OSPAR Regional Seas Convention, of which all states within the North East Atlantic region are members.

In 2014, Stage 2 of the UK Marine Strategy has been kick-started. By July of this year, the UK must have a coordinated monitoring programme to track progress to GES for the 11 different descriptors. The value of a monitoring programme as part of the MSFD is important for many reasons:

1. Allows assessment of how well the UK is meeting the MSFD objectives.
2. Encourages policy decisions related to the Directive to become more evidence-based and flexible.
3. Forms an important basis for helping to deliver the next part of the Directive in 2015/ 2016, when measures to address GES will have to be developed and put in place.
4. Helps generate and increase the knowledge base for marine issues. For example, disentangling the impacts of human pressures from more natural or climate-driven pressures on seabird distributions or marine habitats.

In January this year Defra launched a new consultation for the whole of the UK on the proposed monitoring programmes. Closing in early April, the consultation proposes the methods and assessments that will be used to track progress to the previously agreed targets and indicators (Fig 1). These methods have been developed and will be carried out by scientists working as part of UK Marine Monitoring and Assessment Strategy evidence groups. The consultation covers:

- What monitoring programmes will be used
- How the proposed programme will meet the directives requirements
- Any issues or knowledge gaps that could hinder the process.

The proposals take advantage of many of the long-running monitoring assessments that already take place, such as the annual English Beam Trawl Survey, the UK Bycatch monitoring scheme and the Seabird Monitoring Programme. These established programmes and the data they have already collated will prove invaluable for assessing progress. At the time of writing, the BES was in the process of formulating a response to the consultation using the expertise of our members. The response should be available to view on our website from 3rd April at http://www.britishecologicalsociety.org/public-policy/our-position/consultation-responses/.

For the UK, the implementation of the monitoring programme by July is achievable given the existing programmes already in place. The greater challenge perhaps is the requirement for actions to be coordinated at a regional level with other North East Atlantic Region states. A regional approach is extremely important if the ecosystem-based approach that the MSFD aims for is to be achieved, yet in reality, as the consultation document notes, this can be difficult to achieve. Currently a reported lack of clarity and information from other member states has meant that matching UK plans with others has been challenging. Further regional discussions and work with OSPAR should hopefully address these issues and initiate more coordinated action. However, for the UK at least, there is positive progress towards meeting this next target of the MSFD.

A 21st Century Challenge: Bringing Agroecology into the Mainstream

Greg Counsell / formerly BES Policy Intern
@BESPolicy

In 2011 the human population passed the 7 billion count and current UN projections suggest that by 2050 we will be 9 billion. The challenge of feeding this growing population without further degrading our natural resource base is becoming increasingly urgent, and our ability to meet this challenge could well be the determinant factor in how the second half of the 21st century plays out.

In 2009 the FAO stated a 70% increase in agricultural output would be required to feed the 9 billion. As such, many governments have since committed funding to agricultural research with hopes that a new Green Revolution will help reach that target.

Simply increasing agricultural output does not address the underlying issues facing modern agriculture. Many observers suggest current global agriculture is already producing more than enough to feed our current population, yet recent FAO statistics suggest 842 million people are still going hungry (Joel Cohen spoke cogently on this issue at the BES annual meeting in 2010). So the question of further investment is not simply one of how *much* we invest, but of how and *where* we invest it.

Since the mid 20th century industrial agricultural practices have become the benchmark for agricultural performance, with technological improvements and the expansion of cultivated land more than doubling the global agricultural output. Several decades of Green Revolution research and innovation led by governments and big enterprises have led to a highly productive food industry reliant on agrochemicals, fossil fuels, monoculture and intensive livestock production.

The resultant loss of biodiversity, unsustainable use of water, and pollution of soils are issues which compromise the ability of our natural resources to sustain these industrialised practices. To add to this, climate change is resulting in more frequent and extreme weather events, such as droughts, floods and less predictable rainfall, which is already having a severe impact on farming in certain regions. Extensive vertical integration within the food industry means any such unpredictability in farming output can destabilize markets. As such, further external inputs are required to maintain production, all of which increases running costs, lowers farmers' profits and results in the type of record food price rises seen in 2007-2008.

The relevance of agroecology in place of large-scale industrial farming is becoming more apparent as policymakers, scientists, farmers and citizens realize that business as usual is no longer a sustainable option in the face of peak oil, climate change, water scarcity and the social, public health and environmental costs of industrial and Green Revolution farming.

The term agroecology has suffered from something of an identity crisis over recent decades with different parties utilizing and redefining the term to meet their own ends. The clearest definition is in the name itself: agroecology comes from the combination of the two disciplines 'agronomy' and 'ecology'. As a science agroecology is therefore the 'application of ecological science to the study, design and management of sustainable agroecosystems.'

Agroecology is both a science and a set of agricultural practices. These practices seek to maximize yields while minimizing the need for external fertilizers and energy, instead utilizing closed loops and biological interactions that mimic natural ecological processes. Rather than focusing on individual species, agroecosystems integrate crops and livestock, and through diversification of species and genetic resources the focus is on interactions and productivity across the whole agricultural system. Management of organic matter and soil biotic activity are cornerstones of agroecology, as through this management, soil conditions most favourable for plant growth can be attained with minimal external input.

Sustainable use of water also plays a huge role in implementing agroecological practices. Understanding and utilising the water cycle in a landscape, rotating crops of different root depth and testing nationally sourced crops that are more drought or flood tolerant helps to minimize excess water usage.

The best examples of this can be seen in Cuba. Following the break up of the Soviet Union, Cuba was left without the technology and resources required to farm on an industrial scale; ecological farming methods were a necessity and drought mitigation systems were created that, despite a renaissance of industrial agricultural production, remain in place today.

Agroecology also differs from industrial agriculture in that there is no one-size-fits-all approach. It is highly knowledge-intensive, based on techniques that are not delivered top-down but developed on the basis of farmers' knowledge and scientific experimentation at a local level. These local level systems allow agricultural practices to be designed not only from a sound ecological point of view but also through consideration of the corresponding socio-economic and environmental perspectives.

This system also provides opportunities for forward-thinking businesses that can see beyond proprietary seeds and fertilisers. Again, in Cuba, businesses have emerged to supply location-specific agricultural products produced through agroecological methods, such as pest control products in the form of insects and bacteria. With no industrial patents or need for expensive external inputs, this system of farming can benefit those in the poorest rural areas, and it is these areas which house the majority of the nearly 1billion people whom industrial agriculture is currently failing.

The last few decades of global agriculture have been defined by progressive specialization, centralization and expansion, so the widespread adoption of location-specific and diverse farming systems will undoubtedly face numerous barriers. The Centre for Agroecology and Food Security at Coventry University identified consumer motivation and behaviour as one of the main barriers to mainstreaming agroecology.

Since the 2008 economic downturn there has been a decline in the UK market for organic products, suggesting that when wider society feels the pinch there may not be the willingness required to support an industry of agroecology. The public would have to be motivated to support a switch to agroecological methods for based on ethical considerations, reasons of personal responsibility, and an understanding of the long-term false economy represented by industrial agribusiness models. Price is often considered the main driver of purchasing decisions, and there is evidence to suggest that agroecological approaches can be economically viable when in competition with industrial approaches (United Nations, 2010).

To transform the food industry from one reliant on industrial agribusiness into an agricultural system dominated by small scale agroecological farming, an approach that reflects a shared vision of the future is required, and that means educating consumers and 'reconnecting' them with where their food comes from and how it is produced. If some of the government funds for agribusiness innovation were channeled towards communication and knowledge brokerage, this shared vision might become a reality.

The future of sustainable agriculture for all goes far beyond technology or ecological innovation: it's about understanding local dynamics and exchanging information about adapted experiences, but ultimately it is about once again learning how to live within the limits of our natural resources.

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FORTHCOMING BES EVENTS

Special Interest Groups

Our Special Interest Groups provide a focus of activity in particular fields of ecology. They organise small meetings, field trips and events throughout the year and rely solely on the ideas, enthusiasm and hard work of volunteers. They are always looking for new members, ideas and help, so contact them to see how you can get involved. Please check our website for their most up to date information: www.BritishEcologicalSociety.org/SIG

MARCH

12TH

Computational SIG:
Predictive Modelling Methods

APRIL

1ST

Macroecology SIG:
Challenges in Macroecology

Location: Natural History Museum

1ST – 4TH

Agricultural SIG
Pollinators in Agriculture

13TH-14TH

Plant Environmental Physiology
Young Career Scientist Mini symposium

Location: Sheffield and the Peak District

14TH – 16TH

Ecological Genetics SIG
58th Annual Conference

Location: Longhurst Hall, Newcastle

25TH

Global Climate Change Ecological impacts of climate change
building on the IPCC fifth assessment report

Location: Charles Darwin House

MAY

12TH

Conservation and Computation SIGs
Putting Models into Practice

Location: Charles Darwin House

15TH-16TH

Peatlands Research
Wilder by Design? – Managing landscape change and future ecologies Sheffield Hallam University, Sheffield, UK.

Conservation SIG
Putting Models into Practice

Location: Charles Darwin House

JUNE

2ND – 4TH

Ecological Genetics SIG
Morohmetrics and Multivariates

3RD – 5TH

Forest Ecology SIG
Continuous Cover Forestry

8TH

Citizen Science SIG
Open Farm Day

JULY

8TH – 9TH

Macroecology SIG
Annual Meeting

21ST – 25TH

Aquatic SIG
Early Careers Day, SIG Reboot and Detrital Dynamics in Aquatic Systems

Location: Charles Darwin House

SEPTEMBER

3RD – 5TH

Peatlands SIG
In the Bog – the ecology, landscape, archaeology and heritage of peatlands

Location: Sheffield Showroom & Workstation, Sheffield

17TH

Conservation SIG:
Landscape Delivery Scale

Location: Charles Darwin House

8TH-13TH

Plant Environmental Physiology Workshop

Location: Lisbon

OCTOBER

24TH – 25TH

Forest Ecology and Peatlands SIGs
Waxcap Symposium

Location: Sheffield Hallam University, Sheffield, UK & Longshaw, Peak National Park, Derbyshire.

30TH – 31ST

Conservation SIG
Invertebrate Ecology with AES

Location: Charles Darwin House

SPECIAL INTEREST GROUP NEWS

British Ecological Society
Computational Ecology Group

COMPUTATIONAL ECOLOGY: THE 'SOMETHING FOR ALL GROUP'

Matthew Smith
mattsmi@microsoft.com
@BES_CE_SIG

Quantitative methods are evolving fast in ecology, way faster than any of us can keep up with. We lack the foundational training in mathematical, statistical or computational skills to pick these up easily: otherwise we'd work for banks, obviously. One consequence is that many of us spend a lot of our time feeling frustrated by quantitative methods.

The Computational Ecology SIG exists to help members with the quantitative techniques that involve some form of computation (the vast majority of them). This includes data entry, storage and delivery, statistical analyses and modelling. Our priority is to enable the widest possible community of ecologists understand and use the best quantitative computational methods. We've not been clear about that over the last couple of years because we ourselves were not entirely sure how best to serve you. Therefore we resorted to doing what any self-respecting ecologist would have done and ran a set of experiments; a number of different events pitched at various audiences with different levels of quantitative expertise. The clear winner was to provide people with opportunities to learn how to implement quantitative methods well. Hence, our most popular events in the past year have been training courses on integrated population modelling, species distribution modelling, spatial analysis and good coding practices. At those, people clearly made the most of the opportunity and got on with the learning, discussions and asking challenging questions.

So moving forward we intend to do more training events, and build upon them: broadening out to an even wider community of people aiming to get started with the methods, wanting to understand how to do them well, or simply understand what they are all about. This year we have big plans. We're going to expand our online presence by using a new website to serve you with useful updates, tutorials, guides, advice and blog posts on quantitative methods (**http://bescomputationalecology.wordpress.com/**) . We're also going to provide you with an online Field Guide to Ecological Models; to tell you all those things about the different methods you never get told in any undergraduate ecology degree as well as those things you might have done. As well as expanding this presence we aim to continue to host training events and we'll provide more information about those as they emerge (likely a software carpentry bootcamp, an 'ecological models in conservation applications' workshop and an event again with the International Biometric Society and Royal Statistical Society).

Our SIG does not have the largest membership but we could potentially serve the largest proportion of BES members: those aiming to make sense and use out of the quantitative methods. You don't need to be a computer nerd to join (and NO it doesn't help… that's the point!)

British Ecological Society
Conservation Ecology Group

CONSERVATION ECOLOGY

Tim Graham

The conservation group is looking to maintain its activity again right through 2014, with a number of events and pieces of work. We are continuing to develop potential future working with the Society for Conservation Biology, so watch this space. We will also be examining how we can better approach conservation ecology and the varied research and delivery that is going on across the UK and abroad by BES members.

Working with Computational Ecology we will be running a workshop on 12th May at Charles Darwin House, London, to explore best practice in application of modelling for connectivity and landscape ecology – helping contribute to research needs, conservation practitioners within Nature Improvement Areas and beyond, as well as producing a guide that will no doubt be useful to all.

Building on for previous events on the implications for conservation from the Lawton Review (SIG and BES Policy Team) and Landscape-scale delivery (Natural England) we will be holding a Conference at Charles Darwin House on the 17th Sept to explore how ecological science is moving forward the challenges and constraints to large scale conservation delivery.

Working with both the Amateur Entomological Society and Citizen Science SIG, we will be exploring Invertebrate Conservation on the 31st October at Charles Darwin House, bringing together amateurs, professionals, researchers and practitioners alike.

Two other pieces of work that are being finalised are a workshop and surgery exploring how we can generate better conservation evidence with the Field Studies Council, and also with the AGM in France this year we have the potential to offer support to conservation researchers/practitioners that will bring a new audience and potential partnerships to the AGM in December 2014.

For more details of anything, or if you want to get involved or in touch conservation@britishecologicalsociety.org

British Ecological Society
Forest Ecology Group

FOREST ECOLOGY

Dan Bebber
Forest@BritishEcologicalSociety.org
@BESForests

Hello, my name is Dan Bebber and I am the new secretary of the BES Forest Ecology Group. Markus Eichhorn has handed over the reins after many years of faithful service, and I hope to maintain his high standards in the years to come. This year we have a number of FEG-sponsored events to look forward to, including meetings on waxcaps as indicators, continuous cover forestry, and a large international meeting on threats to tropical forests (jointly sponsored by the Royal Society, the BES Tropical Ecology Group, among many others). We are also looking forward to the Joint Annual Meeting in Lille in December. Our Facebook group, Twitter following (big thanks to Philip Martin for helping to maintain this) and email list continue to grow, and our Forest of the Month entries are now archived on an interactive map on the BES website. Recent meetings on forest fungi and plantations on ancient woodland sites were reported in the latest FEG *bulletin*, along with new publications, jobs, and graduate opportunities. Remember, the FEG is as active as its members, so keep your contributions flowing. If it's about forest ecology, we want to hear about it!

For a report on a recent FEG meeting see p24

British Ecological Society
Tropical Ecology Group

TROPICAL ECOLOGY

Lindsay Banin
Tropical@BritishEcologicalSociety.org
@BES_Tropical

At the beginning of December 2013, BES-TEG jointly hosted a skills event with the Parasites & Pathogens SIG, at the fantastic Natural History Museum. The 35 delegates spent the first day learning all the tricks of the trade in project management, in a session led by Caron King of Kingswood Plus. After a jam-packed day of post-it notes and Gantt charts, delegates enjoyed a social event at the local pub and shared experiences over a drink. For the second day, we were joined by Emma Sayer, Mike Brockhurst and Mike Boots who shared their tips for successful fellowship and grant applications, based on their experiences as successful grant recipients and from the perspective of sitting on funding panels. The day also included an 'elevator pitch' exercise, tips on dealing with interview nerves, the dos and don'ts of CV writing and a great deal of interaction between the delegates and the experts. Many of the researchers who had attended commented that it had been a very valuable learning experience. You can read more about this event on page 40. We encourage TEG members to come forward with ideas for similar skills workshops they may wish to develop.

In 2014 we hope to host our 7th Early Career Researcher meeting, which has proven in the past to be an excellent networking event, an opportunity to meet people with similar research interests, generate ideas and to present work in a friendly environment. Watch this space for further details!

In October, BES-TEG is supporting a meeting at the Royal Society, London, entitled 'Tropical rainforests on the brink: science for their conservation, sustainability and restoration in an era of rapid environmental change'. The meeting is being organised by Glen Reynolds, SEARRP (the Royal Society SE Asia Rainforest Research Programme), and aims to review current knowledge in rainforest science – integrating biodiversity, ecosystem functioning, carbon cycling and atmospheric chemistry – and to examine commonalities and differences across tropical biomes, the threats faced by rainforests, their responses to environmental change and how the science base can more effectively contribute to their conservation, sustainable management and restoration.

British Ecological Society
Invasive Species Group

INVASIVE SPECIES

Helen Bayliss
Invasives@BritishEcologicalSociety.org
@BES_Invasive

It has been a busy start to the year, with the SIG contributing to the House of Commons Select Committee inquiry into invasive species with the help of the excellent BES Policy team, and preparing for several forthcoming events including an invasion science day and a public lecture. At the time of going to press we haven't confirmed all final details but more information will be available from our web page, email list and Twitter feed as things are confirmed. We are also organising and/or contributing to a couple of workshops running this year and will provide an update, and more details for anyone wanting to get involved, in the next *Bulletin*.

ECOLOGICAL GENETICS

Paul Ashton
ashtonp@edgehill.co.uk

The 58th meeting at Newcastle on 14th-16th April 2012 is organised by Dr. Kirsten Wolff and sponsored by the BES and the Genetics Society. The venue is Longhirst Hall, 18 miles north of the city. So a once a year opportunity to talk, eat, drink and dream all things ecological genetics.

The guest speaker will be Prof Per Ingvarsson from Umea. Per's research focusses upon plant evolutionary genetics and population genetics theory. This includes the importance of population structure in determining patterns and rates of divergence during speciation, the importance of hybridization and polyploidy in speciation and the effects of mating system on the distribution of genetic variation in geographically-structured populations. All classic EGG material that has had fresh vistas opened by the power of recent DNA innovations.

The conference will feature the usual excellent mix of study organisms and subject material from new and experienced researchers. Hence talks and posters are welcomed from scientists of all stages. EGG is a suitably supportive stage for new researchers to deliver their first presentation. The conference will also feature an excursion, to the wonderful Northumberland coast, led by long time EGG attendee, emeritus Prof John Richards. It will also feature the EGG heads quiz and the traditional ceilidh following the conference dinner.

Details are on the EGG website **http://www.britishecologicalsociety.org/getting-involved/special-interest-groups/ecological-genetics-group/** with bookings on the Newcastle university webpage **http://conferences.ncl.ac.uk/ecologicalgeneticsgroup2014/**

I hope to see you there!

British Ecological Society
Macroecology Group

MACROECOLOGY

@BESMacroecol

Plans are afoot for a very active 2014, with a number of macroecological events occurring. These are centred around our annual science meeting in Nottingham on 8-9th July, organised by Adam Algar and broadly following the format of our successful 2013 Sheffield meeting. But they also include new initiatives to link with other communities, including citizen scientists and palaeobiologists. On this latter theme, we are delighted to announce a one-day meeting exploring the links between palaeontology and macroecology, in association with the Palaeontological Association:

Challenges in Macroecology – Scaling the Time Barrier

Tuesday 1st April 2014, Natural History Museum, London

Keynote speakers:

Prof. David Jablonski (University of Chicago)
Prof. Kathy Willis (University of Oxford)
Dr Lee Hsiang Liow (University of Oslo)

With an emphasis on discussion and networking opportunities, we aim to facilitate new collaborations between palaeo- and neontological macroecologists, and determine the strengths and limitations of integrating concepts, questions and data across timescales. Registration is open at **http://tinyurl.com/macropalaeo**

As usual, you can keep up with all our events on Twitter (@besmacroecol), Facebook, and via our mailing list – details on our website, **http://tinyurl.com/besmacro**

PEATLAND RESEARCH

Ian Rotherham
Peatlands@BritishEcologicalSociety.org

We have another exciting year of events and activities. Please come along and both enjoy and support.

Wilder by Design? – Managing landscape change and future ecologies

15th & 16th May at Sheffield Hallam University, Sheffield, UK.

Professor Ian D. Rotherham and colleagues are organising a 2-day seminar to explore critical issues around wilding or re-wilding, landscape and ecological history, on nature and heritage conservation and on the impacts of current trends and major socio-economic changes. The seminar which has a UK focus, addresses issues of funding, of skills, of best practice and of awareness in order to consider how conservation writ broad can respond to challenges of environmental change, of climate change, and of a radically altered public sector and political climate. It will set the scene for an international conference on a similar theme in September 2015. Speakers for 2014 include: Peter Taylor, Ken Smith (PDNPA), Professor Chris Thomas (University of. York), Dr Steve Carver (WRI, University of Leeds), Dr Jamie Lorimer (Oxford University), Dr Jan Woudstra (University of Sheffield), Sir Charles Burrell Bt. (Knepp Estate), Richard Scott (Landlife), Ted Green MBE (Ancient Tree Forum), Dr Lois Mansfield (University of Cumbria), Professor Ian Rotherham (SHU) and Natural England. The seminar includes a field visit and concludes with an expert panel session.

The event is sponsored and supported by: BES, IPS, IUFRO, ESEH, Sheffield Hallam University, the Ancient Tree Forum, Landscape Conservation Forum, Thorne & Hatfield Moors Conservation Forum and JBA Consulting.

Places are limited and pre-booking is essential. More information and a booking form can be found at **http://www.ukeconet.org/event/wilder-by-design/** or email info@hallamec.plus.com or telephone 0114 2724227

In the Bog – The ecology, landscape, archaeology and heritage of peatlands

3rd to 5th September at the Sheffield Showroom & Workstation, Sheffield, UK.

Professor Ian D. Rotherham and colleagues are organising a major 3-day conference examining the past, present and future of peatland landscapes across the world. The event is bringing together speakers and presentations from a range of disciplines, backgrounds and countries to look at:

- The history of human activity associated with peatland landscapes – heaths, moors, bogs, fens and commons;
- The ecology and archaeology of peatlands;
- The landscapes of peatlands and their neglected heritage;
- The conservation management of peatlands – problems and issues; and
- The future challenges with climate change and carbon sequestration.

There will be papers relating to specific small case study areas, species or suites of species as well as papers that address the issues at landscape or cultural levels. Speakers confirmed include: Jack Rieley, Clifton Bain, Benjamin Gearey, Alper Colak, Andreas Heinemeyer, Phil Newman, John Coll, Nicki Whitehouse, Peter Poschlod, Rob Rose and Ian Rotherham. There will be an associated field visit at the beginning of the conference and a poster presentation session on the second day. Offers of posters and displays are welcome.

The event is sponsored and supported by: BES, IPS, IUCN, IUFRO, ESEH, Sheffield Hallam University, Landscape Conservation Forum, Thorne & Hatfield Moors Conservation Forum and JBA Consulting.

Places are limited and pre-booking is essential. More information and a booking form can be found at **http://www.ukeconet.org/event/in-the-bog-conference/** or email info@hallamec.plus.com or telephone 0114 2724227

Workshops on Identification and Ecology of Sphagnum Mosses

We continue the highly successful theme with workshops this year on the Sphagnum mosses of 1) Thorne Moors in the Humberhead levels National Nature Reserve; 2) post-industrial wetland sites; and 3) a west Pennine upland site. Places will be limited and pre-booking is essential. More information and a booking form will be available from **www.ukeconet.org** or email info@hallamec.plus.com or telephone 0114 2724227

Field Research Meeting – Glenfeshie Great Moss (Mòine Mhór), Cairngorms National Park. Organised by Dr Olivia Bragg, University of Dundee

Continuing our annual themed field visits, this year we are planning an intensive study of ecological processes, condition and restoration potential of the UK's highest-altitude peat bog (~950m a.s.l.). This meeting will be organised from Dundee University and bring together key UK peatland experts (especially on eroded blanket mire), plus around ten research students, for 3 days of fieldwork. The results will form the basis of a report on site status and potentially a cross-disciplinary peer-reviewed publication.

Exact dates tbc, within the period June–August 2014. To take part, to get involved or to help, please contact Dr Olivia Bragg, University of Dundee directly: o.m.bragg@dundee.ac.uk

Seminar on Sphagnum Mosses

This event, probably in June, is being organised jointly by Dr Simon Caporn & colleagues at Manchester Metropolitan University with the Moors for the Future Partnership. We will announce more details as soon as they are available. If you are interested in this event, please contact Simon on: S.J.M.Caporn@mmu.ac.uk, or Rachael Maskill on: Rachael.Maskill@peakdistrict.gov.uk

British Ecological Society
Conservation Ecology Group

Waxcap Symposium

24th & 25th October at Sheffield Hallam University, Sheffield, UK

Professor Ian D. Rotherham and colleagues are organising a 2-day event to explore issues around the identification and relationship of waxcap fungi (and their allies) to historical wood-pasture and parkland. This event is seen as both extending the scope of previous workshops, and to discuss their role as indicators and the implications for management of historic parklands and 're-wilding' landscapes. It will set the scene for further workshops and develop one of the themes for the 2016 international Capability Brown tercentenary conference. The symposium includes a field visit to the Longshaw estate and concludes with an expert panel session.

The event is sponsored and supported by: BES, Sheffield Hallam University, the Ancient Tree Forum and Landscape Conservation Forum.

Places are limited and pre-booking is essential. More information and a booking form will be available from **www.ukeconet.org** or email info@hallamec.plus.com or telephone 0114 2724227

British Ecological Society
Plants, Soils, Ecosystems

PLANTS, SOILS, ECOSYSTEMS

Franciska de Vries
franciska.devries@gmail.com
@BESPlantSoilEco

A one-year-old BES special interest group on plant-soil interactions, with a focus on biogeochemical cycling, community dynamics, and ecosystem functioning.

Aims

- To promote research on plant-soil interactions and their role in ecosystems through workshops, symposia, and events at BES meetings
- To provide opportunities for networking and collaboration among researchers involved in the study of plant-soil interactions and ecosystem ecology
- To serve as a platform to discuss and share techniques, expertise, and data
- To promote research across scientificdisciplines to students, facilitate training opportunities in different techniques, and provide support for early-career researchers

Committee

The organizing committee currently consists of Franciska De Vries, The University of Manchester (Secretary: franciska.devries@gmail.com); Emma Sayer, The Open University; Paul Kardol, Swedish University of Agricultural Sciences; Tim Daniell, The James Hutton Institute; Dave Johnson, Aberdeen University; Mike Whitfield, Lancaster University; and Sarah Pierce, Imperial College, as student representative. Richard Bardgett, The University of Manchester, supports the committee in an advisory role.

Plants, Soils, Ecosystems is one year old!

We have been up and running for one year now, and our first year was a great success! We have over 150 people signed up for our email list, 225 followers on Twitter, and 98 likes on Facebook. We organised our first meeting in October 2013 'Digging deeper: research challenges in plant-soil interactions' which attracted an international audience of 45 people. We also sponsored a successful symposium at INTECOL and held a well-attended drinks reception afterwards. We are also compiling a two-monthly e*Bulletin* (see below) that compiles all the interesting news in the area of plant-soil interactions. We are full of plans and there will be more! If you are interested in being involved, you can sign up for the email list, like us on Facebook, follow us on Twitter, or contact one of the committee members.

Plants, Soils, Ecosystems Bulletin

Plants, Soils, Ecosystems sends interesting emails about job opportunities, studentships and meetings regularly to those who signed up for our email list, and we also compile a two-monthly *Bulletin*, which encompasses everything of interest to ecologists interested in plant-soil interactions. If you also want to stay up to date with everything that is happening in Plant-Soil-Ecosystem world, sign up for the newsletter! But more importantly, the success of PSE depends on you, so keep sending us your jobs, studentships, and interesting facts.

Plants, Soils, Ecosystems Journal Club

The Plants, Soils, Ecosystems journal club blog is now up and running, and can be found at **http://besplantsoileco.wordpress.com/**. The idea behind the journal club is to highlight interesting papers in the field of plants, soils and ecosystems (potentially a very broad topic!) and stimulate discussion about the papers. The discussion does not necessarily have to focus on the scientific content of the paper – it could also look at the ways in which papers have been written, or data presentation techniques, for example.

Initially, we'll aim to post about a paper every two weeks – this should provide enough time for discussion, which can take place via comments on the blog and on the @BESPlantSoilEco Twitter feed. You can find more details about how to contribute to the discussion on the blog, where you can also read our first post.

We'd like to encourage members of the Special Interest Group to get in touch with their suggestions for interesting papers to discuss, either via Twitter, on Facebook, or by email. Readers of the blog are also welcome to submit a guest post about a particular paper. Please don't be shy! With enough contributions, we can create a lively space for discussion and debate.

2014 Activities

We are full of plans for 2014, but still finalising the specifics. The things you can expect from us this year:

Two-day meeting 'Carbon cycling: from plants to ecosystems'

This meeting will be jointly organised with the BES special interest group PEPG, and will focus on carbon cycling processes from the individual plant level, including photosynthesis and root exudation and their effects on soil C cycling processes, to the ecosystem level, including plant community controls on ecosystem carbon budgets. Talks will also address how global change, including climate change, affects these processes across scales. The date and venue are still to be confirmed, so keep an eye out for us on Twitter (@BESPlantSoilEco) or sign up for our email list (see below).

GSBI Conference in Dijon, France

2-5 December 2014

The First GSBI Conference – Assessing Soil Biodiversity and its Role for Ecosystem Services, is organised by the GSBI (Global Soil Biodiversity Initiative) and Ecofinders and held in Dijon, France, December 2-5th, 2014. This will be a dynamic international meeting summarizing the current state of knowledge and recent advancements in the science of soil biodiversity.

The conference will provide a venue to meet and discuss current research efforts in soil biodiversity and its links to earth processes, and to promote interdisciplinary collaboration. The goal of this meeting is promote scientific research on the role of soil biodiversity for ecosystem functions and ecosystem services, and to integrate such understanding into international environmental agendas, sustainable policy and land management decisions.

Of course, Plants, Soils, Ecosystems will be present and active at this great conference – keep an eye out for details!

Joint BES-SFÉ Annual Meeting in Lille, France, 9-12 December 2014

Still a long time away, but as at every Annual Meeting, of course Plants, Soils, Ecosystems will be present this year! We are proposing a symposium on a topic within the field of plant-soil interactions, and keep an eye out for our social activity, which will hopefully take place in an atmospheric French café somewhere in Lille. This is the ideal opportunity to get to know us and to get involved in the special interest group, as we will make plans for 2015 during this meeting. You can have your say!

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, or like us on facebook.

British Ecological Society
Plant Environmental Physiology Group

PLANT ENVIRONMENTAL PHYSIOLOGY GROUP

@PEPG_SIG

The Plant Environmental Physiology Group (PEPG) is one of the special interest groups (SIGs) within the British Ecological Society and the Society for Experimental Biology.

Plant environmental physiology represents the study of short-term acclimation and long-term adaptation of plants to changing environmental conditions. Our traditional goal has been to integrate leaf and plant- level responses to biotic and abiotic stress under field and laboratory conditions. Increasingly, our focus has been either to set molecular physiology in an ecological context, or to provide a basis for scaling root and shoot level responses to canopy,

ecosystem and region in the context of climate change, whether for crops or natural vegetation.

Our remit is to:

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

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

The main secretary is Dr Matt Davey (mpd39@cam.ac.uk) liaising primarily with the BES, and Dr Colin Osborne (c.p.osborne@sheffield.ac.uk) within the SEB, both assisted by Prof. Howard Griffiths (hg230@cam.ac.uk).

The PEP website and email discussion list is still popular (with nearly 300 members worldwide this ensures a response to your emails whatever time of day or night you send it!). Messages posted to the list are automatically forwarded to all members. Messages may include research questions/methodology and information, discussion and requests, news of future meetings and PhD/job advertisements. To sign up follow the instructions at: http://www.jiscmail.ac.uk/cgi-bin/webadmin?A0=env-physiol

http://plantenvironmentalphysiology.group.shef.ac.uk/

Join the Facebook page at:

The PEPG Facebook page has been a success, with over 200 followers from 14 countries http://www.facebook.com/PlantEnvironmentalPhysiologyGroup

or follow us on Twitter: @pepg_sig

PEPG NEWS:

Things to look out for in 2014…

International Workshop on Plant Environmental Physiology techniques

September 2014

Last year saw the reintroduction of the 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 workshop we are going to repeat the workshop in September 2014 see the advert in this issue of the *Bulletin* – we want to make this *THE* International workshop to attend if you study plant environmental physiology. If you are interested in being involved in organising or sponsoring the workshop, or have any suggestions then please email either Dr Tracy Lawson (tlawson@essex.ac.uk) or Dr Matt Davey (mpd39@cam.ac.uk).

3rd Annual PEPG Young Career Scientist Mini Symposium – Spring 2014 – Sheffield and the Peak District

April 13th-15th 2014 Castleton (Losehill Hall YHA), Derbyshire http://www.yha.org.uk/hostel/castleton-losehill-hall

Registration is now open for our Peak District Young career scientist mini symposium.

The PEPG are inviting proposals for symposium sessions on the final day (15th April) of the workshop. We would like to cover as many areas of plant physiology and eco-physiology as possible and invite talks from PhD students and early career Postdocs.

This year, the symposium will take on a slightly different format, essentially a walk and talk based in the lovely and botanically interesting surroundings of Castleton in the Peak District – we aim for people to arrive at the YHA on the evening of Sunday 13th April for dinner, a day's guided walk in the peaks (probably up Mam Tor) on the Monday 14th followed by dinner in the YHA and an informal after dinner talk by a senior plant physiologist. Tuesday 15th April will consist of talks from the PhD researchers and postdocs on plant physiology and eco-physiology. We aim to finish 5pm on the Tuesday.

This will provide a forum for young career scientists to network and showcase your work. Accommodation (please note that as this is a YHA you will have to share rooms, there are very few private rooms) and meals will be provided from the evening meal Sunday to lunch on Tuesday. There is a bar. People in any stage of their career are welcome to attend.

Registration fees for SEB and BES members £40, or for non-members £60, please register by initially sending your name, institution and proposed talk title (talk is optional) and a 100 word abstract to carla.turner@sheffield.ac.uk or Marjorie.lundgren@sheffield.ac.uk Travel, payment and programme details will be sent out to successful applicants. Numbers are limited so please register early!

Joint SIG mini-symposium with the Plant, Soil and Ecosystem SIG – "C cycling – from plants to ecosystems" Autumn 2014, location TBA.

May we also take this opportunity to remind you to promote the PEP group with academic colleagues, postdocs and PhD/MSc students etc whether starting this year, or by now well established. Encourage them to visit the website and sign up to the jiscmail email forum or Facebook page above.

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.

Zoe Harris
Postgraduate rep Z.M.Harris@soton.ac.uk

Marjorie Lundgren
marjorie.lundgren@sheffield.ac.uk

Richard Webster
rcw@aber.ac.uk

Carla Turner
communications officer –please contact Carla with news and events you would like advertising on our website, email list, Facebook page and twitter @pepg_sig
carla.turner@sheffield.ac.uk

CITIZEN SCIENCE

The committee

The Citizen Science SIG now has an informal committee:

Helen Roy and Michael Pocock (Secretaries)

Gitte Kragh and John Millar (Social media)

Rachel Pateman (Meetings)

Peter Brown

Paul Jepson

Jodey Peyton

Lucy Robinson

Jonathan Silvertown

John Tweddle

Please do get in contact (citizenscience@ceh.ac.uk) if you would like to be involved.

The First Meeting of the SIG

More than 50 people, from many diverse disciplines, met at Darwin House on 1st November 2013 for the first meeting of the Citizen Science SIG – simply amazing! The excellent presentations, lively discussions and stimulating workshop sessions all contributed to the success of the day. There was huge enthusiasm for the collaborations that will be made possible through the SIG. The key points from our meeting demonstrate the multidisciplinary nature of the group:

- Data quality is a key consideration for citizen science.
- Socio-economic perspectives are generally not integrated within ecological citizen science initiatives.
- New technology offers many opportunities but also presents challenges.
- Innovation is important but it is also important to build on legacy of existing technologies.
- Data capture using on-line technologies has made good progress in recent years, now there are opportunities to improve analysis and visualisation.
- Citizen science has huge educational potential but ecologists need to consult with and learn the language of teachers.
- Citizen science can inform policy and also engage people in policy priorities but it is essential that the limitations and opportunities are recognised.
- Understanding uncertainty of data (known quality) is important for end-use of citizen science.
- Collaborative approaches to citizen science are a way forward.
- A deeper understanding of the motivation of participants and professional scientists (the citizen science community) involved in citizen science and their subsequent experiences of citizen science is required.

Open Farm Sunday Pollinator Study – an opportunity to contribute of 8th June 2014.

Announcing the logo and social media

The SIG now has a logo (many thanks to Emma Sayer for her innovative design) and is active on LinkedIn through a group called 'BES Citizen Science SIG' (many thanks to Gitte Kragh for taking the initiative in establishing this group). Please do contribute to the discussions through this group.

Future SIG activities

So what is next for the group? We have exciting plans for the year ahead and are delighted by the support from BES. Our activities include:

- Two day meeting 'Citizen Science Fit for Purpose' (co-organised by CEH (Michael and Helen), Oxford University (Paul Jepson) and York University (Rachel Pateman – leading programme development) and hosted by CEH and Oxford University but date yet to be agreed)
- One day meeting with Macroecology SIG 'Bridging the gap: how can citizen science help address the data deficiency in macroecology?'
- LEAF Open Farm Sunday Pollinator Survey (8th June 2014) – this event will provide an opportunity to talk to visitors on Farms while carrying out a straightforward survey of insects visiting flowers. More than 300 farms across the UK will open their gates for Open Farm Sunday and this provides a fantastic opportunity to promote ecology and lead a citizen science initiative (http://www.farmsunday.org/ofs12b/open/PollinatorSurvey.eb) – please get in contact for more information and how you can get involved.
- Joint one day meeting on invertebrate conservation with the AES.
- Social event at BES Annual Meeting in Lille.

Please do give thought to activities that you might like to run in future years and how you might contribute to the activities listed above.

British Ecological Society
Agricultural Ecology Group

AGRICULTURAL ECOLOGY

@BES_AEG

At the end of 2013, the Agricultural, Computational and Forest Ecology SIGs joined forces to organise a conference in partnership with the Association of Applied Biologists entitled 'Rethinking Agricultural Systems' which was held at St. Catherine's College Oxford. The meeting was well attended, 138 scientists, farmers and policy makers joined us to stimulate new thinking on this topic. We were very lucky to have a programme of distinguished speakers,

Geoff Radley has written an excellent summary of the meeting (p26) and the full programme is on the meeting website futureagriculture.wordpress.com. The output from workshops will up-loaded onto this site in due course.

Four events have been arranged for 2014, so put them in the diary! More details can be found on the Agricultural Ecology SIG webpages.

1-3rd April: Joint meeting with the Association of Applied Biology, *Pollinators in Agriculture*, Courtyard by Marriott, Brussels

30th June: Joint workshop with the Conservation Ecology Group. *Regaining control: How to plan, monitor and evaluate for people who want to make a difference in the real world.* Charles Darwin House.

18th July: *Growing sustainable ecosystem services around farming*, NIAB Cambridge

17th / 18th September: AeG Annual meeting, with an additional Early Career day.

Agro-Ecology: linking research, policy & practice. Harper Adams University, Shropshire

AQUATIC ECOLOGY

@BES_AquaEco

Forthcoming events: additional information will be posted on the SIG website as available. All three meetings will be at Charles Darwin House in London

Monday 21st July 2014 – Early Careers Researcher's Workshop: Analysing Aquatic Community Data with R

This workshop will focus upon methods to analyse community datasets in R. The six sessions will be focused either on specific R packages or on implementing different methods of analyzing data using R. Each session will be led by the authors of the R packages or by experienced users.

The day will be divided into two sets of three sessions running concurrently, and participants will be asked to choose the three they wish to attend. For each session a sample dataset and R script will be provided to allow participants to analyse the data in real time on their laptops. The final session will provide an opportunity for participants bringing their own data to get one-to-one advice from the workshop leaders, or to further explore the tools and techniques presented during the day with the sample data sets.

You will need to bring a laptop with R installed and we recommend bringing any relevant datasets from projects to analyse during the final session. You will be required to have a basic understanding of using R for simple analysis (e.g. loading R scripts, reading in csv files, using functions, etc) as these basics will not be covered. There are plenty of online resources to help get you started if you've not used R before (see the introduction to R guide at www.r-project.org/).

Tuesday 22nd July 2014 – BES-AG Reboot – Aquatic Ecology for the 21st Century

Wednesday 23rd July – Friday 25th July 2014 – Detrital dynamics in aquatic systems – from genes to ecosystems

More details will be posted on the BES website as available.

SEB Society for Experimental Biology

Plant Environmental Physiology group

Ecophysiology Techniques Workshop

Lisbon, Portugal 8-13th September 2014

The PEPG (special interest group of SEB & BES) has re-introduced the Ecophysiology Field Techniques workshop providing a unique opportunity for MSc, PhD students and early career Post-Docs to gain hands-on experience and training in plant physiology techniques in both field and laboratory environments.

Internationally renowned scientists will explain and demonstrate key techniques:

Photosynthesis; including gas exchange, chlorophyll fluorescence, isotope partitioning
Plant water relations; including hydraulic conductance, thermal imaging
Plant 'omic' techniques; including environmental metabolomics, transcriptomics
Whole plant physiology; including growth, imaging, modelling

Confirmed Speakers will include:
Prof S Long, Dr C Bernacchi, Dr A Leakey (Illinois); Prof H Griffiths, Dr M Davey (Cambridge); Prof L Sack (UCLA); Dr E Murchie (Nottingham); Dr C Osborne Sheffield); Dr T Lawson (Essex); Prof. Gail Taylor (Southampton); Prof M Chaves, Dr M Costa (Lisbon); Prof. B. Genty (CNRS/CEA Cadarache, France).

The meeting will provide an unrivalled opportunity for manufacturers to introduce their latest equipment and provide hands-on training. Through a combination of lectures and practical sessions this workshop will provide an invaluable introduction for early stage researchers.

For further information please contact the organiser Tracy Lawson on the following email pepgtw@essex.ac.uk or visit the following website:
http://plantenvironmentalphysiology.group.shef.ac.uk/

This event is supported by the SEB and BES as well as the following organisations:

ADC BioScientific Ltd. · Campbell Scientific · Decagon Devices · Opti-Sciences · LI-COR · Walz Mess- und Regeltechnik

MEETING REPORTS

Silvicultural approaches to restoration of Plantations on Ancient Woodland Sites (PAWS) and plantation diversification

A British Ecological Society Forest Ecology Group Workshop

Scott McG Wilson / Consultant forester
scottmcgwilson@hotmail.com

Ecological restoration of Plantations on Ancient Woodland Sites (PAWS) to native species composition is currently an article of forestry policy across Great Britain. Work undertaken over the past two decades has encompassed (a) radical approaches where non-native plantations are clearfelled in a single intervention, with native trees replanted or allowed to regenerate and (b) gradual approaches where non-native plantations are silviculturally treated to retain timber value whilst conserving and enhancing the status of remnant biodiversity features.

The gradual approach is more attractive to private woodland owners with an economic motivation but requires considerably greater silvicultural skills to ensure that combined objectives are achieved on a single area. The radical approach may ensure more rapid reversion to native species composition but is less desirable for some more sensitive biodiversity components and can result in significant landscape impacts and economic losses. Alongside PAWS restoration work, silvicultural approaches for the species diversification of non-PAWS pine and larch plantations are being prioritised by current tree disease outbreaks. Against this sometimes controversial background the British Ecological Society Forest Ecology Group decided to host a technical workshop to compare and evaluate approaches.

Woodland on the privately owned Duncombe Park Estate near Helmsley, where post-war crops of pine and larch have been progressively removed in favour of hardwood composition, dominated by ash, beech and sycamore, with some oak and birch.

Speaker presentations

In a seminar session, kindly hosted by the North York Moors National Park Authority, we enjoyed a range of speaker presentations setting out different perspectives on the subject at hand. Mark Antcliff of the National Park explained their local experience of encouraging private woodland owners to undertake progressive PAWS restoration work. Rebecca Isted of Forestry Commission England and Christine Reid of Natural England then explained the official policy context for PAWS restoration in England, taking account of current species challenges from climate change and emerging pests and diseases. Tim Hodges set out the Woodland Trust's approach to PAWS restoration across their property portfolio, emphasising the benefits of their gradual silvicultural philosophy. Richard Thompson of Forestry

Robson's Spring, a Woodland Trust site, a native oak-ash woodland partially restocked with conifers in the 1960's

Commission Scotland provided a useful counterpoint based on experience in Scotland, where the single intervention 'clearfell and naturally regenerate' approach is often necessitated by extensive, unstable upland conifer crops on remote and intractable sites. Scott Wilson, a consultant forester based in Scotland, provided feedback on his recent independent case-studies of practitioner experiences of PAWS restoration while retaining timber potential and of the adoption of relevant alternative silvicultural systems. Roger Trout, a consultant mammal ecologist, dealt with the accommodation of habitat requirements for the dormouse (a conservation priority species) when planning and undertaking PAWS restoration. Nick Brown from the University of Oxford provided valuable insights from his studies as regards the survival of ancient woodland species during various forms of PAWS restoration, emphasising fungi and vascular plants. Beth Atkinson of the University of Bristol updated the audience on the results from her recent PhD studies into the effects of PAWS restoration methods on invertebrate populations. Finally Ralph Harmer of Forest Research presented findings from his research work on the relative merits of coupe-felling and thinning approaches when recruiting natural regeneration on PAWS sites with competing vegetation

Suitable arrangements are currently being sought by which the speaker presentations from the workshop can be made conveniently available online.

For the present, the workshop organiser will consider individual requests for the set of presentations to be sent on CD-ROM, but will have to make a small charge in each such case to cover the costs for postage and packaging.

Field visits

Helmsley and the surrounding North York Moors National Park area was selected as the location for this workshop as it gave the opportunity to visit a range of relevant field sites within a convenient radius. On the afternoon of 3rd October we visited mature mixed woodlands on the private Duncombe Park Estate (adjoining Helmsley), led by the estate head forester, Tim Tolliss. Former post-war crops of pine and larch have been progressively removed from PAWS woodlands in favour of hardwood composition, dominated by ash, beech and sycamore, with some oak and birch. These crops are intended to be intensively managed for combined objectives of timber production, shooting, landscape amenity and biodiversity, with a strong emphasis on securing natural tree regeneration. The risk of *Chalara* to the ash component may imply increased emphasis on non-native beech and sycamore, which are more susceptible to grey squirrel damage. Lively discussion followed on the merits or otherwise of retaining some coniferous component (e.g. Douglas fir or larch) on PAWS sites as an 'option for the future' where estate economics remain a major objective of competent forestry management. This is a sharp contrast to woodland nature reserves.

Our second visit on the morning of 4th October was to the Woodland Trust's Robsons' Spring site a few miles to the south of Helmsley, led by WT site manager Mark Feather. Robsons' Spring is a native oak-ash woodland site that had been partly restocked with a variety of conifers in the 1960's. This is a site which the Woodland Trust have expressly developed as a demonstrator location for a variety of PAWS restoration methods to the private estates, hence it illustrated an unusually wide range of techniques from small-scale coupe-fell and replant, through thinning and enrichment underplanting to halo-thinning and natural regeneration. Again, with a looming *Chalara* threat to the ash component (which regenerates very easily), consideration is being given to alternative species, such as oak, that may need to be replanted.

Wykeham Forest, a Forestry Commission property being experimentally diversified by underplanting, natural regeneration and thinning.

Our final visit on the afternoon of 4th October was to the Forestry Commission Wykeham Forest on the North York Moors, lead by FC district forester Graham Jackson. This is an area of mid 20th century Scots pine-larch plantations that are being experimentally diversified by a combination of underplanting of alternative species, natural regeneration and variable intensity thinning for silvicultural transformation. Although this is not a PAWS site *per se,* the diversification techniques applied here will be relevant to PAWS restoration elsewhere.

The workshop organiser, Dr. Scott McG Wilson is an independent consultant forester and forest ecologist based in Aberdeen, Scotland. His professional and authorship interests encompass both species selection and alternative silvicultural systems for plantation forestry and the history and ecology of native woodland ecosystems in Great Britain.

Rethinking Agricultural Systems

A report on the BES/AAB conference, Oxford 18th – 19th December 2013

Geoff Radley / Independent Ecological and Environmental Consultant
gddh.radley@btinternet.com

Why do we need to re-think agricultural systems?

Barbara Smith introduced the conference by stressing that the fundamental challenge facing agriculture was that of how to increase agricultural production whilst reducing its adverse environmental impacts. This was also the principal conclusion of the 2011 Foresight Report on the Future of Food and Farming (Foresight 2011).

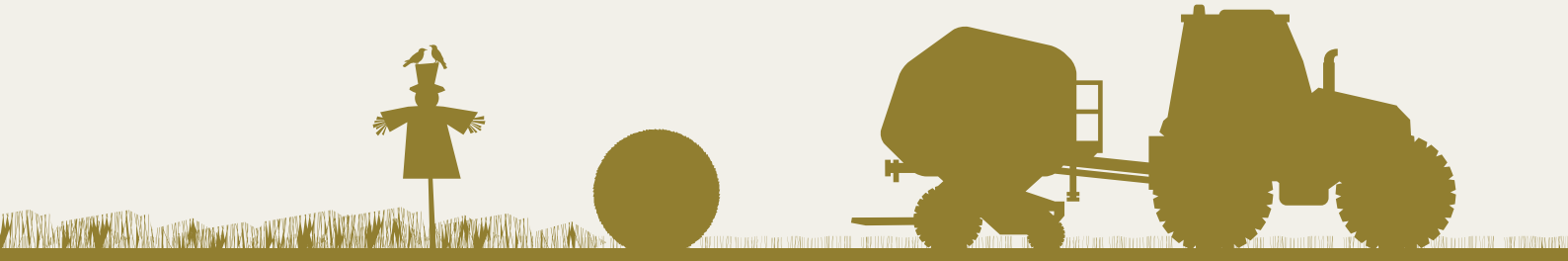
Jonathan Foley, Director of the Institute on the Environment at the University of Minnesota provided a concise summary of the global context. Agriculture is making major demands on the earth's resources. It occupies 40% of the land area, uses between 20 and 90% of available freshwater and makes a very significant contribution to emissions of greenhouse gases. Whilst meeting current demand for food was primarily an economic and political problem, rather than an ecological one, agricultural production would need to double in coming decades to meet the extra demand for food resulting from population growth and dietary change.

Jonathan suggested a number of global issues that, if tackled together, could help food production keep up with demand whilst also improving the sustainability of agriculture. These are:

- Halt deforestation – clearing forest does enormous environmental damage, and most of the cleared land produces very little food.
- Drive up yields, particularly of maize, in areas where there is a big gap between the yields that are possible and those currently being achieved. This can be done using current technology.
- Improve the efficiency of resource use – of water by finding more efficient irrigation techniques and of fertiliser by optimising N applications.
- Change diets – The US corn belt could feed 16 vegans per hectare but only 5 people on a normal western diet. Dietary change doesn't have to involve everyone becoming vegan though. Beef conversion rates are only 3 to 5%, but poultry conversion rates are between 16 and 40%.
- Reserve agricultural production for food – Currently 40% is used for non-food crops, particularly biofuels.
- Reduce food wastage, particularly losses due to poor storage.

Jonathan concluded that the bulk of the supply side issues could be tackled through the application of current technologies in 6 critical areas of the world, which don't include N W Europe, where agriculture is already highly productive and where much of the reduction in farmland biodiversity associated with intensive agriculture has already occurred.

However, Professor Tim Benton's analysis included consideration of the likely impact of a 4o C increase in mean global temperatures. He said this would increase the significance of NW Europe, as this is just about the only major food producing area of the world where climate change may actually benefit food production over the next 50 years. This was likely to lead to very strong market and political drivers to maintain and further increase production in this area. Ensuring that high levels of production can be sustained alongside other ecosystem services will be the major challenge facing UK agriculture.



WHAT ARE THE WAYS IN WHICH AGRICULTURAL SYSTEMS COULD BE RE-THOUGHT?

Four main routes for improving productivity while reducing environmental impact were presented by conference speakers and these are briefly reviewed below.

Incremental improvements in resource use efficiency

These were not a main focus of this conference, but Susanne Padel's paper (Padel *et al.* 2013) showed that calculating NPK balances could improve nutrient management and resource use efficiency in low input and organic dairy farms.

Tony Waterhouse (Waterhouse and Ricci 2013) discussed whether extensive or intensive beef production was better for minimising greenhouse gas emissions, and also considered the impact of different systems on the conservation of biodiversity. It is not easy to devise a system that simultaneously maximises production, minimises pollution and optimises biodiversity management.

Improvements in resource availability and utilisation through better use of soil processes and symbiotic organisms

Ron Stobart's paper (Stobart and Morris 2013) explored the impact of cover cropping on soils and on yields. It describes the impact of two different cover crops and a clover bi-crop on soils and yields under a range of nitrogen application rates and cropping regimes. None of the treatments showed a clear net short term financial benefit, but several have the potential to deliver longer term economic benefits.

The talk by I Brito (Brito *et al.* 2013) explored the potential for mycorrhizal fungi to improve crop yields and increase resource use efficiency. The potential benefits of mycorrhizal fungi for crop plants have been known for some time, but the cost of inoculation and the short cropping cycle have meant that such benefits were considered too difficult and expensive to realise. Brito's work suggests that at field scale, naturally occurring weed species could be used in combination with zero or minimum tillage to encourage mycorhizzal colonisation of wheat and other crops, and that this would allow yields to be maintained with lower fertiliser inputs and allow cropping to be more resilient.

Pete Iannetta identified the inefficient use of nitrogen as a major cause of the adverse environmental impacts of modern conventional farming practices (Iannetta *et al.* 2013). The use of nitrogen-fixing legumes in legume-supported cropping systems, combined with precision farming technologies and conventional pest and disease control measures, have the potential to allow yields to be maintained whilst reducing adverse environmental impact.

Improvements in overall yield through more diverse agricultural systems

The links between diversity, productivity and resilience in ecological systems were discussed by Martin Wolfe. Increased diversity of cropping could hold the key to sustainable intensification and Martin set out the potential advantages of agroforestry. Agro forestry systems can increase carbon sequestration, reduce nutrient leaching, improve soil conditions, benefit biodiversity and increase overall productivity.

The potential for increased diversity in agricultural systems to improve the resilience and sustainability of food production systems was explored by Hannah Jones (Jones *et al.* 2013). Hannah showed how the vulnerability of pollen development, flowering and grain set to abiotic stress could be ameliorated by genotypic diversity and through the buffering effect of pollinating insects.

Sally Westaway (Westaway *et al.* 2013) included a specific example of the potential benefits from agroforestry; alley cropping of willow and hazel between organic arable can produce land Equivalent Ratios of 1.4 to 1.5. The benefits could be further increased by using nitrogen-fixing trees or shrubs, something also advocated in Pete Iannetta's paper.

Landscape-scale approaches

Tim Benton warned against using narrow definitions of sustainability, such as GHG emission reductions, to assess agricultural systems as these can have perverse environmental effects. As sustainability is a complex and multi-faceted concept, it could only be achieved through smart, multi-functional landscapes. Achieving such landscapes would require action at a range of levels, and Governments would have a critical role. If there was a commercial argument it was that greater diversity might improve the resilience of agricultural systems.

An example of this approach was provided by Chris Stoate (Stoate & Szczur 2013) for a mixed farming catchment in Leicestershire. Approximately 7% of the arable land is outside the normal cropping cycle at any one time and is managed to produce multiple ecosystem services. There is a trade-off between food production and other ecosystem services, but the loss of production is minimised by taking the least productive areas out of production and by the intensive, multi-functional environmental management of these areas. Some of the ecosystem services that these areas produce, such the supply of pollinating insects and crop pest predators, may also benefit crop yields, or at least make production more resilient. Reduced cultivation of the cropped land also reduces soil loss and improves soil function. Sally Westaway's paper (Westaway *et al.* 2013) provided a specific example of multi-functional management of non-cropped areas,

showing how existing hedges could be managed to produce modest amounts of biomass without detriment to the other ecosystem services that hedgerows provide.

According to Gavin Siriwardina, (Siriwardina 2013) a landscape-scale approach can be tailored to benefit specific species and species groups. Enough must be known of the target species' ecology to identify the resources that are limiting their spread and design management to provide these resources. If management is not tailored to species needs in this way, there is a risk that it will only benefit generalist species.

Felix Herzog (Herzog & Schuepp 2013) considered whether biodiversity conservation and agricultural production were best reconciled in Europe through land sharing or land sparing; in the more productive agricultural areas it is important to have an element of land sparing to allow for the survival of semi-natural habitats. In more marginal areas it is important to maintain low intensity production methods that can support large areas of valuable wildlife habitats whilst producing limited quantities of high quality agricultural products. Species which cannot easily be accommodated on agricultural land will still need to be conserved on dedicated nature reserves.

Farmers prefer to separate environmental management from their cropped area, said Nigel Boatman, suggesting that small-scale land sparing is their preferred approach (Boatman 2013). Most farmers are very unwilling to modify their production practices solely in order to produce environmental benefits.

Boatman agreed with Herzog that it is important to retain within intensively farmed areas those ecosystem services that are of importance to agricultural production. He also emphasised the importance of farmland across England continuing to provide cultural ecosystem services. Christine Watson's paper (Watson, Edwards and Topp 2013) concluded that re-integrating arable and livestock production could improve resource use efficiency, improve soil condition and reduce pollution. Re-integration at a landscape scale might deliver these benefits whilst also retaining the economic benefits of farm-scale specialisation.

How might change be achieved?

Much current debate is bogged down because the different groups involved do not accept the assumptions and values that the others use as their starting points said Joern Fischer. Environmentalists do not accept the assumption in the agricultural industry that 'we must grow more' and agriculturalists do not always appreciate the importance of the other ecosystem services provided by farmed land. A more constructive starting point for the debate might be the concept of land scarcity. Joern suggested that there should be less emphasis on trade-offs between ecosystem services and more on integration to optimise the sum total of the benefits that land management can provide. Pablo Tittonnell addressed the need to respond to the challenge of sustainably increasing food production; systems that are currently unproductive need to be intensified and systems that are currently very intensive need the process of 'ecologicalisation'.

Increasing agrodiversity was key to t his process and he gave a number of examples of ecologicalisation in practice. Pablo warned that there were no simplistic solutions and tried to describe a pathway to sustainability. Resource use efficiency would be a valuable first step but would not be enough on its own to achieve the goal. The bottleneck in moving to more productive and sustainable systems was input substitution, the use of ecological processes to substitute for manufactured inputs.

Bill Sutherland advocated the maximum use of systematic reviews of the literature and warned of the danger of relying on experts. He advocated use of Delphic techniques for generating an expert consensus when called on to give advice.

Lisa Norton (Norton 2013) reminded the conference of the environmental cost of the first green revolution and stated that agro-ecology could play a vital role in helping to ensure that we learn from our mistakes. She emphasised the need to adopt sustainable production systems and outlined what some of the elements of these systems might be. These include:

- Optimising the use of agricultural land to provide the full range of ecosystem services, using both land sparing and land sharing at a range of scales, and recognising the dependence of agricultural production on biodiversity.
- Developing new approaches to intensive agricultural management including bio-fertilisation using mycorrhizae, improved targeting of nutrients and the selective use of GM technology.

SOME OVERALL CONCLUSIONS

1. Achieving long term food security at a local and a global level is a complex challenge which is as much about economics, governance and future dietary preferences as it is about food production methods. There is nevertheless likely to be a need to increase food production and to do so in ways that do not further exacerbate environmental degradation.

2. Although the UK is not in one of the six critical areas identified by Jonathan Foley as holding the key to sustainably increasing future food production, climate change may mean that the significance of NW Europe as a food producing area will increase in the coming decades, leading to intense commercial and political pressure to maintain and further increase food production.

3. Through a combination of agri-environment schemes and voluntary measures, some progress has been made in persuading farmers to adopt small-scale land sparing approaches. These efforts need to be continued, as the semi-natural habitats and landscape features that they allow for help to broaden the range of ecosystem services that farmed land can provide.

4. The next big challenge is to make the core farming operations of crop and livestock production more sustainable and environmentally benign, whilst also maintaining or increasing yields.

5. There are no simple solutions to developing agricultural systems that are both more productive and more sustainable. The conference has however identified a number of interesting developments that could become elements of such systems:

At the field scale

- The integration of leguminous species into cropping and forage production in ways that improve soil structure and reduce the need for manufactured nitrogen whilst minimising the periodic nutrient releases that have been a feature of conventional organic systems
- The use of reduced tillage and developer plants to encourage mycorrhizal connections to the roots of crop plants to improve nutrient and water uptake
- The development of more diverse production systems such as agroforestry that can more efficiently exploit the resources of an area of land and so increase total yields per hectare, whilst at the same time reducing adverse environmental impact.

At the landscape scale

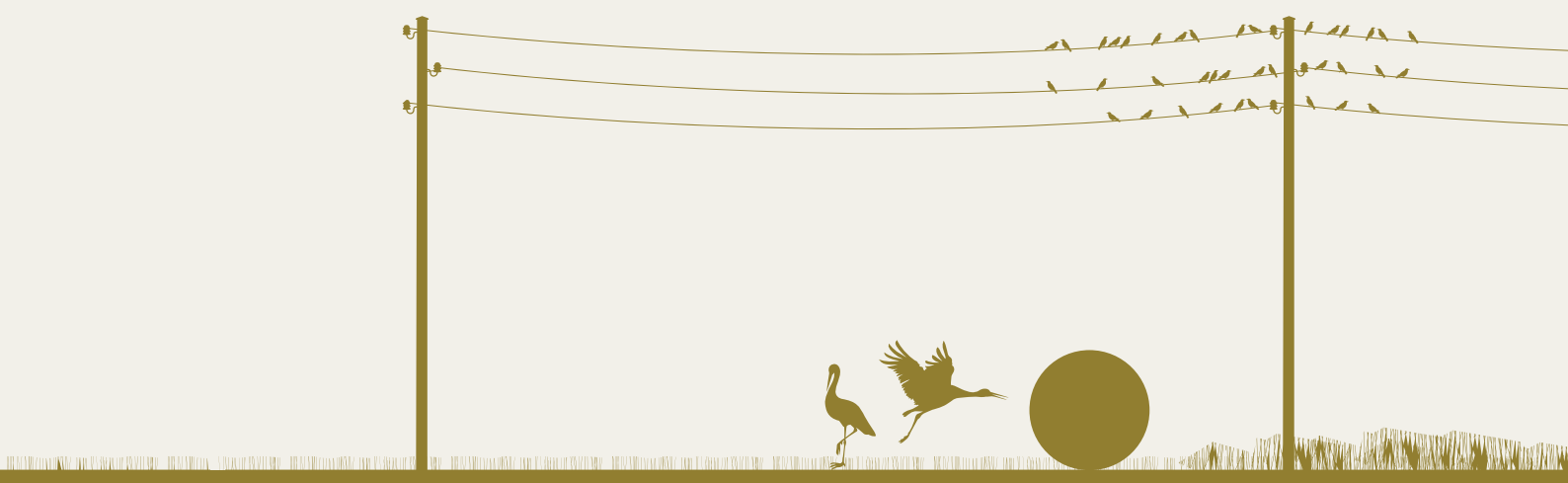
- The re-integration of arable and livestock production in ways that reduce the need for external inputs of nutrients and the production of potentially polluting waste materials
- The intensive and multi-functional environmental management of a small percentage of uncropped land in more productive and intensively farmed areas to sustain the biodiversity necessary to support agricultural production and provide other cultural and regulatory ecosystem services.
- Land sharing techniques that balance agricultural production against other ecosystem services such as carbon storage and biodiversity conservation in less productive extensively farmed areas
- The recognition that the optimal mix of ecosystem services that can be delivered by any particular land parcel will vary according to its physical characteristics and geographical location, suggesting that there is a need to develop new policy instruments to encourage optimal patterns of land management rather than always seeking to maximise the economic returns from agricultural production.

6. Agro-ecology has some useful insights to bring to the development of new agricultural systems, but it doesn't have all the answers. The development of such systems will require close collaboration with agricultural scientists, practising farmers, social scientists, economists and politicians.

REFERENCES

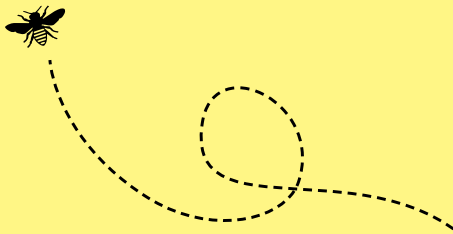
Foresight 2011. *The Future of Food and Farming: Final Project Report.* The Government Office for Science, London.

With the exception of the Foresight report above, all the citations in the text refer to papers published in *Aspects of Applied Biology* 121, *Rethinking Agricultural Systems in the UK* pp 11-16. We have omitted full citations for the sake of brevity.



"Creating a buzz: how to influence bee health policy"

"International bee experts swarm to London"



Sarah Blackford / SEB Head of Education & Public Affairs

These catchy headlines certainly did a good job of attracting a full-house of over 100 delegates and speakers to Charles Darwin House, where our annual 'Trisoc' meeting was held in January this year.

Organised jointly by the Society for Experimental Biology, Biochemical Society and the British Ecological Society, this year's meeting, entitled "Impact of Pesticides on Bee Health"[1], featured presentations by speakers from academia, industry, research institutes and governmental policy departments. It was always the intention of the organisers, Chris Connolly (Dundee) and Geraldine Wright (Newcastle), to open up the meeting to a non-academic audience and include people with genuine concerns about bee population decreases, and they weren't disappointed. The final day featured an open discussion session live streamed[2] to the public, who posed questions to the delegation, providing a lively forum for opinions to be aired and debated. Representatives from the media, environmental pressure groups (e.g. Friends of the Earth) and organisations such as the National Farmers' Union challenged the academic, government and industry scientists on the bigger policy questions and issues.

I was only able to attend the meeting on the final day, but Chris Connolly gave a succinct summary of the key issues during the open discussion at the end of the morning session. The core of the controversy between academic and industry-based scientists seems to be around the issue of research methodology: that is, the validity of field studies vs lab studies. Richard Schmuck (Bayer), who presented on Friday morning, demonstrated from his field studies that, although effects on individual bees is evident, the whole colony remains unaffected when treated with neonicitinoids. He also argued that, without pesticides, more land would be needed to grow crops, which would have a detrimental effect on the environment and biodiversity. Challenging these claims, Dave Goulson (Sussex) highlighted the fact that typical crop fields receive about 22 pesticide applications in a single growing season and, although pesticide use is recorded under an EU regulation, the UK government does not collect this data, so nobody can accurately assess local exposure levels. Dr Goulson also argued that since lab studies had been used to test pesticides before they went to market, current lab studies revealing toxic effects on bees are equally valid. Sandra Bell from Friends of the Earth initiated a discussion on integrated pest management and organic farming options, which she said have been neglected in favour of a pesticides monopoly over the past 30 years. She argued that more research should be conducted into these more environmental friendly and inclusive practices.

The conference concluded with a still-polarised audience, as reported in an article by Emma Bryce for the Guardian (28th January 2014)[3]. Summing up, Chris Connolly said, "Given that we use ~300 different pesticides (700 worldwide), plus other threats such as habitat destruction leading to poor nutrition, we can never prove which has the greatest impact. Our only hope is the usual slow consensus of opinion by which scientific knowledge progresses." The story continues...

REFERENCES

[1] http://www.jointbessebbs.org/2014/Programme.aspx

[2] http://bit.ly/19XSUEl

[3] http://bit.ly/1f7YpiO

[4] http://en.wikipedia.org/wiki/Neonicotinoid

MEDIA COVERAGE

Press Officer Becky Allen issued a press release for the Journal of Applied Ecology on bee health just before the meeting, which also promoted the London gathering, and this worked well to get coverage.

That paper and the meeting generated more than 40 cuttings, including the Mail on Sunday, Daily Mail, Guardian, Mirror, ITV, London Standard and Farmers Guardian:

http://www.dailymail.co.uk/news/article-2542421/Plight-shrinking-bees-Experts-suggest-widely-used-pesticide-responsible-smaller-insects.html

http://www.theguardian.com/environment/2014/jan/20/pesticides-making-bees-smaller

http://www.mailonsunday.co.uk/news/article-2542421/Plight-shrinking-bees-Experts-suggest-widely-used-pesticide-responsible-smaller-insects.html

http://www.mirror.co.uk/news/weird-news/bumblebees-shrinking-due-widely-used-3038581

http://www.standard.co.uk/panewsfeeds/pesticide-threatens-bumblebees-9070785.html

http://www.fwi.co.uk/articles/20/01/2014/142857/pesticide-exposure-39could-lead-to-smaller-bees39.htm

http://www.itv.com/news/london/update/2014-01-20/bumblebees-becoming-smaller-due-to-pesticide/

The meeting itself was covered by NHK (Japan's public service broadcaster) for a documentary

BBC Farming Today, 23 Jan 2013 [http://www.bbc.co.uk/programmes/b03qf7qs] and

Voice of Russia http://voiceofrussia.com/uk/news/2014_01_25/Bee-decline-Whatever-were-doing-its-down-to-our-greed-scientist-1705/

and the Guardian's environment editor also attended the meeting, so lots of publicity all round!

OF INTEREST TO MEMBERS

MEETING ANNOUNCEMENTS

Applications are now open for a short course:

Introduction to Mathematical Models of the EPIDEMIOLOGY & CONTROL OF INFECTIOUS DISEASES

Short Course for Professionals, since 1990

8-19 September 2014
at Imperial College London

In recent years, our understanding of infectious disease epidemiology and control has been greatly increased through mathematical modelling. Since 1990, this course has demystified mathematical modelling and kept public-health professionals, policy makers, and infectious disease researchers up-to-date with what they need to know about this fast-moving field.The course is taught by individuals who are actively engaged in research and who advise governments, international organisations, public health agencies and pharmaceutical companies.

Imperial College London's Department of Infectious Disease Epidemiology has been a world leader in mathematical modelling of the epidemiology and control of infectious diseases of humans and animals. It has developed models of pandemic influenza, SARS, HIV, TB, foot-and-mouth-disease, vector-borne diseases, helminth infections, STIs, bacterial infections and many more.

Participants only need a very basic mathematical ability (high school level is more than sufficient). Since most participants do not use maths regularly, if at all, we introduce concepts gently, step-by-step, and offer an optional 'maths refresher' day. We use simple software such as Excel (for which we offer an optional refresher) in practicals which allow the participants to have a hands-on approach and to explore theoretical concepts on real-life data.

Participants have included hospital clinicians, senior public health executives, health economists, veterinary researchers, biologists and mathematicians.

For further information & to apply, please visit http://www.InfectiousDiseaseModels.org If you have any questions, please contact infectiousdiseasemodels@imperial.ac.uk.

The Ramon Margalef Summer Colloquia

7th to 18th July 2014 in the Marine Sciences Institute in Barcelona (S pain).

This year marks the 10th anniversary of Ramon Margalef's death, and the special topic for this year's colloquium is **What Ecology can learn from natural and human-induced disturbances – A cross-system view.** The colloquia always include theoretical and practical activities, within this central topic, as well as group discussion sessions.

The principal aim of this year's Colloquium is to enhance the exchange of ideas and to promote imaginative thinking by bringing together ecological knowledge from experts on terrestrial, limnetic and marine systems. Substantial interest has arisen during the last 20 years on global studies in the context of future scenarios. Despite this recognition, very few universities have courses considering cross-system approaches and even fewer international forums have been dedicated to merge experts on the ecology of different systems.

The Colloquia, addressed to advanced doctoral students and recent PhDs.

For further information you may visit the web page of the Colloquia at http://www.acoio.org/margalef-summer-colloquia/ or write us to margalefcolloquia@acoio.org

Aurora Requena and Eli Bonfill
Organizing Committee

THE SLOW PACE OF CHANGE IN ECOLOGY SPEEDS UP!

After his rant in the December *Bulletin* Steve Cousins was forced to change his email address (Not, I am pleased to say, as a result of harassment by ecological trolls) and the one given at the head of the article no longer works. Anyone wishing to contact Steve can do so at steven.h.cousins@gmail.com

LETTER TO THE EDITOR

FROM ERIC DUFFEY

Formerly Monks Wood Experimental Station

In the August 2013 *Bulletin* (Vol. 44, No. 3) John Wiens wrote a thoughtful article entitled 'Patterns, paradigms and preconceptions'. He quoted Robert MacArthur who had written 'To do science is to search for repeated patterns, not simply to accumulate facts'. Wiens discusses this in relation to separating an interesting pattern in ecology from the 'maize of seemingly irrelevant data which spawns increasingly complex and sophisticated statistics'. He says we must rely on computers to detect patterns but adds that there is still a role for the practised eye of the keen observer to see a pattern in a mass of data. This recalls the comment, made long before computers, by the French essayist Montaigne (1533-1592), who wrote 'a mind which is taught how to think is better than a mind crammed with facts'.

I agree with the views expressed by John Wiens and Robert MacArthur but I imagine that many younger ecologists might not. I had the good luck to have Charles Elton FRS as my PhD supervisor in the early 1950s. When his book 'The Pattern of Animal Communities' was published in 1966 a distinguished professor described it as 'natural history', implying that it was not scientific. I think it was much more than natural history because it was also a book of ideas by a man whose brain really was trained to think.

No-one denies the value of statistics in animal ecology but there are also risks, the most common of which seems to be the failure to recognise, or else to ignore, the poor quality of some basic field data and the apparent belief that this deficiency can be put right by complex statistics. The most obvious example is the use of pitfall trap data to compare the invertebrate fauna of two or more different habitats. This is the most biased and unpredictable method of collecting field data and yet is widely used in comparative studies basing conclusions on statistical tests which are probably invalid.

ENVIRONMENTAL LEGISLATION

What are the forthcoming legislative issues of interest to ecologists and conservationists in 2014?

William J. Sutherland, Andy Clements, Ellie Crane, Cheryl Pilbeam, John Martin, Kathryn A. Monk, Katharina Rogalla von Bieberstein, and Des B.A. Thompson.

This is the fourth review of environmental legislation likely to occur on a global scale, in the European Union, and in the United Kingdom and its constituent countries (Sutherland *et al* 2011, 2012, 2013). All previous scans are available on the British Ecological Society website and we assume readers have access to these; we do not repeat previously identified issues. It is aimed at researchers to make them more aware of the legislative framework that may influence their work, so they can carry out relevant work, be aware of changes that may impact on their work, or engage in consultation processes. Beyond that, many advisers, teachers, students and practitioners find this forward look useful. Indeed, many policy makers have said they find these reviews invaluable, which has delighted us.

Since we started this series the impact of science has become more important, for example, through the recently completed Research Excellence Framework, by which UK universities will be assessed. Another major trend is that policies are increasingly being directed towards the 'growth agenda' with a concomitant emphasis on research being relevant to business.

As before, the remit of our review covers forthcoming legislation, developments in existing legislation, White Papers that may result in new or revised legislation, and any key Parliamentary Committee work that has a bearing on our topic. We do not give a comprehensive review of each, but aim to give sufficient information so that readers can identify relevant issues.

GLOBAL

INTERGOVERNMENTAL PLATFORM ON BIODIVERSITY AND ECOSYSTEM SERVICES

Having established the Intergovernmental Platform on Biodiversity and Ecosystem Services (the Platform) in April 2012, member governments, at the second plenary meeting of the Platform in December 2013, successfully adopted an ambitious first work programme and budget for 2014-2018 and have already committed more than half (US$ 25.4 million) of the total US$ 43.5 million required. After many years of negotiations on the institutional and programmatic framework of the Platform, the Platform will now commence the work it was created for. The work programme covers a range of assessments, including a set of regional and sub-regional assessments (due end of 2016), a global assessment on biodiversity and ecosystem services (due in 2018) as well as a number of thematic assessments, e.g. on pollinators, pollination and food production (due end of 2015) or on land degradation and restoration (due end of 2016). The work programme also foresees the promotion and further development of policy support tools and methodologies, addressing in particular the issues of scenario analysis and modeling as well as diverse conceptualization of values of biodiversity. To strengthen the foundations of the science-policy interface three task forces have been established to facilitate the implementation of the work programme: capacity building, knowledge and data management, and working with indigenous and local knowledge systems. This first work programme is designed to put the Platform on the right path, firmly establishing its working modalities, deliverables, credibility, relevance and legitimacy. It is intended to pave the way for the incremental strengthening of the science-policy interface for biodiversity and ecosystem services across scales, sectors and knowledge systems.

POST-2015 UN DEVELOPMENT AGENDA, SUSTAINABLE DEVELOPMENT GOALS AND BIODIVERSITY

The UN General Assembly's Open Working Group on Sustainable Development Goals, established in January 2013, took up the issue of biodiversity at its eighth session in February 2014. To inform the work of the working group, the Convention on Biological Diversity, together with other UN entities, the World Bank, and the secretariats of other biodiversity-related conventions, set out four complementary recommendations on how biodiversity could be integrated into Sustainable Development Goals.

UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

The role of the newly-established Warsaw International Mechanism for loss and damage is to promote the implementation of approaches to address loss and damage associated with the adverse effects of climate change. It will be reviewed at the 22nd Conference of the Parties at the end of 2016. The 19th Conference of the Parties had adopted

a number of decisions on Reducing Emissions from Deforestation and Degradation: the Warsaw Framework for REDD Plus in particular postulates that results-based finance is contingent on safeguards. Instead of the set-up of a 'REDD Plus' body, national entities and financial entities are encouraged to meet annually in conjunction with the meetings of the subsidiary bodies, starting in 2014. This institutional arrangement will be reviewed before 2017. Only very modest progress was achieved in laying the groundwork for the envisioned climate deal in Paris in 2015, in particular that all countries will have to submit their commitments to climate protection until 2015. Regarding climate finance, developed countries only agreed to prepare statements once every two years on how they are planning to scale up their finance to deliver the US$100 billion per year target by 2020.

UNITED NATIONS WORKING GROUP ON MARINE BIODIVERSITY BEYOND NATIONAL JURISDICTION

At the sixth meeting of this Working Group, delegates agreed to meet at least three times, probably twice in 2014 and once in 2015, to prepare for a decision on an international instrument to conserve marine biodiversity beyond national jurisdiction under the United Nations Convention on the Law of the Sea. In addition, increasing interest in seafloor mining raises a number of environmental, legal and economic challenges for the International Seabed Authority.

NAGOYA PROTOCOL ON ACCESS AND BENEFIT-SHARING

The Nagoya Protocol on Access and Benefit-Sharing is expected to come into force in 2014. A global multilateral benefit-sharing mechanism, which parties agreed to consider under the Protocol, was addressed at the third meeting of the *Ad Hoc* Open-ended Intergovernmental Committee for the Nagoya Protocol in February 2014.

MINAMATO CONVENTION ON MERCURY

Under this Convention, established in 2013, governments have agreed on a range of mercury-containing products whose production, import and export will be banned by 2020, and to draw up national plans to reduce the use of mercury. The Conference of the Parties of the Basel, Stockholm and Rotterdam Conventions expressed their interest and signaled readiness to cooperate and coordinate with the Minamato Convention on Mercury.

INTERNATIONAL TREATY ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

At the fifth session of the Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture, parties adopted a Resolution on Farmers' Rights that may impact plant variety protection laws. In addition, a newly established working group was mandated to develop a range of measures to enhance the functioning of the Multilateral System of Access and Benefit-sharing for consideration and decision by the sixth session of the Governing Body in 2015.

EUROPE

Major reforms in 2013 of the Common Agricultural Policy and the Common Fisheries Policy were driven through the European Parliament and the Council of Ministers, and were implemented at the beginning of 2014. After such broad changes, the focus this year will be on enacting these policies. Across all aspects of policy, 2014 has been described by the European Commission's President José Manuel Barroso as "a year of delivery and implementation".

EUROPEAN UNION 2020 BIODIVERSITY STRATEGY

The implementation of the headline biodiversity target to halt the loss of biodiversity and ecosystem services by 2020 will continue throughout 2014. At the end of 2013, the Commission put forward proposals for a Regulation to address invasive non-native species and protect biodiversity. This will be assessed by the European Parliament and Council of Ministers in 2014 to meet the target of 'tighter controls on invasive alien species'. There will also be a focus on the implementation of the European Union Strategy on Green Infrastructure adopted at the end of last year under the target of 'better protection and restoration of ecosystems and the services they provide, and greater use of green infrastructure'.

In moving towards meeting the target of 'maintaining and restoring ecosystems and their services' in 2014, work will focus on the mapping and assessment of ecosystems and their services in Europe. Initial work should be completed by all European Union member governments by the end of 2014. The UK completed this in 2011 through the publication of the *UK National Ecosystem Assessment*. Further work is anticipated on the 'no net loss' initiative. The Commission is working towards a proposal in 2015 to ensure that there is no net loss of ecosystems and their services across Europe. As a part of this, an initial proposal is anticipated which will develop a methodology to assess the impact of European-funded projects on biodiversity.

ENVIRONMENTAL IMPACT ASSESSMENT DIRECTIVE

A review of this Directive is currently underway. The Directive aims to protect the environment by ensuring that projects that are likely to have significant effects on the environment carry out an impact assessment before work goes ahead. The Commission's proposals aim to reduce administrative red tape and make it easier to assess potential impacts on the environment. The European Parliament's amendments and position were completed at the end of 2013, and negotiations on implementation will continue through 2014.

HORIZON 2020

This is the next EU Framework Programme for Research and Innovation and it will run from 2014 to 2020. The final legislative text for the programme was adopted at the end of 2013, and the budget agreed at €78.6 billion. Horizon 2020 underpins the objectives of *Europe 2020: Europe's growth strategy*, and comprises three main pillars: excellent science, industrial leadership, and societal challenges.

LIFE+

The LIFE Programme is the EU's funding instrument for the environment. The fourth phase of this came to an end in 2013. Proposals for the next funding round (2014-2020) were developed by the Commission in 2011, and agreed late in 2013. The new regulation creates two sub-programmes: environment and climate action, with an overall budget of 3.4 billion.

UNITED KINGDOM

MARINE STRATEGY FRAMEWORK DIRECTIVE

On 8 January 2014, Defra opened a public consultation on proposals for UK monitoring programmes under this directive. Progress on achieving Good Ecological Status by 2020 should be monitored with reference to 11 descriptors that include: biological diversity; non-indigenous species; commercially exploited fish and shellfish; and hydrographical conditions. The consultation closes on 2 April 2014. There will be a further consultation in 2015 covering the UK's proposals to achieve Good Ecological Status.

NEW RURAL DEVELOPMENT PLANS

Agreement on the Common Agricultural Policy for 2014-2020 was reached in Brussels in June 2013. The UK received a reduced budget for both Pillar 1 (direct subsidies to farmers) and Pillar 2 (Rural Development funding), with flexibility to transfer up to 15% of the Pillar 1 budget into Pillar 2. As the largest single pot of money available, the Rural Development budget is highly significant for conservation in the UK. Scotland, England and Wales have each decided to transfer 9.5%, 12% and 15%, respectively, of the funds to help ensure the continuation of vital agri-environment schemes. Following a legal dispute, Northern Ireland has been left with the default option of zero budget transfer.

COMMON FISHERIES POLICY REFORM

Following the reform mentioned above, the UK has concluded a sustainable fishing deal to begin implementing the new policy. The framework has the objectives that decisions and activities will follow available scientific advice, achieve sustainable fishing levels (Maximum Sustainable Yields), and reduce discards.

CHALARA FRAXINEA – ASH DIEBACK

During 2013, Defra convened a summit and action group to tackle this disease. A plan to manage *Chalara* was published in March 2013 and, amongst other things, work is underway to find genetic resistance in the native tree stock.

STATE OF NATURE

Twenty-five UK nature conservation NGOs joined together to publish the first *State of Nature* report in May 2013. This report headlined the decline of 60% of species assessed over the previous 50 years. This reporting will probably be repeated periodically over coming decades, and there is an intention to improve the quality of monitoring data across broad groups of taxa.

REVIEW OF THE BALANCE OF COMPETENCES

In July 2012 the Government launched a *Review of the balance of competences*, looking at the division of powers between the UK and the European Union. The Government is consulting with stakeholders, the public and the EU institutions. The review of the environment and climate change was led by DEFRA in 2013. In 2014, the review will look at a number of related EU competences, including energy, agriculture and fisheries.

ENGLAND

DEREGULATORY AGENDA

A significant overarching issue is the Government's commitment to deregulation. The Red Tape Challenge is focused on removing what is termed 'unnecessary bureaucracy'. The latest step is the publication of a draft Deregulatory Bill, which will be taken through Parliament this year. The concern is that this process removes regulations that may be providing environmental protection, with very little impact assessment.

OPEN DATA

Following consultation during the year, Defra published a revised Open Data Strategy on 19 December 2013. This sets out a continuing commitment to making data open, and presents a set of principles that Defra and its agencies will apply to embed transparency and the publishing of open data as part of day-to-day business.

TRIENNIAL REVIEW OF AGENCIES

Defra concluded its reviews of the Environment Agency, Natural England and the Joint Nature Conservation Committee (JNCC). The outcome stopped short of a single environment body in England, although there is a strong requirement for working together between the first two. Against a background of continuing public sector funding cuts, Natural England is reassessing its remit and functions. JNCC retains its role as Defra's independent evidence provider, with minor adjustments to address improved services.

MARINE CONSERVATION ZONES

Defra's consultation in 2013 on proposals for designation of Marine Conservation Zones received 40,000 responses. The site designations and summary of site-specific consultation responses were published in November 2013. The focus for the future will be on delivering measures to support the designations, and ensuring the remaining tranche of designations come to fruition. The Environmental Audit Committee will launch an inquiry on Marine Protected Areas.

NATURAL CAPITAL COMMITTEE

This Committee published its first report, The *State of Natural Capital* in April 2013. The report recommends a new framework to measure and account for changes in natural capital assets, and to improve valuation of those changes to feed into decision-making processes. Their second report, focusing on natural capital accounting for companies and landowners, is expected in early 2014.

FOURTH CARBON BUDGET REVIEW

A review of the Fourth Carbon Budget (covering the period 2023–27) will take place in 2014, under Section 4 of the Climate Change Act 2008. The budget can then only be altered if there has been a significant change affecting the basis upon which it was set. The Energy and Climate Change Select Committee is undertaking an inquiry into the appropriate level of the Budget and the Committee on Climate Change has recommended to Government that the Budget should not be altered.

DAVIES COMMISSION

The independent Airports Commission (known as the Davies Commission) produced an Interim Report in December 2013, concluding that there is a need for one additional runway to be in operation in the south east of the UK by 2030 in order to maintain the

UK's status as an international hub for aviation. The Commission will publish a final report by summer 2015. The findings of the Commission are likely to have an important impact on the UK's decarbonisation agenda and, potentially, major ecological impacts at any site chosen.

ENERGY ACT 2013

This legislation received Royal Assent on 18 December 2013. The Act will establish the legal framework for delivering secure, affordable and low-carbon energy, and includes provisions on decarbonisation, pipelines and storage, and nuclear regulation.

BADGERS AND BOVINE TUBERCULOSIS

Badger cull pilots ran in two areas between August and December 2013, though were terminated early before the required proportion of badgers had been culled. Defra will hear from an independent panel as to the outcome of these pilots, and further recommendations.

BIODIVERSITY OFFSETTING

A consultation on this took place in 2013. The Government is considering a range of proposals to implement this measure, though the debate is complex, with little alignment between stakeholders. Scale, the mitigation hierarchy, a voluntary or regulatory approach, and measures to ensure effectiveness in perpetuity are key issues yet to be resolved.

INVASIVE NON-NATIVE SPECIES

The Law Commission will produce a draft Bill this summer as part of its review of Wildlife Management Law covering the conservation, control, protection and exploitation of wildlife in England and Wales. The Government has one year to respond in full, but one element of the proposals, Species Control Orders (for tackling invasive non-native species), may be introduced into law sooner. A ban on the sale of five invasive non-native aquatic plants comes into force in April, under the Wildlife and Countryside Act. The Government's Environmental Audit Committee is undertaking an inquiry on the prevention and management of the introduction and spread of invasive non-native species.

WATER

Implementation of new requirements for sustainable drainage systems, already delayed, is expected in 2014 and will affect new and existing housing. Sustainable drainage systems provide opportunities to better manage local flood risk and water quality while enhancing local biodiversity. Statutory consultations on draft River Basin Management Plans are expected in June.

LOBBYING BILL

The Transparency of Lobbying, Non-party Campaigning and Trade Union Administration Bill could significantly affect the ability of charities, community groups and other organisations to work on environmental issues in the year leading up to an election.

SCOTLAND

THE REFERENDUM

Scotland's Referendum on 18 September 2014 will dominate Scotland's political and environmental agenda in 2014. The Scottish Independence Referendum Bill makes little reference to the environment, though implications for the environment will be discussed by several Westminster and Scottish Parliamentary Committees.

BEYOND THE YEAR OF NATURAL SCOTLAND

2013 was formally designated 'The Year of Natural Scotland', which helped raise the political and public profile of nature. This continues into 2014 (The Year of Homecoming). One major event will be the opening of a new John Muir Way in April 2014, which will consolidate significant effort going into raising awareness of the outdoors and the wide range of benefits brought.

MARINE ISSUES

The Scottish Government's consultations on marine issues closed in November 2013. This covered proposed new Marine Protected Areas, marine planning, and the future of marine renewables. A draft National Marine Plan will be laid before the Scottish Parliament in summer 2014. This is a major component of the Marine (Scotland) Act, and for the first time will set out policy objectives for marine ecosystems, as well as for social and economic aspects.

PLANNING ISSUES, COMMUNITY EMPOWERMENT AND RURAL ISSUES

The draft National Planning Framework 3 will be laid before the Scottish Parliament early in 2014. This has wide ranging influences on climate change targets being met and the Climate Adaptation Programme. The Community Empowerment Bill's consultation closed in January 2014, and will be considered by Parliament. This has implications for 'communities' to buy out or influence the management of land and other assets. The Rural Affairs, Climate Change and Environment Committee deals with a wide range of environmental issues. In November 2013, it took evidence on deer management, and is preparing advice on this for the Scottish Government to consider early in 2014. Red and roe deer, in particular, have many impacts on wildlife, habitat, landscape and socio-economic interests, and it is possible that there will be important steers for government agencies and the land management sector arising from this.

THE 2020 CHALLENGE FOR SCOTLAND'S BIODIVERSITY

This strategy was published in 2013, and new governance has been put in place to take it forward – involving Government, agencies, and a wide range of sectors. There is heavy emphasis on achieving a step change for helping nature and broadening its benefits. The 'ecosystem approach' and development of a natural capital asset index are prominent. It is intended that 'Delivery Agreements' will commit Scottish Government departments and agencies to work taking forward the strategy.

Species conflict issues continue to have a high political profile, and Sutherland *et al* (2013) mentioned the introduction of 'vicarious liability' in the Wildlife and Natural Environment (Scotland) Act 2011. In this, a new offence of vicarious liability in relation to the persecution of wild birds was introduced, allowing for the prosecution of those landowners or managers who fail to take appropriate steps to ensure their employees and contractors act within the law. This has not been tested in the courts, but has implications for wider socio-ecological work on human-wildlife conflicts.

WALES

FUTURE GENERATIONS (WALES) BILL (PREVIOUSLY NAMED THE SUSTAINABLE DEVELOPMENT (WALES) BILL)

The Minister for Communities and Tackling Poverty leads on this Bill. Following the White Paper consultation, the Government decided that the purpose of the Bill was more effectively communicated by changing its name to the Future Generations Bill. This reflects an emphasis on tackling the generational challenges Wales faces in a more integrated way – ensuring Welsh public services make key decisions with the long term well being of Wales in mind. A 'national conversation' on the challenges faced by communities across Wales is planned in early 2014 to engage as wide a variety of the public as possible on what the Bill will mean for them; the Commissioner for Sustainable Futures will help begin this conversation. The Bill will be introduced to the National Assembly for Wales in the summer 2014.

ENVIRONMENT (WALES) BILL

The Welsh Government's White Paper consultation on Wales' Environment Bill, *Towards the Sustainable Management of Natural Resources* closed on 15 January 2014. One of the main purposes of the Bill is to create the statutory basis for a more integrated approach to the management of natural resources, including giving Natural Resources Wales, established on 1 April 2013, a series of additional duties and powers. This would help it to deliver more fully its statutory purpose, namely to ensure that the natural resources of Wales are sustainably maintained, enhanced and used, now and in the future. The Bill should be put before the Assembly in 2015 and, if the Assembly passes the Bill, it will enter into force in early 2016.

WELSH GOVERNMENT NATURE FUND

A £6million Nature Fund was announced by the Minister for Natural Resources and Food in mid-2013 to support practical ideas for improving biodiversity whilst supporting multiple benefits to society. Ideas for its use were sought across diverse stakeholders at events linked to the Environment Bill consultation meetings; details of how to apply for funding are expected in the near future.

THE MARINE AND FISHERIES STRATEGIC ACTION PLAN

As part of a new approach to integrated marine fisheries policy in Wales, the Minister for Natural Resources and Food published the *Welsh Marine and Fisheries Strategic Action Plan* in November 2013. This sets out how Wales can provide comprehensive, integrated marine governance in Wales for the first time. Its aim is that, by 2015, key elements of an integrated approach to managing Welsh seas will be in place. These would encompass marine management, fisheries, marine energy, tourism, transport and more, link with the *Welsh National Marine Plan for Inshore and Offshore* to support the sustainable use of seas and coasts.

'MAKING THE MOST OF EVERY DROP'

Running from mid-December 2013 to 28 March 2014, this consultation asks whether the water abstraction management system in Wales needs to change and explores options for reforming the current system. Following the consultation, detailed policy in relation to future water management in Wales will be set out in the Welsh Government's final Water Strategy, intended for publication in late 2014.

PLANNING (WALES) BILL

This draft Bill and consultation paper *Draft Planning (Wales) Bill and associated proposals to reform the planning system in Wales* were published in December 2013. Comments were sought on proposals to modernise the planning system through changes to legislation, policy and guidance. The Bill should be introduced to the National Assembly for Wales in late 2014.

ENVIRONMENTAL IMPACT ASSESSMENT DIRECTIVE

In November 2013, the Minister for Housing and Regeneration outlined the Welsh Government's position on the UK's negotiating strategy for the proposed amendments to the Environmental Impact Assessment Directive. He highlighted that, in Wales, separate consent regimes exist applying EIA in agriculture, forestry, highways, land drainage, land use planning, marine and water sectors. Around 80% of all cases where environmental reports are produced are determined through the land use planning system.

NORTHERN IRELAND

THE NORTHERN IRELAND MARINE ACT (2013)

The long-awaited Northern Ireland Marine Bill became the Marine Act in 2013. After years of campaigning and lobbying, a framework has been put in place that will lead to the creation of marine protected areas off Northern Ireland's coastline. New Marine Conservation Zones will be created as part of the Act to protect the most important and vulnerable habitats and species. A plan will also be put in place to decide how the sea is used by people, and to balance the demands for development with the need to protect important marine ecosystems.

VALUING NATURE CONSULTATION ON A BIODIVERSITY STRATEGY FOR NORTHERN IRELAND TO 2020

The Northern Ireland Environment Agency is consulting on a Biodiversity Strategy to 2020. *The Northern Ireland Biodiversity Strategy*, published in 2002, provided a focus on action that could be taken to protect vulnerable and threatened habitats and species. The major change within the current strategy will be looking towards valuing ecosystems in their entirety. There will also be an emphasis on reflecting the benefits society at large derives from the environment in economic decision-making, to help improve the performance of the economy.

LONG-TERM WATER STRATEGY

The Northern Ireland Government has now begun work on a long-term water strategy. The vision of this strategic work is to improve and protect the natural water environment and create a more sustainable and secure means of delivering wholesome water. Some of the key aims of the strategy will be to protect and improve the quality of the aquatic environment and manage inland and coastal waters to support tourism, recreation and biodiversity. The strategy is being led by the Department for Regional Development, and it is anticipated that the draft will be published for public consultation in the summer of 2014.

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ACKNOWLEDGEMENTS

This is an activity initiated by the Cambridge Conservation Initiative and carried out as a collaborative partnership. We thank Richard Benwell and Thomas Koetz for contributing sections. WJS is funded by Arcadia.

William J. Sutherland is at the Zoology Department in Cambridge; Andy Clements is Director at the British Trust for Ornithology, Thetford, Norfolk; Ellie Crane is Agriculture Policy Officer at the RSPB, Sandy, Bedfordshire; Richard Benwell is Parliamentary Programme Manager at the RSPB, Sandy, Bedfordshire; Cheryl Pilbeam is Acting Policy Manager for the British Ecological Society; John Martin is Senior Conservation Officer for RSPB Northern Ireland; Kathryn A. Monk is the Science Strategy Manager for Natural Resources Wales; Katharina Rogalla von Bieberstein is Programme Officer at the United Nations Environment Programme World Conservation Monitoring Centre in Cambridge, and Des Thompson is Principal Adviser on Biodiversity in SNH.

Moving onto a PhD & Mastering Ecology: A BES Student Ecology Symposium

Dom Andradi-Brown / University of Oxford
@dandradibrown

In late November 2013 the BES hosted a two-day event for students considering whether a PhD in ecology was the right move for them and giving them a chance to present their work in a student ecology symposium. The event was organized by the BES Undergraduate Fellowship Alumni Group to follow up on the previous successful undergraduate ecology careers days.

The 'Moving onto a PhD' careers day kicked off with Georgina Mace (UCL) giving a welcome plenary of why we need ecology, highlighting human impacts on the environment, biodiversity loss and ecosystem services. While very depressing to hear quite how bad human impacts on the environment are, it certainly was encouraging from a careers perspective that there is a need for people to engage with these issues. Georgina finished her talk highlighting some of the highly desirable skills that an ecological training provides such as; analytical and conceptual thinking, dealing with complexity and team working with individual specialism.

One question addressed in the careers day was whether a PhD was the right move for people when they consider the area they would like to be working in. Paul Jepson (University of Oxford) started the first career session by reflecting on why a PhD is valuable through considering the benefits. Careers benefits identified included; an entry level qualification to academia and research, often the norm in expert technical communities, adding credibility when working in corporate sector and providing an opportunity to change career direction. Paul also identified some of the intellectual reasons for doing a PhD such as developing analytical and technical skills, mastering the ability to write and communicate well and quickly, developing critical appraisal skills and the ability to ask sharp questions and recognise and respect rigorous answers.

Paul analysed the ecology and conservation workscape, grouping ecology and conservation jobs that require PhDs (research based jobs), where a PhD can be useful (NGOs, ecological and environmental consultancy) and those that often don't require one (ecotourism, media). Following this, Paul led a group SWAT analysis considering advantages and disadvantages of doing a PhD at the start or your career (immediately following an undergraduate/masters degree), doing it in your late 20s or doing it in late 30s. The general feeling was that doing a PhD is very much a personal choice, depended on your circumstances and motivations which also affect when the best time to do one is.

The day then moved onto looking in more detail at the mechanics of how to apply to and get funding for a PhD. Mark Mulligan (Kings College London) highlighted different funding options for students, considering different research council studentship types and other scholarships. Other more diverse funding sources were considered, such as partnerships with industry and doing a PhD with your current job if you already work in ecology. One thing that this was really useful for was an overview of when and where to look for PhD funding – a key first step if you're considering a PhD (see the full slides on the website if you want the list!). Mark also addressed the question 'How possible is it to create and get funding for your dream PhD?' with the suggestion that it's very possible but requires finding the right supervisor with similar interests and allowing enough time to apply for funding.

In the afternoon Andy Purvis (Natural History Museum and Imperial College London) outlined how to plan and design good research projects. The session focused on cutting your PhD project into manageable chunks, which fit the trade-off between probability of success and 'honour and glory' for novel, interesting and difficult science. This analogy of the 'Medawar Zone' of optimal payoff for a research project was a great way of thinking about what is achievable.

The last talk of the day was from Ross Mounce (University of Bath – @rmounce) on using social media to help do science. One of the many useful tips Ross mentioned was #icanhazpdf on Twitter. This is where if you can't access a paper you just tweet the URL, #icanhazpdf and your email address. Normally someone with access will help you out and email you a pdf, you should then delete your tweet. Twitter is also fantastic

CAREER STAGE	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Beginning (after UG/ masters)	• Academic continuity • The rest of your career to build up your research • Benefit from existing networks to find opportunities	• May not have efficient time management skills developed	• Few responsibilities • Flexibility- you can live more cheaply when you're young	• Lack of big picture/wrong choice • Opportunity cost of possibilities open to early career ecologists • Missing out on practical experience, may inhibit later career • Lose flexibility – Overqualified?
Early (27-32)	• Better overview and focus of your area of interest • Better time and people management skills	• May turn your settled life up-side down	• May have some money to invest in PhD –financial flexibility • May have networks to allow PhD project partners • Opportunity to switch career • Can open up a portfolio career	• You may seem flighty, disloyal or break some networks if you leave an organisation
Mid (37-42)	• Clearer about your choice and focus • Potentially have networks and knowledge of how system works	• Older than most other PhDs and your life is different • Can't live as cheaply	• Personal reflection and development • Can open up a portfolio career • Could finance PhD from consultancy work	

SWOT Analysis of undertaking a PhD at different career stages

at meetings and conferences, for example at Intecol 2013 it was used as the primary way to ask questions to plenary speakers and some of the on-twitter discussion was great.

A panel discussion and drinks reception followed in the evening with ecologists from a range of careers including; publishing, conservation charities, research and consultancy discussing their career paths and giving individual advice to students.

The second day provided the chance for students and recent graduates to present talks and posters from their undergraduate or masters projects. This led to a wide range of topics all at an extremely high standard. Student talks and posters were judged by a panel, as well as by popular vote.

After the social media talk the previous day there was lots of twitter activity throughout the symposium – check the hashtag #MastEcoBES13 to see the discussion and comments on talks.

Many thanks to all who spoke at the events across the two days and everyone who came. The full slides from the careers day are available on the BES website at: http://www.britishecologicalsociety.org/careers/careers-events/mastering-ecology-symopsium

STUDENT POSTER AND TALK WINNERS

Judged

Talk winner: **Benno Simmons, University of Oxford.** *Geodiversity and biodiversity: evaluating the surrogacy performance of abiotic heterogeneity in the UK.*

Talk runner up: **Chloe Orland, University of Plymouth.** *CT-scanning – towards a deeper understanding of the relationship between habitat complexity and biodiversity.*

Poster winner: **Abigayil Blandon, University of Cambridge.** *Quantitative estimate of commercial fish enhancement by seagrass habitat in southern Australia.*

Poster runners up: **Samuel Leigh, University of East Anglia.** *The effect of agri-environment schemes adjacent to a wet grassland reserve in relation to wader nest predation risk.*

Popular Vote

Talk winner: **George Foot, University of Warwick.** *The influence of colour on the ability of carnivorous plants to lure their prey.*

Talk runner up: **Thomas Leharne, University of Lancaster.** *Assessing the Suitability of using an ENFA Model, Biomapper4.0, to Identify Areas Threatened by Feral Goats Inhabitation; Northland, Aotearoa/New Zealand.*

Poster winner: **Ayla Paul, University of Reading.** *Dietary composition of the common buzzard on Langholm Moor, Scotland, in relation to habitat.*

Poster runners up: **Catherine Kerr, Imperial College London.** *The viability of shade-grown cacao/coffee plantations as a conservation strategy in communities with human-wildlife conflict in Sierra Leone.*

Nicole Ponta, University of Zurich. *Across the border: population structure of wildcats (Felis silvestris silvestris) in the Franco-Swiss Jura.*

Project Management, Fellowships and Grants: A Workshop full of top tips

Jess Stephenson & Emma Gillingham / PhD student, Cardiff University
cripescardiff.co.uk

Susan Withenshaw / PhD student, University of Liverpool
pedersen.bio.ed.ac.uk

One December morning, a group of early career researchers from two of the BES Special Interest Groups (Parasites & Pathogens and Tropical Ecology) gathered at London's Natural History Museum (NHM) for what was to be an engaging and highly informative 2-day workshop on project management and funding applications. The event was organised by Ines Fontes and Jon Bielby of the Parasites & Pathogens SIG, and Lindsay Banin, Sophie Fauset and Frazer Bird of the Tropical Ecology SIG, and was attended by 38 researchers, from first-year PhD students through to post-docs.

Day one focused on Project Management. After initial introductions over coffee and a mountain of croissants, Dr Caron King of Kingswood Plus Ltd. kicked off proceedings. Caron is now a project manager and business consultant, with extensive experience in industry. She began her career as a scientist, completing a PhD and post-doc in pharmacology. This breadth of academic and industrial experience means she is well placed to offer practical advice on the successful management of academic research, from PhD studentships to multi-million pound research projects. Furthermore, by continually drawing on the experiences of individuals within the group, we all came away with highly relevant tips and advice in lieu of abstract concepts and baffling jargon.

Lively discussions enabled participants to identify the project management skills we have already accrued as researchers (we manage projects every day, probably without even realising it), and highlighted other tools to help manage our research projects in novel and efficient ways. For example, always begin with the end in mind; identify your stakeholders and be aware of how to keep them happy (an appropriately gifted tin of Quality Street can do wonders!); remember the scope of your project (identify when you are taking on too much, and learn to say no!); use post-it notes to create detailed and specific plans to transform that daunting task into achievable chunks of work; always assume that tasks will take 20% longer than you originally thought! (See 'top tips' below).

Day two, the funding workshop, was all about grants and fellowships. We were joined by Professors Mike Boots (University of Exeter), Mike Brockhurst (University of York) and Dr Emma Sayer (Open University). Mike Boots is chair of, and Mike Brockhurst is an assessor for, the NERC fellowship committee. Both have been very successful in obtaining grants from NERC as well as the other large funding bodies such as BBSRC, and the Leverhulme and Wellcome Trusts. Emma Sayer, a new lecturer, was recently awarded a £1.4 million European Research Council Starting Grant and is co-PI on a NERC large grant. It is therefore safe to say that our speakers have a lot of valuable experience of applying for and assessing funding applications.

The first session focused on the NERC fellowship, which is widely recognised as one of the most competitive fellowships available. Gaining an appreciation of what makes a NERC fellow, or a 'future world-leading researcher' was therefore very useful in terms of applying for any fellowship. Mike Brockhurst gave us a timetable of application 'milestones' that Caron would have been proud of. He also highlighted that for a fellowship, while a poor project proposal can lose you the funding, your chances of success hinge largely on an impressive CV and publication record. We all felt suitably daunted, but also encouraged: many people who are awarded the fellowship finish their 5 years in a permanent job. Additionally, feedback from the committee is very helpful and supportive, and many applicants are successful the second time they apply.

For at least three, and probably most of the other PhD students in the room, the fellowship suddenly seemed a few years off. So we were all ears for the next session on grants; employment as post-docs on grant-funded projects is perhaps the most common route of career progression after PhD completion. Mike Boots gave us an

overview of NERC grants and the different types of post-doc funding available: you can apply for a funded post-doc position with a PI who has already secured a grant, or, more impressively (with regards to future fellowship applications) you can be a named post-doc, a co-investigator or co-applicant on a grant application that a PI is submitting.

More so than a fellowship, a grant application requires 'cast-iron', 'watertight' planning of an 'ambitious but feasible' idea. Emma Sayer gave us practical suggestions for how to construct clear and impressive applications and, along with the other speakers, made the point that grant reviewers are human: confused humans are often irritable and negative! She also gave us some tips, much needed at this point in our careers, for the management of nerves and self-confidence at interviews, such as: 'BBC' – put your "bum back in chair" so you are not nervously perched on the edge of your seat; train yourself to answer unexpected questions by using a list of your skills and the positive attributes of the project to respond to any conceivable negative points an interviewer could raise; and get the message across quickly by identifying three key points of your research.

These three key points also came in handy when we were given the opportunity to practice some important skills. Creating an 'elevator pitch' – describing what you do in a succinct and engaging way – was great for learning about what others in the room were doing, as well as how to 'sell' your science, something that we can all put into practise at conferences or events like this. We also had a brief CV workshop, which equipped us with several useful tips for creating clear and competitive CVs, which will stand us in good stead for future applications.

All in all, our two days in a seminar room at the Natural History Museum were incredibly useful and lots of fun. We enjoyed coffee on tap, cakes a-plenty and one of the best sandwich selections ever, as well as coming away with a catalogue of tips for the successful management of academic projects. Whilst the funding application process is perhaps still daunting for most, at least now it has been demystified, as we know exactly what we need to do to become future research leaders. Many thanks to all the organisers, speakers and participants who made this such a great workshop.

TOP TIPS – PROJECT MANAGEMENT

1. **Begin with the end in mind:** When planning a paper or application submission, begin your plan from the deadline: handing in 30th September, by 23rd September I need to make sure X is complete; by 1st September I need to make sure Y is complete; etc.
2. **Stakeholders:** Lots of different types of people have an input into your project (e.g. funders, supervisors, collaborators). Each type requires different levels of feedback and involvement – clarify what needs to happen to keep them, and yourself, happy.
3. **Planning:** Brainstorm everything that has to be done onto post-it notes, and use one post-it note per task. Then break down the task, e.g. instead of having a post-it note that says "report", have numerous notes that say "check methods", "organise references", "compile appendix" etc. Identify how long each task will take, and add 20%.

TOP TIPS – FELLOWSHIPS & GRANTS

1. **Planning:** The deadline is October, so ensure any peer-reviewed papers relevant to the application are written and submitted by January of that year.
2. **Location:** Go where the best people are. If family commitments prevent you from moving from your current institution to a new one, say so.
3. **Sell yourself:** Highlight small grants, conference prizes, highly cited papers. State your contribution to papers.
4. **Demonstrate independence:** Write papers without your senior supervisors, apply for small grants for side projects, initiate collaborations.
5. **Successful fellowships:** See how your CV compares to recent fellows by looking at the papers they had published by the time they applied. Equally, ask people at the university who have been successful with fellowships/grants if you can read their applications.
6. **Reviewers may not be experts in your field, so get your proposal proof-read by a non-expert:** if they can't understand it, chances are your reviewers won't either.
7. Make the proposal simple but not simplistic, ambitious yet feasible, and tell a story.
8. **Interview preparation:** match potential weak points of your application with strengths to prepare for tricky questions; identify 3 key points that sell your research.

BES BULLETIN
VOL 45:1 / MARCH 2014

Botany is dead, long-live eXtreme botany!

Rant & Reason

A response from Jonathan Mitchley
University of Reading

Markus Eichhorn's Rant about the Death of Botany in last year's *Bulletin* is still provoking reaction!

Dr M with his beloved students at Wildmoor Heath, Berkshire. (Image credit University of Reading)

The issues discussed in Rant & Reason in the June 2013 *Bulletin* are worthy of much more discussion. Botany is not dead but neither does it need to be redefined as 'plant sciences'. Botany is everything about plants and it is embedded in our psyche. Our task is to continue to kindle the interest and enthusiasm of the young for plants – and to do this effectively in the 21st century we need to adapt. We need to spend less energy bemoaning the losses and more energy embracing the techniques and the possibilities the modern world offers to promote botany to a new generation.

Botany is here to stay. Not only are we a nation of gardeners and plant-lovers, we are a global species for which plants are, and always have been, a source of wonder and joy as well as physical and aesthetic nourishment. OK, botany degrees in the UK are dead in the water, but the extinction of the botany degree *per se* does not mean botany is dead. Whether you rename botany as plant sciences is immaterial but I continue to promote botany as the best 'B' word we have!

I studied Botany at Bangor in the 1970s and it was a different world. I recall the buzz of being part of a school of plant biology full of eminent scientists and a vibrant PhD community. It was a world where the University library had books, journals and microfiches, rather than internet connections and coffee shops. Where lecturers used slide projectors and OHP transparencies not PowerPoint, a world less exercised by the REF and endless administrative responsibilities. A lost world, not better or worse, just different and very last-century! Importantly though, it was a world of field and lab classes where students were taught plant ID skills as well as honing them in their own time with friends out in the countryside.

I still contend that the world abounds with budding botanists and a class full of students can be inspired by the significance, fascination and beauty of plants. However, the modern botanical toolkit must embrace the new century: the internet and social media, fieldwork and outreach. Botany will never die if we continue to write inspirational books and web resources, and get universities into schools and schools into universities.

Last year, I launched my botanical website www.drmgoeswild.com and developed my concept of eXtreme botany as an experiment in spreading my passions for plants and field botany more widely. I am convinced that if we can get people interested in local plants they will find a greater personal connection with their environment and their lives will be enriched; the more this happens the bigger the impact. So, eXtreme botany is about the intrinsic fascination and beauty of plants and reveals how exciting and fun field botany can be; eXtreme botany is about enhancing plant ID skills to the next level, identifying plants under extremely challenging conditions and giving people the tools they need to become extremely knowledgeable about plants. eXtreme botany is about reaching out to the next generation using social media and video. eXtreme botany is about giving other teachers the skills they need to communicate the joy of plants.

eXtreme botany builds on existing initiatives. An important and established player in this arena is the Gatsby Plants project. Another example is the INQUIRE project – a three-year EU-funded project involving 14 botanical gardens, and 17 partners in 11 European countries. The aim is to act as catalyst by training and supporting increasing numbers of teachers and educators. Increasingly important for botanical outreach is the Botanical Society of Britain and Ireland (BSBI) with key events ranging from the annual New Year's plant hunt to the Threatened Plants Project and involvement in the Survey of Plants and Lichens Associated with Ash project (SPLASH).

Botany will never die if we can continue to inspire teachers and students in the field (learning outside the classroom) and show that botany is not only important and fascinating but also eXtremely exciting and wildly fun!

"Botany will never die if we continue to write inspirational books and web resources, and get universities into schools and schools into universities."

REFERENCES AND FURTHER ENQUIRY

Dr M's eXtreme botany manifesto www.drmgoeswild.com

Gatsby Plants project http://www.gatsbyplants.leeds.ac.uk/news.php

The INQUIRE Project http://www.inquirebotany.org/en/

The Threatened Plants Project http://www.bsbi.org.uk/tpp.html

The Survey of Plants and Lichens Associated with Ash www.brc.ac.uk/splash

Jonathan Mitchley is a botanist and plant ecologist who is wild about botany; he teaches field botany and plant identification at University of Reading. He spends half his time teaching and doing research, half working as an ecological consultant and all of his time doing botany.

ECONOMISTS AND ECOLOGISTS AND ECOSYSTEM SERVICES – FINDING A COMMON LANGUAGE?

Claire Wansbury / Atkins Ecology Associate Director
Rupert Haines / Atkins Principal Economist

I say 'tomato', you say 'beneficial agricultural ecosystem food provisioning service...'

'Ecosystem services' provides a common language for environmental and social scientists to work seamlessly together to help businesses and governments truly understand their impacts and dependencies on the natural environment. Well, that's the theory anyway. But such laudable aims of integration present all sort of terminology issues. Both economists and ecologists need to learn each other's language and make sure they are understood in turn.

However, whilst the worlds of economics and ecology are finding a common language it will be through clear external communication on the importance of ecosystem services that decision-making will be influenced. This is not just about communication between ecologists and environmental economists, because the people we really need to be understood by are the political and financial decision makers. Ecosystem services present a compelling argument for better environmental management, not by shouting about endangered habitats and species, but by demonstrating what the environment means to peoples' everyday lives, to the social and economic systems from which they benefit and depend.

As Tony Juniper, author of *What has Nature ever done for us?*, said in a recent debate hosted by Atkins, "The economy is a wholly owned subsidiary of ecology, not the other way around. To see a choice between growing the economy on the one hand and protecting the environment and sustaining nature on the other is perhaps the biggest misconception in history. No nature, no economy. Simple."

However, researchers and practitioners need to ensure that this 'simple' message is put forward using language that keeps it simple – that ensures that it is both comprehensible and relevant for the audience.

In 2013 Atkins led a workshop at Intecol to explore the use of terms like 'biodiversity' and 'ecosystem services', among the primarily academic audience. Participants were asked to imagine they were explaining the terms and the relationship between them to an ecology student, an investment banker, a politician or a five year old. When speaking to a five year old, the ecologists clearly thought about the level of understanding of their audience and how to capture their interest and enthusiasm, and tailored their language accordingly. In contrast, the workshop found that when many ecologists talk to politicians and finance experts they assume the listeners already understand terms like 'ecosystem', speaking to them as if they had the same level of knowledge or interest as ecology students. Even those participants imagining they were talking to ecology students lacked a clear consistent language when trying to explain the interaction between biodiversity and ecosystem services. On the side of the economists, terms like 'stocks' and 'flows' and, indeed, 'externalities' need to be interpreted more clearly for the non-expert.

Word Cloud analysis was used to help us see patterns in the answers given at Intecol. For example, when asked "what is biodiversity?" ecologists used terms like 'organisms' and 'species' extensively when talking to students and politicians, but 'plants', 'animals' and even (and why not!) 'creepy crawlies', when speaking to a five year old.

In order to influence policy decisions it is essential that the importance of biodiversity and ecosystem services is understood by individuals with political or financial responsibility, as well as those who have direct role in national and international policy. At the Intecol workshop, rather than trying to invent the 'perfect' words for each audience, the workshop helped us formulate a simple process to help prepare when speaking to such individuals.

We are not suggesting that we need to treat financial or political decision-makers as if they are five year olds. Well, actually, in one way we are saying just that. We are not suggesting that ecologists need to talk to them *in the same language* as a five year old. Terms like 'creepy crawlies' don't need to start appearing in all the BES policy documents. However, we need to start to research our audience a little and to engage the same thought process we use when preparing to speak to a five year old. It is essential to stop and think about the type of audience being addressed and take into consideration what their priorities may be. This can be done by asking three simple questions: How much can we really expect them to understand? What will spark their imagination? What will make them care?

The language of ecosystem services is jargon-rich – and experiments such as the above demonstrate that we all know it, and that we can avoid it when we want to – so let's try to do so.

'Academic development practitioner': Waiting to evolve?

Recently, I thought of leaving my full-time job as a development practitioner and becoming a freelance consultant. I am an ecologist working to improve the lives of poor people through initiatives that respect their dependence on their local environment.

Haseeb Md. Irfanullah / Practical Action Bangladesh

When I shared this idea with one of my friends, he was strongly opposed! This fellow is a talented young professor from Bangladesh, well-known for his extensive consultancy work in the development sector, particularly in the fields of environment and climate change. (So his objection could be taken as an attempt to nip a potential competitor like me in the bud!) He tried to convince me saying "The world you are trying to get into, I am trying to get out of. So, trust me". Despite high pay, the reason for his recent change in mind was he was not happy with his 'consultant image'. I believe this image crisis resulted from the tension between his 'academic mindset' and the 'respect' he receives from his clients as a paid consultant.

Of course there are basic differences between an academic researcher and a consultant involved in development initiatives. Development needs academics to generate new knowledge, new approaches, new evidence and new models for informed decisions and new programmes. Nevertheless, the academics usually become involved in development work as consultants, rather than as researchers. This situation can be best explained by the way development practitioners perceive academics and research.

In the development sector, academics and practitioners differ in many ways: understanding, working culture, experience, expectation, motivation, and philosophy. If I am allowed to be blunt, academics are 'theoretical thinkers', while practitioners are ' practical doers'. A person who is living or who has lived in both these worlds could bridge the gap between these two communities. Professional academics,like my professor friend, working closely with the development agencies, are not rare in developing countries like Bangladesh. Their intellectual superiority cannot be underestimated. That is why they are employed to design, to advise, to study, and to evaluate development programmes.

But, universities, on the contrary, do not or cannot reciprocate. They may engage reputed development researchers to teach their students development studies. But they do not hire pure development practitioners, no matter how long their working experience. The reason behind such deliberate discrimination is very simple –academic, research and intellectual aptitudes of professional development workers might appear inadequate, measured against the standards set by the academics. The competencies in demand are very rare, if not absent, among the development practitioners.

River bank erosion in Gaibandha Bangladesh. Photograph Haseeb Md Irfanullah

But, for the sake of argument, let us assume that an 'academic development practitioner' or 'academic practitioner' – a professional development worker with academic competencies – does exist. How would he or she be perceived by those in development and academic arenas? Would he or she be more efficient than professional academics in connecting academics and practitioners? How would he or she theorize a practice or practice a theory? How would they balance their academic and practitioner images without jeopardizing their profession or career? Would they often find themselves isolated, belonging in neither camp?

I do not have those answers. But I believe we can find the answer to a rather basic question: why would a person with strong academic background become a professional development practitioner in the first place? The reasons could be many, but could explain many of the characteristics of an academic practitioner: motivation, courses of action, and even career-path.

I would very much like to meet an academic practitioner: to investigate whether he or she could really add value to their academic institution and to the development sector. I want to see such a person as a colleague, bringing better analytical skills, organized thinking, hypothesis-testing and scholarship to our organizational competencies. With these, he or she would contribute to long-term planning, and programme and strategy development of our organization and help our evidence-based decision-making process. I also believe such a person would be a good interpreter – translating theories into practice and vice versa – helping us to understand development paradigms better. We could get many of these benefits by employing an academic consultant on a short term contract, but this would not necessarily bring the commitment that full-time appointee would offer our organization. And, finally, to satisfy my finance department, he or she would definitely be a good case of value for money! By the way, an academic practitioner should not be confused with a researcher working in the research wing of a development agency. The latter is a professional researcher studying development issues, not a practitioner.

Nevertheless, an academic practitioner might not exist for two reasons. Firstly, peer-reviewed publications separate the academic from regular practitioners. A development organization usually does not expect such outputs from its practitioner staff. Even if such a person designs, conducts and publishes research in reputed academic journals, those would not duly be appreciated by the organization's system and might be wrongly categorized with other grey literature. Secondly, there is a strong possibility that academic research conducted by an academic practitioner would be different from standard academic research. It is not only because of the unconventional mix of practice and theory, but also because of the different writing style. Some may appreciate these novelties. But there is a fair chance of such research not being appreciated or cited. Therefore, even if an academic practitioner does evolve, the existing system may not appreciate him or her.

An *academic development practitioner* can originate and flourish only if development officers and academics appreciate his value by creating an enabling environment. Let this article be the starting point to discuss how we can have such a supportive environment and start following such evolution!

Dr Haseeb Md. Irfanullah leads the Disaster Risk Reduction and Climate Change Programme of Practical Action in Bangladesh. He is available at haseeb.irfanullah@practicalaction.org.bd

Pumpkin cultivation on riverine sandbar in Rangpur Bangladesh. Photograph Haseeb Md Irfanullah

The call of the wild – perceptions, history, people & ecology in the emerging paradigms of wilding

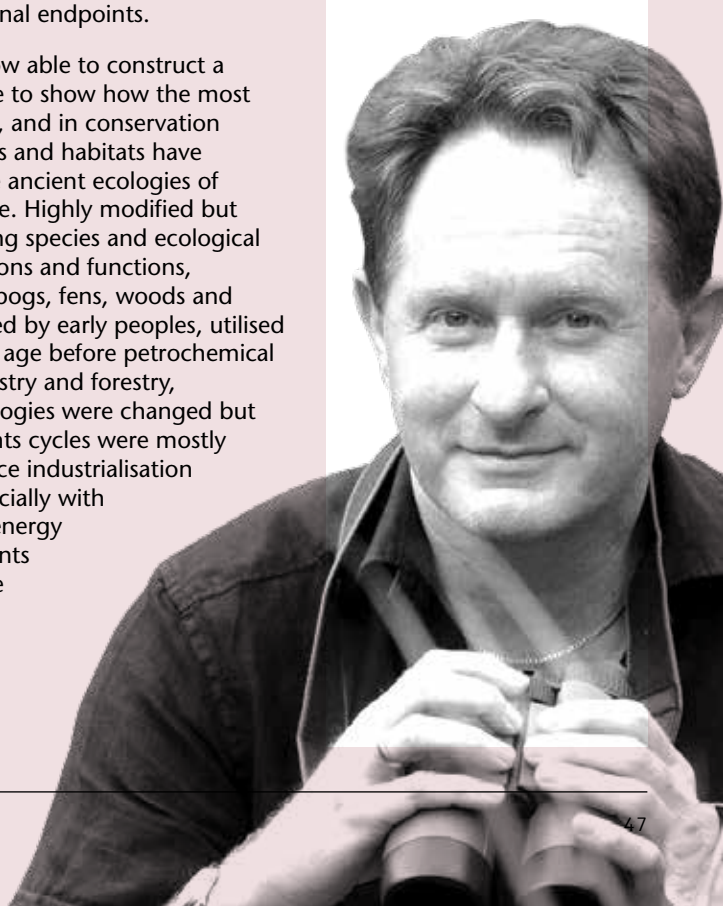
Ian Rotherham / Sheffield Hallam University

In the December issue Markus Eichhorn's rant *Leave it alone!* expressed frustration at the notion that in Britain managed habitats should be maintained for their own sake. We published Keith Kirby's response to Markus in the same issue, but did not have space for the following essay, in which Ian Rotherham takes a more general look at the issues surrounding cultural landscapes.

There is little doubt that across the globe and particularly in countries like Great Britain, the last fifty years or so have seen long-term, irretrievable and often catastrophic losses in species richness, generally described packaged as 'biodiversity'. Causes for these changes have been well documented and clearly relate to industrialisation, urbanisation, globalisation and a headlong rush into an 'Anthropocene'. The underlying drivers of these trends are socio-economic and political. Human-enhanced climate change is viewed as a key factor in the widespread ecological deterioration. In addressing the minutiae of ecological change, it is easy to lose sight of the bigger pictures of human history and human ecologies. Indeed, it is often as if people and Nature are somehow separate and independent, and if only we can remove people from the landscape, ecology will undoubtedly thrive. Yet, this is, I argue, a mistaken belief. From the Amazonian rainforests, to the Australian outback, people have depended upon and have influenced Nature over countless millennia. Across Europe and North America for example, our landscapes and their ecologies are not 'natural' but are 'eco-cultural' and the distinct habitats and wildlife, which we value today, have emerged from long-established interactions between people, Nature and the environment. Abandonment of these ecosystems now will lead to inevitable and predictable successional changes determined by macro-disturbances, massive eutrophication, and an absence of traditional, locally-based utilisation. The results will be simplification, catastrophic species losses, loss of aesthetics, damaged local and regional economies, and impoverished ecosystem services. Above all, abandonment will not lead to some sort of reversion to a mythical, former, pristine condition of pure 'Nature', but to a plethora of degraded, species-poor, secondary successional endpoints.

In Europe we are now able to construct a convincing time-line to show how the most diverse, species-rich, and in conservation terms, valuable, sites and habitats have descended from the ancient ecologies of a primeval landscape. Highly modified but nevertheless retaining species and ecological diversity of interactions and functions, grasslands, heaths, bogs, fens, woods and forests, were adopted by early peoples, utilised and modified. In an age before petrochemical subsidised agri-industry and forestry, landscapes and ecologies were changed but biomass and nutrients cycles were mostly kept in balance. Once industrialisation took hold, and especially with the importation of energy and chemical nutrients into ecosystems, the pace of change and the irreversible dysfunction of 'cultural severance' kicked in.

Ian D. Rotherham is Professor of Environmental Geography and Reader in Tourism & Environmental Change in the Department of the Natural & Built Environments, Sheffield Hallam University. He is Chair of the BES Peatlands SIG.



This 'cultural severance' is best considered as the end of traditional, local, and often subsistence management and the results are predictable, long-term ecological successions with associated increases in available nutrients and biomass, and rapid declines in biodiversity. The species we are gaining are largely catholic, competitive, ubiquitous ones, which are rapidly acquiring global distributions. Those which we are losing are the stress tolerates and the stress tolerant ruderals. We are also seeing simplification of ecosystems and the loss too of species and forms of species associated with long-term utilisation by people. In Europe for instance, we have lost most of our coppice woods which can be associated with the demise of associated ground flora, of birds like nightingales, and of woodland butterflies. Ancient wood pastures are abandoned so we lose 1,000-year-old oaks with their unique saproxylic insects, lichens, fungi and more. Heathlands and grasslands such as meadows and pastures are essentially eco-cultural and if severed from people and tradition become rank, eutrophic communities of little ecological interest aside from catholic, competitive, opportunist. All these ideas are widely known, and predicted in the work of Phil Grime looking at plant strategies, and by specialists like Nigel Webb considering European heathlands. As these areas are abandoned, the landscapes become contested spaces and local, traditional peoples are squeezed out by capital-intensive land-uses, by absentee landowners, and by leisure or recreation. Traditional landscapes morph into either abandonment or into leisurely landscapes detached from any ecosystem functions. With biomass increase and eutrophication, and especially with intensive recreational use or urbanisation, many areas become vulnerable to rampant wildfires. From California to Australia, from Greece, Spain, and Italy to France, and from the Dorset heaths to the Peak District moors, these are a direct result of cultural severance and abandonment, and are entirely predictable. Traditional peoples often used regular fires to manage their landscapes, to re-cycle and release precious nutrients, and to provide essential grazing at the right time of year. When European imperialists populated the planet they generally viewed indigenous peoples as ignorant, primitive, and a 'bad thing'. In particular, from South African Fynbos to New Zealand, to North America, and to Australia, they suppressed the local fire management of the landscape. The catastrophic wildfires of today are direct consequences and descendants of that cultural severance and suppression in the past.

Turning my environmental historian gaze to Britain, we have the case of the English Lake district, which Marcus finds so depressing, and that George Monbiot recently described as an ecological desert. (George even suggested that parts of the Peak District, which I walk every week, are virtually devoid of wildlife and that he would see more bird species in his back garden. This is a strange view of the world, which does not accord with the reality of place unless his garden hosts skylarks, meadow pipits, stonechats, wheatears, red grouse, curlews, lapwings, snipe, short-eared owls, kestrels, peregrine, merlins, ravens, snow buntings, cuckoos, whinchats and more; one hell of a garden). I find this view of the world troubling since the southern Lakes are beautiful and ecologically rich almost beyond description. The ancient coppice woods, the meres and mosses, the limestone pavements of Gaitbarrows, the evocative limestone of Whitbarrow Scar, down to Arnside Knott, Leyton Moss and Silverdale, are certainly not an ecological desert. We all know and accept the damage done by intensive over-grazing by sheep, and growing up in the 1970s Peak District I was involved in conservation battles to remediate this. We take as read, these impacts, and the dreadful state of many hilltops in mid-Wales for example. However, there are other very basic environmental and historical factors at play and it is important to understand these before making statements which might be fundamentally flawed. The northern high ground of the Lakes is bleak, climatically extreme, and highly leached, and is composed of low nutrient, acidic bedrocks. Furthermore, areas such as the Skiddaw massif, were intensively exploited in the 1500s to the 1800s, for peat turf fuel. This is detailed and documented in relation to local communities and especially for the massive regional mineral extractive industries of that time. Peat turf and peat charcoal were stripped from the hillsides and mountains to fuel the smelting of metals such as copper and iron. Given these hugely significant factors that have formed the landscapes we see today, simply abandoning them cannot be expected to cause much 'improvement'.

There are major difficulties with approaches to conservation or to landscape management which advocate 're-wilding' or 'abandonment'. The first concern is that they may compound the already desperate decline in biodiversity of the last half-century. Re-wilding itself is a misnomer since it implies a reversion to a former 'natural' state, which in reality is a myth. Re-planting the Great Forest of Caledon for example is a great idea, one which catches the emotional senses; if only it had existed, then the whole idea would be even better. Archaeology and history tell us that most of the landscapes which lack trees in northern Scotland have done so for 5,000 years or more. These were settled, populated landscapes and not 'wild', 'natural' areas. Separating people from Nature and taking people out of the landscape is wrong on many levels of social, ethical, economic and political process. It is damaging to ecology and biodiversity too. To address the massive and often irreversible declines in species and in ecosystem resilience and function requires drastic and bold actions, but abandonment is not one of those. We first have to recognise that much of the problem today is not related to anthropogenic climate change, although that certainly compounds the issues. The truth, which politicians and economic planners cannot face up to, is that over-exploiting, destroying and fragmenting global ecosystems is not sustainable. The scale of damage and destruction or abandonment I have described elsewhere makes the search for alternative explanations redundant. We must face up to this and to the scale of re-construction and remediation that will be necessary to halt and reverse the declines. Building from the remaining sites where functioning ecologies and their biodiversity now cling to a precarious existence we need to re-build connectivity and to re-establish functionality. This has to be from a local to a landscape level and it will not be easy. Furthermore, the essential controls and cycling of energy and nutrients that control the balances of competitors, ruderals, and stress tolerators, have to be re-established if the inevitable successional changes and biodiversity declines are to be avoided.

These processes were a part of the primeval landscape of Europe and were maintained or even enhanced through long-established traditional practices over several thousand years.

We want and indeed need 'wilder' landscapes, but simple re-wilding and abandonment will consign many species to oblivion, and will do so quickly. The test will be to recognise why these ecosystems have changed, and to apply long-term solutions to re-constructing a functioning Nature to include people. Given basic sets of ecological parameters we can easily predict the outcomes and consequences of successional changes with or in the absence of intervention. The successful vision will also require long-term socio-economic function and socio-political currency; or else it will simply fail. It has been said at meetings to discuss the future of the uplands that farmers can be done away with and that the Pennines for example, would be economically powered by 'ecotourism'. A national newspaper ran an article which suggested that herds of reindeer and perhaps Heck cattle might roam the moors and bogs between Sheffield and Manchester and become an ecotourism spectacle. Such statements show zero knowledge of landscape history, ecological carrying capacity, or animal welfare, or of tourism and economics. Yet many ecologists at the meeting seemed convinced that a 're-wilded' Pennines, complete with reindeer, might be a great idea. There seemed little thought about local communities or even about the motivations and reasons for tourism visits, or the need for 'opportunities to spend' if economic benefits are to flow. Most of this rural tourism is based on visiting traditional landscapes and the monetary flows are through resident, local communities. Tourists come to experience local communities in their landscapes, and to partake of locally distinctive hospitality, cuisine and drinks, not of de-populated, abandoned dereliction. Furthermore, what may be a bleak, forbidding and profoundly depressing upland landscape to one person may be ecstatically close to heaven for another; our opinions and emotional responses are subjective. Perhaps if you don't like somewhere, then don't go there...

Finally, the idea of abandonment to allow Nature to follow its own course will appeal to the current crop of politicians who see conservation as needless red tape, and environmentalists, (according to George Osborne) apparently as 'a sort of Taliban'. In a Brave New World with a Big Society, we will no longer need nature reserves, wildlife trusts, or conservation officers and we won't need grants or other monies to pay for all of these. I know plenty of politicians who would love to hear this.

In May 2014, we are holding a two-day workshop and symposium on the theme of 'Wilder By Design', followed in September 2015 by a three-day international conference. We are now inviting contributions for what will be informative, cutting-edge, and controversial gatherings.

FROM OUR SOUTHERN CORRESPONDENT

Richard Hobbs / University of Western Australia

Scottish comedian Billy Connolly has a hilarious routine about coming to Australia and encountering fauna of all shapes and sizes that can bite, sting, maim and kill you. According to Billy, everything is out to get you in Australia, and it's a surprise that Australians make it to adulthood at all. Nevertheless, he also jokes about the way that, by and large, Australians take the dangerous creatures they live alongside pretty much for granted as part of the Australian environment. Indeed, serious injuries or death as a result of encounters with dangerous wildlife are relatively uncommon (particularly in comparison to things like road and workplace accidents, alcohol-related deaths and so on).

So it's perplexing to witness the situation happening currently in my home state of Western Australia, where the state government, led by Premier Colin Barnett, is implementing a policy of deploying baited drum lines 1km offshore from popular beaches with the aim of catching and killing large sharks, some of which are endangered species. This action is in response to an increase in the number of shark attacks on humans recently, and particularly seven fatalities in the last 3 years. While the prospect of being eaten by a very large fish with lots of sharp teeth is undoubtedly scary, and everyone sympathises with victims and their relatives, there is now a major grass-roots protest movement underway aimed at forcing the government to give up the baiting program.

There are many reasons to be sympathetic with this movement. One is the simple perspective of relative risk. Even the popular media picked up on the observation that shark attacks remain remarkably uncommon. The Sydney Morning Herald editorial on 4 January 2014 (www.smh.com.au) commented: "Given that millions of swimmers and surfers have taken to the waters around Australia during the past century, and given the proximity of so many sharks close to shore through that time, there have been remarkably few attacks relative to these numbers.". Relative to other risks, shark attack is pretty low on the list. In fact, a colleague from New York once told me that, in any given year, more people are bitten by New Yorkers than by sharks worldwide. I thought this was just a crazy New York joke from a crazy New York friend, but it turns out to be true. It also turns out that many more people are killed annually by, for instance, pigs or coconuts than by sharks.

"In fact, a colleague from New York once told me that, in any given year, more people are bitten by New Yorkers than by sharks worldwide."

There is also evidence to suggest that many shark attacks are chance or mistake encounters – if sharks really wanted to eat us, they'd be in at the popular beaches every day during summer picking up fast-food humans (well, they'd probably actually go for the slower moving variety). Speaking of fast-food, a local fish and chip restaurant in Fremantle (not far from Little Creatures) has two wave-skis hanging from its ceiling, each with large ragged-edged holes in their middle – instances where sharks bit the equipment rather than ate the people. Another such instance involved two lawyers paddling off Cottesloe Beach – again, the lawyers survived but their craft was chomped, prompting a long-running spate of shark – lawyer jokes.

Having said all that, the fear factor defies logic, and it's clear that rational consideration of the relative risks of being eaten by a shark – rather than, say, being run over by a truck – does not play much of a part in decision making, either at a personal or societal level. Sharks, like other big fierce things with teeth, have a place deep within the human psyche and many people – including our state Premier – appear unable to get past this. Even people who should know better get caught up in the hysteria. For instance, Barry Carbon, a former Chair of the Western Australian Environmental Protection Authority, commented in our local newspaper (The West Australian, January 4-5, 2014): "Unfortunately sharks eat people. People feel insecure because they think sharks might eat them. The consequence of this is the necessity to kill sharks that enter into restricted areas."

OK, so the first part of this statement makes sense, sort of – sharks, as we've seen, don't actually eat that many people, but people may well feel insecure because of the fear that a shark *might* eat them, however small the probability

Photo by Richard Hobbs.

of this occurring is. However, the last part of the statement is a huge leap of logic and/or faith that needs to be examined a bit more carefully. It's also been at the heart of the protests going on since the move to bait and kill sharks off WA beaches was announced. The main point of contention is that there appears to be no evidence whatsoever that baiting for and killing sharks has any effect at all on the incidence of shark attacks on humans. It's even possible that the baited drum lines actually draw sharks into areas they would normally not visit, hence potentially increasing the risk of shark attack. As every fisherman knows, for every fish that gets hooked, there are many that get away. There is, however, good evidence from other parts of the world where baiting has taken place that significant by-catch occurs and that baited areas become locally depleted of many forms of aquatic life. Indeed, a report produced for the Western Australian Fisheries Department concluded that: "Due to the environmental impacts of shark control activities, it is not recommended that either shark nets or drum-lines be introduced into Western Australia." (McPhee, 2012).

Christopher Neff, who has studied the politics of shark attacks, concluded that: "There are no simple government solutions when sharks bite people. These rare and sometimes fatal incidents are fraught with uncertainties and command a disproportionate amount of psychological space in the minds of the public, as well as a large degree of policy space and funding from many governments." (Neff, 2012). From an ecologist's perspective, the interesting part of this story relates to the process at the top of a lot of people's minds these days – the effective meshing of science with policy. There is undoubtedly much more research needed on every aspect of the shark story. For instance, there is more hot air than light at the moment on the question of whether shark numbers are increasing or decreasing. Many shark species, especially the big relatively rare ones, are classic cases of wide-ranging mobile organisms whose numbers, movement patterns and behaviour are remarkably difficult to study effectively. So the standard scientific response that "We need more research" certainly applies here.

However, there is also a clear need for more immediate responses. In particular, as we all know from watching "Yes, Minister", the government needs to be seen to be doing something. The key aspect here is that we would all, I think, aspire to contributing to an evidence-based approach, especially if you listen to Bill Sutherland and others. And yet, the government decision in this case was taken *despite*, rather than because of, evidence. There is no evidence that the proposed course of action will reduce the risk to humans, and it is even possible that it could increase the risk. Christopher Neff commented in the Guardian on 27 December 2013 (www.theguardian.com) about the baited drum-line proposal, "If the point is to symbolically kill a protected species for political gain then it will be successful, but if the point is to protect the public from sharks this policy will likely be a failure." However, even the political gain may be short lived if the public, social media and international response is anything to go by. At a 4000-strong rally on one of Perth's main beaches in early January, beach-goers, swimmers, divers and others voiced strong opposition to the policy. Many of the signs on display confirmed what Billy Connelly observed – that Australians are prepared to live with the remote risk of shark attack. One sign succinctly said: "It's an ecosystem, not a swimming pool".

In the meantime, other options are being implemented to reduce shark attacks. A shark-proof enclosure is being trialled at a local beach, and this *was* recommended as an option by the Department of Fisheries report. Regular aerial searches occur off popular city beaches during the summer months. Sharks are being tagged with transmitters that are detected by off-shore buoys and set off

Rally protesting against proposal to install baited drum-lines off popular Western Australian beaches, January 2014. Photo by Richard Hobbs.

alerts when the shark comes within a kilometre of a beach. Beach goers are now also able to get warnings on shark movements from Twitter (it seems that it's not just INTECOL meetings that have turned to Twitter for help). There are also various personal shark deterrents available, and research is underway on innovative colour designs for wetsuits and watercraft that make sharks less likely to mistake the swimmer or craft for a potential meal.

So, what's the prognosis for evidence-based environmental policy? Well, the answer partially lies, as has been often repeated, in the willingness of scientists to engage with the policy process. But it also has to rely on politicians being willing to move beyond simplistic solutions, particularly where there is no evidence these solutions will have any effect other than wasting a lot of taxpayer money. And of course, there has to be a modicum of desire to take note of the evidence that is there. This last point is becoming moot in Australia as a whole, with both state and federal governments seeking to reverse or compromise existing conservation policies and practices (Ritchie *et al.*, 2013). And, of course, we have a new federal government that has spent its first few months in power backtracking on climate change and dismantling key bodies designed to advise and act on climate issues. The Climate Commission, set up under the previous government to provide scientific advice on climate change, was one such body to be disbanded – only to be resurrected as an independent body, the Australian Climate Council, after a swift and effective web-based crowd-funding effort showed huge popular support for the body to continue. Around the same time, our new Environment Minister Greg Hunt was in the press saying that he had looked up Wikipedia to check on whether there was a link between climate change and increased bushfire intensity (Sydney Morning Herald, 23 October 2013).

Meanwhile, 2013 was a year of climatic extremes in Australia, with many temperature records being exceeded and anomalous rainfall patterns across much of the country. I had planned not to mention the cricket, but the English cricket team certainly felt the heat this southern summer – not just from the rejuvenated Australian pace attack, but also from the bouts of hot weather that seemed to come on whenever there was a Test match – here in Perth, the hot weather started on the first day of the test and ended just after England had capitulated. An evidence-based approach might suggest that England doesn't do well in hot weather – but then again, maybe it was more to do with the Australian pace attack? No doubt further replication will help sort this out.

"Beach goers are now also able to get warnings on shark movements from Twitter (it seems that it's not just INTECOL meetings that have turned to Twitter for help)."

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Be careful what you wish for

John Wiens / Point Blue Conservation Science
jwiens@pointblue.org

Photo courtesy of Ron LeValley

Can conservation ever be too successful? The ongoing loss of habitats, the growing lists of imperiled species, and the appeals of conservation organizations suggest not. But what if efforts to bring species back from the brink of extinction are so successful that they create conflicts with people and their interests? Let me tell two stories to illustrate this conundrum.

The first story is about geese. Aleutian cackling geese (*Branta hutchinsii leucopareia*) were once abundant, breeding throughout the Aleutian Archipelago and wintering in the Pacific Northwest (where they were first described by the Lewis and Clark Expedition). During the eighteenth and nineteenth centuries, fur traders introduced Arctic foxes (*Vulpes lagopus*) on many islands in the Aleutians. Geese and their eggs and goslings were easy prey, and numbers plummeted. By the middle of the twentieth century the goose was thought to be extinct. A breeding population of a few hundred birds was rediscovered on a remote island in 1962, however, and the species was listed under a precursor to the U.S. Endangered Species Act in 1967. A recovery plan was drafted: foxes were removed from potential breeding islands, birds were reintroduced as islands became fox-free, hunting was curtailed, and habitat in the wintering and migration areas was protected and managed. The population exploded, and the recovery goal of 7,500 birds was quickly exceeded. The protection and restrictions afforded by the Endangered Species Act were no longer necessary, and the species was "delisted" in 2001. A resounding conservation success.

But goose numbers have continued to increase. By 2011, the population was estimated at nearly 112,000. Well before that, it became apparent that grazing by the thousands of geese gathering at spring migratory stopover areas in California and Oregon was damaging newly emerging pasture and crop vegetation. Birds roosting overnight on offshore islands were degrading habitat in seabird breeding colonies. To protect their lands, landowners began hazing birds to drive them from their fields. An Agricultural Depredation Plan was prepared to address the goose problem[1]. There is now a hunting season; California hunters are permitted to take up to six geese per day over a 100-day season. These measures have reduced pressures on private lands by shifting the geese onto nearby public lands. The current objective is to maintain a population of 60,000 birds, but even with control and hunting, reducing the population to this level will be difficult. A species once thought extinct and then struggling to survive has, in the space of 50 years, become an agricultural pest. A Recovery Plan has been replaced by a Depredation Plan[2].

Recovery of the Aleutian cackling goose surpassed all expectations. For most of the 1500 species listed under the Act, however, the bar for what counts as "success" is set pretty low. Fewer than one percent of listed species have gone extinct since the Act was passed 40 years ago, and declining trends of others have been stabilized or reversed. To some, this counts as success. But the aim of the Act is not just to avoid extinction, but to enable species to recover so they no longer require extra legal protection. Some species, such as brown pelicans (*Pelecanus occidentalis*) or peregrine falcons (*Falco peregrinus*), have exceeded recovery goals and have been delisted. Pelicans are now a fixture on the Gulf of Mexico and California coasts, and peregrines have expanded their habitat to nest on skyscraper ledges in many cities. These successes give conservationists hope and justify continuing support for recovery efforts for other species on the cusp of extinction.

My second story is about wolves. Once upon a time (isn't that how all wolf stories begin?), gray wolves (*Canis lupus*) were widespread across North America. As settlement moved westward, wolves were forced out or killed, initially because they were a threat to livestock and later because they competed with hunters (fewer wolves meant more big game). Bounties were paid for killing wolves. In 1902, Theodore Roosevelt called the wolf "the beast of waste and destruction," and in 1907 the United States Biological Survey declared the extermination of the wolf to be "the paramount objective of the government." By the 1950s, wolves had been eradicated from the United States, although they remained abundant in Canada and Alaska. Wolves were listed under the Endangered Species Act in 1973, leading to lengthy and contentious debates about recovery planning. Finally, in 1995 wolves were reintroduced into Yellowstone National Park and remote areas of Idaho. Numbers grew dramatically, and dispersal established new wolf packs in other areas. Initial proposals to delist the wolf in Idaho and Montana were overruled by a federal court, whereupon the U.S. Congress, as part of an unrelated budget authorization bill, interceded to remove the Act's protection in these states. Last year the U.S. Fish and Wildlife Service proposed delisting the wolf in most of the United States and Mexico[3]. Another conservation success story.

Gray wolf. Photo: U.S. Fish and Wildlife Service.

But consider what has followed. Reprising debates from the previous century, ranchers have protested about increasing losses of livestock to marauding wolves and hunters have complained about reduced big game populations. The ecological argument that wolves act as keystone predators, voiced so eloquently by Aldo Leopold in his essay *Thinking Like a Mountain* (1949)[4], does not resonate with ranchers and hunters. Several states have now opened hunting seasons for wolves, including organized "wolf hunt" contests. Hundreds of wolves have been killed. Idaho has hired a professional hunter to eliminate two wolf packs from a wilderness area[5]. Some legislators in western states are now calling for the eradication of wolves. An Op-ed in the *New York Times* (June 7, 2013) wondered "have we brought wolves back for the sole purpose of hunting them down?"

In both stories, legal protection and intense management efforts were successful in bringing a species back from imperilment, only to encounter economic, social, or political pressures to reduce or eliminate the gains. But there is an important difference between the stories. Geese eat grass and grain. Wolves eat cattle and sheep and elk. People have a deep-rooted fear of wolves (and of sharks and tigers and crocodiles—things that now and then eat people). Childhood fables like *Little Red Riding Hood* or *The Three Little Pigs* instill a fear of wolves; *Mother Goose* does nothing of the sort for geese. Culture as much as science influences what counts for "success" in conservation.

None of this is to say that conservationists should be looking over their shoulders for the culture police. It does suggest, however, that it may be wise to think about the consequences of success and plan accordingly. We are usually so preoccupied with fighting against extinction that even modest gains are victories, and we don't look ahead to consider what might happen if we are too successful. In both stories, the outcomes might have been anticipated. Geese are prolific breeders and effective grazers, so removing the threat of predation would sooner or later lead to problems where large numbers of geese aggregate. We might have expected that the deep-rooted attitudes about wolves that led to their eradication in the last century would reappear as soon as wolf numbers increased.

Understanding the ecology of an imperiled species is essential in charting a course toward recovery, but understanding societal attitudes may be just as important once we get there. Determining what 'success' means, and whether it is enduring, depends on much more than science.

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FOOTNOTES

[1]Mini and Le Valley (2006)

[2]Mini et al (2011 provide a useful review of Aleutian cackling goose recovery and management

[3]For a perspective, see Buskotter et al (2013)

[4]For a recent treatment, see Callan et al (2013)

[5]January 29, 2014: Reports indicate that the hunter was successful in killing all the wolves in the two packs. The purpose is to allow the elk population to grow, which will provide more big game for hunters but alter the "wilderness" ecosystem.

[6]In his essay in this issue of the *Bulletin*, Richard Hobbs calls attention to a similar story unfolding in Australia, and to the distinctively Australian attitude about dangerous animals.

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

Left image: Medal winner David Stubbs CEnv FCIEEM is presented with his trophy by CIEEM President John Box. Right image: Penny Anderson CEcol CEnv FCIEEM (Penny Anderson Associates) and Philip Austin (SCaMP programme manager at United Utilities with their awards

BEST PRACTICE AWARDS

During the Autumn Conference we were delighted to present our annual CIEEM Medal and Best Practice Awards to worthy recipients.

The CIEEM Medal was presented to David Stubbs CEnv FCIEEM in recognition of his outstanding contribution to the development of ecologically sustainable sports facilities and sports event management. A founder member and Fellow of CIEEM, David is an internationally renowned specialist in the field of sport and the environment. His career started in the field of conservation biology, particularly in relation to the Hermann's tortoise *Testudo hermanni*. He then moved on to lead the London Wildlife Habitat Survey team, which undertook the first complete ecological database for all of Greater London's natural green spaces. From here he pioneered the application of ecological principles and environmental sustainability to sports developments and activities, commencing with golf courses and extending into other sporting areas.

Initially as part of the London 2012 Olympics Bid Team and then for the seven years it took to organise the event he was responsible for developing and coordinating the sustainability programme and for ensuring that the ambitious vision was fully delivered. Among his achievements while at the London Organising Committee of the Olympic and Paralympic Games (LOCOG), David was instrumental in the development of ISO 20121, the first certifiable international sustainability management system standard, which is already having a strong impact on the global events sector.

The Best Practice Awards aim to celebrate individuals, projects and schemes that exemplify best practice, promote innovation and share knowledge in the realm of ecology and environmental management.

The Best Practice Award for outstanding achievement in both the Practical Nature Conservation category and in the Innovation category went to Penny Anderson Associates for the Sustainable Catchment Management Programme (SCaMP). The SCaMP project is based on the Bowland Estate, Lancashire and Peak District moorlands on land owned by United Utilities which incorporates 21 farms and 45 land holdings. The project, run in collaboration with the RSPB, set out to improve river catchment quality whilst ensuring a sustainable future for tenants of the Bowland Estate which comprises 56,385ha of catchment, mostly in the uplands, of which 17,343ha are Sites of Special Scientific Interest (SSSI).

The project began in 2005 with a five-year plan to meet the Government's target of 95% of SSSIs being in favourable or favourable recovering condition by 2010. SCaMP helps individual farms across the estate to work towards improving water quality, reducing run-off rates, sediment load and downstream flooding. SCaMP has made a significant contribution to the quality and functionality of upland ecosystems and biodiversity conservation across an extensive area with all the habitats of value safeguarded within Farm Plans, with enhancement management included where necessary.

The award for Outstanding Individual was presented to Simon Boulter CEnv MCIEEM, a Principal Consultant at the environmental consultancy RSK. Simon was nominated by colleague and peer Sarah Harmer. Sarah said "Simon has a thirst for knowledge and takes on many of our challenging projects. He is committed to training and developing his skills on Ecological Impact Assessment and holds many posts outside of his work at RSK. Amongst his many commitments he is a dedicated Council Member and Publications Officer for the Mammal Society, teaches at Reading University and is a devoted badger ecologist, holding position of Director of the Badger Trust and involved with his local Oxfordshire Badger Group, undertaking surveys and aiding vaccination treatment against Bovine TB."

The New Professional Award was presented to Jessica Batchelor GradCIEEM, a graduate ecologist at Arup, an independent firm of designers, planners, engineers and consultants dedicated to enhanced sustainability through its design projects. Jessica was nominated by Senior Ecologist and colleague Oliver Barnett. Oliver said *"Jess has a positive and infectious can-do attitude and has displayed a depth and breadth of knowledge that is advanced well beyond what is normally expected of a graduate ecologist."*

CONGRATULATIONS TO ALL OUR WINNERS.

The 2014 Awards are currently being judged and will be announced at our special Awards Luncheon at Birmingham Botanic Gardens in June.

REGISTER OF CHARTERED ECOLOGISTS

A further 32 Chartered Ecologists joined the new Register in January and applications continue to come in at a steady pace, keeping our assessors suitably busy. These early registrants represent a broad range of ecological practitioners working across the employment sector including academics, land managers, ecological consultants and those working in the public sector.

The assessment is a two-stage process based on CIEEM's Competency Framework. The first stage is a desk-based assessment of a comprehensive application form in order to determine whether an applicant is likely to have reached the standard and merits a Professional Review Interview (PRI). The PRI is the second stage of the assessment and is a face-to-face interview with two senior professionals.

Typically the process takes 3 – 6 months once an application is received.

Further details of the Register are available on the CIEEM website www.cieem.net/chartered-ecologist

MORE ACCREDITED DEGREES ANNOUNCED

At the start of the year CIEEM was delighted to announce several more accredited degree and degree pathways. Students following an accredited degree will cover all of the required content and quantity of practical work required by the scheme. For a degree pathway it is only the required combination or combinations of core and optional modules that are accredited.

The following two degrees were approved by the Governing Board for accreditation:

Nottingham Trent University
MSc Biological Conservation

Oxford Brookes University
MSc Conservation Ecology

The following five degree pathways were also approved by the Governing Board for accreditation:

University of Hull
BSc (Hons) Ecology

Northumbria University
BSc (Hons) Environmental Management

Oxford Brookes University
BSc (Hons) Biology
BSc (Hons) Animal Biology and Conservation
BSc (Hons) Environmental Sciences

Further details of the accreditation scheme and the closing date for the next round can be found on the CIEEM website at www.cieem.net/accreditation

CIEEM Past-president Dr David Parker CEcol CEnv FCIEEM presents Simon Irvin, Countryside, Environment and Wildlife Courses Manager at Harper Adams University with their certificate of Accreditation

NEW FELLOW

One member has recently been admitted as a Fellow of the Chartered Institute.

Dr Mike Wells has over 20 years experience as an ecological consultant including 7 years of running his own consultancy, Biodiversity by Design Ltd. For the past 10 years he has also been involved in academic teaching as an external lecturer, external examiner and visiting research fellow. The main focus of his work in recent years has been on matters relating to green infrastructure, sustainable master planning and habitat restoration/creation in urban settings. He has published many articles and contributed to several books on this topic as well as lecturing extensively in the UK and overseas. He is a well-known advocate of biodiversity in urban design and, as such, has extensively promoted the principles of biodiversity planning to other professionals through publications, presentations and inter-disciplinary working.

PUBLISHING NEWS

Preprints: a new challenge for ecological journals?

Peter Livermore / Assistant Editor, Journal of Animal Ecology

While much has changed with advances in online delivery of information, the scientific paper remains the primary currency of research output.

The first major step towards the enshrinement of scientific discoveries as 'facts' is the publication of peer reviewed papers, and these papers are the principal form in which findings are disseminated to the scientific community at large. However, scholarly communication has traditionally begun, and still does begin, long before the publication of papers – for example, findings are presented and discussed at workshops and meetings, whilst nascent manuscripts are often shared with and critiqued by colleagues. Generally, these practices serve a dual purpose: to publicise findings as soon as possible and to open up discussion and critique from peers. Rapid dissemination of ideas and results is important because it accelerates the progress of science; other researchers may be moved to test and develop associated ideas or discouraged from re-treading similar ground. More widely, the very latest scientific information may be transmitted readily to those who require it (e.g. policymakers). Peer scrutiny is also crucial in order to ensure rigour and accuracy, which are traditional ideals of science; pitting research against the legitimate scepticism of others is a good way of testing its veracity, and it is expected that such critique removes errors and improves the reliability and reproducibility of research prior to submission to a journal.

Such sharing of research of course requires efficient communication, and the 'online era' has opened up new communication channels that offer a reach and accessibility beyond that of email. In particular, the development of the so-called 'web 2.0' has been marked by an increased array of interactive and collaborative digital tools for the creation and free dissemination of user-generated content. Prominent examples of these platforms are Twitter and blogs, which are both seeing increased usage among the ecological community for sharing and discussing burgeoning research. Another associated trend facilitated by this movement has been towards self-archiving of research (uploading a free copy of a scientific manuscript to the internet). The development of dedicated public preprint servers means that authors can share their manuscripts freely prior to submitting them for peer review to a scientific journal. In the strictest sense, preprints refer to unreviewed manuscripts not yet published in a scientific journal, though servers often offer the facility to also upload an updated (reviewed, but not published) version of the manuscript. With developments in digital technology, these electronic repositories can now easily host large numbers of preprints and make uploading and accessing them simple. Importantly, these servers often have provision for comments on preprints, to which authors can respond – the idea being that these public exchanges, whether by identifying flaws in the science or challenging the authors to clarify, help to mould the dynamic preprint.

Preprint servers are attractive because they neatly serve the two primary purposes of pre-publication research-sharing. Firstly, in terms of dissemination, they provide rapid evidence of research output – once a preprint is submitted it is made freely available within a matter of days (usually subject to some degree of quality control such as a basic screening by a moderator). Such immediacy is particularly important for early career researchers who are under ever-increasing pressure to display evidence of research output, but it also helps to establish precedence of discovery, which is especially important in highly competitive and fast-moving areas, by removing the stochastic influence of journal processing times prior to publication. Secondly, because preprint servers are 'open' (i.e. preprints are electronic and usually are published under creative commons licences), they afford a much greater reach than traditional pre-publication sharing methods such as emails to colleagues and presentations at conferences, and consequently can increase the impact of research. Importantly, this reach also means that a manuscript will likely be subjected to a higher number and diversity of critical viewpoints than is obtainable from the customary 2 or 3 experts in the field employed by journal peer review – ostensibly leading to a version of record that has been more rigorously vetted and is of higher quality.

This trend has, however, come into conflict with the traditional practices of publishing since it is customary for original research journals to insist that submitted work has not been published or publicized previously – the so-called 'Ingelfinger rule', named after Franz J. Ingelfinger, an erstwhile Editor of *The New England Journal of Medicine.*

This is firstly about protecting the originality of papers and thus the value of the journal; if a journal publishes a paper that is not materially different from another version published elsewhere, (i.e. same findings and conclusions) it could be guilty of dual publication. This can have numerous problems including wasting limited journal space, inflating the publication record and skewing meta-analyses. Moreover, libraries with subscriptions may therefore end up paying for duplicate information, which could even be replicated across multiple platforms to which they pay for access. The other raison d'être of the Ingelfinger rule is to avoid the proliferation of methodologically or factually incorrect information, or information that does not appropriately attribute credit to previous work. Scientists are likely to be circumspect when interpreting research that has not been vetted by peer review, but the press and other non-expert audiences less so. From the authors' perspective, there is also the danger that others who read the preprint may publish their own paper first, undermining or even superseding the paper arising from the preprint, which will likely prejudice subsequent publication.

On balance, though, it is hard to dispute that preprints are overall positive for science, and, in any case, they are popular with researchers; in many disciplines preprint servers have evolved from little-used tools into essential platforms for dissemination of research. The arXiv server, for example, is often the first point of call for those seeking the latest research in maths and physics. While depositing preprints is still far less common in the biological sciences, the direction of the wind is clear, as marked by the increase in submissions to the quantitative biology section of arXiv and, more recently, the launch of bioRxiv (http://biorxiv.org/). As biologists become more familiar with preprint servers, and they see increased usage, concerns about getting scooped will likely diminish and ultimately we might expect that the preprints become the standard way of establishing priority, as in physics and maths. Therefore, if journals are to keep pace with the prevailing attitudes of the communities that they serve they need to embrace preprints.

An obstacle to the peaceable marriage of preprint servers and subscription journals is that many journal Editors have traditionally adopted the policy of deciding themselves exactly what constitutes 'prior publication'. From an author's perspective, obviously not wanting to jeopardize subsequent publication, this makes preprints a little worrying because they don't know if a journal will consider their preprint to be prior publication; indeed, authors have been turned off depositing preprints by ambiguous, idiosyncratic or non-existent journal policies. Therefore, there is a need for journals to provide clear guidance on their expectations and the limitations regarding preprints. At the BES, we realise that impeding communication between researchers goes against our core aims – advancing ecological science and making it count. Therefore, the BES journals have decided to take a clear stance on preprints, and following a Publications Committee meeting on 21 October 2013, a formal policy was agreed; the latest version is as follows:

BES journals do not consider for publication articles that have already been published in substantial part or in full within a scientific journal, book or similar entity. However, posting an article on the author's personal website or in an institutional repository is not viewed as prior publication and such articles can therefore be submitted. The journals will also consider for publication manuscripts that have been posted in a recognized preprint archive (such as arXiv, bioRxiv and PeerJ PrePrints), providing that upon acceptance of their article for publication the author is still able to grant the BES an exclusive licence to publish the article, or agree to the terms of an OnlineOpen agreement and pay the associated fee. Following submission and peer review organized by the journal, posting of revised versions of the article on a preprint server with a CC-BY licence might affect an author's ability to sign an Exclusive Licence to publish in a BES journal.

It is the responsibility of authors to inform the journal at the time of submission if and where their article has been previously posted and, if the manuscript is accepted for publication in a BES journal authors are required to provide a link to the final manuscript alongside the original preprint version.

This policy also extends to allow theses, dissertations and posters published on F1000 Posters with the same findings and conclusions as a paper submitted to a BES journal. To reiterate, BES journals are unlikely to be able to publish papers if an author uploads an updated preprint following review of the paper with a CC-BY attribution licence (which allows others to distribute, edit and expand the work for commercial purposes provided that they credit the creator for the original). This is because the updated preprint is not likely to be patently different to the final published version, and if such a licence has been signed for this version, then the authors cannot grant the BES a requisite Exclusive Licence to publish it. The reason we require this licence for this is the protection of the original value of the work, which is necessary to sustain our current publishing business model and consequently the many BES activities in the ecological community it supports.

It remains to be seen how preprint servers will affect traditional journal publishing in future. While Web of Science does not count preprints, Google Scholar, which is now widely used by academics, indexes preprints and recent data suggest that, in disciplines where preprints are commonly deposited, servers have reached a similar level of impact to journals. Nonetheless, the feedback from these communities is that journals have thus far not been adversely affected by preprint servers, so perhaps there is some possibility for a harmonious coexistence. In any case, we hope that the development of BES preprint policy will mark at least some progress in our vision for the advancement of ecological science.

Journal of Ecology

www.journalofappliedecology.org
@JAppliedEcology

Golden jubilee and INTECOL

The INTECOL congress in August 2013 was the focus for many Journal initiatives for the 50-year anniversary. We were very pleased with the success of the Journal's activities at this exciting and lively conference.

Details on the Journal-sponsored workshop 'How best can international journals support ecologists in emerging economies?', organised by E.J. Milner-Gulland and Jos Barlow, along with a link to a podcast recording of all speakers and a lively discussion with t he workshop participants can be found on the Journal website (http://www.journalofappliedecology.org/view/0/virtualissues/fiftyyearsvirtualissue.html). The symposium "Putting Applied Ecology into practice: Knowledge and needs for the 21st Century", organised by Phil Hulme and sponsored by the Journal, was very successful and popular. Peter Kareiva (The Nature Conservancy) started the symposium with an interesting keynote presentation about how science has transformed conservation. A recording of the keynote talk is also available as a podcast and can be downloaded through the Journal homepage.

We also celebrated the *Journal of Applied Ecology*'s golden jubilee at the British Ecological Society Journals' reception by recognising the contributions of our reviewers, authors and editorial board members in a short awards ceremony. We were delighted to be joined by several past Editors as well as many of our current editorial board members. The awards and their recipients are as follows: The Alpha Diversity and Beta Diversity Prizes for, respectively, the most authors on one paper and the most collaborative author, were awarded to Regula Billeter and Bill Sutherland. Rob Marrs was awarded the prize for the Most Published Author, with an impressive 35 papers published in the Journal. Edward Newman attended the reception to receive the award for the Journal's Most Highly Cited Paper for "A method of estimating total length of root in a sample" published in 1966 and still being cited today. The award for the best title went to the paper "Hotspots of exotic free-spawning sex: man-made environment facilitates success of an invasive seastar", authored by Scott Ling *et al*. James Pearce-Higgins and Gavin Siriwardena were recognised for their contribution as the reviewers who completed the highest number of reviews for the Journal in the past 5 years. We also recognised David Kleijn and Nathalie Pettorelli as the Associate Editors who handled the greatest number of papers over the past 5 years. We awarded the prize of Longest-serving Associate Editor to Davy McCracken, who worked on the Journal for 17 years. Finally, we were delighted to be joined by Gillian Kerby, the previous Managing Editor for the Journal, and we thanked her with the award of Outstanding Contribution to the Journal.

2013 has been an excellent year for the Journal and we would like to take the opportunity to thank everyone who has participated in and contributed to all of the golden jubilee initiatives.

Virtual Issue on Applied Ecology in Agricultural Systems

We were delighted to attend the recent joint BES–Associate of Applied Biologists meeting on sustainable agriculture in the UK. Associate Editor John Finn put together an excellent Virtual Issue on Applied Ecology in Agricultural Systems which is available on the journal website (http://www.journalofappliedecology.org). The articles in this Virtual Issue are intended to provide examples of applied ecology in agricultural ecosystems and landscapes from around the globe. We hope they will be of interest to a variety of stakeholders engaging in the challenge to feed the population in a changing world while ensuring the provision of ecosystem functions and services, and the conservation of biodiversity both within and adjacent to agricultural ecosystems.

Farewell to Phil Hulme and introducing our newest Editor

At the end of 2013 we said farewell to Phil Hulme as he stepped down from his role as Editor. Phil has been an Editor for the Journal for over 10 years and we have been very grateful for his thoughtful and insightful input. In recent years, Phil has been integral to the launch and development of the Practitioner's Perspectives series, a highly successful initiative that was launched in 2011 with the aim of providing a voice for practitioners within the pages of an academic journal. On behalf of the whole editorial team, we wish Phil all the very best for the future.

We are very pleased to welcome Natalie Pettorelli as our newest Editor. Natalie has been an enthusiastic and very hard-working member of our editorial board since 2007 (we've already mentioned Natalie earlier in this article as a recipient of a golden jubilee award). Natalie is passionate about science communication and an avid tweeter (@pettorelli). We look forward to Natalie's involvement as the journal continues to build on the success of its first fifty years.

Erika Newton
Assistant Editor

Andrea Baier
Managing Editor

Functional Ecology

Functional Ecology banner
www.functionalecology.org
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Volume 28, Issue 1 is available free online and includes a new Special Feature, as well as a commentary from Simon Pierce, a new Perspective from George S. Bakken and Michael J. Angilletta Jr and a new review from J. William O. Ballard and Nicolas Pichaud.

Our Special Feature, edited by Joe Bailey, looks at Climate Change and Species Range Shifts. The global climate is rapidly changing, affecting patterns of temperature and precipitation at many geographic scales, so future climate changes have the potential to greatly modify species ranges and/or alter the ability of plants to adapt to future changes. Climate effects geographic patterns of plant distributions, plant traits and even the ability of plants to adapt to environmental gradients, but in climate change research it is important to move beyond climate and climate alone as the primary driver of species range shifts. A species' niche is much more complicated, and it is necessary to acknowledge that traits are likely to vary throughout a species range and incorporate an evolutionary perspective. Papers in this special feature address many of the above issues and questions linking evolution, ecology and global change across both abiotic and biotic gradients

Our commentary from Simon Pierce 'Implications for biodiversity conservation of the lack of consensus regarding the humped-back model of species richness and biomass production' is also published in this issue *(Pierce, S. (2013), Implications for biodiversity conservation of the lack of consensus regarding the humped-back model of species richness and biomass production. Functional Ecology. doi: 10.1111/1365-2435.12147).* Senior editor Ken Thompson discusses the background and implications of this paper in a podcast, available from our Soundcloud page: http://soundcloud.com/besjournals/kenthompson-discusses-the.

Photo showing steps in the construction of an anatomically accurate Te thermometer with an internal temperature logger. from Bakken and Angilletta's Perspective article

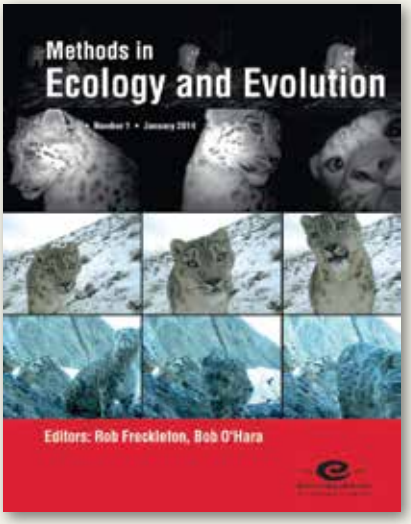
Bakken and Angilletta's new Perspective looks at how to avoid errors when quantifying thermal environments (*Bakken, G. S., Angilletta, M. J. (2013), How to avoid errors when quantifying thermal environments. Functional Ecology. doi: 10.1111/1365-2435.12149*). Until recently, it was assumed that variation in functional traits within species was negligibly small compared to variation across species, and so had little effect on plant communities or ecosystem function. Recent research has demonstrated that this is not always the case. The authors measured traits for 10 populations of *H. radicata*, then used six statistical methods (comparisons of coefficients of variation, analysis of variance, tests for homogeneity of variance, qualitative comparisons, mixed effects models, and Bayesian hierarchical modelling) to look at differences in average traits and the variability around those averages, as well as comparing their measured trait values with those reported in the literature. The authors found evidence of substantial trait variation within and across the measured populations. The choice of statistical method significantly influenced the interpretation of the outcome, leading the authors to recommend that ecologists adopt a Bayesian approach to quantifying, comparing, and incorporating measures of intraspecific variation.

The issue also contains our latest Review on Mitochondrial DNA: more than an evolutionary bystander (*Ballard, J. W. O., Pichaud, N. (2013), Mitochondrial DNA: more than an evolutionary bystander. Functional Ecology. doi: 10.1111/1365-2435.12177*). In this review, Ballard and Pichaud delve into the literature and show that a more complete understanding of mitochondrial functions can enable important ecological and evolutionary insights.

Methods in Ecology and Evolution

www.methodsinecologyandevolution.org
@MethodsEcolEvol

We began 2014 with a freely available issue 5.1, so please spread the word to anyone who may be interested in the content (and remember that as a member of the BES, you have free access to *Methods* papers all year round!). Since the last *Bulletin* was distributed issues 5.2 and 5.3 have also been published, including a number of open access articles and freely available applications.



There are some new videos for you to watch on our YouTube channel (youtube.com/MethodsEcolEvol): In October, David Warton interviewed Joost Keuskamp and Mariet Hefting about their innovative new method, the Tea Bag Index; David also interviewed Distinguished Professor Noel Cressie, a leading figure in spatial statistics; and in November, Todd Jones summarised his article on how tagging aquatic animals can disrupt their natural behaviour. Todd's paper attracted some attention in the news after the University of British Columbia published a press release about it (methodsinecologyandevolution.org/news). The Max Plank Institute for Ornithology also published a press release about one of our papers by Holger Goerlitz and colleagues, who came to the interesting conclusion that friendly information signs left on scientific equipment in the field reduce the incidence of vandalism and theft.

Barb Anderson's series of podcasts are now all available online; Barb (one of *Methods'* Associate Editors) interviewed a number of INTECOL 2013 delegates, and asked them what the oldest method is that they still use, the newest method that they currently use, what method they would like to invent, and what has been the most transformational method in their field of research. The podcasts and a list of the people interviewed can be found on the methods blog (methodsblog.wordpress.com).

From 6th January 2014 *Methods* and the other BES journals require that authors of accepted articles archive any raw data associated with their study. This is to ensure that future generations of researchers are able to reproduce a study independently and perform their own analyses, thus minimizing the time and energy required to advance ecological science. More information can be found in our data archiving Q&A document located in the Author Guidelines (methodsinecologyandevolution.org/AuthorGuidelines).

Finally, we're happy to welcome 5 new Associate Editors to the team: Diana Fisher from the University of Queensland, Holger Schielzeth from Bielefeld University, Steve Kembell from the University of Quebec at Montreal, Kate Jones from University College London and the Zoological Society of London, and Louise Johnson from the University of Reading. You can read about their areas of research on the *Methods* website (methodsinecologyandevolution.org/EditorialBoard).

Samantha Ponton
Assistant Editor
coordinator@

methodsinecologyandevolution.org

Journal of Ecology

www.journalofecology.org
@JEcology

2014 has got off to a bang at *Journal of Ecology*. The first issue of the year included the article 'Looking forward through the past: identification of 50 priority research questions in palaeoecology' by Alistair Seddon and colleagues. This is the first synthesis of research questions in palaeoecology for the purpose of future agenda setting and the paper is free to access for all. President of the British Ecological Society, Bill Sutherland, provided advice to Alistair Seddon *et al*. based on his experiences with the paper 'Identification of 100 fundamental ecological questions' which was published – also in *Journal of Ecology* – at the start of 2013 (101:1).

As always, the first issue of the year (102:1) also features the *Journal of Ecology* News, which presents an overview of the *Journal's* involvement in the British Ecological Society's Centenary celebrations during 2013.

A definite highlight of 2013 for the *Journal's* Editorial team was INTECOL. The *Journal* was really pleased to sponsor a symposium at the meeting organised by Associate Editors Hans Cornelissen and Will Cornwell. If you were not able to attend the symposium in person the keynote given by Lisa Donovan is available on the BES journals' Sound Cloud account (https://soundcloud.com/besjournals). This symposium has formed the basis of a Special Feature published in issue 102:2 of the *Journal*, guest edited by Hans and Will, entitled 'The Tree of Life in ecosystems: evolution of plant effects on carbon and nutrient cycling'.

Virtual Issue in honour of J Philip Grime

The *Journal* Editors honoured the work of Phil Grime via a Virtual Issue published at the end of 2013. The Virtual Issue included papers published by Phil between 1965 and 2007 in *Journal of Ecology* and coincided with the publication of 'Intraspecific functional differentiation suggests local adaptation to long-term climate change in a calcareous grassland' by Ravenscroft, Fridley & Grime in issue 102:1. *Journal* Editor Mark Rees also interviewed Phil and a podcast is available online via https://soundcloud.com/besjournals/journal-of-ecology-mark-rees. If you submitted a question on Twitter listen to see if yours was chosen. Phil also very kindly composed a post for the *Journal* blog, which went online in December 2013 and includes some brilliant photographs towards the end of the piece.

Journal blog (http://jecologyblog.wordpress.com/)

Journal blog Editor Scott Chamberlain stepped down from his role at the end of 2013. We would like to take this opportunity to thank Scott for the time that he has invested in the *Journal* blog and especially for the interviews he conducted with lots of members of the ecological community. All of the interviews are of course still available via the link above.

Also visit the *Journal* blog to read Executive Editor David Gibson's first-hand experience of publishing in the cascade journal *Ecology & Evolution* whilst simultaneously archiving data with Dryad. At this point it should be noted that since January 2014 all authors submitting papers that are accepted for publication in the *Journal* are expected to archive their data. Visit the *Journal's* Author Guidelines http://www.journalofecology.org/view/0/authorGuideline.html for more information.

If you have a topic that you would like to write a guest blog post on contact the Editorial Office (admin@journalofecology) with your proposal.

Lauren Sandhu
Assistant Editor
admin@journalofecology.org

Journal of Animal Ecology

www.journalofanimalecology.org
@AnimalEcology

2014 has ushered in a number of personnel changes for Journal of Animal Ecology, beginning with Ben Sheldon joining the senior Editor team, replacing Graeme Hays who remains as an In Focus Editor. We are delighted to have Ben on board as he brings a wealth of expertise, along with extensive editorial experience, having served as an Editor or Associate Editor on numerous other high profile ecology and evolution journals. The other major change has been Ken Wilson's elevation to Executive Editor (the Editor who takes primary responsibility for the development of the journal). Both Ben and Ken have already begun enthusiastically and are bringing a lot of impetus and many new ideas to the table. Overall, we are therefore very excited about developing the journal over the next few years and meeting the challenges of this dynamic publishing environment.

In terms of content, 2014 has begun strongly, with the inclusion of a Special Feature on 'metabolic currencies and constraints in animal ecology' in Issue 1, guest edited by our Associate Editor Murray Humphries and former Editor Kevin McCann. This is a collection of seven papers, including one by the Guest Editors themselves, which takes a broad-brush look at the varied roles of metabolism in ecology across the ecological hierarchy. This is clearly an exciting area and we are hopefully that this collection of papers will generate much interest and stimulate further work. The issue also included Graeme Hays' first In Focus article, in which he discussed the paper by Klaassen *et al*. tracking mortality patterns in migrating birds.

Our latest issue – the March issue (83:2) – maintains the high quality established in Issue 1. It opens with an In Focus paper in which Michael Heithaus and Aaron Wirsing provide a more general context to the paper by DeCesare *et al*., who show how resource selection and predation risk from wolves affects spatial variation in caribou survival. The In Focus authors discuss the importance of considering individual behavioural

variation in studies of animal resource selection, outlining the relevance to other taxa as well. Other papers the Editors particularly liked were 'When does diversity matter? Species functional diversity and ecosystem functioning across habitats and seasons in a field experiment' by Frainer *et al*. and also 'Linking social and pathogen transmission networks using microbial genetics in giraffe (Giraffa camelopardalis)' by VanderWaal *et al*. However, the quality of the papers was generally very high across the issue and we are pleased to be receiving submissions of increasing quality.

On the processing side of things, we are now a few months into the new BES data archiving policy, in which it is now mandatory for authors to archive their data. We hope that authors are considering this to be a positive step rather than a burden – we remain of the opinion that data archiving will greatly accelerate the progress of ecological science. Nonetheless, we are certainly open to feedback and questions regarding the policy.

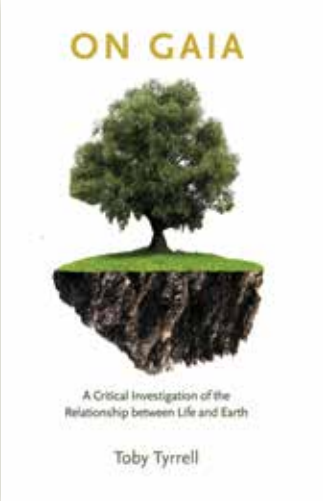
Looking forward, we have three virtual issues in the pipeline, covering food webs, molecular ecology and insects, to add to the successful VI on African ecology edited by Ken Wilson. We also have a Special Feature currently in progress that will focus on current issues in the ecology of animal movement. This is another exciting area and should feature contributions from a range of leading experts in this field.

Peter Livermore
Assistant Editor
admin@journalofanimalecology

A magnificent caribou from the paper by DeCesare et al in the March issue

BOOK REVIEWS

The book reviews are organised and edited by **Peter Thomas and Sarah Taylor**



On Gaia: A Critical Investigation of the Relationship between Life and Earth

Toby Tyrrell (2013) Princeton University Press, Princeton.

£24.95 (hbk)

ISBN 978-0691121581

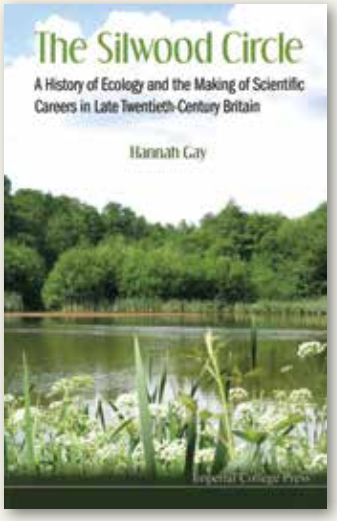
Accidentally I had the privilege a few years ago to spend half an hour in conversation with James Lovelock. In my opinion, more than any other individual, he can claim to be the founder of Earth system science, although I am sure he would be too modest to do so. Despite this I have long thought that by naming his main Earth systems theory after the goddess Gaia he entered into a Faustian pact. It got his ideas wide attention, but uncritical adoption by those less interested in the underlying science, including some flaky new-age types, and uncritical rejection by many in the science community.

In *On Gaia* Toby Tyrrell unpacks Gaia theory into three underlying hypotheses, a job made less easy by Lovelock's occasional re-expression of his ideas. With real intellectual clarity he assembles a wide range of evolutionary, ecological and geological information to test the three hypotheses, and includes an extended reflection on the role chance has played in the persistence of life on Earth. The result is not just a test of Gaia theory but a stimulating synthesis of current Earth systems science, and I hope those more sceptically minded about Gaia won't be put off by the title.

In this book a very persuasive case is made that the first two hypotheses of Gaia, that the biota is shaped by Earth's environment and living things regulates Earth systems are well supported by evidence. Tyrrell has persuaded me that the evidence is stacked against the third Gaia hypothesis, that life regulates the Earth system to ensure its own comfort and survival. In an age where we are increasingly aware of the profound perturbations we are wreaking on earth systems it is an important conclusion that we cannot expect life's persistence under all future scenarios.

This is a really excellent book with carefully marshalled ideas, supporting information and critical analysis, all set out with great clarity for the general as well as the specialist reader. Even more I read it with real pleasure.

John Hopkins



The Silwood Circle: A History of Ecology and the Making of Scientific Careers in Late Twentieth-Century Britain

Hannah Gay (2013) Imperial College Press, London.

£26.00 (pbk)

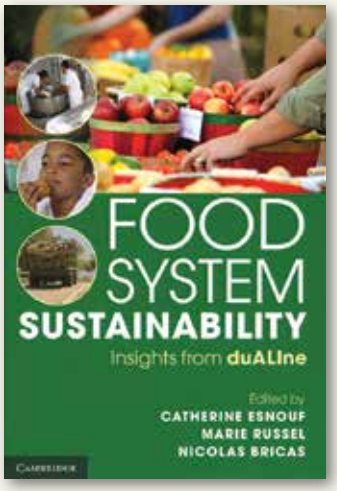
ISBN 978-1-78326-292-2

As the subtitle suggests, this in not just a history of Silwood Park – the Berkshire outstation of Imperial College – but also of the many ecologists that have passed through its gates. The author suggests that ecology was moved from the 'scientific periphery' of the 1960s to 'become more centrally placed' by this group of scientists interacting with each other – the 'Silwood Circle'. This may be considered a bit over the top by those outside the circle, especially those outside the UK, but it is worth noting that five of the 19 BES presidents since the late 1970s were part of the Circle or associated with it, probably more than any other institution. Gay makes it clear that the success of Silwood was due to two ingredients: the calibre of the people involved – Richard Southwood, Bob May, John Lawton (and the list could go on for many lines) – and the fact that research was centred on the need to bring together field experimentation with theoretical modelling.

Reading this book is a little like listening to *Desert Island Discs* where people who are household names, whose work you know, give us an insight into what makes them tick. So it is here; there are sections on individual ecologists that chart their ecological allegiances, influences and backgrounds. But it goes beyond that since it builds a bigger picture of how these people influenced each other and those outside the Circle, and gives a peep into the breath-taking world of Silwood at its peak, crackling with ideas mixed with croquet on the lawn.

The book is well written and easy to read, drawing the reader into the story. The penultimate chapter (the personal journey of the author) is a little out of place but overall this is a fascinating read that will make a train journey or two pass with pleasure. And the central colour pictures of the great and the good will raise a smile or two as well.

Peter Thomas



Food System Sustainability: insights from duALIne

Edited by Catherine Esnouf, Marie Russel & Nicolas Bricas (2013) Cambridge University press, Cambridge.

£60.00 (hbk)

ISNB 978-1-107-03646-8

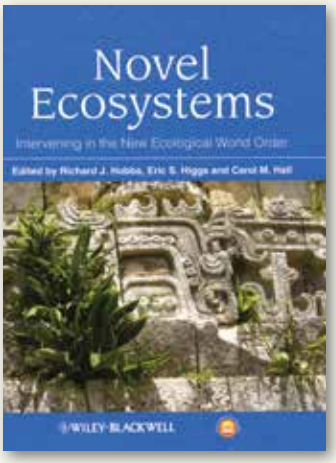
This excellent book of 303 pages contains a wealth of information, contributed by 125 experts taking part in the two year (2009-2011) duALIne project organised by INRA/ CIRAD in France. It is a foresight project aimed at outlining the possibility and problems of achieving food sustainability throughout the world by 2050. The experts were divided into 10 groups and each contributed a chapter to this volume.

I was very impressed with the objectivity of the contributors and the way in which they took geographical, cultural and other factors into consideration. These range from the obvious differences between Northern and Southern areas, to local difference, for example within Europe. As we all know, sustainable food production has to be balanced against greenhouse gas production, and in this book that is largely taken to mean carbon footprints. The difference between objectives of a socio-economic agenda and those of a geopolitical nature are highlighted and I like the emphasis on the need for bio/agri-industry to create added value. How this might be achieved is illustrated in some of the many excellent figures, for example showing the many uses to which anatomical fractions of wheat may be put. In this the first subdivision is into kernel and straw and the pathways from these into feed, biofuels, chemical products, etc. are well laid out. This figure is typical of many in the book that manage to put a vast amount of information on to a single page. A minor criticism here is that the root system and the soil are not considered. In most chapters, there are sections on questions for future research and most have a concluding section with pertinent statements such as 'a revolution of attitudes is necessary: considering food losses and wastage as abnormal is a notion that needs to be rediscovered both individually and collectively.'

When reading this volume I marked numerous pages for possible mention. This proved impossible in the space available. However, one on biodiversity is very pertinent to BES readers. It is stressed that this should be considered at three levels, ecosystems, species and intra-species. The last, in my view, has been neglected by the vested interests of large seed producers rather than the development of seed production of locally adapted genotypes of important food sources such as cowpea and bambara groundnut.

I have for years been impressed by the quality of the science generated by INRA and CIRAD. This volume impresses me even more with its attention to the many and varied problems facing the world if food sustainability is to be achieved. A very good read, but not all at one sitting!

Janet Sprent



Novel Ecosystems. Intervening in the New Ecological World Order

Edited by Richard J. Hobbs, Eric S. Higgs, and Carol M. Hall (2013) Wiley-Blackwell, Chichester.

£45.00 (hbk)

ISBN 978-1-118-35422-3

This is a remarkable book. Just as I picked it up and struggled to read the editors' blurb on the back cover (my only complaint – you can barely read it!) two of my colleagues (Alan Mowle and Gordon Patterson) purred in praise of their former Edinburgh University contemporary – evidently young Hobbs had been something of a star student. Well, as readers of this *Bulletin* and the wider ecological literature will know, he has remained so, and is in inspiring form here.

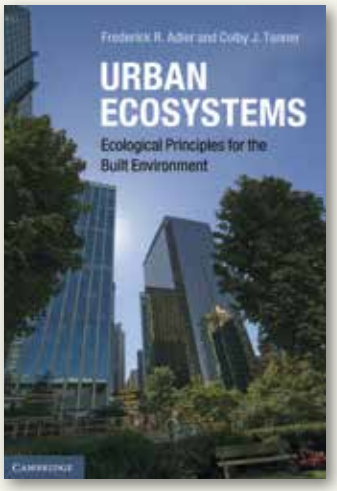
Think about this – climate change, species invasions, all manner of land use changes and pollution are throwing up new ecosystems, which the son of one of the editors likened to 'freakosystems'. And what is our response to these, as landscapes and wildlife transform and transmute at speed? Well, some of us holler after former glories and strive to conserve what was there before – and for ever – whilst at the other extreme, we try to adapt to change and get the best out of the 'new' ecosystems. But how do we decide what to do, and where and how – and who does it? This book builds on some recent work in this area to set a benchmark for a revisionist approach to ecosystem stewardship.

Elegantly produced and delightfully readable, the editors have cleverly weaved together 42 chapters arising from a workshop held at Poet's Cove, Pender Island, in May 2011. At that meeting, a large group of ecologists assembled to think through how we should manage novel ecosystems. And out of this the 50 contributors (many from Australia, US and Canada) have produced a fresh, informative and highly challenging contribution.

Divided into five parts, the core of the book deals with definitions and examples of novel ecosystems, what we do and do not know about them, when and how to intervene, a variety of perspectives on our appreciation of these, and some thoughts on the future. Kristin Hulvey and nine co-authors provide an important management framework for identifying and managing these, wisely emphasise the range of issues you may wish to consider, and suggest some ensuing tactics to be deployed by a wider range of organisations and people. There is a pleasing mixture of case studies, frameworks and perspectives. The case study by F. Stuart Chapin III and colleagues on novel socio-ecological arctic and boreal systems provides a clear outline on four approaches to building resilience.

Frankly, each and every one of the chapters deserves to be highlighted; such is the quality of this book. It is full of ideas and hopes which challenges us to embrace opportunities to help nature and humanity in the face of unprecedented change. This is an exceptionally important book – the Hobbs, Higgs and Hall testament to the world's new nature.

Des Thompson



Urban Ecosystems: Understanding the Human Environment

Robert A. Francis & Michael A. Chadwick (2013) Routledge, Abingdon

£29.99 (pbk)

ISBN 978-0-415-69803-0

£85.00 (hbk)

ISBN 978-0-415-69795-8

I remember being intrigued in the late 70s when I was given a copy of Bunny Teagle's *Endless Village* report on wildlife of the urban West Midlands. Since then the development of urban ecology has been surprisingly slow and enthusiasm for urban conservation in the UK has waxed and waned. Might one conclude this is because ecologists and conservationists are more inclined to work on the more exotic and esoteric, or am I being too harsh? The recent publication of several books on urban ecology suggests the urban environment is more interesting than once thought and is achieving better focus.

Although there are several recent books published on urban ecology, so far as I am aware this is the first textbook. It provides an excellent overview of the topic and whilst the main focus is on ecology, there is enough information about the geographical and social context for this textbook to be of value not just in teaching ecologists, but also geographers, planners, engineers and others who influence the urban environment.

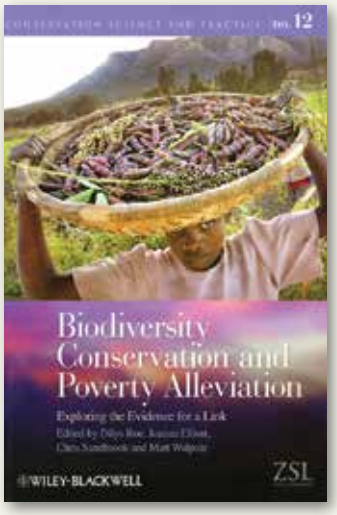
An early chapter in the book deals with the spatial character of urban areas, both in terms of i) settlement morphologies and how these evolve, and ii) the influence of resulting land use patterns on ecological processes; notably dispersal. It provides an interesting bridge between the traditional urban geographer's perspectives and those of the ecologist. Following a chapter dealing with ecological processes in urban areas there are chapters on urban green spaces (including rivers and lakes) and buildings. The chapter on urban species includes lengthy discussion of the particular role of generalist and non-native species in urban areas, as well as 'pest' species. The concluding chapters deal with nature conservation, urban planning and the future for urban areas.

The authors of this book have done an excellent job in bringing together in clear and purposeful text and well-chosen graphics the varied strands of urban ecology as a discipline. Like all good text books it is also an excellent introduction to the topic for the general reader, and I hope it will encourage the wider teaching of urban ecology.

REFERENCE

Teagle W.G. (1978) *The Endless Village. The Wildlife of Birmingham, Dudley, Sandwell, Walsall and Wolverhampton.* Nature Conservancy Council, London.

John Hopkins



Biodiversity Conservation and Poverty Alleviation: Exploring the Evidence for a Link

Edited by Dilys Roe, Joanna Elliott, Chris Sandbrook & Matt Walpole (2013) Wiley-Blackwell, Oxford. £80.00 (hbk)

ISBN 978-0-470-67479-6

£45.00 (pbk)

ISBN 978-0-470-67478-9

Part of the received wisdom of biodiversity conservation is the part it plays in alleviating global poverty. This linkage is not new, having been restated over at least the last 20 years, but what evidence exists of its validity beyond lazy or expedient rhetoric? This volume of collected papers sets out to test the proposition, drawn from a symposium held at the Zoological Society of London in April 2010. The key messages and related materials can also be accessed via: povertyandconservation.info/en/event/e0071 .

The 2010 symposium posed 3 initial questions:

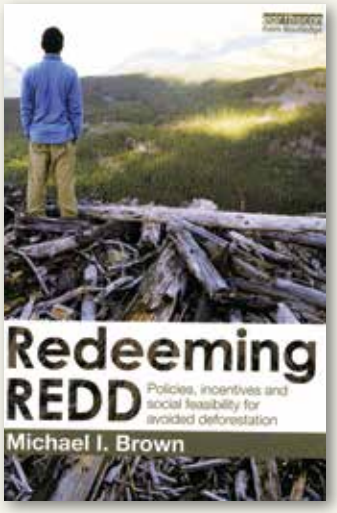
- Is there a geographical overlap between biodiversity and poverty?
- Are poor people dependent on biodiversity?
- Is biodiversity conservation an effective mechanism for poverty alleviation?

The assembled evidence addressing these questions is grouped into 5 parts. Parts 1 and 2 explores the broad relationships between biodiversity and poverty, observing that as biodiversity losses increase then the rural poor are often deprived of linked ecosystem services. This highlights distributional effects and the implications of changing access rights. In some cases, access to these non-market ecosystem services can create a 'poverty trap' which can be difficult to break away from. Part 3 goes on to explore the implications of various conservation interventions, showing how hard it is to gather robust evidence beyond anecdote and generalising from individual case examples. Part 4 explores the consequent distributional challenges suggesting, for example, that payment systems will tend to exclude the poorest and neediest. Part 5 examines the relationship between these local perspectives on biodiversity and poverty in the context of larger-scale drivers including climate change and dynamics of consumption-based economic growth itself.

The concluding chapter draws all these threads together, answering the three initial questions as: yes, yes (but only for some of the rural poor) and, thirdly, 'it depends'. A more nuanced conclusion recognises that biodiversity conservation and poverty alleviation are not two sides of the same coin, although the evidence shows that biodiversity can alleviate poverty for *some* people in some places. To reinforce the linkage with poverty alleviation, biodiversity must be addressed at the national level by finance and development, not just environment, ministries; the TEEB (The Economics of Ecosystems and Biodiversity) publications (www.teebweb.org) are commended. At all levels, 'good governance' is required, addressing distributional effects

and the social dimensions of conservation measures. These conclusions are spelled out in 10 'pointers for policy and practice'; not a simplistic 'win-win' rhetoric, but pragmatic and evidence-based attention to 'win more and lose less'. At the price, this is not a book many will be going out to buy, but nevertheless provides a valuable library reference resource.

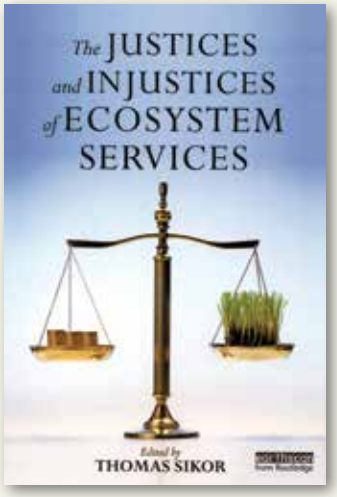
Alan Mowle



Redeeming REDD: Policies, Incentives and Social Feasibility for Avoided Deforestation

Michael I. Brown (2013) Earthscan from Routledge, Abingdon. £29.99 (pbk)

ISBN 978-0-415-51786-7



The Justices and Injustices of Ecosystem Services

Edited by Thomas Sikor (2013) Earthscan from Routledge, Abingdon. £85.00 (hbk)

ISBN 978-0-415-82539-9

£24.99 (pbk)

ISBN 978-0-415-82540-5

Forests store huge amounts of carbon and so Reducing Emissions from Deforestation and forest Degradation (REDD and its new version REDD+) has been widely endorsed. But as Brown shows, the current aims and policies are not designed to put people first, and indigenous people often lose out while others gain the economic benefits. In a similar way, the wider provision of ecosystem services (the multitude of resources and processes that are supplied by ecosystems) should be a good thing, especially where payment for ecosystem services (PES) should put money into the pockets of those who manage their land to maximise services. But, you know what's coming next, it turns out that impoverished or indigenous people are often not the people to gain. So if you are interested in social justice, and in particular how these wrongs can be put right, then these two books are worth reading. The first book obviously covers just the REDD process but Brown is passionate about what he sees as the solutions to encourage a socially responsible reduction in deforestation, and indeed he makes good sense. The second book includes a chapter on REDD and another on PES, and then looks at the wider implications of these and other issues for people. The solutions offered are more general but wider ranging and all have a positive feel to them. The world can be a better place while being looked after in a more ecologically sustainable fashion. If this concerns you then either book would be a useful read, which one depending upon your focus.

Peter Thomas

Ignoring Nature No More: The Case for Compassionate Conservation

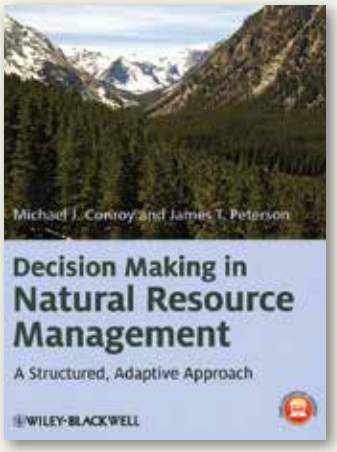
Edited by Marc Bekoff (2013) University of Chicago Press, Chicago. £28.00 (pbk)

ISBN 978-0-226-92535-6

Compassionate conservation is a new mind set and social movement that brings together animal welfare ideologies and conservation. The editor, Mark Bekoff, is at the heart of this movement, presenting a paper on *Compassionate conservation as a unifying and integrative movement: who lives, who dies and why* at a Compassionate Conservation Symposium in Baltimore in 2013. This timely edited collection contains 26 wide ranging essays by 38 contributing authors, which highlight the intersection between conservation and protectionism and demonstrate that the 'putting out fires mentality' to conservation has not worked. The book is arranged into five parts: (1) ethics, conservation, and animal protection; (2) conservation behaviour and 'enlightened management'; (3) conservation economics and politics; (4) human dimensions of social justice, empathy, and compassion for animals and other nature; and (5) culture, religion, and spirituality. Unlike many edited collections, Bekoff's influence can be seen throughout the book, as each part has a 5-6 page introduction by Bekoff, with useful summaries of each chapter that emphasise the key messages presented by the authors and linkages to other parts of the book. Each chapter stands alone, with its own reference section, and there is really nicely done index at the end of the book. There are no tables or diagrams to illustrate the arguments in the text, or cute glossy pictures of furry animals to pull at the heart strings – the written words suffice. The book makes you re-examine some of the basic foundations of conservation. For example, the concepts of population viability and ecosystem health underpin most conservation programmes, and yet what do they really mean, and is their sole objective just motivated by meeting the so-called needs of humans? A scary thought, as on closer inspection this is very often the case! As Bekoff states in the preface, 'it shouldn't be all about us', and this is later echoed in his closing words of the book in which he quotes the late theologian, Thomas Berry: 'our relationship with nature should be one of awe, not one of use'. This emotively written book will be of interest to a wide audience, from students, academics and practitioners studying, researching and working in the fields of conservation and animal welfare, to those with a more general interest in the subject matter.

For more information about Compassionate Conservation, check out the Bornfree website: www.bornfree.org.uk/comp/.

Sarah Taylor



Decision Making in Natural Resource Management: A Structured, Adaptive Approach

Michael J. Conroy & James T. Peterson (2013) Wiley-Blackwell, Oxford.

£90.00 (hbk)

ISBN 978-0-470-67175-7

£25.00 (pbk)

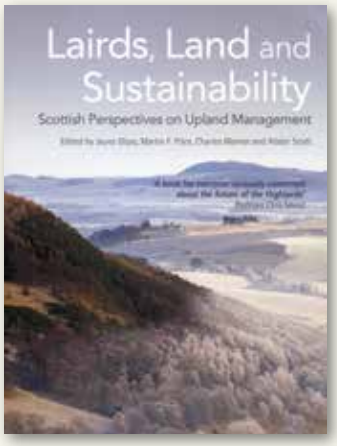
ISBN 978-0-470-67174-0

Managing biodiversity is a vexed enterprise. The real world is an unreplicable morass of causal networks that undermines attempts at controlled manipulations. Thus, inference and predictions rely heavily on advanced statistics and simulation modelling, making ecological management a highly complex science. At the same time, biodiversity management is about much more than science: it also depends on ethics, politics and economics. How can practitioners marry these disparate threads together, without rendering biodiversity management subjective, and without undermining its credibility? This is the subject of this book.

Conroy and Peterson note that the reputation of biodiversity management suffers when decisions are made in an opaque and ad hoc manner, and that this also undermines the efficient use of resources. To remedy this, they focus on Structured Decision Making (SDM) and Adaptive Resource Management (ARM). These processes are explicitly intended to separate value judgements from science, to deal objectively with differences in value judgements, and to connect decisions to predefined objectives in a defensible and transparent way. The authors note that, conceptually at least, these processes seem intuitively obvious. Regrettably, however, the history of biodiversity management is replete with examples of ad hoc decisions based on conflating science with value judgements.

The book is sensibly arranged, with sections covering introductory material, the hard science of structured decision modelling (ranging from Bayesian inference to dynamic optimisation), and practical applications of the SDM/ARM process. Some elements (such as what attributes make a good facilitator at a stakeholder meeting) seem relatively obvious – but it is unusual and telling to have these alongside detailed introductions to probability, uncertainty and modelling (together with example R code and a very helpful companion website). I was a little disappointed not to see more obvious integration with other efforts to improve the objectivity of biodiversity management decisions, such as the focus on rigorous conservation evidence emerging in the UK, and return on investment championed by groups in Australia. Nevertheless, as a one-stop-shop primer for decision-makers who need to incorporate science, and scientists who hope to influence decision making, this is likely to be a very important textbook. I hope it will be widely read.

Phil Stephens



Lairds, Land and Sustainability: Scottish Perspectives on Upland Management

Edited by Jayne Glass, Martin Price, Charles Warren & Alister Scottet (2013) Edinburgh University Press, Edinburgh. £75.00 (hbk)

ISBN: 978-0-74864591-6

£24.99 (pbk)

ISBN 978-0-74864590-9

This interesting publication is timely, with Scotland's land reform legislation under review by a Review Group set up by the Scottish Government, and a separate inquiry by the House of Commons Select Committee on Scottish Affairs. The book is the product of a privately funded programme of doctoral research 'Sustainable Estates for the 21st Century', conducted at the Centre for Mountain Studies, Perth College. The research started from the 'general proposition that improved policy making and decision making are needed to facilitate sustainable management and governance of upland areas.' The authors are clear that their coverage is not comprehensive: 'detailed attention is not given to ecological processes in upland regions', which may come as a disappointment to many *Bulletin* readers. However, it does provide a useful opportunity to place these processes in their wider social and economic context.

The heart of the book is a series of chapters reporting on the research, 'bookended' by more general chapters setting the scene and drawing the threads together. Part One comprises two extensively referenced review chapters which illustrate just how many different facets of interest are found in Scotland's uplands, and explore many of the elements making up the ecosystem services they provide (one surprising omission is the whole complex of issues thrown up by renewable energy generation, both wind and hydro).

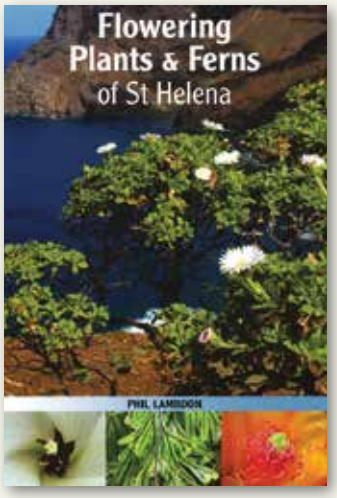
Part two summarises three of the four research projects. The first draws on a questionnaire survey of members of Scottish Land & Estates, the landowner's representative body, supplemented by interviews to characterise the challenges faced by owners and land managers. The second is a more detailed study of the motivations of 11 landowners described in terms of economic, social and environmental drivers. The third reports an exploration of the relationships between landowner and local community on 6 estates. All these suffer from an over-emphasis on the individual 'private owner' when, as evidence to the Commons Select Committee is showing, the land as often as not is owned by a trust, a company or other vehicle (sometimes registered offshore) designed around the tax and fiscal regimes. As explored briefly in Chapter one, there's much more to property rights (of access, use and exploitation) than the issues of 'ownership' *per se*.

Part three redresses the balance somewhat by exploring the fourth research topic, community ownership (some of which has resulted directly from Scotland's land reform legislation) and also the increasing scale of ownership by environmental NGOs. The latter, alas, is pretty thin; the

chapter relies on a literature review and so adds none of the new insights provided by the survey findings in the preceding chapters. The final section presents a 'sustainability tool': 'designed to enable estate owners and managers to understand how their decisions and actions can… affect a range of economic, environmental and social outcomes, and adjust their management practices accordingly", closing with a chapter entitled Lessons for sustainable upland management. These may be the most interesting for *Bulletin* readers.

Judged against the stated ambition of this work, how well does it deliver? The book certainly illustrates the diversity of perspectives on management of Scotland's uplands, but it falls short by failing to bring out some important drivers for Scotland's rural land owners and managers, especially the tax and fiscal regime and the availability of land management subsidies funded by the taxpayer. Across upland Scotland, the latter amount to around £100m per annum, without which many land management businesses could not be economically viable. These key policy measures can only be justified, in the end, by the public value they deliver. Despite occasional references to the wider public interest, it is disappointing that the authors have not taken the opportunity to explore the part played by these policy measures in achieving sustainable management.

Alan Mowle

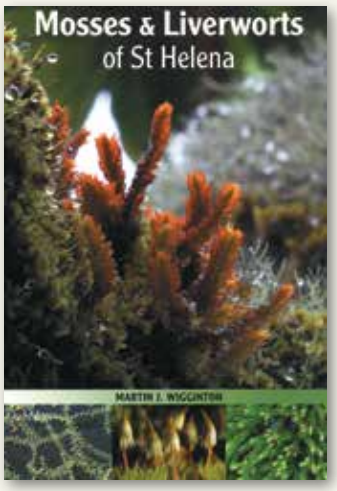


Flowering Plants & Ferns of St Helena

Phil Lambdon (2012) St Helena Nature Conservation Group, Pisces Publications, NatureBureau, Newbury.

£34.95 (pbk)

ISBN 978-1-874357-52-0



Mosses & Liverworts of St Helena

Martin J. Wigginton (2012) St Helena Nature Conservation Group, Pisces Publications, NatureBureau, Newbury. £12.95 (pbk)

ISBN 978-1-874357-51-3

Lichens of St Helena

André Aptroot (2012) St Helena Nature Conservation Group, Pisces Publications, NatureBureau, Newbury.

£11.95 (pbk)

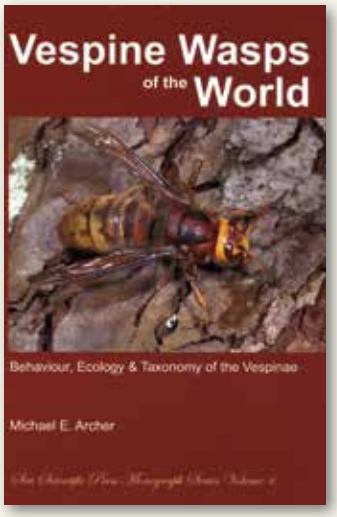
ISBN 978-1-874357-53-7

The chances are you won't travel to St Helena, a British Overseas Territory in the Atlantic some 1800 km west of Angola, so why would you be interested in three new 'floras' from this remote island? Well, they make a superb case study of the vertical zonation of vegetation from desert coastlines to high altitude cloud forest, not unlike that of Tenerife but with more exotic introductions. And therein lies the real lesson, the effect that we humans have made on the island's vegetation since the first Portuguese arrived in 1502. Through a mixture of introducing grazing animals such as goats, extensive deforestation and the introduction of new plant species, the native vascular flora has been devastated. At present there are 45 endemic species, another 30-40 native species (depending how you count) hidden in a dominant mix of close on 400 naturalised and adventive species, ranging from European gorse and oaks to the widespread New Zealand flax, *Phormium tenax*, a commercial source of fibre until the 1960s. Some of these plants were accidental introductions, while others were deliberate, like the gorse used for hedging. Many others escaped from captivity when the island was used as a staging ground for the movement of useful species to and from Asia.

By contrast, the bryophyte flora of some 120 species (related to those of African and the Americas) has 25 endemic species with just a couple of introductions established from mosses used as packing material. As a further contrast the 225 species of lichen are all native with just 9 endemic species. So these books provide lovely material on how 'floras' develop naturally (including how spores move more easily round the world than seeds leading to less endemism) and how we humans can drastically alter things (flowering plants) but not everything (lichens and bryophytes) in the same place. It also opens the window to investigate how these different groups will change in the future. A set of these in the library would make a superb resource for a self-directed student project. And you may, of course, be tempted to visit St Helena and use these as the field guides they are intended.

Each species of flowering plant and bryophyte has one or more colour photos, distribution maps, descriptions (and recognition features for the bryophytes) with useful notes on the ecology and history. The lichens are organised by genera with notes on the genus plus brief descriptions of the species and their identification where this is possible; as the introduction to the bryophytes and lichens notes, there is still a lot of work needed. Keys are provided for each group at whatever taxonomic level is appropriate. All three books are superbly produced on good quality paper; equally useful in the field, the library and as winter fire-side reading.

Peter Thomas



Vespine Wasps of the World: Behaviour, Ecology and Taxonomy of the Vespinae

Michael E Archer (2012) Monograph Series Volume 4, Siri Scientific Press, Manchester.

£95.00 (hbk)

ISBN 978-0-9567795-7-1

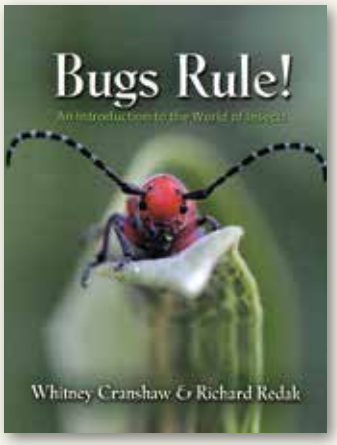
Michael Archer has devoted many, many hours to the study of the Vespinae, that is the social wasps, including pioneering work on the details of their nesting biology and behaviour, the establishment of national recording schemes, and the undertaking of many activities designed to help engender interest in these wasps and their conservation. His knowledge of the Vespinae is truly extraordinary and forms the basis for consideration of many of the exciting and challenging paradoxes that are found in the behaviour of social insects. This book includes an absolute wealth of information!

There are around 65 species of social wasps found world-wide, including what are familiarly known as hornets and yellow-jackets (in America). In essence, the life cycle starts with a pluripotent reproductive female (the queen), who founds a paper nest and raises a small brood of non-reproductive females (the workers) that then cooperate with the queen to rear many more workers and eventually a brood of new reproductive males and females. The paradox that workers 'unselfishly' forego their own reproductive potential to rear the queen's offspring is at the heart of the debate about the evolution of social behaviour.

One of the strengths of Archer's knowledge of the Vespinae is that he has counted and measured the various castes and developmental stages in numerous individual societies, in many of the species, and he sets out here a full numerical description of the nests and broods and then the way that this changes as the colonies develop. He was an early modeller, using computers to assist in this aspect of the biology of the Vespinae. At times the sheer weight of detail rather obscures the development of the arguments, but there are helpful summaries throughout and anyway, for the conclusions to be sound, they have to be informed by this detail. There is then a chapter on foraging behaviour and finally one on population and community ecology, covering many relevant aspects such as causes of mortality and interactions with other species.

The last part of the book then consists of a full key, descriptions of all species and colour photographs of typical individuals. The literature section is as full and authoritative as you would expect from such an expert author and a welcome feature is that it includes much older descriptive work. Overall this is a monumental accumulation of information on all aspects of the biology of the Vespinae, which will allow anyone interested in the ecology and evolution of social behaviour to base their conclusions on reliable and comprehensive data. It is a genuine treasure house and the only regret is the rather high price.

Mark Young



Bugs Rule! An introduction to the World of Insects

Whitney Cranshaw & Richard Redak (2013) Princeton University Press, Princeton.

£37.95 (hbk)

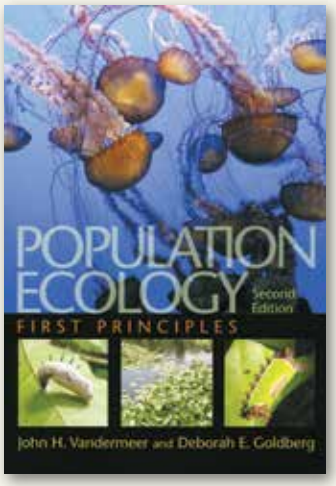
ISBN 978-0-691-12495-7

Whenever I see a book with a title like this my heart sinks and I think 'not another book of whacky insects that I'm unlikely ever to see'. Happily this is not one of those and … I like it! After years of teaching courses on entomology the authors have come up with a book designed for non-science students, and indeed anyone wishing to learn about the world of insects and their near relatives. Overall the book is more a natural history of the arthropods with introductory chapters on anatomy, physiology and systematics which are succinct but which are expanded later if necessary. Despite its title, two chapters are devoted to other arthropods such as spiders and millipedes, the reason being that novice students often get confused between the orders so it is better to deal with them together. I suppose the word Bug doesn't help as it has two distinct meanings!

The bulk of the book is taken up with reviews of each of the insect orders. These are well-written and beautifully illustrated with clear diagrams and over 800 photographs which feature largely American species, though parallels can be found on every continent. Throughout the book there are numerous side-bars that explain and expand on key features of arthropod natural history. There are three appendices. One lists the US state insects which, while interesting, is not of much use outside the US. Appendix 2 lists some examples of the World's largest arthropods both living and extinct while Appendix 3 gives a useful, if sometimes too brief, summary of the main features of each Hexapod order. Finally there is a glossary, which might have benefitted from a few line drawings or page references.

This book accomplishes what it set out to do – and very well. I would recommend it to anyone wishing to learn more about arthropods and their world.

David Emley



Population Ecology: First Principles (2nd edn)

John H. Vandermeer & Deobrah E. Goldberg (2013) Princeton University Press, Princeton.
£65.00 (hbk)

ISBN 978-0-691-16030-6

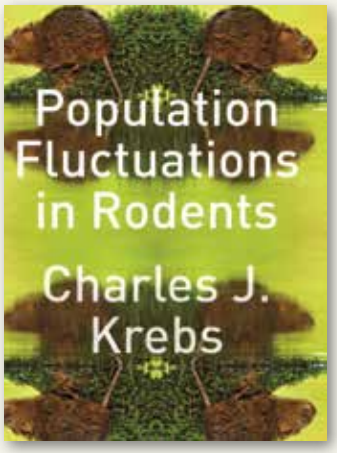
£52.00 (pbk)

ISBN 978-0-691-16031-3

Population ecology, perhaps more than any other ecological discipline, has a firm mathematical basis. From the days of Slobodkin, Gause, and Lotka & Volterra, mathematical modelling has proved the

most effective approach to understanding the behaviour of populations of organisms. One must expect, therefore, that any text providing an account of population ecology will be grounded in mathematics, and this is very true of this book. The authors begin their account with a simple description of density independent population growth, followed by the more realistic scenario of density dependence, leading on to thinning laws in plant populations. These accounts assume that the reader is familiar with calculus, and the next chapter on structured models demands a further knowledge of matrix algebra. Having covered these basic theoretical concepts, it is possible to examine how such models operate in practice and various examples are given. Next comes the question of dynamics and the attainment of stability in a population. In order to explain this, the authors turn to physics and set out the concept of attractor and repeller using the well-used mathematical metaphor of a ball in a valley or on a hill top. Models can be created in which there is just one, or several attractors (valleys, stable states). Populations exhibit temporal dynamics, moving toward particular stable states, but they also display spatial dynamics, especially plant populations in which individuals lack any capacity for movement, and the authors devote a chapter to the development of spatial pattern in populations, relying strongly on trees as examples. They develop this theme further into metapopulations theory. Later chapters in the book deal with predator/prey interactions (with an innovative section on disease ecology), competition, and finally mutualism, including the concept of facilitation. The three features that stand out in this book are first, its logical sequence and development, second, its clarity of explanation, and third, its brief but relevant incorporation of practical applications. The authors assume a relatively advanced knowledge of mathematics, but this is a reasonable prerequisite of any understanding of population ecology. The book's market, therefore, will be mainly among graduate classes in this specialist subject. In this field, however, it is arguably the best text currently available.

Peter Moore



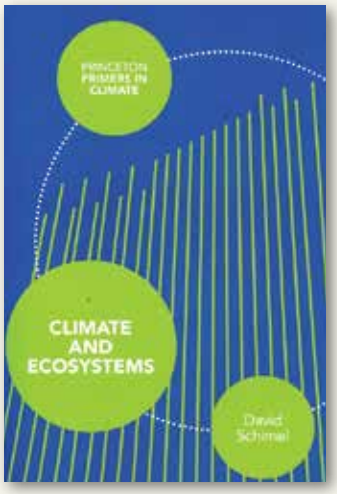
Population Fluctuations in Rodents

Charles J. Krebs (2013) University of Chicago Press, Chicago. £35.50 (hbk)

ISBN 978-0-226-01035-9

Fluctuations in the populations of rodents over the course of time, often in a cyclical pattern, are well known in nature and are often of considerable biogeographical and economic significance. Here, the author has gathered together a wealth of information about such fluctuations among voles and lemmings in the Northern Hemisphere, with some additional material pertaining to rats and mice. Some populations are relatively stable, and others cyclic; populations may exhibit different behaviours in various parts of a species range; the time scale of fluctuations varies, but can be very short, even monthly. Understanding such processes demands the identification of the factors that determine population growth. Using lemmings and voles as examples, Krebs considers various possible correlates with amplitude of fluctuation, such as latitude, ecosystem complexity, and landscape connectivity. High latitudes seem to have more extreme fluctuations, but little information exists about such processes in the tropics. He also asks whether food supply or predation levels are the keys to the peaks and troughs in population variations. Reproductive output is clearly an important factor in determining population growth rate, and he examines the age of sexual maturity, litter size, and length of breeding season as factors affecting output. In addition, the levels of mortality, immigration, and emigration are considered. His conclusions are that food quality and quantity are important for understanding fluctuations, but cannot explain them in isolation from other factors. He examines predation, but finds that mortality from this cause is too weak and sporadic to account for observed population fluctuations. Disease and parasitism may well be involved, especially as these may interact with the availability of an adequate diet. Self-regulation in such populations could be an important determinant of fluctuation: behavioural changes are associated with competitive stresses and consequent hormonal alterations. His final conclusion is that any explanation of fluctuations in rodent populations must be based on a multi-factorial approach. Models should even incorporate short- and long-term changes in weather conditions and climate. As might be expected from this author, the text is extremely readable. It follows a sequential development that gives it the air of a detective story, and the conclusions reached are well argued and balanced. It should prove of great interest to behavioural ecologists, population ecologists, and to biogeographers.

Peter Moore



Climate and Ecosystems

David Schimel (2013) Princeton University Press, Princeton. £55.00 (hbk)

ISBN 978-0-691-15195-3

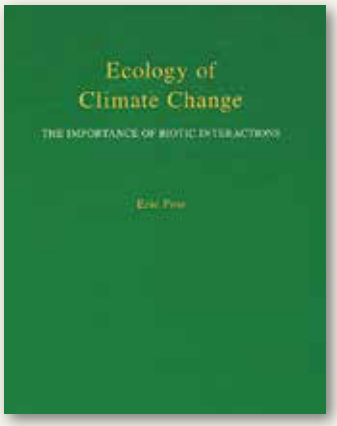
£19.95 (pbk)

ISBN 978-0-691-15196-0

The intimate relationship between climate and ecosystems is the focus of many interests: scientists attempt to define, explain and monitor the various factors involved, while politicians are becoming increasingly called to account for human impact on this relationship and its mitigation. This is the fourth book in the *Princeton Primer in Climate* series which is devoted to providing up-to-date information on this vital topic for a general as well as academic audience. Following an introduction, which sets a temporal framework for climate studies ranging from daily events to geological timescales, the second chapter focuses on relationships between the physical/chemical characteristics of the environment and biological components; water, heat nutrients and organisms interact dynamically at all spatial and temporal scales. Chapter three examines the relationship between climate and ecosystems, notably the control by climate over ecosystems, and outlines concepts such as ecological niche, species ranges,

equilibrium, nonequilibrium, adaptations to climate, nutrient limitations, and photosynthesis with examples from terrestrial and marine environments/ ecosystems. This suggests a one-way relationship until the feedbacks from ecosystems to climate are considered, as in Chapter four which focuses on the carbon cycle, an especially significant factor in climate regulation and change. The amount of carbon dioxide in the atmosphere has varied significantly through geological time though increases in the last 250 years due to fossil-fuel use are now recognised as the cause of unprecedented climate/environmental change. Carbon stocks and fluxes within the biosphere and atmosphere are highly complex; unicellular to multicellular organisms of land and sea are involved via photosynthesis, decomposition, natural and cultural (agriculture) food webs, deforestation, and land use such as forestry and urbanisation as are fossil-fuel and other greenhouse gas and aerosol emissions. Such interactions affect local, regional and global environments and climate as computer models, even if relatively simplistic, demonstrate. The latter are discussed in chapter five in relation to model reliability, sensitivity and margins of error, predictors of change, and terrestrial and marine ecosystem response. Where will all the carbon dioxide go? What will its impact be? How can the carbon and related cycles be managed? Such issues are examined in the final chapter. Overall, this book provides a sound introduction to a much publicised topic; it dwells on the science rather than the politics and provides a glossary and reasonable reference list.

Antoinette Mannion



Ecology of Climate Change

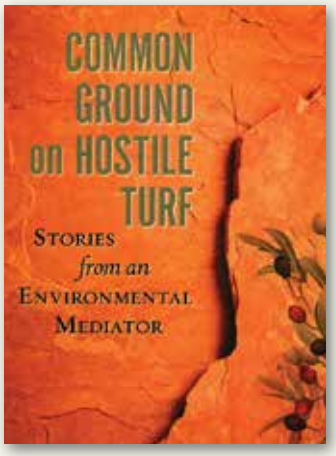
Eric Post (2013) Princeton University Press, Princeton. £41.95 (hbk)

ISBN 978-0-691-14847-2

On-going questions surrounding climate change have resulted in numerous books concerned with its interactions with society and the biosphere. Such issues are becoming increasingly pressing, especially against a backdrop of decisions about future energy provision. The opening chapter presents information on recent temperature, precipitation, snow and ice cover changes, and introduces evidence on ecological change from phenological and ecological monitoring studies. It is followed by a discourse on Pleistocene climatic/ecological change as evidenced by megafaunal assemblages and how such a narrative is significant to contemporary change. Phenology, i.e. periodic plant and animal life cycle events which are influenced by seasonal climatic characteristics, is then detailed including its influence on population dynamics with examples from amphibian and bird populations. This links with a more detailed examination of population dynamics, the difficult determination of 'stability' and issues such as thresholds and extinction.

Further heavyweight chapters examine the niche concept and associated phenotypes and responses to climate change, community dynamics and controversies about species and/ or community responses which reflect the complexity of species, community, trophic structures and climate relationships. Can such intricate relationships be modelled satisfactorily and are generalisations possible or worthwhile? Individuals, species and communities contribute to biodiversity which has a particular distribution in space and time; whilst obviously dynamic the worst cases are unviable populations and extinction. Such issues are discussed in relation to tropical deforestation and amphibian loss. Chapter eight focuses on ecosystem function and dynamics with reference to climate, biogeochemistry with emphasis on carbon cycling, the role of deforestation plus insect and herbivore reactions to changed circumstances. Finally, the significance of trends and variability in the physics and chemistry of the environment, including the increased incidence of extreme climatic events and the difficulties of predicting their occurrence and impact on biota are highlighted for further investigation. Similarly, increased attention to phenology is recommended to help identify the patterns and timings of organism response to external stimuli. Perhaps one of the most important issues raised is the question of vigilance; failure to detect change by whatever means (field data, satellite imagery, etc.) does not necessarily mean that organisms or communities are unresponsive; this reflects inherent resistance and thresholds which may be narrow or broad and which are species-specific. This book is for the specialist rather than the generalist; its strength lies in its appraisals of current ecological-climate knowledge and its suggestions re research directions.

Antionette Mannion



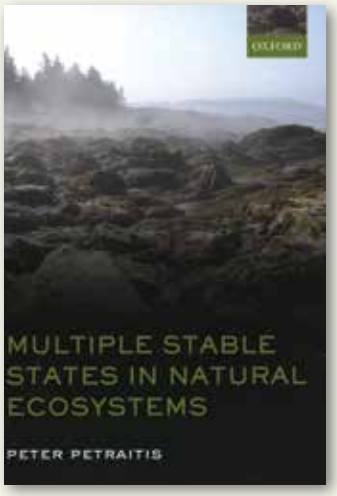
Common Ground on Hostile Turf: Stories from an Environmental Mediator

Lucy Moore (2013) Island Press, Washington, DC. £12.99 (pbk)

ISBN 978-1-61091-411-6

The United States often seems to want to surround perfectly sensible actions with rules that make life difficult. In part this seems to be due to the laudable aim of getting all interested parties involved in decision-making but when these parties involve Federal Government, State Government, agencies, native people, business and the public at large, the chance of agreement seems remote. This book is a series of stories told by a professional mediator about her experience in attempting to broker agreement in disputes between such parties over environmental problems – SuperFund sites with toxic metals, water rights, etc. Whilst I have no doubt over the seriousness of these questions I remain unsure what lesson I am meant to learn from these as each one is a different dispute. If the conclusions are that building trust is difficult and that science alone will not provide a solution to problems with emotional and cultural elements, then I think we all know that already. I am even more puzzled about who the audience is for this book and conclude that it is not ecologists.

David Walton



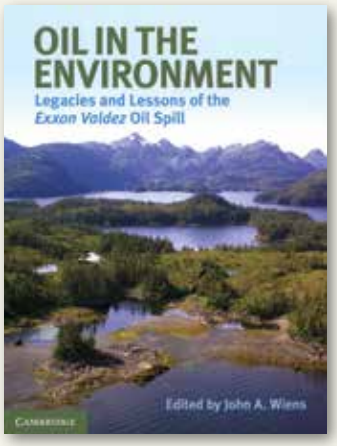
Multiple Stable States in Natural Ecosystems

Peter Petraitis (2013) Oxford University Press, Oxford. £45.00 (hbk)

ISBN 978-0-19-956934-2

The simplistic, Clementsian concept of ecosystems passing through a series of developmental stages and eventually achieving a stable climax state, in equilibrium with the prevailing climate, has long been abandoned, thanks mainly to the mathematical modelling studies of Lewontin, Noy-Meir, and May in the 60s and 70s. The idea that other stable states could exist had already been floated by Tansley with his concept of 'plagioclimax', and Petraitis here introduces his review by giving examples of human activity deflecting the development of ecosystems into new states of equilibrium that are similar to those used by Tansley. He summarizes the models that describe multiple basins of attraction, the situations within which an ecosystem can attain a degree of stability. He illustrates the concept by reference to field examples using the live weight of sheep, which exhibits a bimodal relationship with stock density, and the density of mussels on seashore, which is again bimodal in relation to degree of wave exposure. Movement from one stable state to another is often set in motion by a natural (or unnatural) disturbance, or the removal of one species from the system. But such movement does not always come in the form of a sudden jump, but can be a smooth shift, and the author explains this in terms of catastrophe theory. His incorporation of catastrophe theory and his emphasis on it is perhaps the most innovative feature of the book. The other feature that makes the book more accessible than most in this field is the frequent use of examples taken from the natural world. The author is at pains to emphasise the potential practical applications of theoretical modelling studies to field situations. This approach leads to the possibility of interpreting observed ecosystems processes in a new way and applying the multiple stable state concept to the management and even restoration of fragile ecosystems.

Peter Moore



Oil in the Environment: Legacies and Lessons of the Exxon Valdez Oil Spill

Edited by John A. Wiens (2013) Cambridge University Press, Cambridge. £65.00 (hbk)

ISBN 978-1-107-02717-6

£29.99 (pbk)

ISBN 978-1-107-61469-7

It was shortly after midnight on 24 March 1989 that the tanker *Exxon Valdez* grounded in Prince William Sound, Alaska, and shed some 11 million gallons of crude oil into the waters of a once pristine wilderness. More than 200,000 seabirds are thought to have died and commercial fishing in the area was closed for many months. The *Exxon Valdez* became the most intensively studied oil spill in history, generating several thousand research citations, and this multi-author review considers the studies designed to unravel the consequences of the spill and the lessons learned from them, with particular regard to ecological recovery.

Following a general introduction to the nature of oil in the sea and the importance of a prompt response to pollution incidents, there is a review of the clean-up programme (the unfortunately named SCAT – Shoreline Cleanup Assessment Technique) carried out in the weeks and months following the spill. Urgency in the collection of samples, and thoroughness in their analysis and interpretation, are the key lessons learned. This is seen as particularly important when assembling the data needed to reassure local residents and stakeholders that an incident is under control. Chapters also cover cultural resource protection (e.g. vulnerable archaeological sites), biodegradation and bioremediation, use of biomarkers to indicate responses to environmental events, and oiling effects on characteristic and charismatic species. Much of this, however, is highly theoretical and conclusions sometimes essentially negative.

This book is not a field or laboratory manual and will be of limited use to those dealing with marine oil pollution incidents as they occur. It also tends to be repetitive on basic and rather obvious points and offers few protocols based upon either experience or good practice. It is, however, comprehensively referenced and would offer a valuable framework for drawing up 'action-plans' against future spills. As a history of a single catastrophic event, however, it offers testimony to the enormous amount of work that was done to rescue one environment from a man-made disaster.

Ian Lancaster

ALSO RECEIVED

Extremes: Life, Death and the Limits of the Human Body

Kevin Fong (2013) Hodder & Stoughton, London. £8.99 (pbk)

ISBN 978-1-444-73777-6

Not so much an ecology book, it deals with how the human body copes with extremes of environment, including space travel, in a popular science, easy to read fashion.

Handbook of Meta-analysis in Ecology and Evolution

Edited by Julia Koricheva, Jessica Gurevitch & Kerrie Mengersen (2013) Princeton University Press, Princeton. £44.95 (pbk).

ISBN 978-0-691-13729-2

Does what it says on the cover; at 500 pages this should answer any queries, at whatever level, on meta-analysis.

North Pacific Temperate Rainforests: Ecology and Conservation

Edited by Gordon H. Orians & John W. Schoen (2013) University of Washington Press, Seattle. $60.00 (hbk)

ISBN 978-0-295-99261-7

This provides an overview of key issues important for the management and conservation of the rainforest in northern British Columbia and SE Alaska.

DIARY

THE SOCIETY'S MEETINGS

The Society's Meetings (meetings of the Special Interest Groups are listed on p15)

2014

JUN 25 – 27
BES and DICE Joint Symposium: Considering the Future of Conservation, University of Kent, UK

DEC 9-12
Joint Annual Meeting British Ecological Society and Société Française d'Ecologie. Grand Palais, Lille, France. Details: www.BritishEcologicalSociety.org/AM2014

THE SOCIETY'S COMMITTEE MEETINGS 2014

2014

APR 01
Finance & Management Board (Charles Darwin House)

APR 23
Grants Committee (Charles Darwin House)

APR 28
Publications Committee (Charles Darwin House)

MAY 15
PPC (Charles Darwin House)

MAY 21
Meetings Committee (Charles Darwin House)

JUN 03
Council (Charles Darwin House)

JUN 26
ETCC (Birmingham, Priory meeting rooms)

SEP 09
Finance and Management Board (Charles Darwin House)

SEP TBC
Membership Committee (Charles Darwin House)

OCT 07
Meetings Committee (Charles Darwin House)

OCT TBC
Publications Committee (Charles Darwin House)

OCT 16
Public and Policy Committee (Charles Darwin House)

OCT 23
Education, Training and Careers Committee (York, Brewery meeting rooms)

06 NOV
Grants Committee (Charles Darwin House)

NOV 11
Finance Board (Charles Darwin House)

DEC 09
Council (Lille, France)

OTHER MEETINGS 2014

APR 4-6
Butterfly Conservation's 7th International Symposium – The ecology and conservation of butterflies and moths. Southampton, UK. Website: http://butterfly-conservation.org/4218/symposium-2014.html

MAY 7-8
Sustainable Agriculture – Annals of Applied Biology Centenary Conference. Rothamsted Research, Harpenden, Herts. Website: http://www.aab.org.uk/contentok.php?id=168&basket=wwsshowconfdets

MAY 14-16
Networks of Power and Influence: ecology and evolution of symbioses between plants and mycorrhizal fungi – 33rd New Phytologist Symposium. Zurich, Switzerland. Website: http://www.newphytologist.org/symposiums/view/4

MAY 18-23
Joint Aquatic Sciences meeting, Portland Oregon USA www.freshwater-science.org/Annual-Meeting/2014-Portland---JASM.aspx

MAY 23RD
Anniversary Meeting 2014 – The Linnean Society. London, UK. Details from: http://www.linnean.org/Meetings-and-Events/Events/Anniversary+Meeting+2014

JUN 8-13
Biology of Host-Parasite Interactions. Newport, USA. Website: http://www.grc.org/

JUN 14-17
Evolutionary Biology of Caenorhabditis and other Nematodes. Cambridge, UK. Details: https://registration.hinxton.wellcome.ac.uk/display_info.asp?id=390

JUN 14-15
Annual Field Trip The Linnean Society. Dorset, UK. Details from: http://www.linnean.org/Meetings-and-Events/Events/Annual+Field+Trip+2014.

JUN 18-20
Agronomic Decision Making in an Uncertain Climate. Leeds, UK. Website: http://www.aab.org.uk/

JUL 1-4
Society of Experimental Biology Annual Meeting. Manchester UK. Details from: http://www.sebiology.org/meetings/Manchester/Manchester.html

JUL 1-4
International Statistical Ecology Conferences. Montpellier, France. Website details: http://isec2014.sciencesconf.org/

JUL 13-16
2nd North America Congress for Conservation Biology, Missoula Montana USA www.xcdsystem.com/scbna/website/

JUL 13-17
BIOGEOMON 2014. 8th International Symposium on Ecosystem Behaviour. Bayreuth, Germany. Website: http://www.bayceer.uni-bayreuth.de/biogeomon2014/.

JUL 13-18
The 27th Congress for the International Union for the Study of Social Insects. Cairns, Australia. Website: http://www.iussi2014.com/.

JUL 14-17
2nd Annual International Conference on Ecology, Ecosystems and Climate Change, Athens, Greece. Further details: http://www.atiner.gr/ecology.htm

JUL 14-18
Network Tools in Biosciences. Barcelona, Spain. Details from: http://www.transmittingscience.org/courses/syst-bio/networks/.

JUL 15-18
Systems biology and ecology of CAM plants. Lake Tahoe, CA, USA. Details: http://www.newphytologist.org/symposiums/view/5

AUG 3-8
10th European Congress of Entomology. York, UK. Details from: http://www.royensoc.co.uk/meetings/20140803_ece2014.htm.

AUG 3-8
9th IsoEcol Conference. The University of Western Australia, Perth. Details http://www.isoecol2014.org/.

AUG 3-8
9th European Conference on Ecological Restoration, Oulu, Finland. Further details: http://chapter.ser.org/europe/upcoming-events/conferences-workshops/.

AUG 10-15
From Oceans to Mountains: It's all Ecology – 2014 Annual Meeting, Ecological Society of America. Sacramento, USA. Website: http://esa.org/am/.

AUG 19-22
SCB ASIA 2014 — The 3rd Asia Regional Conference of the Society for Conservation Biology – Asia Section. Melaka, Malaysia. Details from: http://scbasia2014.org/.

AUG 25-30
Combining experimental and theoretical approaches to understand biogeochemical interfaces in soil at the Goldschmidt Conference. Florence, Italy. Details from: http://goldschmidt.info/2013/

SEP 8
Ecofil 2014. Ecology of Fish in Lakes and Reservoirs. Ceske Budejovice, Czech Republic. Details from: http://www.ecofil2014.wz.cz/

SEP 14-18
Wetlands2014 – Wetlands Biodiversity and Services: Tools for Socio-Ecological Development. Huesca, Spain. Details from: http://www.wetlands2014.eu/

SEP 22ND -23RD
3rd Annual International Conference on Geological and Earth Sciences (GEOS 2014). Singapore. Website: http://www.geoearth.org/

SEP 25-26
Are There Limits to Evolution? Cambridge, UK. Website: http://www.nature.com/natureevents/science/events/20748-Are_There_Limits_To_Evolution

SEP 28-OCT 3
Ecological Society of Australia Annual Conference, Alice Springs NT Australia www.ecolsoc.org.au/conferences/esa-2014-annual-conference

OCT 6-8
Biogeochemical Interfaces in Soil – Towards a Comprehensive and Mechanistic Understanding Of Soil Functions. Leipzig, Germany. Details from: http://www.spp1315.uni-jena.de/Meetings+_+Events/International+Symposium+2014.html.

OCT 12-15
Experimental Approaches to Evolution and Ecology using Yeast & Other Model Systems. Heidelberg, Germany. Details from: http://www.embl.de/training/events/2014/EAE14-01/

TRAINING WORKSHOPS

FEB 4-7
Modelling Dynamics In Biology: From History To Practical Examples. Barcelona, Spain. Further details: http://www.transmittingscience.org/courses/syst-bio/intro-system-bio/

MAY 26-30
Introduction to Individual based models in Ecology using NetLogo. Barcelona, Spain. Further details: http://www.transmittingscience.org/courses/eco/system-bio-ecology/

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

University of Oxford Field Techniques for Surveying Mammals & Reptiles. Online course that can be taken for academic credit (10 CATS points at QCF Level 7) or not for credits. Details from http://www.conted.ox.ac.uk/ftsmr02.

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CONTACT DETAILS

OFFICERS:

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

Vice-Presidents: Richard Bardgett
(r.bardgett@lancaster.ac.uk)

Mick Crawley
(m.crawley@imperial.ac.uk)

Honorary Treasurer: Drew Purves
(dpurves@microsoft.com)

Honorary Secretary: Dave Hodgson
(D.J.Hodgson@exeter.ac.uk)

HONORARY CHAIRPERSONS:

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

Meetings: Andrew Beckerman
(a.beckerman@sheffield.ac.uk)

Publications: Alan Gray, Charles Darwin House, 12 Roger Street, London WC1N 2JU (ajg@ceh.ac.uk)

Education, Training and Careers: Lesley Batty
(l.c.batty@bham.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), Tim Coulson, Ben Sheldon and Mike Boots

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 E. J. Milner-Gulland (Executive Editor), Marc Cadotte, Mark Whittingham, Jos Barlow and Nathalie Pettorelli.

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

Email: admin@journalofappliedecology

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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) and Bob O'Hara with Samantha Ponton (Journal Coordinator).

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: Peter Thomas
Email: p.a.thomas@biol.keele.ac.uk

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)

Computational Ecology: Matthew Smith
(mattsmi@microsoft.com)

Conservation Ecology: Tim Graham
(Conservation@BritishEcologicalSociety.org)

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

Forest Ecology: Dan Bebber
(forest@BritishEcologicalSociety.org)

Invasive Species: Helen Bayliss
(invasive@BritishEcologicalSociety.org)

Macroecology: Nick Isaac
(besmacroecol@me.com)

Parasite and Pathogen Ecology and Evolution: Jo Lello
(LelloJ@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: Lindsay Banin and Daisy Dent.
(tropical@BritishEcologicalsociety.org)

Citizen Science: Helen Roy

Aquatic Ecology: Mel Fletcher and Guy Woodward
Email: mfletcher@fba.org.uk and guy.woodward@me.com

ADMINISTRATIVE OFFICE:

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

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

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

Education Manager: Karen Devine
Email: Karen@BritishEcologicalSociety.org

Policy Manager Acting Head of Policy: Cheryl Pilbeam
Email: Cheryl@BritishEcologicalSociety.org

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

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

Head of Publications: Catherine Hill (currently on maternity leave)
Email: Catherine@BritishEcologicalSociety.org

Deputy Head of Publications: Andrea Baier
Email: Andrea@BritishEcologicalSociety.org

Deputy Head of Publications: Liz Baker
Email: Liz@BritishEcologicalSociety.org

Assistant Editor, Journal of Animal Ecology: Peter Livermore
Email: Peter@BritishEcologicalSociety.org

Assistant Editor, Journal of Applied Ecology: Erika Newton
Email: Erika@BritishEcologicalSociety.org

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

Assistant Editor, Methods in Ecology and Evolution: Samantha Ponton
Email: Samantha@BritishEcologicalSociety.org

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

Clerical Assistant: Debra Grinham
Email: info@BritishEcologicalSociety.org

Policy and Education Assistant: Katherine Maltby
Email: Katherine@BritishEcologicalSociety.org

Assistant Editor: Kate Harrison
Email: Kate@BritishEcologicalSociety.org

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

Another photograph from the Tansley Archive: this one comes from the Fifth International Phytogeographical Excursion in Poland, 1928. The accompanying note records this as 'dinner in the forest near the top of Lysica, during an excursion in the St Cross Mountains'. It is not recorded whether the formal attire is because the chaps dressed for dinner, or whether it reflects what they've been wearing while out in the field. It is not recorded whether the absence of women is because the ladies have withdrawn while the gentlemen circulate the port, or if there were simply no females present in the first place.

Photograph credited to Edmund Massalski, Kielce, Poland

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