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inpractice

25 YEARS CIEEM 1991–2016

Issue 92 | June 2016

Valuing Ecosystem Services

In this issue

TESSA: A Toolkit for Ecosystem Service Site-Based Assessment

Valuing Nature in Local Decision-Making

An Ecosystem Services Valuation of an Urban Oasis

Welcome

From Our Chief Executive Officer

Welcome to the latest edition of *In Practice*, where you will find a wide range of interesting articles on **Valuing Ecosystem Services**. It is six years since our last edition on Ecosystem Services (June 2010) and it is noticeable how we have moved from theoretical exploration of the concept to more practical tools and techniques of valuation. There has been a fundamental shift from 'is this a useful approach?' to 'how do we make it work?' and as ecologists and environmental managers we have had to develop our thinking and learn new approaches. I am pleased that *In Practice* is an effective mechanism for sharing ideas in this way.

This issue also includes some articles written to help mark CIEEM's 25th Anniversary in August this year. As my opening paragraph suggests, our profession has seen many changes since 1991 and will no doubt undergo further significant change over the next 25 years as new tools, techniques and technologies become more widespread (which incidentally is the theme of our Autumn conference in Nottingham in November). As a relatively young professional body we should be pleased (but not complacent) that our membership continues to grow and our profile with stakeholders and decision-makers becomes more evident.

I was somewhat dismayed, therefore, to see a headline on the front of the February issue of *Management Today* that asked 'What is the point of professions?'. The author (a member of a chartered institute himself) argued that the value to society of 'professions' is in danger of being lost as a result of professional bodies (and their members) being reluctant to accept reforms, promoting restrictive practices and losing public respect and trust.

Well he has a point if that is how they do behave, but I do not think the majority of them do so. After all, the role of a professional body is to act in the public interest (this is particularly so for those with a Royal Charter) and not just in the interest of its members. Nor is a professional body a trade union. The public interest is served by promoting high standards of professional practice and by requiring members to maintain or improve their competence through training and development. How it achieves this may vary from body to body but, as a minimum, it normally requires compliance with a Code of Professional Conduct and an obligation to undertake a minimum level of continuing professional development (CPD).

Other activities, such as providing training, producing guidance and policy work, are additional ways in which a professional body can serve the public interest – i.e. by helping its members to do their jobs as well as they can within a policy context that delivers good outcomes for society. It is perhaps not surprising that, as CIEEM has matured, these aspects of our work have become increasingly important, as is our work in supporting our members to explore new ways of doing things.

So it is fitting that we should take some time to look back over the past 25 years at how the profession has changed and we will certainly do that in the coming months. But it is even more important to look forward. We need to be thinking now about future challenges and how we make sure that our profession is equipped to meet them. We also need to make sure that ecological and environmental management is an exciting, progressive and solutions-orientated career choice for those yet to join us. That is our collective responsibility and will be a measure of our success in another 25 years' time.

Sally Hayns CEcol MCIEEM
Chief Executive Officer

Information

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Forthcoming CIEEM Conferences

Summer Conference 2016

Linear Infrastructure and Biodiversity: Impacts and Opportunities

28 June 2016, Birmingham

Conference Objectives:

- To share understanding of the impacts that linear Infrastructure development such as, roads, railways, pipelines and powerlines can have on biodiversity.
- To examine, through case study examples, the design, impact assessment and consenting processes for major linear infrastructure projects and the challenges they place on the environmental practitioner.
- To identify tools and techniques for overcoming linear infrastructure site and scale constraints and managing impacts on biodiversity effectively.
- To explore the application of off-site compensation and biodiversity offsetting approaches in managing impacts and creating opportunities.

Autumn Conference 2016

Developing Your Skills for the Future: Understanding the Impacts of New Tools, Techniques and Policies

1-2 November 2016, Nottingham

Call for papers open. See page 26 for more information.

Conference Objectives:

- To showcase new tools and technologies in relation to understanding, managing, monitoring and enhancing the natural environment.
- To understand the implications of new policy and legislative approaches as drivers of skills acquisition.
- To reflect on the potential skills gaps within the profession and how they should be addressed.

Special Interest Groups Conference 2016: Protecting Marine and Coastal Areas in the UK and Overseas Territories

21 September 2016, London

Call for papers open. See page 69 for more information.

Jointly organised by the Overseas Territories SIG and Marine and Coastal SIG.

For more information on CIEEM conferences please visit www.cieem.net/events

Does Your Employer Pay for your Membership Subscription?

Would you like us to contact your employer directly to arrange payment for your membership subscription this year?

If you've answered yes to both of the questions above and haven't yet contacted the CIEEM membership team then get in touch via membership@cieem.net. Please confirm that you would like us to invoice your employer directly and provide us with the name and email address of the relevant point of contact at your business (e.g. finance officer, office manager) we would need to send your renewal invoice to.

Please get in touch with the membership team by 22 July to set up this arrangement or if you have any questions.

Please note that membership subscriptions are due on 1 October each year. If you have a Professional Directory listing you will need to ensure that you have the necessary Professional Indemnity Insurance cover.

Appropriate Use of Membership Suffix

A revision of current membership regulations has highlighted the need to support members by clarifying the appropriate use of their post-nominals (where applicable). Membership regulations now state that *"any reference to CIEEM membership made by an individual member, including in their marketing, professional literature and reports, should clearly state what grade of membership they hold in order to avoid misleading the public as to the level of experience and competence of the member concerned. This is also applicable to retired members who should use the appropriate suffix. In some instances it may be appropriate for reference to be made to general membership of CIEEM, for example where multiple employees hold membership, but every effort should be made to avoid ambiguity."*

CIEEM Awards 2016

The CIEEM Awards 2016 finalists have been announced.

Following on from the success of the 2015 Awards, tickets for the 2016 event (to be held at Birmingham Botanical Gardens on Thursday 30 June 2016) are now on sale.

This year's guest speaker will be Stephanie Hilborne OBE (CEO, The Wildlife Trusts) and we will be hosted by Paul Rooney MCIEEM (Liverpool Hope University).

In 2016 we will be presenting 14 awards:

- CIEEM Medal
- Best Practice Award: Practical Nature Conservation (Large-scale)
- Best Practice Award: Practical Nature Conservation (Small-scale)
- Best Practice Award: Innovation
- Best Practice Award: Knowledge Sharing
- Best Practice Award: Stakeholder Engagement
- Tony Bradshaw Award
- Corporate Achievement Award
- NGO Impact Award
- Student Project Award (Undergraduate)
- Student Project Award (Masters)
- Promising Professional Award
- CIEEM Members' Award
- *In Practice* Award

Further details on the 2016 Awards, including details of the finalists and how to book tickets, can be found online at www.cieem.net/awards-2016.

Staff Changes

Katherine Birch has decided to move on from her role as CIEEM's Registration Officer. We wish her all the best in her new role and for the future. We are very pleased to welcome **Michael Hornby** as the new Registration Officer.

CIEEM and the EU Referendum

CIEEM continues to be engaged with the now imminent EU referendum. The survey of CIEEM members report is available on the website, and we continue to update the webpage with links to relevant information. Of particular interest to members may be the following reports and publications:

- EU survey results – ENDS and the Society for the Environment
- EU and UK Environmental Policy report – Environmental Audit Committee
- EU Referendum and UK environment: expert review – Dr Charlotte Burns, Professor Andrew Jordan, Viviane Gravey *et al.*, The UK in a Changing Europe
- Brexit: the Implications for UK Environmental Policy and Regulation – A special independent report commissioned by the All Party Parliamentary Environment Group (Prepared by David Baldock, Andrew Farmer and Martin Nesbit from IEEP)
- The potential policy and environmental consequences for the UK of a departure from the European Union – IEEP report commissioned by RSPB, The Wildlife Trusts and WWF-UK

See more at: www.cieem.net/eu-referendum

Skills Gaps and Skills Shortages Research

At the forthcoming Summer Conference, Training, Education and Career Development Committee will be launching a member consultation on professional skills. This is the first phase of a bigger project to assess current and future skills needs in order to provide an update to CIEEM's previous research in this area, which was published in 2011 (www.cieem.net/ecological-skills). The theme will be continued at the Autumn Conference which will look at skills for the future in more detail, including the impact of new techniques and technologies on skills.

Online AGM Voting

For all of this year's Annual General Meetings (including the Geographic Sections) we are now intending to move to online voting to make it as quick and easy as possible for members to vote. Details will be sent out to all members in September but it would be very helpful if members could check that their contact details, including their current email address, are up-to-date by logging in to the Members' Area of the website. Members who would prefer to vote by post or by submitting a voting form electronically will still be able to do so but will need to ask for the relevant form when the Notice of the AGM is sent out. The outcome of the voting for the main CIEEM AGM will be announced at the Autumn Conference as usual and reported to all members via the website and *In Practice*.

New Guidelines for Accessing and Using Biodiversity Data

Last month CIEEM, in partnership with a range of other stakeholder organisations, published new *Guidelines for Accessing and Using Biodiversity data*. This new document is intended to help members, and their clients, planners and other interested parties, to understand the what, why and how of using biodiversity data effectively. It has been written by Lisa Kerslake CEcol FCIEEM (Swift Ecology) and Tom Hunt (ALERC) with input from organisations such as the NBN Trust, BTO and the National Forum for Biological Recording.

http://www.cieem.net/data/files/Publications/Guidelines_for_Accessing_and_Using_Biodiversity_Data.pdf

Professional Standards Committee (PSC) Update

In the context of discussions about ongoing work to revise the Preliminary Ecological Appraisal guidelines, PSC discussed the relative merits of establishing criteria to help define small-scale, low impact EcIAs. Members felt there were a number of issues, not least of which being that small-scale does not always mean low impact, and might not account for cumulative impacts. The working group will give further consideration to points raised by PSC in their revision of the guidelines.

The committee reviewed and agreed to support a proposed approach to revising the Marine EcIA guidelines. Members of PSC will work closely with the group taking the work forward.

PSC continued its work looking at Good Practice Guidance (GPG), produced by other organisations, by attempting to apply CIEEM's recently published *Principles of Good Guidance* to a number of key pieces of guidance. Whilst this proved a useful exercise, a common issue encountered was that of how to ensure that guidance is up to date and relevant. Most of the documents reviewed, which are relied upon by CIEEM members in their work, were felt to be out of date, and no longer meet the principles. Work on this continues with ongoing feedback from PSC.

PSC agreed that there would be value in further exploration of options to pilot a scheme looking at the sharing of mitigation interventions. The nature and scale of this will be heavily dependent on availability of funding.

Future themes for *In Practice*

Edition	Theme	Submission deadline
December 2016	Working in Partnership	29 August 2016
March 2017	TBC	28 November 2016

If you would like to contribute an article to one of these editions please contact the Editor at gillkerby@cieem.net. Contributions are welcomed from both members and non-members.

Recommendations for using automatic bat identification software with full spectrum recordings

In response to the increased availability and use of Auto-ID software, Paola Reason (Arcadis), Stuart Newson (BTO) and Kate Jones (UCL) have prepared an initial guidance note describing how these software packages work, and considerations for their use. This guidance note will be of use for anyone considering or already using these new tools.

www.bats.org.uk/autorec

Bat Exclusions

Jo Ferguson, the Bat Conservation Trust's Built Environment Project Officer, would be interested in hearing people's experience of using and monitoring bat exclusion devices. BCT would like to understand the level of use of exclusion devices and how and where they are being deployed and monitored. If you have any experience or information please could you get in contact providing the following details: exclusion device type, how fitted, feature intended to exclude bats from, species and numbers involved, how monitored, and monitoring results. Please email Jo (jferguson@bats.org.uk). BCT would like to use any case studies provided to generate discussion during a National Bat Conference 2016 workshop dedicated to this subject.

Wildlife Mitigation Case Studies Forum

The Bat Conservation Trust's Bats and the Built Environment programme will be running a mitigation case studies forum at end of 2016/start of 2017. There will be speakers presenting a range of case studies on mitigating the impacts of development on biodiversity in the built environment. The aim is to share both successes and failures and therefore to emphasise the importance of monitoring in ensuring effective implementation and measuring the level of success. Please bear this in mind during the 2016 survey season and keep an eye out for the call for project examples. In the meantime, if you have any queries, please contact the BCT Built Environment Project Officer, Jo Ferguson (jferguson@bats.org.uk).

Northern Ireland Departments changed on 8 May 2016

Functions will remain the same:

- For agriculture, environment, marine, fisheries, sustainability and rural affairs issues, the new Department will be the Department of Agriculture, Environment and Rural Affairs (DAERA).
- For drainage and flooding issues, contact the Rivers Agency in the Department of Infrastructure (DfI) (www.dfi-ni.gov.uk).
- For built heritage issues, contact the Department for Communities (DfC) (www.dfc-ni-gov.uk).
- Staff contacts and telephone numbers will remain the same, but there will be a new website www.daera-ni.gov.uk and new e-mail addresses for staff (e.g. john.smith@daera-ni.gov.uk).

More information: https://www.nidirect.gov.uk

Defra publish guidance on providing and protecting habitat for wild birds

The guidance applies to competent authorities to take steps as appropriate to preserve, maintain and re-establish habitat that is large and varied enough for wild birds to support their population in the long-term.

www.gov.uk/guidance/providing-and-protecting-habitat-for-wild-birds

Mitigating the Impact of Bats in Historic Churches

This study used a combination of artificial roost provision and deterrence at churches in Norfolk, where significant maternity colonies of Natterer's bats *Myotis nattereri* damage church features. It shows that deterrence can be used to move bats humanely from specific roosting sites and limit the spread of droppings and urine.

http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0146782

Ireland Best Practice Management Guidelines: Japanese Knotweed

The *Best Practice Management Guidelines: Japanese Knotweed* guidance document, produced by Invasive Species Ireland, provides best practice management guidance on the control of Japanese Knotweed (Fallopia japonica).

https://www.doeni.gov.uk/sites/default/files/publications/doe/natural-guidance-japanese-knotweed-best-practise.pdf

Wales Environment Bill has received Royal Assent

On 21 March, the Environment (Wales) Bill received Royal Assent. The Environment Act complements the Well-being of Future Generations and Planning Acts.

http://gov.wales/topics/environmentcountryside/consmanagement/natural-resources-management/environment-act/?lang=en

SEPA publishes guidance on natural flood management

The Scottish Environment Protection Agency (SEPA) has published a new handbook to help local authorities and landowners implement natural flood management measures.

http://media.sepa.org.uk/media-releases/2016/sepa-publishes-guidance-on-natural-flood-management/

Updated Ireland invasive species distribution maps

Records have been added and distribution maps updated for 49 invasive species in Ireland. Over 1,000 new records were added to the National Invasive Species Database. There are now 40,953 records for 116 species assessed at risk of high or medium impact in the Data Centre's Biodiversity Maps system.

http://www.biodiversityireland.ie/up-dated-distribution-maps-february-2016/

Most significant conviction for bat crime ever recorded

Bat Conservation Trust believes that this case is the most significant conviction for bat crime ever recorded. Not only is it the first occasion where such a case has been heard in the Crown Court but to their knowledge it is the first time that a proceeds of crime application has been heard in relation any wildlife crime not involving the illegal trade in endangered species.

www.bats.org.uk/news.php/317/most_significant_conviction_for_bat_crime_ever_recorded

A Conversation about Conservation

Katherine Drayson MCIEEM and Peter Massini MCIEEM
Greater London Authority

Keywords: ecosystem services, green infrastructure, natural capital

The conservation sector is divided, and even at times actively opposed as a result of the different value systems people choose to adopt in order to protect, manage and improve the natural environment. This article outlines the key differences between two main conservation approaches ('traditional' versus 'new'), and describes how we are trying to resolve these conflicts in our work at the Greater London Authority.

Most of us ply our trade as ecologists and environmental managers because we respect and have a passion for nature. Yet we, and our society, also value things that often result in destruction or damage to the natural world: things like housing, schools and hospitals, good quality affordable food, and an efficient transport system; things that have an economic value, allowing them to be commodified and traded.

As a result, many of us are caught between very different value systems. We entered into the profession because of an appreciation of the intrinsic value of nature, but earn our bread and butter through adopting a more pragmatic approach (seeking mitigation and enhancement on the back of development springs to mind).

The conservation sector agrees that continued biodiversity loss is a problem. With the rate of loss increasing, there is an added urgency to find better solutions. However, there is confusion and division over what is required and the frame within which to present our case. Not just division, but often active opposition (Tallis and Lubchenco 2014).

On the one hand, we have proponents of 'traditional' conservation claiming that 'new' approaches involving economic valuations will result in the trading of nature and the destruction of habitats and species (e.g. Soulé 2013). On the other, we have conservationists claiming that traditional approaches are not doing enough to protect biodiversity on their own and that new approaches are needed (e.g. Marvier 2014).

But what are these two conservation approaches? Table 1 outlines some of the main differences. However, do all conservationists fall entirely into one or other of these 'camps'? Looking at this table, we can certainly see merit in both arguments in favour of conservation. And we are not alone. For example, some have expressed sympathy with utility arguments for conservation, but are wary of market-based mechanisms (e.g. Sandbrook 2014). In addition, having conservationists focus purely on intrinsic value, with economists focusing on utility value, could "lead to choruses of the deaf, with neither side hearing, understanding or learning from the other" (Abson 2016). So, it may be that the focus on 'traditional' and 'new' conservation approaches isn't actually very helpful.

Table 1. A simplified comparison of 'traditional' and 'new' approaches to conservation. Adapted from Brown *et al.* (2016), Phoebus and Fenger (2015).

	'Traditional' Conservation Approaches	'New' Conservation Approaches
Goals	Protect and maintain biodiversity.	Conserve and enhance biodiversity in tandem with improving human wellbeing.
Why conserve?	Biodiversity has intrinsic value.	Biodiversity has utility value to humans.
How to conserve?	Motivating others through moral arguments, including, for example, rewilding.	Motivating others through economic arguments, such as natural capital accounting and ecosystem services concepts.
Benefits	A legislative and regulatory framework already exists that does not depend on priorities determined by ecosystem functions or arbitrary metrics.	Viewing conservation objectives through the lens of social and economic outcomes could result in biodiversity gains through greater investment in 'nature-based solutions'.
Problems	What is 'natural'? 'Intrinsic biodiversity value' is a subjective measure.	High ecosystem service provision is not always provided by sites or features which are biodiverse. Utility value may outweigh nature conservation outcomes.

Given that nature and its conservation mean different things to different people (Massini 2016, Sandbrook 2014), perhaps we need as many different ways of engaging people with conservation as possible. For some, this will involve spiritual or moral arguments; for others, a range of pragmatic ones; and for others a combination of both. Indeed 'traditional' and 'new' approaches to conservation are not mutually exclusive, and can work best in combination to provide even greater support to the nature conservation argument.

Nevertheless, there is still the problem that these different approaches have different rationales, which in turn give rise to 'business cases' that can easily result in potentially conflicting actions (Hartig 2014). Because of this, we need to be clear about the circumstances in which each approach is most appropriate, when both approaches are needed, and which value system supports the investment decision when there is conflict. Green Alliance's recent report (Brown *et al*. 2016) has begun to address this, outlining cases where, for example, private sector investment or government funding might be most appropriate (Figure 1). These will, however, vary over time in response to political aspirations and fiscal incentives.

In London, these contrasting approaches to nature conservation have determined the business case for different types of river restoration projects. At the Beverly Brook in south-west London, habitat enhancement for biodiversity has provided the justification for extensive channel naturalisation. In contrast, the establishment of a naturalised channel at Chinbrook Meadows in south-east London was a secondary outcome of a flood management project. These different drivers to deliver similar nature conservation outcomes are frequently observed in river restoration/flood management projects because of the obvious interplay between the two objectives – both of which are championed by the Environment Agency. We need to look more carefully for this interplay in other areas where an economic objective might provide the more compelling reason for a project that can provide (secondary) nature conservation benefits.

At the Greater London Authority, we have tried to bridge the gap between 'traditional' and 'new' conservation approaches by using the unifying concept of 'green infrastructure' (Box 1). The green infrastructure approach does not replace the tried and tested 'traditional' approach, but builds on it. So, the most important sites for biodiversity (i.e. sites designated under the 'traditional' approach via legislation), will remain as designated sites because of their natural heritage value. However, other sites may be recognised as equally important for their contributions to flood risk management or recreation. Under this approach, the different rationales behind the river restoration projects at Chinbrook Meadows and Beverly Brook are equally valid.

The key difference in this approach is that it questions (and therefore considers adding to, or changing) the purpose of some of London's urban green spaces. London has many green spaces that could work harder and deliver more or greater ecosystem services, such as flood risk management, air quality improvements and urban cooling, than they do at present. These are services that can have a measurable economic value. But to make the most of these services, sites need to be designed and managed on ecological principles, which also offers the opportunity for biodiversity gains. The green infrastructure approach is therefore characterised by trade-offs, rather than the benchmarks that characterise the traditional approach to nature conservation. This thinking is

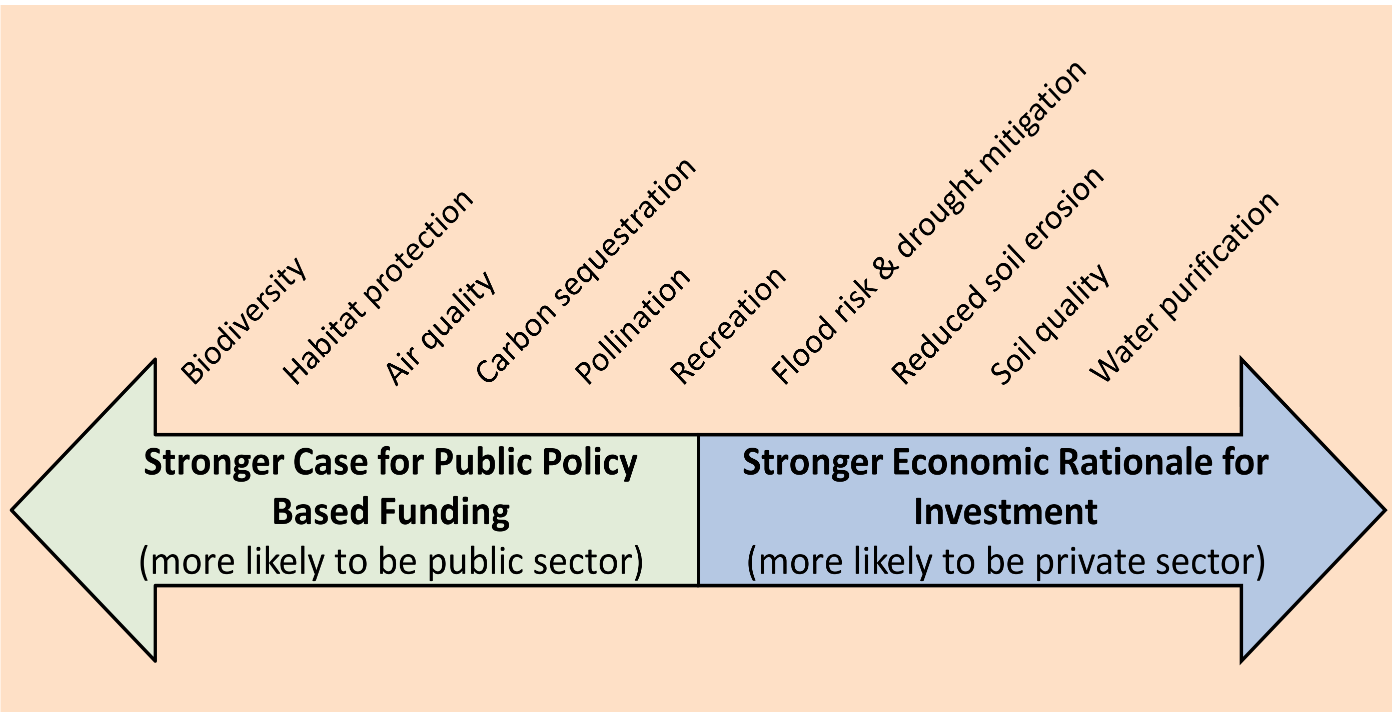

Figure 1. Examples of where the case is strongest for private investment or government funding. Modified from Brown *et al*. (2016).

Box 1. What is Green Infrastructure? (Green Infrastructure Task Force 2015)

Green infrastructure is the network of green spaces (as well as features such as street trees and green roofs) that is planned, designed and managed to deliver a range of benefits, including:

- healthy living
- flood mitigation
- improvements to air and water quality
- cooling the urban environment
- encouraging walking and cycling, and
- enhancing biodiversity and ecological resilience.

set out in the recently published *Natural Capital: Investing in a Green Infrastructure for a Future City* (Green Infrastructure Task Force 2015).

Although a green infrastructure approach may be easier to apply and articulate in an urban context, it can also be applied to the wider countryside. Intrinsically valuable conservation sites can be protected from a moral standpoint, whereas economic perspectives can be used to shape ecological improvements in the wider landscape. Green infrastructure is not a perfect solution, but it is the best compromise we have found to help make a real difference in the way that the natural environment is protected and enhanced.

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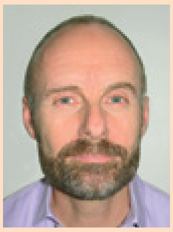

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TESSA: A Toolkit for Ecosystem Service Site-Based Assessment

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Keywords: biodiversity, ecosystem services, impact assessment, natural capital, stakeholders

The Toolkit for Ecosystem Service Site-based Assessment (TESSA) is a rapid, low-cost, participatory valuation tool designed to be used by non-experts for assessing the benefits that people get from nature (ecosystem services). It was created to make ecosystem service assessment more accessible and straightforward. It aims to promote better land use planning decisions by providing guidance and methods to value ecosystem services at the site level under different management alternatives. Although initially developed for conservation practitioners, there has been increasing interest in TESSA from other sectors including consultancy, business and governments. Here we provide an overview of the tool, outline how it could be useful for environmental professionals and managers, and present examples of its application within the UK.

Restored wetland at Wicken Fen Nature Reserve. Photo credit: Francine Hughes.

Introduction

Ecosystems and the services they deliver underpin our very existence. We depend on ecosystem services to produce our food, regulate our water supplies and climate, and protect us from the effects of extreme weather (TEEB 2010), and we recognise the benefits they give us in terms of spiritual experience, recreational enjoyment and improvements to our mental and physical health. However, the value of these benefits to society has been overlooked in policy and decision-making arenas until recently. In 2005, the landmark publication of the Millennium Ecosystem Assessment (Millennium Ecosystem Assessment 2005) estimated that 63% of ecosystem services globally are declining, with significant detrimental effects on wellbeing.

In the UK, this prompted the government to recommend a review of the UK's natural environment in terms of the benefits it provides to society and to continuing economic prosperity (UK National Ecosystem Assessment 2011). At the international level, the Parties to the Convention on Biological Diversity (CBD) – comprising nearly all the world's governments – met in 2010 to adopt a *Strategic Plan for Biodiversity for 2011–2020*, recognising the need to reverse the trend in biodiversity decline and ecosystem degradation. This global framework includes 20 '*Aichi Biodiversity Targets*', of which several refer directly to the protection and restoration of ecosystem services. In 2015, world leaders adopted 17 *Global Sustainable Development Goals* committing their nations to end poverty, fight inequalities and tackle global environmental issues such as climate change. This includes commitments to better integrate ecosystem and biodiversity values into local planning, development processes, poverty reduction strategies and national accounts. There is considerable complementarity between these two international agreements. In July 2016, the Natural Capital Coalition, a global, multi-stakeholder platform to support the development of methods for natural and social capital valuation in business, will launch the *Natural Capital Protocol.* The aim is to help businesses measure and value their impacts and dependencies on natural capital through recognising the value of biodiversity and ecosystem services.

In support of delivering on these policy commitments and in response to the need to measure and value ecosystem services, there is a need for simple, accessible and scientifically robust tools. TESSA has been designed to address this need, for local level policy and decision-making.

Wetland areas surrounding Wicken Fen have been converted to arable farming.
Photo credit: Francine Hughes.

Definitions:

Natural Capital can be defined as the world's stock of natural assets, which include geology, soil, air, water and all living things. It is from this Natural Capital that humans derive a wide range of services, often called ecosystem services, which make human life possible.

Ecosystem services are the benefits that people receive from nature such as global climate regulation, food, fibre, clean water, and opportunities for recreation and spiritual enrichment

Biodiversity is the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

What is TESSA?

TESSA is a rapid, low-cost, participatory valuation tool designed to be used by non-experts for assessing ecosystem services at particular sites in order to generate information that can be used to influence decision-making (Peh *et al*. 2013). It has been developed through a collaboration of six institutions with multi-disciplinary input from scientists and practitioners. The toolkit allows users to obtain qualitative and quantitative information on ecosystem services provided by a site, or sites, and to communicate this value to decision-makers. TESSA was specifically developed to be accessible to users with relatively limited scientific expertise and resources.

With a focus on practicality, the toolkit is packed with definitions and examples to guide users through the process of valuing ecosystem services (in biophysical, monetary and non-monetary terms). For example, the value of an intact mangrove forest for global climate regulation can be demonstrated by calculating the total carbon dioxide (a greenhouse gas) that the forest stores and sequesters annually. The value of that same forest for protecting the lives of people living along the coast who are at risk of storm surges, can be represented by the total number of people with increased protection from storms. In some cases, monetary values can also be assigned to ecosystem services. Five modules are provided to assess the following ecosystem services: climate change mitigation, water-related services (such as water provision and flood regulation), harvested wild goods, cultivated goods, and nature-based recreation. An updated version is due to be released in 2017 with two further modules to assess cultural services and pollination.

TESSA attributes

- Designed to be used at the site level
- Limited technical/specialist knowledge required
- Rapid and low cost
- Participatory
- Quantitative methods are paired with qualitative assessments
- Information can be gathered on the ground or from existing datasets
- Identifies who the beneficiaries of specific ecosystem services are
- Identifies what decision-makers need to know (e.g. net change in economic value)

The toolkit promotes collaboration and local stakeholder participation, acknowledging that local people are best placed to identify who benefits from the ecosystem services, and who might be impacted by land use changes at an individual site. The toolkit also helps to engage local communities in thinking through a problem, and in communicating their findings to target audiences.

Unlike many other ecosystem services assessment tools, TESSA is designed to be used at sites rather than at the landscape scale, for example a nature reserve or minerals extraction site.

Using TESSA to conduct an ecosystem services assessment

Users follow an eight-step process to carry out the ecosystem services assessment for a site (see Figure 1). This involves an initial scoping of the context (Step 1), such as gaining an understanding of the social, political, economic and ecological attributes of the site. Engagement with relevant policy and decision-makers for whom the results will be relevant is the next step in order to ensure the information collected will be useful and relevant (Step 2). A stakeholder workshop is then carried out to obtain relevant information about the site. Bringing in all stakeholder groups allows a better understanding of the site from the local context, incorporation of the values that different groups of people hold and greater uptake of the results. As part of the exercise, the stakeholders are asked to prioritise the ecosystem services that are important at the site and to identify who benefits from these services (Step 3). This local information is combined with the scientific understanding of the implementing team to plan the full assessment (Step 4).

The next step is to determine the plausible alternative state of the site for comparison purposes (Step 5). Comparative assessments are more useful for decision-makers than simple gross estimates of the value of ecosystem services at a site because they allow us to understand the economic, social and ecological consequences of decisions about how land is used (Balmford *et al.* 2008). For example, knowing what the change in ecosystem services would be, and who would be affected, if a natural wetland was converted to agriculture, or understanding the added benefit of converting a quarry to a recreation area, is more useful than a static gross estimate of a site's current value.

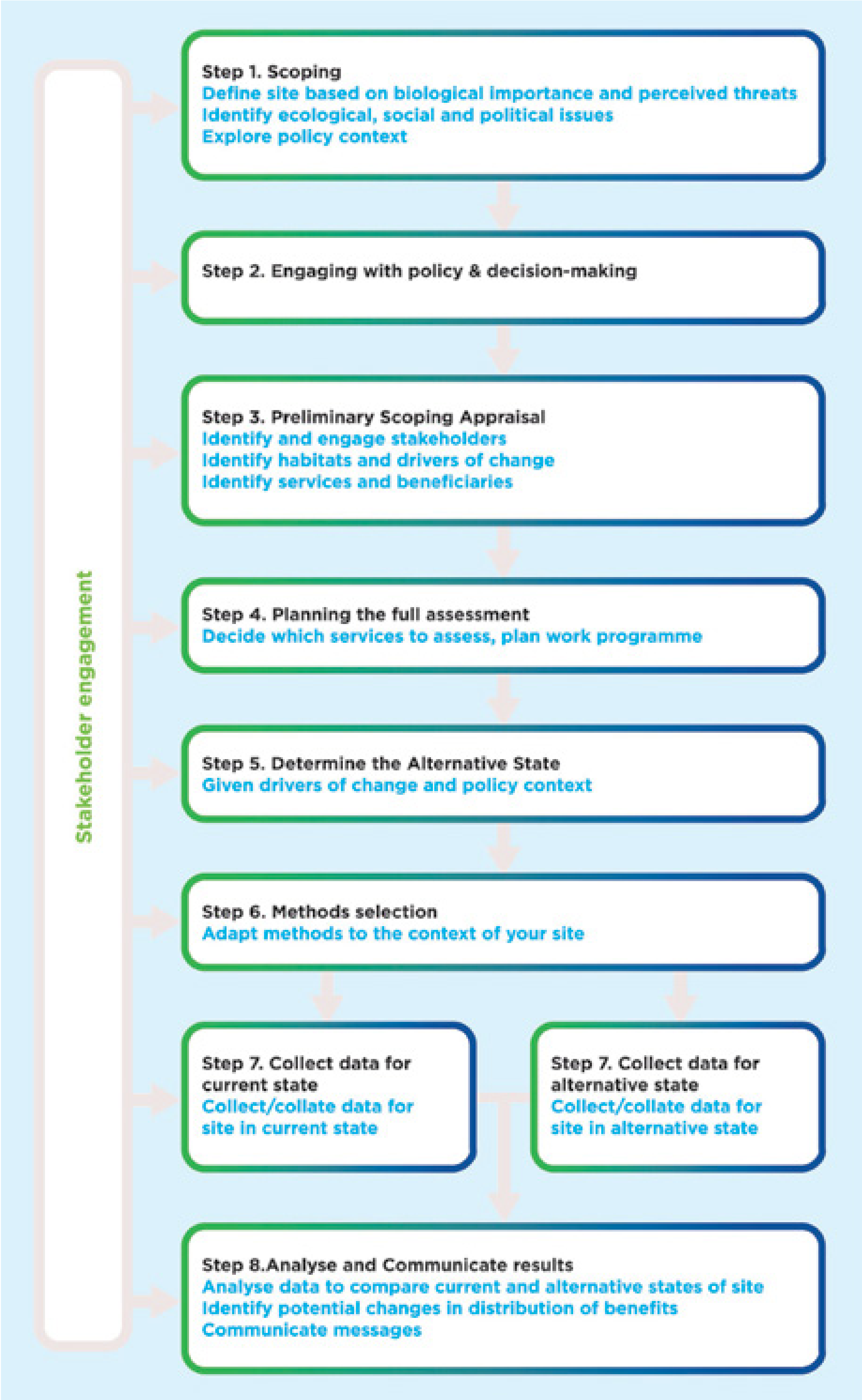

Figure 1. The steps involved in a TESSA assessment. Extracted from Peh *et al.* (2014a).

The final steps use the decision trees in TESSA to identify the best methods for assessing the ecosystem services delivered by the site (Step 6; Table 1) and then recommend either carrying out field work to collect primary data or conducting a desk study review of previously published data (Step 7). Finally, TESSA provides guidance on how the results can be analysed and communicated for decision-making purposes (Step 8).

Case studies working through these steps are available on the website at: http://www.birdlife.org/assessing-ecosystem-services-tessa/case-studies.

TESSA case studies

To date, the toolkit has been applied at over 40 different sites, across five continents and in a variety of habitats. Case studies are available from the UK, the Netherlands, Cameroon, Dominican Republic, Ecuador, Grand Cayman, Kenya, Malawi, Madagascar, Montserrat, Nepal, Vietnam, and Fiji.

Fen Drayton case study

Fen Drayton Lakes Nature Reserve in Cambridgeshire, UK, was used for gravel extraction for 50 years but is now managed by the RSPB and is an important bird watching site for the local population (Figure 2). Some of the gravel pits have been left unmanaged since extraction finished and are now deep areas of open water with naturally colonised vegetation. Other pits have been managed for nature conservation including reed-bed establishment and interventions to attract target bird species. TESSA was used to find out the ecosystem service benefits provided according to the way in which the gravel pits were rehabilitated.

Using a combination of site-specific primary field data, benefits transfer and modelling, the study assessed the economic value of global climate mitigation, livestock grazing, fishing, flood risk mitigation and nature-based recreation at Fen Drayton, comparing these values between the unmanaged and managed restoration areas. The analysis revealed that ecosystem services at Fen Drayton are influenced by the way in which the site has been restored. The study found greater carbon storage and increased benefits from livestock grazing in the areas where intervention for nature conservation had occurred, but lower flood risk mitigation and fishing than in the deeper ponds. Overall, the current mix of rehabilitation, with and without intervention for nature conservation, provided the best combination of ecosystem services, particularly when recreation value was considered. For further information see Blaen *et al*. (2015).

Table 1. Example of methods that might be used in an ecosystem services assessment.

	Published / secondary data	Focus group	Individual level questionnaire	Ecological field work on site	Modelling tool
Global climate regulation					
Water quality					
Water regulation					
Cultivated goods					
Recreation					

Wicken Fen case study

Wicken Fen National Nature Reserve forms part of the fenland basin used for intensive arable farming in Cambridgeshire, UK. Previously, this area was a vast floodplain wetland with deep peat soils, many of which have been depleted by conversion to farmland. The Wicken Fen Vision aims to create up to 5300 ha of wetland over the next 100 years. TESSA was used to compare the ecosystem service values of the wetland with those of the adjacent arable land to understand the impact of converting agricultural land back to wetland habitat. The team measured global climate change mitigation, nature-based recreation, flood protection, arable crop production and livestock grazing. Overall, results suggest that wetland restoration is associated with a net gain to society as a whole of \$199 $ha^{-1}y^{-1}$, for a one-off investment in restoration of \$2320 ha^{-1}. However, whilst countryside users from the local area would benefit through increased recreation, local residents from increased flood protection, and the global community from greater greenhouse gas sequestration, arable farmers would lose economic benefits. Thus when making land use decisions, the impact on different beneficiary groups should be identified in order for appropriate solutions to be sought. For further information see Peh *et al*. (2014b).

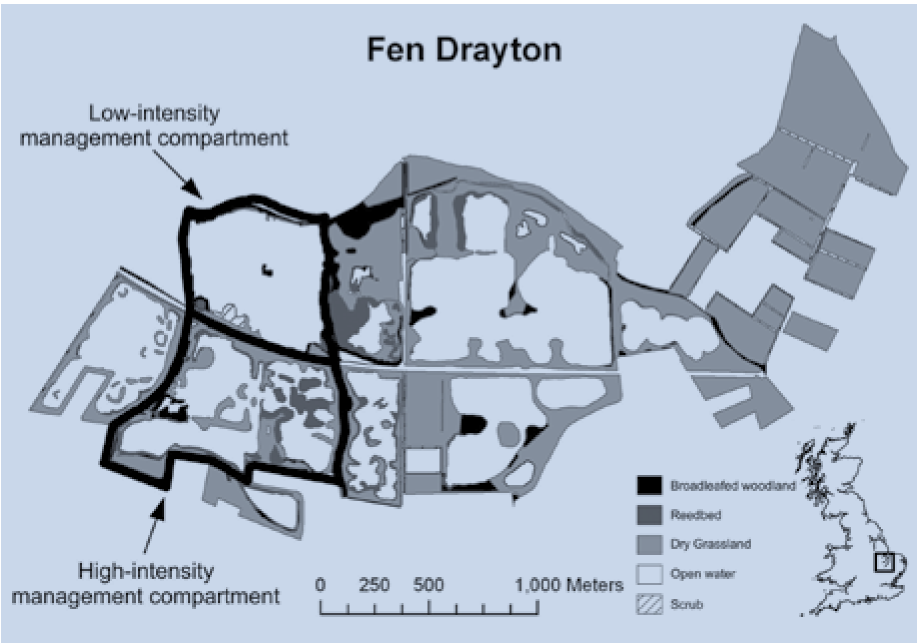

Figure 2. Map of Fen Drayton showing the main habitat types present at the site. Adapted from Blaen *et al.* (2015).

Concluding remarks

TESSA has proved to be a quick and useful tool that offers robust evidence of the multiple benefits that nature provides to society, and also helps to communicate these findings to decision-makers. The results from TESSA assessments highlight that there are often hidden benefits to society that are not taken into account when land-use decisions are made, such as the impact on local livelihoods from loss of access to resources or recreational opportunities, and impacts on water provision and regulation. TESSA can be used to demonstrate nature's value to people in an objective manner, thereby helping to achieve sound planning decisions based on evidence.

In essence, the toolkit enables users to:

1. determine the current value of specific ecosystem services at a site;
2. determine the value of ecosystem services under an alternative land-use;
3. calculate the net difference in value;
4. work out who benefits from the provision of specific ecosystem services;
5. identify trade-offs between ecosystem services;
6. communicate the results to a target audience.

To date, TESSA has mainly been used by conservation practitioners to assess sites of high biodiversity value. However, demand is evident across all sectors (within and outside of the UK) including government, consultancies and corporates. Partners are exploring ways in which TESSA can be improved in terms of content and access, with the release of a revised version expected in late 2017. Adaptation for use by the private sector is also being considered, as there are opportunities for aligning TESSA with specific needs of corporates, such as enabling businesses to assess the potential impacts of development operations or integrating ecosystem services assessment within Environmental Impact Assessments and Strategic Environmental Assessments.

TESSA is available from http://tessa.tools following completion of a short registration form. The TESSA partners welcome feedback on refining or adapting the toolkit for different audiences. Contact us at tessa@birdlife.org.

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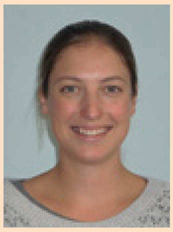

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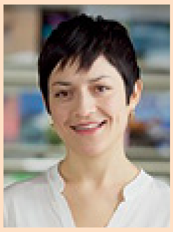

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Valuing Nature in Local Decision-Making

Ruth Waters and Tim Sunderland
Natural England

Keywords: economics, evidence, local decision-making, tools, valuation

Poppy field, England. Photo credit: Dean Waters, York University.

Natural England has been working with partners to include environmental benefits in local decision-making. We share our experiences and describe some of the evidence and tools we have commissioned and collated to facilitate incorporating the value of nature into local decisions.

Introduction

Love it or loathe it, economics is the dominant decision-making framework in the UK. This is problematic for those concerned about the environment for two reasons. Firstly, economics has no place for protecting the environment for its own sake: it's focussed only on benefits to people. Secondly, it can be difficult to make those benefits provided by the environment 'count' in economic terms. Environmental benefits such as cleaner air often have no buyer or seller, so they don't feature in GDP (Gross Domestic Product) and are difficult to put a value on. Furthermore, the generation of ecosystem services and the subsequent benefits to people from the natural environment are complex and poorly understood. Consequently, they are difficult to measure and value.

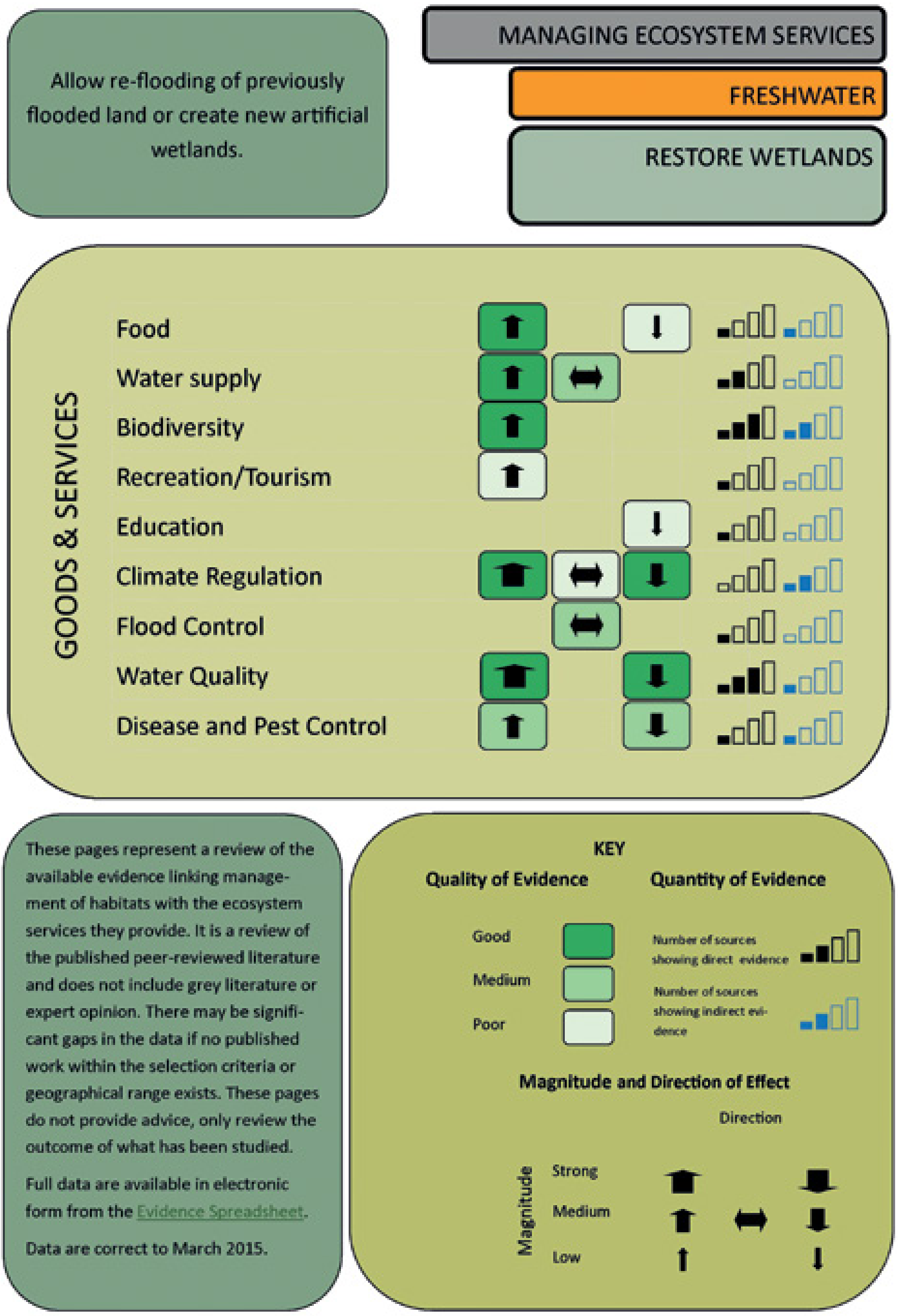
Our concern is that the benefits provided by the environment are frequently given insufficient weight in public and private decision-making and that this is a significant factor driving long-term environmental degradation. In order to remedy this situation it's necessary to put the benefits provided by nature explicitly on the table, so that they are not implicitly ignored.

Valuation of the natural environment isn't easy. There are lots of pieces missing from the 'valuing nature' jigsaw. Natural England has been attempting to put pieces of the puzzle in place where opportunity allows. The picture is still very incomplete but this article describes the work we have been doing to contribute, and describes some of what we have learnt on the way. Boxes 1 and 2 highlight where our own work, and our work with others, has helped to bring the value of the environment into decision-making.

Place-based decision-making

Natural England facilitated three upland ecosystem services pilots working with a wide partnership to consider the current and future provision of ecosystem services and benefits, and agree a shared vision and delivery plan for each place (Waters *et al*. 2012).

In one of these pilots – the Keighley and Watersheddles catchment of the South Pennines – we undertook valuation using cost-benefit analysis (Clarke *et al*. 2015). Our initial expectation was that we would gather the evidence first then produce values for the benefits provided by the environment under different land management scenarios, which would inform participatory decision-making. In practice, we could only value three ecosystem services due to evidence gaps and uncertainties. This meant that the valuation evidence was partial and had to be used alongside a qualitative narrative, which included expected changes to all the benefits. In the end, the stakeholder group decided its preferred management option before the valuation evidence was complete! The amount of time and investment required for this sort of analysis is therefore a barrier to its use. The valuation conducted was useful in terms of piloting what was possible but it's debatable whether this level of analysis would be practical in many local decision-making contexts. In this case, the participatory approach to understanding the full range of benefits that the catchment provided was sufficient to inform the decision-making effectively within the partnership.



Managing for ecosystem services

Figure 1. Managing Ecosystem Services Evidence Factsheet for Restoring Wetlands: Management option: *Allow re-flooding of previously flooded land or create new artificial wetlands.*

Arrows signify the magnitude and direction of the effect based on good, medium or poor quality evidence: thicker arrows indicate a bigger effect and horizontal arrows show there is evidence that nothing changes. The darker green means higher quality evidence as defined by the underpinning systematic evidence review. The black bar chart shows the number of direct sources of evidence, while the blue bar chart shows the number of indirect sources of evidence. For example, for water quality there is strong, good evidence that restoring wetlands improves water quality but there is also some good evidence that it can have a medium negative impact on water quality. This is based on a number of sources of direct evidence and a few sources of indirect evidence. The practitioner can therefore see that an intervention of this kind often improves water quality but not always. So they may wish to monitor their management more closely if water quality is of particular interest, or follow-up the evidence to determine which information more accurately describes their own local situation, and then act from there.

Evidence for place-based decision-making and valuation

Our experience of undertaking cost-benefit analysis in the South Pennines highlighted the paucity of information and evidence on ecosystem services, their values, and the consequences of management. To help address some of these gaps, Natural England commissioned York University to undertake a systematic evidence review of land and sea management interventions and how they change ecosystem service provision. This information is presented in the *Ecosystem Services Transfer Toolkit* (Waters *et al*. 2015). The toolkit is presented as a spreadsheet that users can search for ecosystem services provided by upland, freshwater, urban, lowland agriculture, coastal and marine habitats, and see the evidence base for the effects of management on service provision. To make the information more quickly and easily accessible, we developed evidence summary factsheets (Figure 1). Twenty three summary sheets were produced for marine, coastal and terrestrial habitats and associated management interventions where sufficient evidence was available. The sheets provide an overview of the quantity and quality of evidence and the direction of the effect.

Using evidence appropriately

In our experience, some people lack the confidence to use economic values in decision-making due to concerns that they don't understand economics, or the evidence they are using. Others are perhaps over-confident and therefore misapply or misuse evidence. This is unhelpful because it can damage the credibility of the principle of valuing the natural environment. Credibility is important because the principle is still not universally accepted even though it is officially part of central government decision-making (HM Treasury 2003). To address these problems a Natural England literature review, called MEBIE2, includes evidence that meets UK government standards (Rolls and Sunderland 2014) and enables non-specialists to contribute meaningful values in decisions.

Place-based decision-making. Photo credit: Ruth Waters, Natural England.

Box 1. Tools for valuing nature better

Ecosystem Services Transfer Toolkit and Evidence Summary Sheets. This toolkit gives a review and summary of how land management interventions change ecosystem service provision (including in marine systems). It provides links back to the scientific information and also highlights where evidence is conflicting or missing. It is available as a spreadsheet that users can query for relevant information and is supported by evidence summary sheets. See http://publications.naturalengland.org.uk/publication/5890643062685696

Micro-Economic Benefits of Investment in the Environment (MEBIE) Review 2. A user-friendly literature review of relevant economic evidence that includes quotable bullet-point summaries and links back to the original research. It also reviews the natural and social science which is part of the logic chain, even where valuation evidence is not available. The review only includes information that meets national government standards for use in decision-making. See http://publications.naturalengland.org.uk/publication/6692039286587392

Green Infrastructure Valuation Tools Assessment. 'Green Infrastructure' describes the network of green spaces planned, designed and managed to deliver a range of benefits provided by nature, often in urban areas (EFTEC *et al*. 2013, Drayson and Massini 2016). There are a wide variety of tools to help you place an economic value on Green Infrastructure improvements, some more robust than others. An independent review is available at http://publications.naturalengland.org.uk/publication/6264318517575680

Guidance for non-economists commissioning valuation or cost-benefit analysis. It is difficult for non-economists to know what to expect from valuation or cost-benefit analysis, and how to get best value for their investment. A step-by-step guide to the process is given in the recently published *Green Infrastructure Handbook* (Sunderland *et al*. 2015).

Green Infrastructure's contribution to economic growth. Some partners will be primarily interested in the impact of ecosystem services on economic growth, rather than economic value. A review of the available evidence is available at http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=19056

Local Environment and Economic Development Toolkit. This toolkit is designed to help Local Enterprise Partnerships and Local Authorities to build evidence about the significance of environmental change into their economic growth plans (see Sunderland and Butterworth 2016; http://ecosystemsknowledge.net/apply/local-economy/LEED)

Box 2. Valuations

Keighley and Watersheddles Catchment. In support of our ecosystem service pilot in the South Pennines we used cost-benefit analysis to compare three scenarios: the current situation, increased investment and the withdrawal of public funds (Clarke *et al*. 2015). Potential increased investment in improving land management in the Keighley and Watersheddles catchment was found to have a cost:benefit ratio of 1:3. Conversely removing current investment was found to have a cost of £5 for every £1 investment removed. This assessment is based only on carbon, water-quality and biodiversity benefits. Cost-benefit analyses include non-market, as well as market, benefits.

Health benefits of urban greenspace (Rolls *et al*. 2016). We used Natural England's Monitor of Engagement with the Natural Environment to assess how many people visit urban greenspace and what their motivations were. This allowed us to hypothesise about likely changes in behaviour due to a decline in quality or access to urban greenspace and to put economic values on the change. See http://publications.naturalengland.org.uk/publication/6213889835401216?category=47004

Ecosystem services: A family enjoying and learning in nature.
Photo credit: Ruth Waters, Natural England.

Values and green infrastructure

Economic values are being used increasingly to help make decisions concerning green infrastructure improvements and people are investing significant time and money in carrying out valuations. Natural England's review of green infrastructure valuation tools (EFTEC and CASCADE 2013) aims to make this process more efficient by steering people towards the best tools. Step-by-step guidance for non-specialists who wish to commission valuation or cost-benefit analysis has also been published (see Sunderland *et al*. 2015 in the *Handbook on Green Infrastructure: Planning, Design and Implementation)*.

Planning for Economic Growth

Economic growth is a major focus of planning and policy but it focuses on the size of the market and therefore does not include non-market benefits. This means that an extra step is required to make the environmental evidence relevant to decision-making. It's not enough to show that people appreciate urban greenery, or even that it makes them happier and healthier; additional links to productivity or reduced risks to the economy are needed. By using the Local Environment and Economic Development toolkit (Ecosystem Knowledge Network 2015, Wyatt 2014), Natural England has been able to organise environmental evidence so that it is relevant to Local Enterprise Partnerships and other partners concerned primarily with economic growth.

Conclusion

At Natural England, we have been exploring ways of including the value of the environment in decision-making. There is compelling evidence that quantifying the value of environmental benefits will lead to better social and economic outcomes. We have shown that this evidence can be organised in a way that makes sense to decision-makers and informs planning. There's clearly a great deal of work still to be done in this area, however, and the complexity of the evidence base means certainty will rarely be possible. Our experience suggests that as well as developing evidence to feed into cost-benefit analysis, wider changes to decision-making frameworks will be required.

The default option in many cases is for the benefits from the environment to be implicitly ignored in decision-making, or to be included only partially. We encourage you to ensure that they are explicitly and fully included wherever you can. The evidence base is strong enough to do so. We offer the tools and valuations in Boxes 1 and 2 as 'pieces of the jigsaw' to help you. We would be very keen to hear how you get on and to work with you to complete other pieces of this puzzle.

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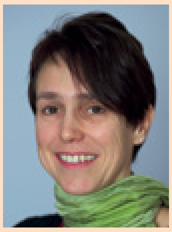

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An Ecosystem Services Valuation of an Urban Oasis: Camley Street Natural Park

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Keywords: ecosystem services, human benefits, Natural Capital, Natural Park, urban ecology, valuation, wellbeing

Figure 1. Camley Street Natural Park (courtesy of London Wildlife Trust).

This article provides an important contribution to literature on ecosystem service valuation by describing for the first time how a key nature reserve in a highly urbanised area was fully analysed through ecosystems services valuation.

Camley Street Natural Park is an exceptional site: small but with ecosystem service value enhanced by its urban setting and its status as a hub for volunteering. The article provides a summary of ecosystem services, the site, our approach to the valuation and key messages. It outlines our findings, and how we have tried to balance the message of monetised and non-monetised values.

Introduction

Ecosystem services describe the benefits that people obtain from the natural environment. These are delivered at all scales, from national to local. The Millennium Ecosystem Assessment reviewed the consequences of ecosystem change for human beings (MA 2005) and established a widely accepted categorisation of ecosystem services, including: provisioning, regulating, cultural and supporting services.

Several studies have looked at valuing London's green space (Adams 1989, GLA Economics 2003, City of London 2010), highlighting the importance of green infrastructure in London. These studies identify the importance of monetary values and the equally important non-monetary benefits that green space provides to its immediate and wider environment and population.

Camley Street Natural Park

Camley Street Natural Park is located between St Pancras and King's Cross Railways Stations, adjacent to Regent's Canal and Camley Street / Goods Way Roads (Figure 1). It is one of London Wildlife Trust's 42 nature reserves, and is a Local Nature Reserve and Site of Metropolitan Importance for Nature Conservation.

The Natural Park is a hub for London Wildlife Trust volunteers and has a visitor centre that is well used. It provides habitat for birds, butterflies, amphibians, and a rich variety of plant life. London Wildlife Trust is seeking funding to upgrade buildings and maintain the Natural Park as one of London's most iconic nature reserves.

Camley Street Natural Park was opened to the public in May 1985, following a long local campaign to secure the site as a natural space. After being constructed in the 1870s as a railway coal drop on the banks of the Regent's Canal (Figure 2), the site closed in the 1960s and had lain derelict prior to being reopened. It was redeveloped by the Greater London Council, in liaison with London Wildlife Trust, to become an urban nature reserve. The Natural Park now provides access to nature in a densely populated area and contains a pond, a meadow, a marsh and woodland. The Natural Park has been managed by London Wildlife Trust since its opening, on behalf of London Borough of Camden.

Figure 2. Camley Street Coal Drop in the 1930s (courtesy of London Wildlife Trust).

Local Context

It is essential to consider the context of the Natural Park, as the ecosystem services valuation is strongly influenced by social and economic factors:

- Camley Street Natural Park is surrounded by an area of major redevelopment, with urban regeneration leading to new housing, new office developments and new urban open space for local residents and visitors, focusing on King's Cross.
- Camley Street is within the London Borough of Camden. The Borough contains three major rail terminals (Euston, St. Pancras and Kings Cross) and over 200,000 people work in, visit or travel through Camden every day. Given the proximity to these transport connections, Camley Street Natural Park is considered one of the best-connected urban nature reserves in Europe.
- Camden has a mix of residential and business land. It also has 400 hectares of parkland and 150 theatres, museums and music venues.
- Camden is expected to experience significant future jobs growth, with the King's Cross Area expecting to see an additional 25,000 jobs through investment in key locations.
- Approximately 30% of Camden's residents are from Black, Asian and Minority Ethnic (BAME) backgrounds and over half of school children in Camden have English as an additional language.
- The average property price in July 2015 was £806,336. The London Borough of Camden is one of the least affordable Boroughs in terms of house price to income ratios.
- Broad indicators on the economy (e.g. productivity and economic composition) and future economic and jobs prospects for Camden are positive. However, this masks some economic and social issues including pockets of deprivation, low economic activity and poor health levels within certain areas of Camden.

Valuation Methodology and Limitations

There is no standard approach to ecosystem valuation, so approaches must be tailored to each specific site or project. The approach we have taken has ensured that outputs are robust but also highlights gaps in knowledge where further work is needed (e.g. ecosystem services which are not easily monetised). We chose a value transfer economic valuation approach for Camley Street Natural Park because of its suitability when there are time and resource constraints.

Value transfer is used to estimate economic values for ecosystem services by transferring available information from studies already completed in another location and/or context to the situation in question. We followed the *United Nations Environment Programme: Guidance Manual on Value Transfer Methods for Ecosystem Services* (UNEP 2004) and, in particular, we drew upon the guidance for 'value function transfer'.

We used information provided by the London Wildlife Trust about the site (e.g. visitor numbers, size of site, types of activity at the site, and volunteer profiles) and secondary information gathered from Camden Council and nearby developers (e.g. size of local developments, environmental data), Government (e.g. size of local population, business base and housing), and other sources (e.g. house prices, environmental issues relating to the canal). The analysis included checks for double counting; temporal and geographical applicability of data and studies; the local area context and how

Box 1: Valuing ecosystem services using the value transfer method to calculate the amenity value to nearby properties

Broad Stage	Detail
To assess the value of amenity as captured through property values, we looked at a range of studies that provided detail of property value uplifts. Few residential properties overlook the site but benefit to both residential and commercial properties can still be derived from being proximate to the site.	Four studies provided seven greenspace uplift values of between 0.23% and 19% of the total property value (commercial and residential).
We used national statistics and a site visit to understand the scale of residential and commercial land that was impacted. This included looking at the number and type of residential properties nearby and the size and value of commercial property.	There are 710 residential properties and 325 business premises in the local area with combined property values of £290 million[1].
Calculation of property value contribution of greenspace.	We calculated the added value that properties derive from greenspace in the immediate vicinity using the properties' values (£290 million collectively for residential and commercial) and the greenspace property uplifts (0.23% to 19%). For example, for residential properties the range was between £270,000 (lowest uplift) and £2.4 million (greatest uplift). We averaged the ranges for residential and commercial to provide the total contribution from amenity to be approximately £20.1 million for residential property and £2.1 million for commercial property.
Outlying figures interrogated and discounted or assessed in further detail. The residential and commercial property added value is considered to be a one-off and was linked to the number of years that people stay in a property (on average 20 years) and the number of years a business stays in a given area (also 20 years); both were backed up by research on movement of people, businesses and lease length. The study assumed that the value and the benefits are constant.	Outlying figures were looked at and discounted or assessed in greater detail (e.g. we looked at the study it was transferred from). Once this had been completed, we divided each calculated value of residential and commercial property by 20 (years). When finalized, this produced a total contribution of **£903,712** from residential property and **£168,302** from commercial property. Altogether, the amenity value (just over £1 million) was around 38% of the total ecosystem services valuation of the park and 39% of the total cultural ecosystem services value.
In transferring values, we referred to several studies that were international or were undertaken many years ago. However, for property values, we did not have to calculate present day values or convert currency values as the information was all up to date and presented in pounds sterling. Using international studies requires further assessment of a study's suitability for transfer and the method of calculation.	
We assessed the upper and lower figures calculated to identify outlying figures and then removed them from the analysis. It was noted that there are other less tangible benefits of greenspace for both commercial and residential properties. These include opportunities for residents to exercise, learn and relax. The value of the ecosystem services in the area may increase as regeneration continues.	

1. Calculated using commercial property values for Camden and estimating property nearby. Likely to be underestimate as Council offices which overlook the park were built at a cost of £123 million.

values interact or double count; evaluation of the quality of studies; and a review of whether the values reflected the benefits provided by the Natural Park.

Box 1 outlines the method in more detail and provides an example of the type of information that was used in the value transfer; the example focuses upon amenity value (part of cultural ecosystem services).

Following analysis of all ecosystem services, we assessed the final outputs and removed outlying figures which could distort the valuation. We focused particularly upon the larger contributing ecosystem services that Camley Street supports, notably employment (and volunteering) and property value.

Ecosystem Services Valuation

We present the ecosystem services generated by Camley Street Natural Park qualitatively and quantitatively (Tables 1 and 2). The tables provide a more detailed overview of the benefits to humans than a simple valuation of aspects that can be monetised. It is important for both qualitative and quantitative valuations to be included given the challenges inherent in valuing certain ecosystem services.

Qualitative Description of Ecosystem Services

Table 1. Ecosystem Services at Camley Street Natural Park

Service Type	Comment
Provisioning Services	Includes an anaerobic digestion plant; a small area of crops and food for human consumption; ornamental resources; and material and energy outputs for wildlife, insects and plants.
	A limited but important role in water quality regulation by filtering the water of Regent's Canal, which is connected to the large pond on site.
Regulating Services	Reduces the amount of CO_2 in the atmosphere through sequestering carbon in plants and soil; contributes to heat regulation by reducing the urban heat island effect; reduces surface water runoff into the sewer system thereby helping to reduce energy consumption and carbon emissions from water distribution and treatment.
	Trees and vegetation help to reduce air pollution in one of the most polluted London Boroughs thereby improving the health of residents and reducing mortality rates. Volunteers and the vegetation remove pollutants and waste from the canal.
	Small role in reducing flooding from surface runoff on the areas next to the site and the canal, but important given the slow movement of the water, urban location and heavy use of the canal.
	Pollination benefits are restricted but the site acts as a 'stepping stone' for wildlife moving across the local network of gardens and open spaces.
	Highly important role in regulating noise, benefiting commercial and residential buildings and open space.
Cultural Services	A significant role in delivering important non-material benefits to people through enhancing community cohesion, spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences in a comparatively deprived area of London. The site is highly accessible and at the heart of regeneration projects.
	The average property prices (residential and commercial) in the local area are linked to the location and the amenity benefits increase values.
	Receives approximately 15,000-20,000 visitors a year. There are also health benefits for workers, and the reputation and profile of the area. Plays a key role in attracting businesses into the local community. An 'oasis of tranquillity'.
	A popular destination for visitors described variously as 'awesome', 'beautiful', 'a nice spot for lunch', 'lovely haven for wildlife', 'a wonderful site' and an 'oasis of birdsong and calm' (Figure 3).
	An important cultural and arts venue, which balances visitors, culture and the natural environment.
	Includes an outdoor classroom where people can learn about flora and fauna, and offers family learning events at weekends. Around 2,000 school children visit each year from 30 schools in Camden and Islington A London Wildlife Trust venue for numerous events (Figure 4).
	Provides employment for paid and voluntary staff, which benefits the local economy and society; supports the local economy through the direct and indirect spend of visitors, including those that travel within London and also remain in the Camden area for a period of time.
	Contributes to social identity and provides a focus for emotional attachment; its history and the campaign to protect the site, and then create it, represents a significant step in the urban nature conservation narrative.
	Supports biodiversity, providing both a cultural and regulation benefit. (This is noted here but not under regulating services to avoid double-counting.)
Supporting Services	Plays a role in supporting the cultural, provisioning and regulating services by contributing to the soil, water and nutrient cycles. Provides a habitat and nursery for various animals and insects including: plants and trees (70 species), insects (including 32 species of bees, wasps and ants), mammals, amphibians and reptiles (20 species), birds (75 species) and fish (8 species).

Quantitative Valuation of Ecosystem Services

Table 2 presents the ecosystem services in quantitative terms, their type and the extent to which Camley Street Natural Park provides these services. This table presents the final calculations from the value transfer method and is based on the individual values for each ecosystem service.

In contrast to the qualitative assessment, supporting services are not included in the quantitative analysis because they underpin all of the other services meaning there is overlap of values between these services and a risk of double counting.

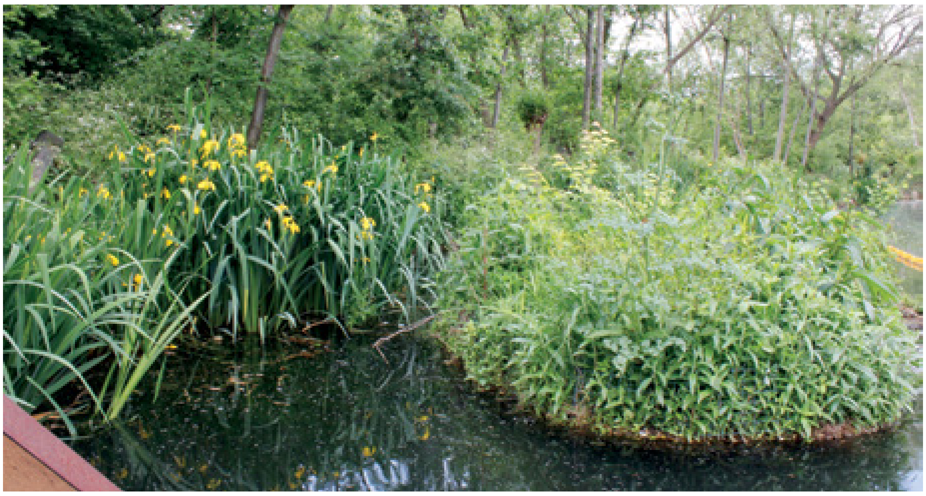

Figure 3. An "oasis of calm" (courtesy of London Wildlife Trust & David Ware).

Table 2. Estimated Monetary Value of Ecosystem Services at Camley Street Natural Park

Service Type	Comment
Provisioning Services	The provisioning ecosystem services are minor but include some food, raw materials, water, mineral and ornamental resources. Valued at **£3,600 per year**, which reflects the size of the site, its urban location and spatial arrangement.
Regulating Services	The various species of plants, including trees, as well as the ponds, soil, insects, mammals, amphibians and reptiles, birds and fish, together with other ecosystem features, play a role in regulating the local climate, pollution, noise, water, biodiversity, temperature and hazards. Valued at **£93,600 per year**. Fiscally, the largest contributing ecosystem services are noise regulation, and biodiversity support and regulation (together more than half the total). In the future, heat regulation may be valued more highly as additional buildings are built and climate change contributes to the urban heat island effect.
Cultural Services	Local residents and visitors benefit from a range of cultural ecosystem services. The cultural ecosystem services are valued at **£2.72 million per year** due to the variety and number of human interactions with Camley Street Natural Park, notably employment and volunteering opportunities, local expenditure and amenity, all reflected in local property prices. Several cultural ecosystem services are difficult to measure, e.g. the contributions from education, art, inward investment and interaction with boating. These services are estimated at low value or are not captured due to difficulties in determining monetary values.

Figure 4. Pond dipping at Camley Street Natural Park (courtesy of London Wildlife Trust).

Given the variety of interactions between nature and humans, it is likely that the cultural ecosystem service valuation is underestimated overall (Tables 1 and 2). For example, the figure attached to education is linked to 'children's outdoor educational experiences' and does not value educational benefits from the site linked to adults, influence on future careers, informal experiences and learning behaviours. It is not possible to value all ecosystem services using value transfer, therefore it is important to highlight both the range of ecosystem services and the qualitative value of nature to humans.

Conclusions

Urban nature reserves provide valuable ecosystem services to the local community and economy. Ecologists are often wary of placing a financial value on biodiversity, concerned that a value or price tag can be used negatively. However, when ecologists actually talk to economists, we start to understand two things. Firstly, economists are very comfortable with the concept that green space can have a value with aspects that can be monetised and others that cannot. Secondly, ecologists and economists can work together to develop values and therefore influence decision-making.

Our approach has shown that in 2015 the total ecosystem services value of the Camley Street Natural Park was estimated to be **£2.8 million per year**. We assessed the site in 2015 and note that changes to the park and the surroundings in the future could enhance (or negatively impact) its value.

The valuation is largely driven by the contribution from cultural services due to the Natural Park's location and use by people. The valuation demonstrates clearly that the Natural Park plays a key role in visitor and local resident wellbeing, which is very valuable in monetary terms. It also highlights the fact that the actual monetised value may be higher because some ecosystem services cannot easily be quantified.

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Further information

We have produced a summary and full report, which are available on request. Please find the summary at http://www.atkinsglobal.co.uk/~/media/Files/A/Atkins-Corporate/group/cs/Camley-st-natural-park.pdf.

We recommend the following actions:

- Further academic/industry work on urban ecosystem valuation to explore the myriad of interactions between humans and urban green space, particularly the interaction between education and green spaces.
- Further guidance and value transfer information where specific data can be captured at a detailed level (e.g. air quality): this would facilitate more accurate valuations.
- Further work to explore relationships between urban green space, ecosystem services and business communities.
- Further exploration of how contextual information and discussion with local stakeholders can contribute to more detailed ecosystem services analysis. The use of contextual information in this study was found to be very useful to support valuation analysis and sensitivity tests.

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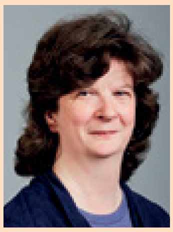

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Investigating an Ecosystem Approach to Funding Catchment-Scale Natural Flood Management:

The Holnicote 'Payments for Ecosystem Services' Pilot Research Project

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Keywords: ecosystem services, National Trust, natural flood management, Payments for Ecosystem Services

Payments for Ecosystem Services (PES) is now a well-established concept in the UK based upon many practical examples. This article describes one of five recent PES pilot projects funded by Defra. The research investigated the use of PES to fund catchment-scale Natural Flood Management at the National Trust's Holnicote Estate in Somerset.

Figure 1. Properties in Allerford village benefitting from reduced flood risk. Photo credit: Nigel Hester.

Introduction

It's widely known that the natural environment provides ecosystem services that are vitally important to our wellbeing and economy. These include clean water, healthy soils, flood regulation, and human health benefits. Until recently, these functions of the natural environment often went unquantified and undervalued in decision-making. As a consequence, policy-making and actions on the ground could lead to the loss, or deterioration, of critical ecosystem services.

The UK National Ecosystem Assessment (2011) and Natural Environment White Paper (Defra 2011) have embedded an ecosystem approach in protecting and improving our natural environment. Increasingly, this has resulted in the valuation of ecosystems becoming more mainstream within policy and plan-making for businesses, local government, statutory agencies and NGOs. One consequence has been the emergence of Payments for Ecosystem Services (PES) as a mechanism for recognising the monetary value of ecosystems.

PES is a voluntary financial transaction between two or more parties in exchange for provision of an ecosystem service. A *Best Practice Guide* (Smith *et al*. 2013) gives some examples of PES schemes currently operating in the UK such as the United Utilities' Sustainable Catchment Management Programme (SCaMP) where the water company incentivises tenant farmers to deliver land management that improves raw water colour and the condition of Sites of Special Scientific Interest (Anderson 2014).

In 2011, Defra established a research fund to support new PES initiatives to test their practical application. Ten pilot projects were funded between 2011 and 2013 (Defra 2014). In 2014, a further round of pilots was commissioned to take PES initiatives forward from concept to market-ready stage. The Holnicote PES pilot is one of these projects. It explored PES funding opportunities for catchment-scale Natural Flood Management at the National Trust's Holnicote Estate in Somerset.

Holnicote Estate

The Holnicote Estate in the Exmoor National Park covers around 5000 hectares of moorland, farmland, semi-natural ancient woodland, and coast. The iconic upland and coastal landscape is exceptional and is estimated to receive over a million visits a year.

The Estate encompasses the majority of two river catchments of contrasting characteristics. The Horner Water is 22 km^2 of high upland moors, steep wooded gullies and confined floodplains. In contrast, the Aller catchment covers 18 km^2 of lower-lying land with woodland, grassland and arable uses. Horner Wood, an ancient semi-natural woodland designated as a SSSI and SAC, covers a large part of the upper Horner catchment.

There are fourteen tenant farms on the Estate, mainly rearing livestock with pockets of arable and some horses. The moorland is grazed by commoners and supports Exmoor ponies and red deer.

Allerford, West Lynch and Bossington villages lie at the confluence of the catchments and are at risk of flooding following periods of high rainfall (Figure 1). The properties within the villages are picturesque: many are thatched cottages and a significant draw for visitors. Around half of the properties are owned by the National Trust and, together with private dwellings, are valued at £30 million for insurance purposes.

Natural Flood Management

The National Trust has explored a catchment-scale Natural Flood Management approach at Holnicote with partnership funding from Defra and the Environment Agency, as one of three multi-objective flood demonstration projects. Since 2009 Penny Anderson Associates, with support on hydrological/hydraulic modelling work from JBA Consulting, has helped the National Trust to develop and implement a range of Natural Flood Management measures across the Horner and Aller catchments. This has involved creation of catch pools to hold back water in the uplands, woodland planting, arable reversion, *Molinia* management, retention of woody debris and bunded floodplain storage (Figure 2) (National Trust 2015).

Works were implemented between 2010 and 2015 and monitoring is ongoing. A catchment-wide hydrological monitoring network has demonstrated a measurable reduction in peak flood flow as a result of the work completed to date. Future monitoring will be vital to continue the provision of a robust evidence base.

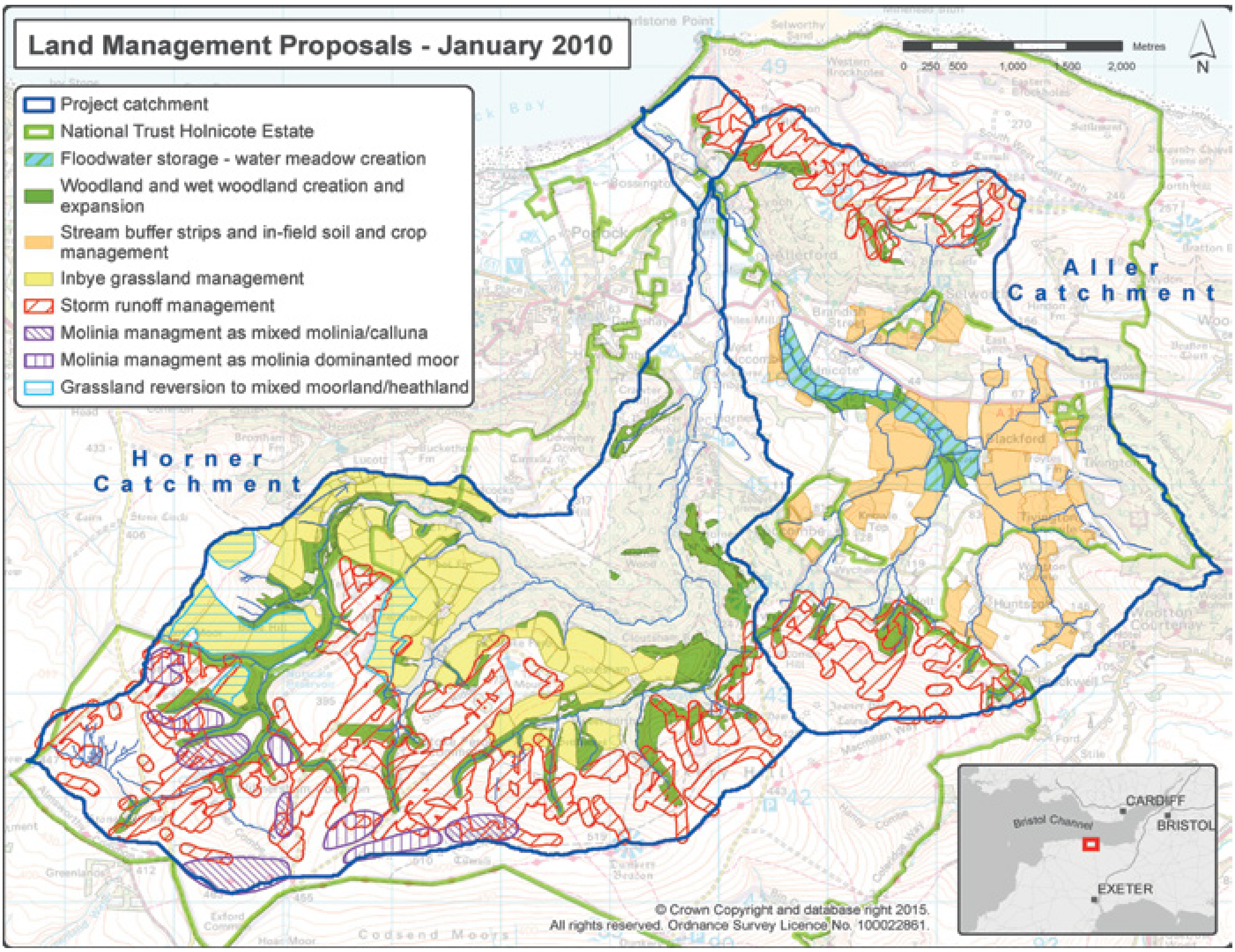

Figure 2. Natural Flood Management proposals across the Aller and Horner catchments. © PAA 2015.

Payment for Ecosystem Services: Objectives of the pilot

The Holnicote PES pilot sought to generate novel sources of investment in Natural Flood Management to enable further land management changes to be extended across more of the Horner and Aller catchments from 2015 onwards, and to allow monitoring to continue. It was hoped that beneficiaries of Natural Flood Management might be persuaded to invest in upstream land management change to reduce flood risk.

The pilot also considered if multiple benefits could be used to lever funding from people who might not necessarily be interested in flood risk management but would be willing to invest in other environmental services being provided by Natural Flood Management, such as carbon sequestration or biodiversity enhancement.

The pilot quantified tangible outputs to be used in dialogue with potential buyers of ecosystem services, principally:

- Flood risk reduction
- Biodiversity
- Carbon sequestration
- Soil management.

Penny Anderson Associates, with support from JBA Consulting and in partnership with the National Trust, engaged with National Trust farm and business tenants, the Parish Council, Community Flood Group, West Somerset Flood Group, nature conservation agencies and businesses to gauge interest in PES. The flood insurance industry was also approached to investigate potential for flood insurers to invest in Natural Flood Management.

Ecosystem services delivered

The Holnicote scheme has been very successful in delivering a broad range of critical and quantifiable ecosystem services.

Flood risk reduction

The Natural Flood Management measures implemented to date resulted in a 10% reduction in peak flood flow on the Aller during a severe storm event of at least a 1-in-70-year return period experienced in winter 2013/14, most likely avoiding the flooding of properties in Allerford and Bossington.

Figure 3. Retention of large woody debris in Horner Wood contributing to Natural Flood Management. Photo credit: Chris Chapman.

Biodiversity

The diversification of floodplain habitats has resulted in the creation of 11 ha of flood meadow, ponds and scrapes. Numbers of wintering waders and wildfowl such as snipe *Gallinago gallinago* and teal *Anas crecca* have increased and a pair of whooper swans *Cygnus cygnus* were spotted in winter 2015/16. Around 327 ha of blanket and upland valley bog and upland heath have benefited from wetting and the number of course woody debris dams in Horner Wood has increased four-fold from 17 in 2010, to 81 in 2014 (Figure 3).

Carbon Sequestration

Natural Flood Management implemented to date has increased carbon storage in soils, woodland and upland valley bog compared with the baseline. Ninety-five hectares of upland valley bog has been 'wetted' by the creation of catch pools enabling the peat to store around 25,500 tonnes of carbon. Two and a half hectares of new woodland planting will store 308 tonnes of carbon and 24.5 ha of reversion to improved grassland will have increased carbon storage by 475 tonnes, compared with the equivalent area of arable land.

Soil Management

Across the Estate, 35% of the soils surveyed were found to be structurally degraded making them more prone to the generation of rapid run-off and erosion. This has resulted in significant volumes of soil moving onto highways, fields and into watercourses during larger rainfall events. A PhD study of the catchments has demonstrated that estimated suspended sediment yields from the intensively managed land (26-116 t/km^2) can be twice that from semi-natural habitats (22-58 t/km^2) (Glendall and Brazier 2014). The reversion of arable land to grassland as part of the Holnicote scheme has the potential to reduce sediment yield.

Lessons learnt in developing markets for Payments for Ecosystem Services

Finding willing buyers of Natural Flood Management was not straightforward. The pilot identified important lessons, which are applicable to other catchment scale projects (Rogers *et al*. 2015).

Cost of catchment-scale change: The financial cost of implementing catchment-wide Natural Flood Management measures, and therefore the amount of money that a PES scheme would need to generate, is significant. The total estimated cost to deliver the full suite of Natural Flood Management measures at Holnicote is £7 million. It is unlikely that a PES scheme alone could generate this amount of funding; rather PES would need to form part of a mix of different funding options.

Landowner/tenant incentives: Incentivising the providers of ecosystem services, in this case National Trust tenant farmers, is critical to bring about the desired land management change. At Holnicote, the National Trust works closely with their tenants to ensure that the land remains productively viable whilst reducing flood risk. Financial incentives used to date include Environmental Stewardship payments, notably Higher Level Stewardship options for arable reversion, and a one-off payment towards winter housing for cattle so that floodwater can be diverted onto grazing land during the winter months (Figure 4).

Evidence base: Those people benefitting from flood risk reduction wanted to know what difference Natural Flood Management had made to them, therefore credible data demonstrating tangible results was crucial when discussing the concept of PES with the local community. The Holnicote project has good monitoring data that can be used to derive robust evidence of reduced flood risk.

Perception of flood risk: The business tenants felt that flood risk to them was low. Flood meadows created previously had successfully held back floodwater in winter 2013/14. Combined with Environment Agency Property Level Protection (i.e. flood boards at individual properties), there was a sense that flooding was not a major issue and there was little incentive to invest in further flood protection. One tenant commented that 'it needed a flooding disaster' to motivate action.

Perception of who is responsible for managing flood risk: Whilst those we spoke to were generally positive about Natural Flood Management, there was a strong feeling that responsibility for managing flood risk should fall to Defra, the Environment Agency or the landowner (in this case the National Trust).

Importance of demographics: The rural location of the pilot project meant that a relatively small number of residents and businesses would benefit from reduced flood risk (less than 100 properties overall). The majority of properties protected from flooding are owned by the National Trust and are let to predominantly retired, private residential tenants on low-incomes. Even if members of the local community were willing and able to pay for investment in Natural Flood Management, at Holnicote this would be unlikely to generate anything near the level of funding required.

Figure 4. Retaining floodwater on grazing land on the Aller floodplain. Photo credit: Peter Worrall.

Property tenure: A high proportion of properties at risk of flooding are tenanted and this is likely to have a significant influence on attitudes towards flood risk compared with privately owned and insured properties.

Whilst almost everyone consulted was supportive of the concept of PES, it was clear that there was no obvious market for Natural Flood Management amongst the local beneficiaries of reduced flood risk. It was therefore necessary to look further afield to potential buyers from beyond the immediate catchment boundary.

The way forward for Payments for Ecosystem Services

The pilot identified three possible PES approaches for the National Trust to consider:

Visitor Giving: The Holnicote Estate receives around 1.2 million visits from the public each year and Visitor Giving might be one way of capitalising on heightened public interest in the causes and effects of flooding. Visitors could be asked to donate via a smart phone app or in donation boxes. However, experience from other Visitor Giving projects is that it is critical to link funding requests to tangible benefits of Natural Flood Management, such as increased numbers of wetland birds or tonnes of carbon stored (Reed *et al.* 2013). Therefore, the National Trust is considering a River Centre at Holnicote to showcase the benefits of the Natural Flood Management project.

Agri-Environment Schemes: The new Countryside Stewardship scheme is an example of a publicly funding PES project whereby public monies are distributed to land owners/managers in return for specified environmental enhancements. The so-called 'mid-tier' of the new Countryside Stewardship scheme is a possible source of future funding for Natural Flood Management at Holnicote and elsewhere. Amongst other objectives, Countryside Stewardship provides financial incentives for land managers to conserve and restore wildlife habitats, and to reduce flood risk (see Further Reading). The mid-tier is designed to offer greater opportunities for co-operation between clusters of farmers to deliver landscape-scale changes. However, Countryside Stewardship funds are limited and there are practical difficulties to overcome. For example, a number of the farm tenancies at Holnicote are already tied into ten-year Higher Level Stewardship scheme agreements so cannot be entered into Countryside Stewardship in the near future.

Carbon Trading: The Woodland Carbon Code and the Peatland Carbon Code are initiatives that allow businesses to invest in carbon sequestration (see Further Reading). Both new woodland planting and wetting of upland valley bog at Holnicote have potential to qualify under these schemes and could attract funding from investors seeking to fulfil Corporate Social Responsibility targets.

Wider Benefits of Pilot Study

The pilot study has helped to inform the National Trust Land Choices strategy for Holnicote. The Land Choices process seeks to understand the current functions of National Trust landholdings and how they might be better balanced to improve soil and water management, reduce flood risk and yield other environmental gains. Traditionally, National Trust tenanted farmland has been viewed primarily as productive land that provides money through rental income to support conservation work in the wider countryside. The Land Choices approach demands a re-think so that water, soils, carbon and other ecosystem services are seen as equally valid functions of farmland as agricultural productivity. The PES pilot has developed new ways of thinking about funding land management change, other than for food production.

At a strategic level, a new *'Catchments in Trust'* partnership was established between the National Trust and the Environment Agency in 2015 to develop a programme of nine catchment-scale, multi-benefit projects throughout England. The Holnicote work is regarded as a catalyst in securing this partnership by demonstrating how collaborative working at a catchment scale can deliver multiple and quantifiable benefits, including options for funding of ecosystem service provision.

Conclusions

The Holnicote project has highlighted some of the challenges involved in funding catchment-scale land management, which has ecosystem services as the primary objective. Traditional funding models do not recognise or reward the management of land for Natural Flood Management, biodiversity or water quality, at least not on a sufficient scale to bring about catchment-scale change.

At Holnicote, the rural catchments do not support a sufficiently large number of people with the means to pay for catchment-wide Natural Flood Management. In any case, investment in flood risk management was seen to be the remit of Government or others, rather than an individual responsibility. There is no current mechanism for the flood insurance industry to invest in individual Natural Flood Management projects.

Future investment in the provision of ecosystem services at Holnicote is most likely to come from beyond the immediate catchment in the form of visitors to the Estate (through Visitor Giving), the taxpayer (through agri-environment scheme payments) or corporate investment (through Carbon Codes).

The National Trust is re-thinking its own approach to management of its landholdings for uses other than productivity, and this will be at the heart of the *Catchments in Trust* project.

In the meantime, hydrological monitoring at Holnicote will continue for as long as possible to provide a vital evidence base for the effectiveness of Natural Flood Management. It is hoped that sufficient funding, through PES or other means, can be secured to make the Natural Flood Management project financially viable in the long term.

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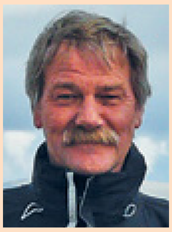

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The Case for High-Density Compact Cities

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Keywords: *brownfield, compact city, garden city, greenfield, high-density housing, low-density housing, urban sprawl*

As the UK's population and housing demand increases, harm to the environment can best be avoided through well-designed, sustainable, compact urban development, which promotes use of brownfield sites and avoids low-density urban sprawl. To this end, the role of the ecologist is more vital than ever to ensure that the increasingly densely populated urban realm does not become devoid of greenery and ecologically impoverished.

Figure 1. Relatively formal, non-native but nectar-rich, herbaceous courtyard planting within the Crest Nicholson Centenary Quay development in Southampton; design by Allan Scott Architects and Biodiversity by Design.

Introduction

Recently I was in discussion with a Local Authority ecologist who was bemoaning the high-density new developments in his city, and the apparent adverse implications for urban biodiversity and the environment more generally. Unthinkingly I nodded in solidarity, in opposition to the *'town crammers'* as they are disparagingly labelled (see Lock 2015).

To counter the wider trend towards urban densification, there has been talk of revitalising *'garden city'* living in the UK. The Town and Country Planning Association (TCPA) published *'Creating Garden Cities and Suburbs Today'* (2012); a recent Conservative-backed report has proposed a new *'Thames City'* – an expanded London zone featuring 40 new garden developments surrounding the capital; and the Chancellor of the Exchequer has established a Garden City Development Corporation at Ebbsfleet in Kent.

But is low-density *'garden city'* living really the urban development model that ecologists should be supporting? In this article, I argue that our profession should be more aware of the often under-acknowledged sustainability concerns linked with this approach, and instead make the ecological and wider environmental case in favour of high-density, compact city living. In taking this stance, I am not giving up on the wildlife of our towns and cities. Rather, I strongly believe that ecologists must be integral to the urban planning and design process. We must, though, become smarter in our efforts to integrate biodiversity into urban areas where space is increasingly at a premium.

History of the compact urban living movement

Low-density garden city living was first envisioned by John Ruskin and Ebenezer Howard in the nineteenth century in response to the pollution, poor sanitation and overcrowding of Victorian cities. The movement gained momentum in England after 1945 when urban housing densities declined markedly in response to changing aspirations, rising incomes, and planning policies supporting spacious urban extensions and the building of new towns (Whitehead 2012).

More recently, many economists and urban planners have challenged the merits of the post-war trend towards low-density living. They argue that well-organised, compact urban agglomerations achieve economies of scale, and are more economically productive and competitive (Glaeser 2012). Although counterintuitive, the creation of compact densely populated urban centres also has many environmental benefits, recognition of which is certainly not new and dates back at least to Jane Jacobs' seminal 1961 book *The Death and Life of Great American Cities*. Jacobs' ideas later inspired the Ahwahnee principles in the USA in the early 1990s followed by the New Urbanism and Smart Growth movements. All of these approaches to

Figure 2. Award-winning linear wildflower meadow created in the heart of Bristol in Crest Nicholson's Harbourside development; design by Grant Associates and Biodiversity by Design. Photograph courtesy of Grant Associates.

Figure 3. Living (green) roofs established across the London Olympic Athletes' Village at Stratford as analogues of four key priority habitat types; design by Vogt and Biodiversity by Design. Photograph courtesy of Olympic Development Authority.

urban design seek to avoid low-density urban sprawl by promoting compact, transit-oriented, pedestrian- and bicycle-friendly urban development.

Partly in response to these movements, the trend towards lower housing densities has been reversed in the UK. The mean density of new houses built in England nearly doubled between 2000 and 2009, from 25 to 43 dwellings per hectare, while densities for brownfield sites and in London rose even higher (DCLG 2010). This trend has been encouraged by demographic changes, i.e. a growing population and declining household size; government policy, especially protection of the greenbelt and a presumption in favour of brownfield development (the so-called *'brownfield first'* policy); and market pressures.

Environmental effects of urban sprawl

The environmental rationale in favour of high-density compact cities gained momentum with the arrival of the *'Urban Millennium'* in 2007, when the majority of the world's population became urban for the first time in human history (UNDESA 2009; the figure is 82% in England and Wales). David Owen (2011) and Edward Glaeser (2012) have in particular championed the cause, highlighting how the post-war growth in low-density urban sprawl (including commuter settlements beyond the suburbs) has resulted in higher car usage per capita in these areas compared with more densely populated urban centres. People drive significantly more to work, shop, and take their children to school, increasing congestion and air pollution. Transport accounts for 21% of UK greenhouse gas emissions (DECC 2015), whilst other exhaust output, including nitrogen oxides, particulates, carbon monoxide and hydrocarbons, has a much more immediate and local impact on both the health of people and wildlife. Low-density, leafy, residential development may include lots of green space but the environmental benefits are undone because the residents drive so much (Glaeser 2012).

By contrast, those living in urban centres are far less inclined to drive because services are readily accessible by foot or public transport. Policies are also in place to constrain car use in cities, e.g. restricted and costly parking charges; road capacity not being expanded to ease congestion; and a congestion charge in London. Car use in London, and in many other densely populated cities in the developed world, is no longer growing and may be declining relatively as population densities increase – the so called *'peak car phenomenon'* (Metz 2015).

In low-density suburbs, homes tend to be larger and predominantly detached or semi-detached. They use more energy because heat consumption is correlated with floor area (Palmer and Cooper 2012). These homes also have a higher wall area to floor area ratio compared with flats and terraced housing and thus have greater heat loss in winter. In 2010, the residential sector accounted for 31% of the UK's carbon emissions (DECC 2010).

Taking a global environmental perspective, urbanisation is continuing apace in the developing world, led by India and China. Global carbon emissions could soar were these countries also to adopt leafy suburbs, large homes and the cars those suburbs entail (Glaeser 2012).

Brownfield or greenfield development?

In 2000, the UK Government introduced the *'brownfield first'* policy as a strategic tool for controlling urban sprawl, as well as for promoting urban regeneration (Payne 2013). In addition to prioritising brownfield over greenfield development, the policy also encouraged higher density housing on brownfield sites (see *Planning Policy Guidance 3 Housing* from 2000). Consequently, the mean number of new houses per hectare has risen most sharply on brownfield sites, increasing 75% from 28 to 49 between 2000 and 2009 (DCLG 2010).

While previously established housing density targets have not been taken forward in the new *National Planning Policy Framework* (NPPF), concentrating new development on brownfield sites wherever suitable has remained a priority for Government (HM Treasury 2015). For various reasons, including perceived viability issues, developers generally also still favour higher density development on brownfield land (Payne 2013).

While *'brownfield first'* is broadly supported from an ecological perspective (CPRE and Natural England 2006), some environmental groups have questioned the policy, highlighting the notable ecological value of some brownfield sites compared with many ecologically impoverished greenfield alternatives (Buglife 2009). Others highlight that most of the countryside has not, contrary to popular rumour, been paved over with concrete, and so can accommodate many more homes (TCPA 2003). Unfortunately, however, the proponents of greenfield development frequently neglect to fully consider the wider sustainability concerns which are discussed here. The environmental balance between greenfield and brownfield development must not come down to a simplistic comparison between their respective ecological characteristics, or be decided on the basis of unqualified urban-rural ratio statistics. Much bigger

Figure 4. Restoration of the formerly canalised River Wallington within Grainger's Berewood residential development in Waterlooville; design by Mayer Brown, Fabrik and Biodiversity by Design. Photograph courtesy of Mayer Brown.

environmental considerations are at play. With regard to the carbon footprint of the alternative urban development models, it is particularly important that ecologists remind themselves that climate change is the biggest threat to UK and global biodiversity.

In 2004, the Barker review concluded that the UK needed to construct 250,000 homes annually for 25 years to deal with the nation's housing crisis (Barker 2004). As the area of suitable available brownfield land is insufficient to accommodate these numbers, it is recognised that further greenfield development will also be needed (Dixon and Adams 2007). The Government's proposal to concentrate new development around commuter hubs with good public transport links is therefore welcomed.

'Density done well' philosophy

If the more sustainable trend towards compact city living is to continue, new residential areas will need to meet a wide variety of household aspirations – applying Jane Jacobs' (1961) *'density done well'* philosophy. These aspirations include creating a sense of *'place'*; provision of good quality public services, e.g. efficient public transport; walkable neighbourhoods; high-quality architectural design (avoiding volume-built *'featureless boxes'* and including water/energy efficient technologies); and providing attractive, high-quality green spaces.

Maximising opportunities for biodiversity in high-density cities

Given the need to provide attractive, high-quality green space, the role of the ecologist in urban design is more vital than ever in ensuring that the increasingly densely populated urban realm does not become ecologically impoverished and devoid of associated ecosystem services. To this end, it is imperative that ecologists become smarter at integrating biodiversity within high-density development. This becomes increasingly challenging where seemingly opposing types of green infrastructure are competing for space. For example, should limited green space be provided for children's play or for wildlife?

In response to these challenges ecologists should:

- Work effectively with architects and landscape architects to maximise opportunities for biodiversity in small green spaces, including those intended to have relatively formal appearance, e.g. courtyards, squares, the streetscape and pocket parks, where ecologists have typically been excluded from the design process (Figure 1). To achieve this partnership, ecologists must champion multifunctional green infrastructure, and develop a better appreciation of the wildlife value of non-native planting, plant sourcing, seasonal appearance, maintenance requirements, design of nature-inspired play features, etc. Even within seemingly formal green space settings, it may be possible to incorporate native Section 41 Habitats of Principal Importance (Figure 2).
- Promote living architecture, the opportunities for which are increasing due to the shift towards building more flats (Figure 3). Living (green) roofs and façades provide multiple ecosystem services and have high value as invertebrate habitat, thereby helping to compensate for brownfield losses.

Figure 5. Multifunctional, biodiverse, sustainable drainage at the award-winning London Olympic Athletes' Village, Stratford; design by Vogt, Arup and Biodiversity by Design.

- Maximise the ecological value of areas considered sub-optimal for development, e.g. promote river restoration along flood-prone canalised river corridors (Figure 4).
- Contribute to the design of truly multifunctional SuDS, maximising their value with respect to biodiversity, amenity and landscape, in keeping with the new SuDS Manual (CIRIA 2015) (Figure 5).
- Better integrate newly created green space with existing green infrastructure networks, thereby creating a more permeable landscape for wildlife and enhancing ecological carrying capacity, e.g. see the *All London Green Grid* strategy (Greater London Authority 2012).
- Define measurable targets for high-density, ecologically rich urban environments (Wells *et al*. 2011).
- Ensure long-term, ecologically informed management of green infrastructure (TCPA and The Wildlife Trusts 2012).

While urban green spaces must be designed to *'work harder'* to achieve multiple functions for both people and wildlife, it will become more challenging to adequately compensate for ecological losses entirely on-site as cities become increasingly dense. In an urban context, however, net change in ecosystem service provision may be a more useful criterion of success. Further, biodiversity offsetting can provide a mechanism for compensating for residual impacts, although where applied it should be implemented as close as possible to the habitats and human populations most affected by relevant developments (Garland and Wells 2009).

Conclusions

There has been recent talk of revitalising Ruskin and Howard's dream of garden city living, in opposition to the trend towards urban densification. If garden city living were to become widely implemented, however, and fails to achieve sufficient density and economies of scale to support good infrastructure, accessible by public transport, bicycle and on foot, then the dream of garden living could turn into an *'ecological nightmare'* (Glaeser 2012).

Greener, sustainable city living that reduces CO_2 emissions, and benefits biodiversity and the environment more generally, will only be achieved by minimising urban sprawl and championing more-compact urban living. High-density urban environments must also be attractively designed to include high-quality, biodiverse green space. Ecologists must contribute to these design goals, seeking new and innovative ways to integrate biodiversity within the limited spaces of an increasingly compact urban realm.

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Featured CIEEM Training Events

Coastal Habitats and Coastal Change: Shingle, Lagoons and Saltmarsh

Walberswick, Suffolk 22 June NEW

Understand the importance of coastal processes and coastal dynamics in the formation shingle, lagoon and saltmarsh habitats. This one day classroom and field based course, based at Walberswick National Nature Reserve, offers opportunities to explore the ecology, zonation, dynamics and management of key coastal habitats.

Camera Trapping for Ecologists

Stockton-on-Tees 1 July NEW LOCATION

This course serves as a thorough introduction to camera trapping, a fast-emerging technique to monitor animals covertly, particularly useful for accurately determining the presence of protected species such as otter, badger and water voles.

Grasses for Beginners

Durham 29 July NEW LOCATION

Get to grips with grass identification in this one day training event based at Rainton Meadows Nature Reserve. Classroom sessions are supplemented with visits to two different field sites to gain an understanding of key grass features, and the ecology and growing conditions of semi-improved grassland and calcareous grassland habitats.

Green Infrastructure

Central London 16 September NEW

Gain a solid introduction to the key aspects of urban Green Infrastructure and the important role it plays in delivering ecosystem services. This course offers an overview of different Green Infrastructure features, the practicalities of delivering them and a framework to assess a site's potential for Green Infrastructure (new or retrofit). Learning is supported with a range of local case studies and includes a fieldtrip to Green Infrastructure projects in the area.

Introduction to Coastal NVC Communities

Newcastle 12 July NEW

Develop a comprehensive understanding of the communities and important sub-communities of the National Vegetation Classification (NVC), using innovative pictorial e-guides which will be provided as a downloadable app to all delegates attending this course. The training has a particular emphasis on the identification, ecology and management of coastal vegetation types recognised as SSSI features in coastal areas of North East England.

Introduction to Hydrological Monitoring

Shrewsbury 26 July NEW

Gain a practical introduction to setting up and using a hydrological monitoring programme in this one day course. Classroom sessions focus on hydrological monitoring programme design, practical application and data interpretation and introduce the principles and impacts of hydrological management. Field sessions offer practical experience of installing and reading a range of basic hydrological monitoring equipment including dipwells, gauge boards and divers.

Introduction to Wetland Habitats, NVC and Hydrology

Shrewsbury 27 July NEW

Develop your skills in identifying a range of key lowland wetland habitat community types and using the National Vegetation Classification in wetland environments. This training also introduces the basics of hydrology and explores how different hydrological regimes determine habitat type. The majority of the day will be spent in the field, with visits to floodplain grazing marsh, fen, lowland bog and reedbed on a range of soil types.

Livestock Management in the Uplands

Malham 14 September NEW

Improve your knowledge of the methods, terminology and economics of upland farming and gain confidence in discussing livestock management and land management solutions with farmers. This one day course is based on a working upland farm, and will provide an understanding of how a 'typical' upland farm manages their livestock. The course will cover farming constraints, opportunities and pressures and the impacts that they have on conservation of the uplands.

Surveying for Bats in Woodlands

Wotton-under-Edge, Gloucestershire 8-9 August NEW

Develop your understanding of how to design and implement surveys for bats in woodland habitats. Delivered over two days, the course explores survey design, survey methods and analysis of results. Classroom sessions are complemented with fieldwork to develop practical skills, including setting up of catching equipment and up to two evening catching sessions. The training is pitched at intermediate to advanced level and is intended to build on participants' existing knowledge of UK bat ecology and standard survey methods.

Using Indicator Species for Habitat Assessment (Phase I and NVC)

Salisbury / New Forest 22/23 June NEW

Develop your skills and confidence in assessing habitat type and quality across two complementary training days focusing on Grasslands (22 June) and Heathlands and Acid Grasslands (23 June). Each day is structured around confidently identifying the key indicator species which will immediately tell you what sort of habitat you are in and assist with final habitat or community classification. The training is offered as two separate days which can be attended on their own or as a two day course.

www.cieem.net/training-events

BS 42020:2013 – Cracking the Code

James Simpson MCIEEM
ADAS

Keywords: *biodiversity, British Standard, consistency, professional judgement, proportionate, raising standards*

This article considers the guidance and recommendations within the British Standard *BS 42020:2013 Biodiversity – Code of practice for planning development* and how it can shape the decisions that you make when considering different issues relating to the various stages of planning, whether you are an ecologist in the private, public or NGO sectors.

Reading BS 42020:2013 (hereafter referred to as BS42020) from cover to cover will be for many a task left at the bottom of the to-do list and may mean that this valuable document has sat on the shelf gathering dust since its publication nearly three years ago. Others who have merely skimmed through the pages may be forgiven for thinking there is nothing new for them in this first British Standard on biodiversity management, and others may even consider it an unjustifiable expense. In this article I suggest that those who take the time to crack the code will find that it gives them a useful tool to approach the planning process in a systematic way thus providing a better outcome for biodiversity.

Introduction

BS42020 was published in August 2013 and CIEEM's recent publication *Guidelines for Ecological Impact Assessment in the UK and Ireland* (2016) was written in accordance with the approach and recommendations set out therein. Arguably, therefore, BS42020 is becoming the standard guidance document for all ecology professionals.

The BS42020 document itself is designed for professionals working in the planning, development and land use sectors. The Standard aims to promote transparency and consistency, providing planning authorities with confidence that biodiversity has been considered, encouraging a proportionate approach and above all promoting a good environmental legacy. It has three sections: 1) considers professional practice; 2) integrates biodiversity into all stages of the planning process; and 3) provides reference material in a series of annexes.

The only diagram in the document (Figure 1) breaks down the planning process into five key stages: Stage 1 – Pre-application, Stage 2 – Validation and registration, Stage 3 – Decision-making, Stage 4 – Determination, Stage 5 – Implementation. The diagram is pivotal and provides a useful key reference point.

Section 1 – professional practice

The first section of the Standard begins by recognising that professionals can reach different conclusions even when presented with the same facts, i.e. there can be multiple responses to a situation and not all of them will lead to a positive outcome for biodiversity. The Standard therefore considers the ethics, conduct and competence of the professional, emphasising the need to take a proportionate approach and apply professional judgement, as follows:

- Proportionate approach – to ensure that the provision of information is appropriate to the potential environmental risk associated with the proposed development (see clause 4.1.2[i] and 5.5 [i]);
- Professional judgement – to provide expert advice based on sound scientific method and evidence that can be clearly justified (see clause 4.4[i]).

Section 2 – guidance for the ecologist

As a BSI standard, BS42020 went through an extensive and robust consultation yielding over 800 responses from relevant stakeholders. Consequently, users can apply it with confidence knowing that they are following an accepted and robust approach. The Standard also identifies three key areas with potential for improvement: i) saving time during the planning process, ii) encouraging innovation to establish key facts, and iii) greater promotion of biodiversity.

Saving time during the planning process

Preparing a planning application for submission can be time-consuming, especially if surveys are needed in order to determine whether sufficient information has been gathered to make a professional judgement. Efficiency can be improved if ecology is integrated from the outset. Therefore, from the start of Stage 1 (pre-application), the Standard covers the concept and detailed design process of a scheme which is seeking planning approval (see clause 5.1[i]), the mitigation hierarchy (see clause 5.2[i]) and the Ecological Constraints and Opportunities Plan (ECOP) (see clause 5.4[i]). These three aspects should be treated in combination to ensure that the design process is developed in the context of any potential ecological constraints. This method provides an opportunity to put in place measures to avoid and/or minimise potential biodiversity impacts at every step. In turn, this means that a proportionate approach (see clause 5.5[i]) can be taken, potentially reducing the number of surveys required. If these measures to minimise the impacts on biodiversity are further developed through the use of an ECOP then those assessing a planning application can understand clearly

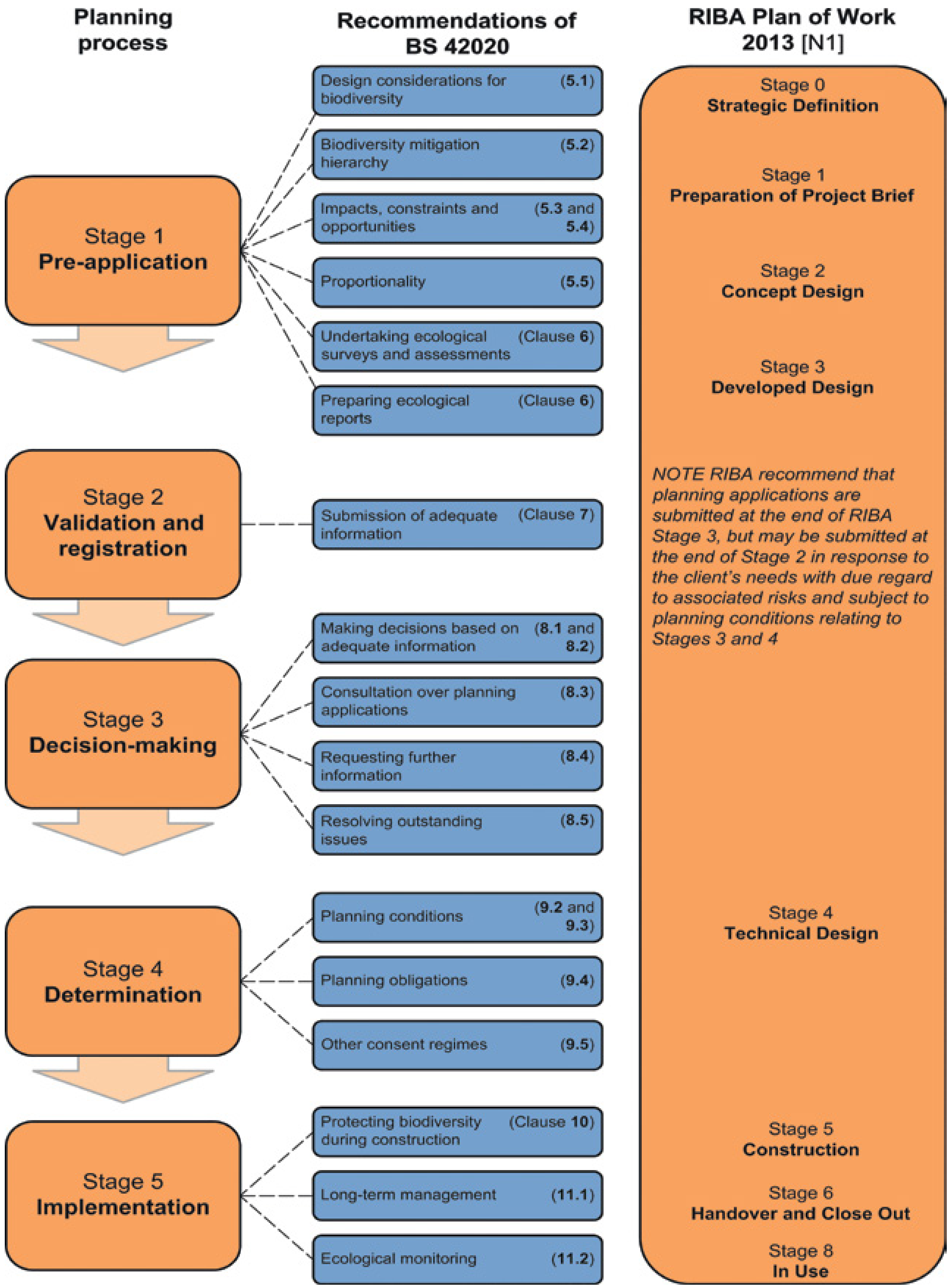

Figure 1. Taken from British Standards Institution (2013). *BS 42020:2013 Biodiversity – Code of practice for planning and development.* British Standards Institution, London.

how the proposed design for a planning application and the likely impacts on biodiversity have been balanced. Overall, incorporating ecology into the design from the outset rather than retrofitting it will save time and be more efficient.

Innovation

BS42020 highlights that over-reliance on written guidance and standing advice may not be appropriate for every situation (clause 6.3.7[i]). Innovative techniques should always be considered. Combine this flexibility with clause 9.2.4[i], which sets out exceptional circumstances when surveys may be conditioned, and you can really see the potential to develop innovative ideas to establish adequate information for decision-makers to be able to determine planning permission. For instance, clause 9.2.4 (c)[i] advises that further surveys may (in exceptional circumstances) be conditioned if *they will make no material difference to the information provided to the decision-maker but are still required to obtain a European Protected Species (EPS) licence*. Therefore, within the parameters set out in 9.2.4[i], by using innovative or alternative approaches there may be an opportunity for decision-makers to consider that a planning application can be submitted with further surveys completed through the use of a planning condition.

Promoting biodiversity

As ecologists, we should find opportunities to promote and enhance biodiversity, especially given the importance of *'no net loss'* in the National Planning Policy Framework. Throughout the pre-application (Stage 1) of the planning process, BS42020 recognises the importance of incorporating biodiversity enhancements through the mitigation hierarchy (see clause 5.2.2[i]), the application of an ECOP (see clause 5.4.2[i]), consultation (see clause 6.1[i]) and report writing (see clause 6.3.3[i]). BS42020 also points out that the best way to achieve certainty that enhancements will actually be undertaken is through the use of specific language (see clause 6.6.2[i]). Words such as "may", "might" and "could" used inappropriately can leave uncertainty over commitment and delivery and lead to negative outcomes for biodiversity; whereas words such as "will" and "must" help to establish a clear and unambiguous course of action, giving confidence to the decision-maker that the applicant is committed to recommended actions.

As we can see, the application of BS42020 in these three key areas can be positive for the ecologist. However, there are two recommendations within the document where practice and/or reality have not yet caught up with the aspirational thrust of the standard. Firstly, although the ecologist is required to provide a clear statement of biodiversity net loss and gain (see clause 6.5[i]), the tool identified in BS42020 for aiding in this process unfortunately leads to a blank page on the Biodiversity Planning Toolkit website at present (http://www.biodiversityplanningtoolkit.com). Work on this tool is in progress but it is not yet available. Secondly, there is a recommendation that there should be adequate consultation with the decision-maker at pre-application stage. However, with planning authorities struggling with workloads *and* with only a third of English Local Planning Authorities (LPAs) employing an in-house ecologist, it is clear that this part of the process is critically under-resourced (CIEEM Professional Standards Committee 2016).

Section 2 – guidance for the decision-maker / Local Planning Authority

Stage 3 of the planning process (Decision-making) effectively mirrors that of Stage 1. Where an ecologist has followed the recommendations in BS42020 and stated this in their report and pre-application communication with the decision-maker, the latter will have confidence that a proportionate outcome has been achieved and can then set appropriate planning conditions and/or obligations (see clause 8.1[i]). However, if the decision-maker does not have confidence in the information provided, they should be prepared to request further information (see clause 8.4[i]) as long as it's appropriate and proportionate. This may include the raw data upon which a report has been based, such as data from the Local Records Centre (LRC) (see clause 6.4.2[i]). Ecologists do not necessarily have to include all the raw data in their initial report but their main findings and conclusions should be backed up by appropriate references.

Once a decision-maker is satisfied with the information, BS42020 highlights two points that should be agreed with the applicant (see clause 8.5.2[i]): the net loss and gains for biodiversity and the necessary planning conditions and/or obligations. In my personal experience, many schemes receive planning permission with a series of conditions that have not been prepared in agreement with the applicant. Often, conditions must be discharged pre-development and/or will require long-term monitoring but if these are not specified effectively they can easily be overlooked or can simply be undeliverable. This reflects poorly both on the planning process and the applicant. In this context, Annex D[i] is a particularly useful reference for decision-makers. It provides a set of model conditions that both applicant and local authority can use to identify appropriate means by which to secure the necessary mitigation and enhancement measures that will deliver the outcomes for biodiversity identified in the Ecological Impact Assessment (EcIA).

BS42020 also provides guidance to decision-makers on how to advise on consents such as a European Protected Species (EPS) licence (see clause 8.5.3[i]). Importantly, it also considers where appropriate conditions can be applied in order to avoid the need for such other consents with, instead, the delivery undertaken using a method statement (see clause 8.5.4[i]). Again, drawing upon the principle of avoidance, this approach can save time and money and, above all, eliminate unnecessary impacts on biodiversity, which potentially might result from the application of an inappropriate EPS licence.

BS42020 also considers how to apply conditions during Stages 4 (Determination) and 5 (Implementation) to secure biodiversity gains through planning obligations such as biodiversity offsetting and financial provisions (see clause 9.4.3[i]). There are also helpful specifications for preparing and implementing Construction Environmental Management Plans (CEMPs) (see clause 10.2[i]) and for identifying the responsibilities of an Ecological Clerk of Work (ECoW) (see clause 10.8[i]).

Monitoring

BS42020 recognises that one of the key challenges for the decision-maker is the lack of a comprehensive method for calculating the overall effect of development on biodiversity and the scale of losses or gains (see clause 11.2.3[i]). BS42020 recommends that the decision-maker should collate all monitoring data which can be used to establish the extent to which planning and development contribute towards the EU and UK national targets to halt the loss of biodiversity by 2020 (see clause 11.2.4.3[i]). Unfortunately, although this is clearly a very good concept, the necessary tools and structure are still some way off and, arguably, the industry needs to come together to address this particular point.

Conclusion

In support of the new guidance for ecology professionals (CIEEM 2016), BS42020 provides a structure that brings together useful recommendations and encourages good practice in taking account of biodiversity through the planning process. This includes taking a systematic approach, enabling innovation and promoting biodiversity enhancement as well as providing definitions of key words. In effect, it sets the ‘height of the bar’ and should gradually help level the playing field, where those currently working ‘under’ the bar will have to raise their game. The design of BS42020 is such that it acts like a manual, which the reader can dip into at the appropriate point to find the guidance they require.

If the relevant professionals from applicant to ecologist to planning officer all follow the code of practice outlined in BS42020, all those involved can be confident that a proportionate approach is being taken in respect of biodiversity. However, this could be a challenge where there is a shortage of Local Authority ecologists able to provide consultation at the pre-application stage, and indeed to enforce compliance with planning conditions (although the presence on-site of an ECoW offers an effective means of influencing compliance), and in the worst case to refer potential criminal offences to the police.

There are other challenges for the industry, perhaps most notably the lack of mechanisms for recording and sharing data, both in terms of determining net loss and gain, and providing Local Records Centres with a clear set of biological records (Smith *et al*. 2016). This issue has been explored by CIEEM’s Professional Standards Committee and their findings were reported in the March 2016 issue of *In Practice* (Hayns and Hall 2016). The committee concluded that the Conservation Evidence tool aligns best to members’ needs (see Ockendon and Sutherland 2016, www.conservationevidence.com) in terms of sharing evidence that will help to deliver benefits to biodiversity through development projects. There may still be a specific need for standard templates which the industry as a whole can use so that data processed at the point of collection in the field can be taken all the way through to determination of a planning application and finally to the Local Records Centre.

In my opinion, a great strength of BS42020 lies in the encouragement to be innovative to promote the best outcomes for biodiversity. By addressing each planning application on a specific case-by-case basis, and taking all the ecological features of a site into account rather than just applying generic guidance, different options can be considered for the avoidance or mitigation of impacts on biodiversity. As long as new survey techniques or alternative methods of collecting evidence are based on sound science then innovation is welcome.

In conclusion, BS42020 is the first document that explains the whole planning process in relation to ecology. By using it like a manual, the different stages of the planning process can be more effective and collaborative for ecologists and Local Planning Authorities alike.

Acknowledgements

Mike Oxford, David Hill, Brandon Murray, Jodie Twose, Peter Hancocks, James Packer, Chris Foster-Brown, Rob Nicholson, Sam Lowe and Darcy Simpson.

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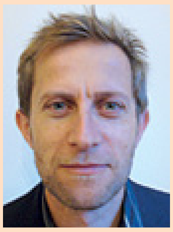
About the Author



James Simpson is a Principal Ecology Consultant at ADAS. He is an all-round ecologist with a keen interest in botany and the development of eDNA. Previously, he managed a SSSI where innovation was often a key component to deliver positive biodiversity outcomes with limited resources.

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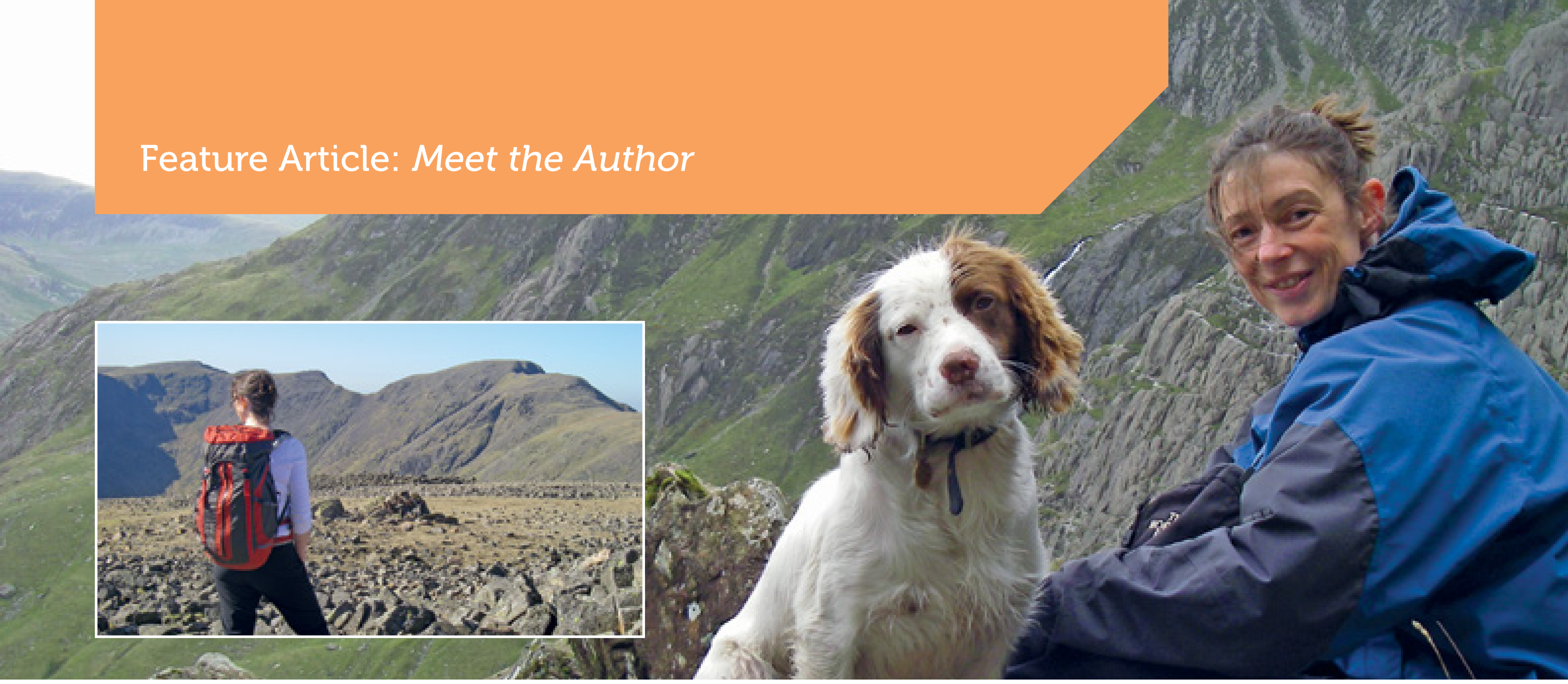

Meet the Author – Sacha Rogers

What do you do?

I am the Managing Director of Penny Anderson Associates Ltd, which entails combining consultancy work with running a business. I am a long-serving member of CIEEM's Membership Admissions Committee. On a personal level, I act as Treasurer for my local rowing club. Aside from rowing, I am a keen runner and mountaineer (accompanied by my two loyal spaniels).

What or who first inspired you to make a career in ecology or environmental management?

I grew up, during the 1970s, on Romney Marsh, Kent, where I spent time exploring farmland and nature, and knew the names of all the plants and butterflies we found on countryside walks. The natural environment has been in my blood for a long time and a career in nature conservation was always the logical choice.

How did you get to where you are today?

After my degree in Rural Environment Studies at Wye College, I took every job going – chambermaid, tomato grower, farm shop assistant, selling ice creams – so that I could support myself whilst working voluntarily within the environmental field. Whilst volunteering with the Kentish Stour Countryside Project I was offered my first job as a Biodiversity Officer with the then National Rivers Authority (now the Environment Agency). I spent eight years in this role before moving into consultancy work and I became Managing Director of Penny Anderson Associates Ltd in 2013.

What have been the most important steps along the way?

For me, the most important steps were using my volunteering experience to make contact with professionals and to begin developing a network of contacts, grabbing every opportunity that came along to work hard and shine and, eventually, to take on greater levels of responsibility. I work on the basis that you do not just do the job you are getting paid to do, but you also do the job that is one level above that too.

Are there any 'must-have' qualifications and/or experience?

Not only does a career in consultancy require great field skills, it also requires a blend of expert technical knowledge, superb people skills and a healthy dose of pragmatism – so it is really important to work on these areas too.

Do you have any advice for someone setting out on a career in ecology and environmental management?

It is a challenging time to enter the profession, with funding pressures on the public sector and intense competition in the consultancy world. That said, there are some great jobs out there. Be pro-active, keen and enthusiastic, and this will get you noticed.

What's the best thing about your job?

I love the fact that it is not a typical nine to five job. Every day is different and I get to work with great people. It is a privilege to be engaged in some of the most pressing debates of our time – adapting to climate change, flood management and sustainable food production to name a few.

What's the downside?

It is not recommended if you aspire to a high-maintenance lifestyle or early retirement. The pressures of a highly seasonal workload can be tough too.

What's next for you?

By the time this piece goes to press, I hope to own my own small corner of England – a little smallholding where I can put into practice the advice I give my clients. We have lots of plans to encourage wild birds, create wildflower-rich limestone grassland and improve our soil carbon content, alongside growing food and rearing livestock.

What is your top tip for success?

Work hard and embrace new challenges and experiences. Don't be afraid to put yourself forward – be the one who volunteers for everything. Through the consultancy's graduate intake scheme, I see lots of fresh graduates each year but the ones that really stand out are those who are willing to give anything a try, and are willing to get stuck in.

For further information

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The Raising Standards Survey

Sally Hayns CEcol MCIEEM
CEO, CIEEM

The December 2015 issue of *In Practice* included a summary report on the findings of the Raising Standards project which was launched in 2012. Following the article in *In Practice* we ran a members' survey to gauge opinion on current standards of practice within the profession.

Less than 10% of respondents felt that practice standards have definitely improved over the past 3 years. A further 50% felt that standards are improving but that there are still areas of concern that need to be addressed. The remaining respondents felt that standards had stayed the same (20%) or declined (16%).

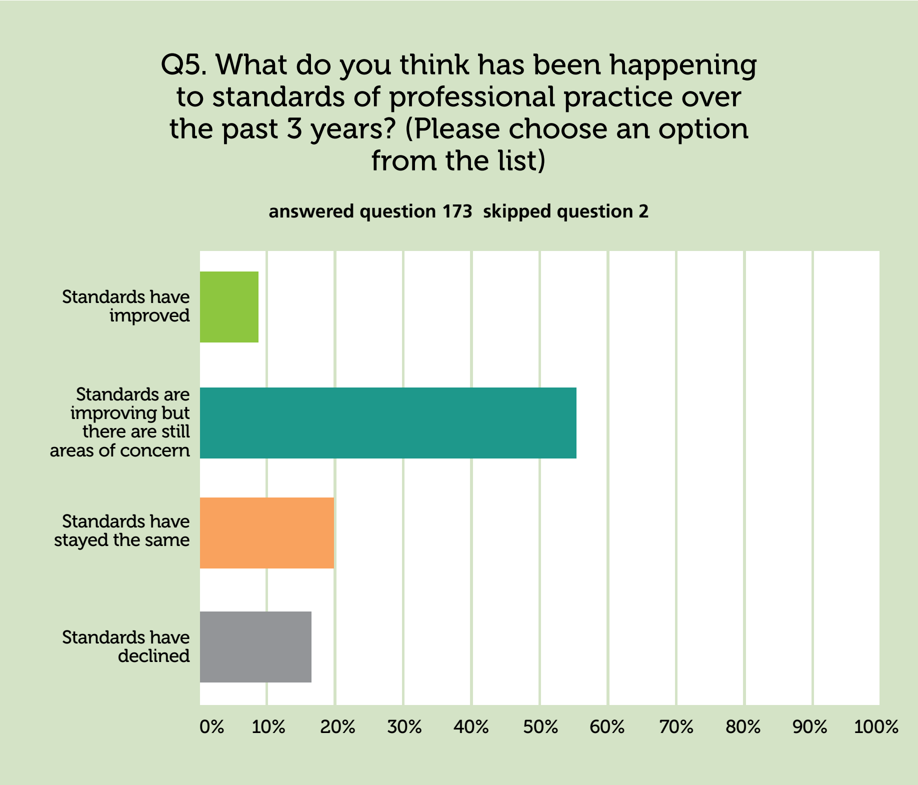
Those who felt that standards had definitely improved attributed this, in order of impact, to new guidance, CIEEM, increased scrutiny by competent authorities and high expectations of clients.

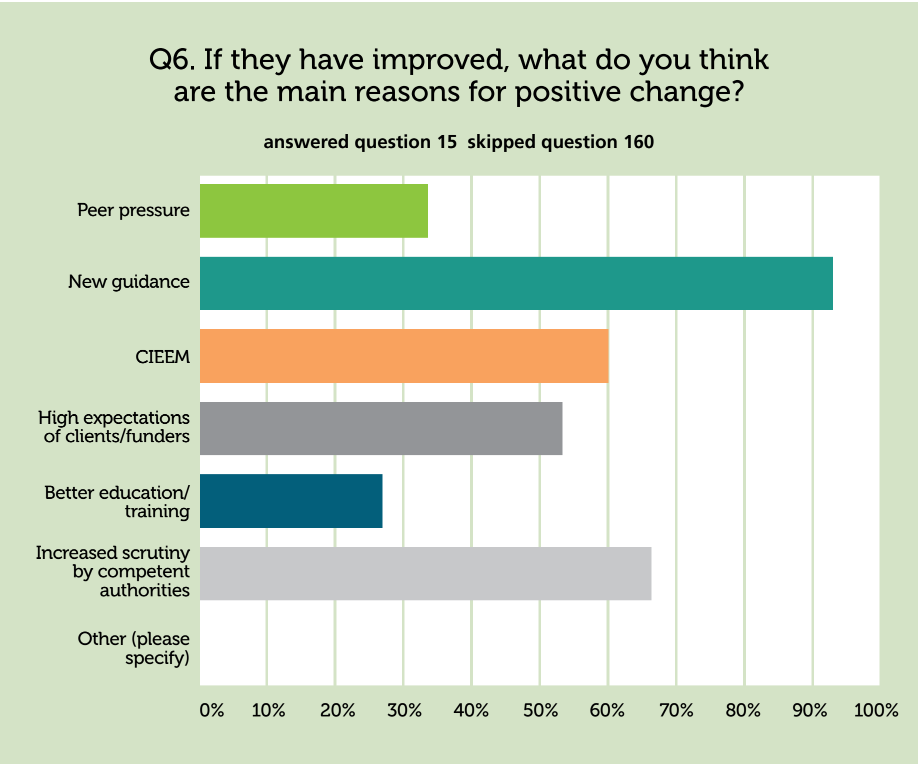
In terms of CIEEM's positive impact on standards, the 'top 6' activities that respondents felt had contributed to this were:

- the publication of guidance;
- provision of new training courses;
- articles in *In Practice*;
- the implementation of the disciplinary process;
- the introduction of the Competency Framework; and
- changes to membership eligibility criteria.

If we turn to areas of concern, we see some familiar problems. Again in order of respondents' views the 'top 5' problems are:

- a lack of experience relative to the work being undertaken (i.e. people working outside their competence);
- poor ecological report writing;
- poor understanding of species/ habitat ecology;
- inappropriate interpretation of guidance/ poor use of professional judgement; and
- poor field survey, species identification and/or habitat management skills.





Suggestion	Comment
Undertake checks/audits of members' work	How? By whom? Who would pay for the resources required? What about non-members? PSC will be discussing this further following comment from the Advisory Forum.
Produce more guidance/ support others to produce more guidance	We are involved in producing/updating guidance but this is resource-intensive and relies heavily on volunteer input. How do we get more people with the right expertise involved? How do we cover the costs?
Provide more training/ more accessible training/ cheaper training	The number of training course has doubled over the last 5 years and a greater emphasis has been placed on improving the geographical distribution of courses to make them more accessible. Costs of training are dependent on trainers' fees and they do have to make a living which reflects the effort involved in preparing and running the training course. We will be exploring e-learning as a way of making training more accessible and cheaper.
Make membership eligibility competence-based/have exams	Membership eligibility is now competence-based. Written exams would be impractical given the breadth of roles that members work in but oral exams are a feature of the Chartered Environmentalist and Chartered Ecologist assessment process. Also, this would not help with current members as it would be difficult to apply retrospectively.
Introduce a competency framework	We have one!
Provide more training for local authority planners	We do provide some courses aimed at planners but they are difficult to reach in terms of promoting the courses. Can members help?
Facilitate better sharing of evidence of what survey and mitigation works and what does not	PSC is looking at ways of doing this – see the March 2016 issue of *In Practice*.
Require or incentivise members to undertake refresher training	We would be interested in members' views on this and are consulting the Advisory Forum.
Introduce a mentoring programme	We would like to do this when we have the financial resources to do so (to cover training for mentors and mentees and the facilitation role).
Introduce accreditation for companies	The Advisory Forum are looking at this but it raises lots of issues that would need to be addressed including how companies would be assessed/audited, and how would accreditation influence competent authorities' attitudes and client's choices of who to work with.
Make training compulsory	This could only work for specific roles/accreditation. Again the attitude of competent authorities/clients is key.

So how do we address this as a profession? This is a question that is occupying the members of the Professional Standards Committee (PSC). Respondents to the survey were asked to identify one thing that they felt would make a difference in raising standards. The most popular suggestions, together with a response, are shown in this table.

So there are plenty of suggestions for PSC and the Advisory Forum to consider. But we would be pleased to hear other members' views and have set up a LinkedIn discussion thread for this purpose (https://www.linkedin.com/groups/4306428).

Thank you to all those who contributed to the survey for your thoughtful and helpful responses.

About the Author

Sally is CIEEM's Chief Executive Officer. She has been in post since 2010.

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A Revised *Code of Professional Conduct*

Find out more at: www.cieem.net/professional-conduct

At the beginning of June we introduced a new *Code of Professional Conduct* for members, together with some smaller changes to the Disciplinary Procedures.

The *Code of Professional Conduct* is an important means by which the Institute can serve the public interest. Adherence to the Code is an obligation of members and the disciplinary process provides the public with confidence that those members who do not work to the professional standards described in the Code can be recognised and dealt with appropriately.

Whilst we are proud of the fairness and robustness of our Code and Disciplinary Procedures, there is always room for improvement so the Professional Standards Committee (PSC), which has oversight of the Code and the Disciplinary Procedures on behalf of the Governing Board, keeps them under review and benchmarks them against current good practice. Accordingly, in September 2015 PSC set up a Working Group of current PSC and Disciplinary Pool members to undertake the review process.

Changes to the *Code of Professional Conduct*

The Working Group used, as its reference points, issues identified by Subjects and Complainants, Disciplinary Pool members and PSC members over the last two and a half years since the most recent versions of the Code and Disciplinary Procedures were published. They also analysed which clauses of the Code have been referenced as part of disciplinary investigations to look for duplication or unnecessary inclusion and they looked at the codes of several other professional bodies including the Landscape Institute (LI), Royal Institution of Chartered Surveyors (RICS), Chartered Institution of Water and Environmental Management (CIWEM), Royal Town Planning Institute (RTPI) and the Institution of Chemical Engineers (IChemE) in order to benchmark our approach. Finally, the proposed changes went out to consultation with all members of PSC, the Disciplinary Pool and CIEEM Fellows.

The principal changes to the Code, now approved by the Governing Board, are that:

- it is more concise;
- it is more obvious which part of the document is 'the Code';
- we have introduced supplementary notes to provide more clarity with the interpretation of each of the clauses; and
- we have removed duplication in the content of some clauses.

The revised Code came into effect on 1 June 2016. For the purposes of any current ongoing disciplinary inquiries, the previous version of the Code, current up until 31 May 2016 will still be used. For any complaints received on or after 1 June 2016 the new version of the Code applies. However a member may not be found in breach of the Code if a complaint refers to a past event or piece of work (i.e. one that took place before 1 June 2016) where it can be shown that the alleged breach would not have been a breach under the version of the Code applying at the time.

Disciplinary Procedures

The Working Group concluded, and the consultees agreed, that there were only minor changes required to the Disciplinary Procedures. These included:

- providing more clarity on the timescales for making a complaint, why a complaint may not be referred to a Disciplinary Board and the Appeals Process; and
- emphasising the importance of respecting confidentiality throughout the process.

Members often raise the issue of not being able to make complaints anonymously. Whilst, in exceptional circumstances, PSC may allow a complainant to be anonymous up until it is determined whether the complaint should be referred to a Disciplinary Board (i.e. the non-judicial part of the process) it is not possible to allow a complainant to be anonymous throughout the whole process. This is because the law requires any judicial process to be transparent and fair and it is a fundamental principle of fairness that the 'accused' knows what they have been accused of and by whom in order to properly prepare their defence. Similarly, CIEEM is not able to proactively look for potential breaches of the Code based on 'tip offs' because CIEEM cannot be both the complainant and the judge in the same process.

Disciplinary Inquiries Publications Policy

The Institute has a responsibility to publish the outcomes of disciplinary inquiries where a member has been found to be in breach of the Code. This is because the implementation of the Code, and therefore inquiries into alleged breaches of the Code, is undertaken in the public interest and to provide reassurance to the public regarding the standards to which CIEEM members can be expected to work. Not to publish the outcome of complaints which have been upheld would be regarded as not acting in the public interest and 'sweeping matters under the carpet'. Publication can take the form of announcements in *In Practice* and on the CIEEM website, notification to employers, to statutory agencies and planning authorities, and to other organisations where relevant. The decision on how to publish is made by the Disciplinary Board at the conclusion of a case and notified to all parties.

Both of the revised documents, together with the Disciplinary Inquiries Publications Policy, are available on the website and members are reminded that it is their responsibility to make sure that they have read copies of the most up-to-date versions and that they are fully aware of the obligations of the Code. PSC is always happy to receive feedback on any aspect of the complaints process.

Disciplinary Matters

End of Year Complaints Report 2015-2016

Each year we publish a short report on the number of types and complaints received. Table 1 compares the number of cases investigated by the Institute over the past two years and the outcomes for them. Complaints are reported in the year they were confirmed by the Secretariat as within the jurisdiction of CIEEM to consider. The Preliminary Investigation Panel, drawn from members of the Professional Standards Committee (PSC), establishes whether there is sufficient evidence to support an allegation of a breach of the *Code of Professional Conduct* to justify further inquiry by a Disciplinary Board. The Disciplinary Board establishes whether any breach of the Code has occurred and, if so, what sanction is appropriate, in line with CIEEM's Disciplinary Procedures. Where alleged instances of mis-use of post-nominals are drawn to our attention we contact people for an explanation as to how this has happened. Their response is then referred to the Chair of PSC who provides direction on the appropriate action required to conclude the case.

Table 1

Complaint Assessment Outcomes	1 April 2014 – 31 March 2015	1 April 2015 – 31 March 2016
Preliminary Investigation		
Complaint not eligible or no evidence supplied	**4**	**4**
Referred to Trading Standards, and letter copied to the Police, CEO and Chief Planner relevant planning authority relevant SNCO	**0**	**0**
Letter of explanation regarding mis-use of post-nominals accepted by PSC and advice given (to members and non-members)	**15**	**4**
Letter of explanation accepted by PSC regarding inaccurate text on website and advice given (to members and non-members)	**1**	**2**
Preliminary Investigation Panel found no case to answer and case not referred for further inquiry (members only)	**7**	**4**
Disciplinary Board Inquiry (Sanction applied)		
Case not upheld	**0**	**6**
Case upheld (Reprimand)	**3**	**0**
Case upheld (Reprimand with advice)	**5**	**3**
Case upheld (Reprimand with conditions)	**4**	**1**
Expulsion	**0**	**0**
Cases Still Undergoing Assessment	**0**	**2**
Total Number Cases Validated	**35**	**22**
Leave to appeal against Disciplinary Board decision sought	**2**	**3**
Appeals against Disciplinary Board decision upheld	**0**	**0**

At first glance the figures above suggest a sharp fall in complaints received: 35 cases in 2014-15 and 22 cases in 2015-16. However when complaints relating to alleged misuse of post-nominals and the annual CPD audit are excluded then the figures for other types of complaint are remarkably similar. In both 2014-15 and 2015-16 the Institute received four complaints from members and nine complaints from non-members. It is also noteworthy that in 2014-15 all complaints that were referred to a Disciplinary Board were subsequently upheld whereas in 2015-16 this was only true for 50% of cases referred. This was probably because there were some cases that were considered by the Preliminary Investigation Panel (PIP) to be 'borderline' but, without appropriate precedent, they had to be referred to a Disciplinary Board for a judgement. Anonymised case summaries are circulated to all members of PSC and the Disciplinary Pool in order to share any lessons learnt and to support consistency in approach from all those involved in disciplinary inquiries.

Table 2 captures the main focus of each complaint received during the last two years. The majority of inquiries (60%) have been into complaints relating to survey and reporting. The article in the March 2016 edition of *In Practice* entitled 'The Alternative Decalogue for CIEEM Members' highlighted specific areas of poor practice for members to avoid – with the need to write clear reports listed as number one. In 2014-15 five complaints about bat surveys were lodged but dismissed after the Preliminary Investigation Stage as having no case to answer. It is hoped that the two documents recently published by PSC – *What to Expect From A Bat Survey: A Guide for UK Homeowners* and *A Householders Guide to Engaging An Ecologist* – will help prevent such complaints being lodged in the first place.

Table 2

	Year	Main Focus of Complaint						
		Data search issues	Land Access	Non return of CPD as part of the annual CPD Audit	Survey and Reporting	Reviewing/ signing off work of insufficient quality	Unprofessional Conduct	Working outside sphere of competence
Preliminary Investigation								
Preliminary Investigation Panel found no case to answer and case not referred for further inquiry (to members only)	**2014-15**	**0**	**0**	**0**	**7**	**0**	**0**	**0**
	2015-16	**0**	**0**	**0**	**4**	**0**	**0**	**0**
Disciplinary Board Inquiry (and sanction)								
Case not upheld	**2014-15**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	2015-16	**2**	**0**	**1**	**3**	**0**	**0**	**0**
Case upheld (Reprimand)	**2014-15**	**0**	**0**	**3**	**0**	**0**	**0**	**0**
	2015-16	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Case upheld (Reprimand with advice)	**2014-15**	**0**	**0**	**0**	**2**	**1**	**1**	**1**
	2015-16	**0**	**1**	**0**	**2**	**0**	**0**	**0**
Case upheld (Reprimand with condition(s))	**2014-15**	**0**	**0**	**2**	**2**	**0**	**0**	**0**
	2015-16	**0**	**0**	**1**	**0**	**0**	**0**	**0**
Total Number of Complaints		**2**	**1**	**7**	**20**	**1**	**1**	**1**

25 Years On: A View from the Vice Presidents

Introduction

This year CIEEM celebrates its 25th anniversary. We asked each of the four Vice Presidents to give an overview of CIEEM in each country and what progress has been made.

England

I joined IEEM as a founder member whilst working as a local authority ecologist. Since then there have been many changes in our profession; some good and others less so! Throughout it all the Institute, to me, has remained a constant; necessarily changing over the years in response to external drivers and internal pressures, but always there in support of its members and the profession.

In 25 years, ecological representation (and therefore members) in the public and NGO sectors has decreased, countered by an increase in private practice. Seemingly particularly prevalent in England, this shift sadly reflects, in my view, a decline in the value that local and national Government places on the environment; further demonstrated by changes imposed on England's environmental advisory bodies. The UK-wide, scientifically respected Nature Conservancy Council, whose title described its purpose exactly, was dismantled in 1991 and later incarnations in England have never commanded NCC's sense of purpose nor been allowed to consolidate its robust scientific foundations. Both Natural England and the Environment Agency (and therefore their grant-aid budgets) have been subject to severe and ongoing funding cuts.

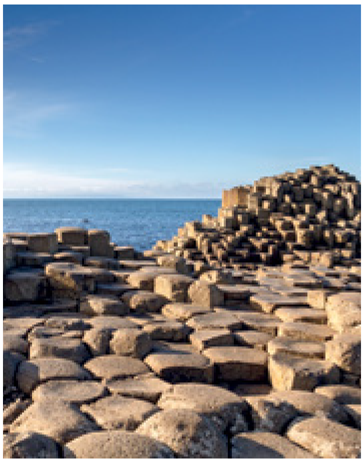
Given this climate, we need CIEEM more than ever, to support ecologists during a time of uncertainty and to oversee and maintain professional standards that are otherwise in danger of being eroded due to reduced scrutiny by regulatory authorities. CIEEM works hard to meet these needs in many ways, including active engagement in dialogue with Natural England, Defra and other policy-makers; taking an active role in producing and influencing guidance, and providing robust responses to significant consultations and national policy changes; tackling areas of concern such as professional standards; delivering a diverse, challenging and interesting programme of training and conferences; providing members with opportunities for networking and exchange of ideas; consulting members on matters of importance and using the results to guide policy and practice; and taking a reasoned but robust lead on Brexit, potentially one of the biggest threats to our environment in many years.

In terms of professional representation and support, in England and elsewhere, we are clearly much better off than we were in 1991; but the need may be greater than it ever was!

Lisa Kerslake CEcol FCIEEM
Vice President (England)

Ireland

Ireland is uniquely placed as a Geographic Section in that it straddles two jurisdictions – Northern Ireland (NI) and the Republic of Ireland (RoI). The Shadow Section was set up in 2005 and was formally constituted in 2006, so as well as being CIEEM's 25th Anniversary, 2016 is the Irish Section's 10th anniversary. The all-island geography of the section is reflected in the makeup of the Committee which has members from all parts; with recently elected Convenor, Paul Lynas, being the first NI member to hold this position.



Whilst relatively slow initially with some 60 members by 2005/2006, membership growth continues steadily across the island, increasingly so since the appointment of the first Irish Section Support Officer (SSO) in 2013. This has had a positive influence on the Section and CIEEM's profile in Ireland. Our current SSO, Kate Flood, energises and supports the Committee. By early 2016, membership numbers had risen to over 220, with a NI:RoI ratio of approximately 1:3.

The Section continues to have a key role inputting to CIEEM's professional and technical guidance documentation to make it equally relevant in Ireland, including for example, the recently revised EcIA Guidelines. CIEEM's support to members gives a sense of credibility and confidence when dealing with those who are less (or not at all) familiar with the importance/relevance of ecology in relation to plans and projects. CIEEM's technical guidance series, *In Practice*, training courses and conferences assist members, particularly those who work in both jurisdictions and require training to be able to do this. Indeed CIEEM is recognised in Ireland as providing high calibre workshops and training courses; and organising well attended conferences in both jurisdictions, with conferences being regularly attended by staff from statutory bodies including Northern Ireland Environment Agency, National Parks and Wildlife Service, Environmental Protection Agency, and Local Authorities. Events provide vital networking opportunities for members – particularly appreciated by the many members who work as sole traders.

Across Ireland, CIEEM members are well known to state and semi-state agency staff, and perceived as having high professional standards. Over the last decade, especially in consultancy practice, CIEEM membership has become the benchmark for well qualified and experienced professionals – understood by private and public sectors alike – with many contracts now requiring at least one CIEEM member on a team. Similarly in recruitment, membership is increasingly seen as a requirement.

CIEEM's reputation in Ireland is enhanced by its participation in partnerships. For example, it has a representative on the Irish Forum for Natural Capital research working group, and is a committed partner on the All-Ireland Pollinator Plan. The Section is involved with the new Irish Ecological Association (IEA), a British Ecological Society (BES) Special Interest Group. CIEEM took part in the original scoping meeting, attended by BES President and staff in 2015; and organised follow up meetings with key IEA personnel. Joint activities are planned.

CIEEM sponsored the Biodiversity prize at Environ 2016, the annual Researcher's Colloquium, organised by the Environmental Science Association of Ireland (ESAI). It was won by Tara Dirilgen, School of Biology and Environmental Science, University College Dublin, for her presentation 'What controls the abundance and diversity of soil animals? – a manipulation study using mesocosms in a controlled laboratory setting'.

CIEEM's public profile was boosted by an excellent article in *The Irish Times* on Saturday 2 April 2016 entitled 'Rise of techno-ecology a double-edged sword' (bit.ly/1M9vC1M) which followed on from the Section conference in February 2016.

CIEEM's influence and reputation has increased in recent years as the Irish Section has become more active in the area of policy. The Policy Review Group, established in 2014, has contributed to more than 11 public consultations in relation to key strategies, policies and plans governing biodiversity, habitat management and wildlife conservation in Ireland – North and South (http://www.cieem.net/ireland#Policy).

Jenny Neff
CEcol CEnv FCIEEM
Vice President (Ireland)

Scotland

Carol Crawford wrote 'A View From Scotland' for the 21st Anniversary edition of *In Practice*. Carol and I come from similar consultancy and CIEEM backgrounds, therefore I thought it would be interesting to provide a revised 'View From Scotland' on CIEEM's 25th Anniversary.

I was one of those volunteers in 1998 under David Jamieson and I gave a paper at the Scottish Section launch event entitled 'Enhancing the Status of Ecologists and Environmental Managers in Scotland', written by my then colleague Dr Kathy Ader CEnv MCIEEM, who had had a baby the week before. I talked about the growth of the profession in the 1980s and 1990s from the nature conservation sector, the requirement for consultancies to support the increasing workload of agency staff, and the ecological input into planning and development with the emergence of environmental assessment legislation and techniques. However, despite the need for independent professional ecologists and environmental managers they had poor status and remuneration compared to associated professions. In addition, many Local Government ecologists' jobs had disappeared with the organisation into unitary authorities. The net result was that either ecological issues were poorly addressed, or they were passed on to Scottish Natural Heritage (SNH), who did not have the resources to deal with day to day planning matters.

Since 1998 much has changed. The number of Local Government ecologists has probably increased, although there is not one in every authority, and SNH has reduced its input to planning matters by concentrating on designated sites and protected species. There is now another body to engage with, the Scottish Environment Protection Agency (SEPA), which was formed in 1996 and has been at the forefront in recent years with new guidance and initiatives, especially in the freshwater environment, which is my area of expertise. The need for highly qualified, independent ecological and environmental consultants has never been greater, and now they have Chartered status on a par with other professions. Professional standards have increased and consultants are valued in a development team.

The Scottish Section Committee has been instrumental in forging links with the Scottish Government and its agencies so that CIEEM can engage at all levels. It has also facilitated numerous training courses and events focussing on Scottish issues at Scottish locations, often out in the field. Representation of its members is key to an Institute's success and the grass roots work done in Scotland has raised CIEEM's profile enormously. The Scottish Government's focus in recent years has been more 'environmental', and First Minister Nicola Sturgeon said at the World Forum on Natural Capital in 2015 that *"Scotland's rich and diverse natural environment is a national asset which contributes hugely to our economy and to our wider sense of wellbeing"*. This demonstrates a greater awareness of environmental issues at a high level and CIEEM can capitalise on this by promoting its members' services, which provide a valuable contribution to protecting Scotland's natural environment.

Kathy Dale CEcol FCIEEM
Vice President (Scotland)

Wales

Our nation is an area of great natural diversity, a reflection of its geological, historical and ecological character, which from the 16th century has attracted a succession of natural historians who contributed to the understanding of our flora, fauna and underlying geological structure.

Today the majority of the population is concentrated in South Wales, much of this area being heavily influenced by past industrial legacy and its post-industrial recovery.

In contrast the West and North of the country is still predominately rural, relying on tourism, agriculture, and other land-based activity.

CIEEM established a Shadow Section in Wales following the November 2006 Autumn Conference in Cardiff. In 2012 the Section emerged from the shadows and held its first AGM. Since then we have held regular AGMs and Spring Seminars, covering topics as diverse as Major Road Schemes, Renewable Energy Development, Remote Sensing and IT application, and in April 2016, Environmental Issues in the Marine Environment. Field visits, providing opportunities for members to discuss and explore practical issues in the field have been held across Wales.

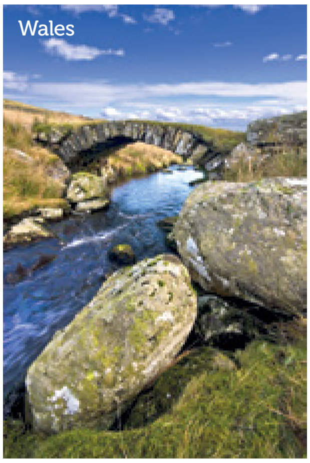
The distribution of our membership tends to have a South Wales dominance, though there are clusters in Mid and North Wales, associated with university, local government and statutory body office locations. The scattered nature of our local membership has actively encouraged us to use video and telephone conference facilities from the outset of the Section to reduce unnecessary travel to Committee meetings.

Since devolution in 1999, the Welsh Assembly and Government have enshrined the concept of 'sustainable development' in their overall planning policy strategy. With the recent passage of the Well-being and Future Generations Act, The Environment (Wales) Act and the forthcoming Planning Bill, this concept will become even more embedded in land-use planning in Wales.

We are in an interesting period in the Welsh environmental journey. The freedom of devolution has created the opportunity for real sustainable land-use planning, based on ecosystem service thinking. The challenge is to achieve this highly desirable outcome with adequate resources, both in terms of professionally qualified practitioners to advise and undertake the necessary work and with necessary finances to undertake and maintain the necessary changes in land management. This is a significant challenge in the current climate of public expenditure constraint. As ever there is a need for highly competent ecological practitioners to enable these important changes to occur.

This is hopefully where CIEEM Members can help!

Michael Willis CEcol MCIEEM
Vice President (Wales)



The Benefits of Aligning the Atkins and CIEEM Competency Frameworks

Kate Vincent MCIEEM
Senior Ecologist, Atkins

Introduction

In 2013, CIEEM established the Register of Chartered Ecologists. This Register recognises the effective application of knowledge and understanding of the science of ecology by professionals. The register was adopted to recognise those professionals who are committed to the highest standards of practice. The definition of a Chartered Ecologist is *"an active professional who uses their knowledge, experience and influence to promote and advance ecology as an applied discipline"*. As part of the chartership process, applicants are rigorously assessed to ensure that they are fully competent and confident practitioners. This is an essential part of the process but how do you define 'competent' and how do you know whether you have the required competencies in the relevant technical, commercial, and project management areas to begin with? To help our ecologists answer these questions Atkins has produced a framework based on survey, reporting and commercial competencies that provides a format for people to record their technical and non-technical experience against defined criteria. The framework also targets areas for training and development. This formalised framework ensures a structured and individually tailored approach based on consistent criteria, and empowers positive career development planning, particularly for junior ecologists.

What is Competence?

'Competence' is the ability to do something successfully or efficiently (definition taken from the Oxford English Dictionary). Competencies are the skill sets, related knowledge, and attributes that are required to perform certain activities well and which are critical to success in specific professional roles. Put simply, you are competent if you: know what to do; know how to do it; know when to do it; know why you do it; can do it consistently well; and know your limits and when to seek help and advice.

Prior to the introduction of a competency framework, Atkins ecology staff had guidance called 'What Every Ecologists Needs to Know'; this was linked to appraisals and promotion and provided information about what competencies were required to progress. However, it did not go into the finer detail of species specialisms and competencies that the newly adopted competency framework provides. Within Atkins, there are over 60 ecologists across multiple offices and we are committed to the ethos of high standards and creative thought. As a result, maintaining technical excellence and growing skills rigorously is extremely important to us. Technical excellence is at the heart of everything we do and our ecologists contribute to a culture of 'right first time' delivery excellence. Consequently, the Atkins ecology team identified the need to implement a structured staff development programme to ensure a baseline of technical knowledge within the team and a guide for how ecologists could develop in each specialism and a way of systematically recording experience. Through implementing a competency framework it allows clear, time-based targets for progression, enables the progression to be assessed, and facilitates future career development.

The Purpose of a Competency Framework

The purpose of CIEEM's Competency Framework is to: specify the levels of competence expected of members at different professional grades and thereby provide for a competence-based assessment of membership and Chartered Ecologist eligibility; support members in identifying their current and required levels of competence and to plan their continuing professional development in order to achieve these new levels; enable the identification of competence-based professional role profiles; and promote high standards of professional practice. The last point is key, as compared to more established professions such as civil engineering (whose professional institute is over 150 years old) the profession of ecology is still seen as a nascent industry as far as professional standards and practices are concerned. Through the implementation of a competency framework, it ensures we have consistent and high standards across Atkins staff and, more importantly, across a developing industry.

The Atkins ecology competency framework defines the knowledge and skills we expect of our ecologists working at different competency levels. It enables staff to identify competencies required for different levels of specialisation, such as becoming an authoritative ornithologist, and then to map their competencies against this framework for career development and progression.

The Atkins ecology competency framework is aligned with the terminology used in the CIEEM Competency Framework for consistency within the profession. It is also linked to the CIEEM competencies for species surveys guidance. Each 'specialism' within our framework has a set of criteria related to the levels of competency stated within the CIEEM Competency Framework (*basic, competent, accomplished* and *authoritative*), together with a logbook to record experience against the criteria. The criteria outline the knowledge and skills expected for ecologists to reach these levels. We have also gone beyond just including the skills for each species and included commercial competencies that are tailored to Atkins internal business systems, as well as reporting and assessment competencies. The competency criteria are written by a member of staff who is at an *'accomplished'* level (as a minimum) in that technical topic.

Benefits to Atkins Ecologists

Adoption of the Atkins ecology competency framework applies to all ecology staff and, through its implementation, staff can choose particular specialisms to develop to a higher competency level or may wish to obtain a broader experience in a number of specialisms at lower competency levels.

Once the trainee has identified which technical competency logbooks they wish to complete, they are assigned a 'mentor' who is responsible for checking the completion of logbooks and helping the person set specific training targets. The mentor is someone considered at least *'accomplished'* in the particular specialism. The trainee records and details appropriate experience such as the number of hours in the field or number of survey techniques used and demonstrates progression through the levels of competency required. A lead surveyor or mentor will validate a record within the logbook. For the trainee to progress past each level of competency, a member of staff recognised as *'accomplished'* or *'authoritative'* in that topic would need to complete a 'final sign off' of the logbook. This will usually require the mentor to have witnessed the trainee's competency in the field and held sessions to examine the trainee's knowledge. In order to demonstrate their own competency, mentors and other staff who have already attained a level of competency during their career produce an evidence of competency form, which is approved by two senior members of staff.

The Atkins ecology competency framework also feeds into the wider Atkins Graduate Academy. The Academy is designed to offer graduates a structured career development programme across all parts of Atkins' water and environment-related practices, not just ecology. Those enrolled onto the Academy are able to develop the skills they need to become professionally qualified. It works by offering three groups of development modules that have to be completed: discipline-specific individual modules, environment wide modules, and core business wide modules.

The discipline-specific options focus on the requirements for each technical discipline; for ecology this means completion of the technical competency logbooks. The environment wide modules cover project-based technical development within the wider discipline of the environment. For example, one such module is Environmental Impact Assessment, which gives our ecologists a good understanding of how their specialist work can be applied in the context of a wider environmental assessment. The core modules cover elements that lead to a much broader understanding of Atkins working practices and standards such as project finance, health and safety, and commercial awareness. Through enrolment into the Academy, an Atkins ecologist will become a technically competent ecologist who will gain chartership, as the CIEEM Competency Framework is at the heart of the individual's development. However, they will also have the added benefit of becoming a much more commercially and business aware ecologist.

The overall benefits to Atkins in implementing this competency framework approach are multifaceted. It ensures Atkins ecologists are being assessed to defined professional standards and there is a consistency across our team and with the wider ecology profession. It demonstrates that Atkins values their staff through offering them support and opportunity to help in their career progression, as well as being able to demonstrate high professional standards to our clients. From an individual career development perspective, this structured approach enables staff to identify their current levels of competence, objectively match their skills and knowledge, and determine what is required of them to progress. It inspires a targeted and self-guided user led plan, resulting in the individual taking ownership of their own career development, with a clear and transparent pathway to applying for chartership. Ultimately, it guarantees they easily know why and when they are eligible for promotion and qualify for Chartered Ecologist status. This can only be a positive and beneficial win-win for all parties in a bourgeoning but extremely competitive industry.

About the Author

Dr Kate Vincent is a Senior Ecologist at Atkins and has 16 years' experience as an ecologist in the academic, conservation and the private sectors. Kate acts as Atkins Competency Framework and Academy Co-ordinator within the Atkins Ecology team, both promoting and managing the implementation of the framework across the discipline. Kate would like to thank Katrena Stanhope, Associate Director at Atkins for comments on this article. Katrena was responsible for establishing the Atkins Competency Framework for ecology staff.

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New Bat Survey Guidelines

Matt Cook MCIEEM
Senior Ecologist, Baker Consultants Ltd

At the end of January 2016, a revision of the Bat Conservation Trust (BCT) *Bat Survey Guidelines* was issued. Following previous versions in 2007 and 2012, this is the third edition of this guidance, which aims to provide a good practice framework for designing and undertaking professional bat surveys, analysing the data collected and writing survey reports.

This article provides a chapter-by-chapter guide to the key messages from the 2016 edition and gives readers an overview of the main changes.

Chapter 1: Background

Who are these guidelines for?

They are now unequivocally for professional ecologists. Whilst they may be *useful* for developers, planners and those policy-makers responsible for reviewing and assessing the implications of professional bat surveys, BCT is clear that the guidelines are *not* directly intended for such other professions.

What is a bat survey?

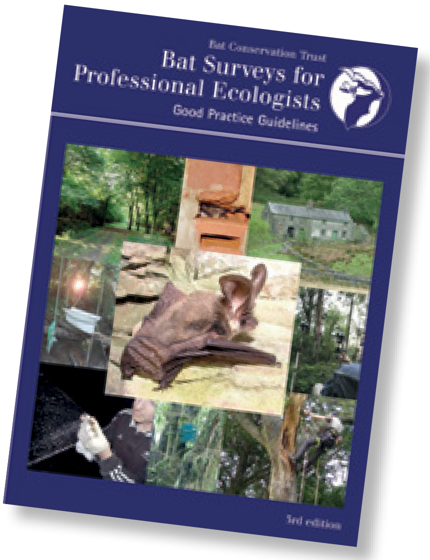
We should know the answer to this, but do we? A bat survey is defined by BCT as *"a sampling activity in which a wide range of variables are measured to describe a site or an area"*. The guidelines relate to professional bat surveys carried out to assess how proposed activities may impact bats. They do not provide recommendations for the survey effort required for monitoring, such as to quantify change or measure mitigation success, or for research purposes.

How should these guidelines be used?

They provide *descriptive* rather than *prescriptive* good practice guidance intended to raise professional standards and increase consistency. That means that they do not aim to either override or replace knowledge and experience and it is acknowledged that there may be departures from the recommendations. In these instances, the ecological rationale should be clearly documented, as well as the expertise of the person making any such judgment. We are also reminded that someone with no prior knowledge or experience of professional bat surveys should not expect to read this document and then be able to design, carry out, interpret the results of, or report on professional bat surveys competently.

Overall, BCT intends this guidance for use within the framework of *British Standard 42020: Biodiversity – Code of practice for planning and development* (British Standards Institution, 2013) and alongside the *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal* (CIEEM, 2016). Chapter 1 also provides important information on the legislative and planning policy contexts regarding bats and bat surveys, as well as on licensing.

Note that this document is not intended to replace the English Nature *Bat Mitigation Guidelines* (Mitchell-Jones, 2004) or the *Bat Workers Manual*, 3rd Edition (Mitchell-Jones and McLeish, 2004).



Chapter 2: Considerations for bat surveys

Bat surveys should only be undertaken where there are possible impacts upon bats and their habitats. This seems obvious but BCT reminds us that unwarranted, speculative surveys are costly and cause reputational damage to the ecological profession. Ultimately, this could also undermine conservation efforts for these protected species.

Proportionality and good survey design are therefore important principles underpinning this chapter. Where bat surveys are required, they should be carefully tailored to address the likely impacts of

Brandt's Bat

Lesser Horseshoe Bat © John Black

the proposed activity, which will vary between different projects. As such, early engagement with a bat ecologist is strongly recommended for all projects where bats may be a consideration, and potentially also with the Local Planning Authority or licensing body. The aims and objectives of a suite of bat surveys should be established at the outset, but there should always be scope for change, as one stage of surveys informs the next. The final report should demonstrate this iterative process and how aims and objectives have been met. Where bats are present on a project, the overall aims and objectives should be to use robust survey results to devise an appropriate strategy for bats based on the standard mitigation hierarchy (i.e. impacts should be avoided in the first instance but, where they cannot be avoided, they should be adequately mitigated or, as a last resort, compensated for).

Chapter 2 also includes recommendations on taking into account survey limitations, such as those relating to sub-optimal weather, old survey data, and access restrictions. Of course, ideally, such survey limitations are avoided. BCT therefore recommends that bat surveys should be undertaken in weather that is conducive for bat activity: temperatures at 10˚C or above at dusk and with no strong winds or rain. This is particularly pertinent on a single survey visit. For survey data, BCT recommends that planning or licence applications are ideally submitted on data from the last survey season. Where older survey data must be used, its validity should be assessed on a case-by-case basis. Overall, BCT recommends that any survey limitations should be documented. Note that a lack of appropriate equipment is not a reasonable survey limitation.

The remaining sections of this chapter cover human resources for bat surveys, such as surveyor competencies and equipment requirements. They also introduce pertinent considerations regarding data collection, survey timings, risks and hazards associated with bat work. These are covered in more depth in later chapters and the appendices.

Chapter 3. Ecological considerations for bat surveys

Rather than being distributed across several chapters as in the second edition, a single chapter now covers ecological considerations for bat surveys. This includes essential information on species' ecology including their roosting preferences, and also references the roost types used by Natural England for licensing purposes. Importantly, there remains a section on species-specific considerations for Annex II and quiet-echolocating bats, which are difficult to survey for. Primarily, this recommends the careful deployment of full-spectrum bat detectors, advanced bat survey techniques and/or night-vision and infrared cameras for these species.

Chapter 3 now also includes information on BCT's Core Sustenance Zones (CSZs). CSZs use existing research, such as from radio-tracking studies, to identify *"the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roost"* (i.e. where proposed development could have potentially adverse impacts on this colony or roost including upon their commuting and foraging habitats). CSZs should therefore be accounted for when undertaking desk studies and designing survey strategies. Table 3.5 (p30) shows the level of confidence in each CSZ for most UK bat species, based upon the number of bats and number of studies used to inform the calculation.

Chapter 4. Preliminary ecological appraisals for bats

Perhaps of most note in this chapter is Table 4.1 (p35), which seeks to provide a more consistent approach for assessing the potential suitability of a 'site' for bats based on a preliminary ecological appraisal. This single table consolidates three separate sets of assessment categories from the second edition of the guidelines: the bat roost potential of structures and buildings; of trees; and the habitat suitability of a wider site for bats. It is therefore regularly referred to elsewhere in the new guidance. This chapter also provides guidance on undertaking and interpreting desk studies to inform this appraisal.

Chapter 5. Bat roost inspection surveys – buildings, built structures and underground sites

This chapter was previously covered in Chapter 8 (roost surveys). However, most of the information on bat ecology is now upfront in Chapter 3 (see above) and bat roost inspections of trees are now covered separately (see below). The key message from Chapter 5 remains that further surveys of a site are required if the likely absence of bats cannot adequately be determined by a preliminary (daytime) survey, or are usually necessary to characterise a roost where the presence of bats has been determined. This chapter describes the survey methods and provides guidance on which additional surveys might then be appropriate – a useful flow chart is provided on page 38 (Figure 5.1) to help with this.

Chapter 6. Bat roost inspection surveys – trees

Chapter 6 recommends that tree inspections for bat roosts are appropriate where trees are to be subject to *direct* impacts (e.g. felling, lopping, etc.), but also where they may be subject to *indirect* impacts (e.g. increased light, noise, nearby vegetation removal). Another useful flow chart is provided on page 45 (Figure 6.1) to help determine the best course of action for further bat surveys of trees following initial inspections – this chapter acknowledges the difficulties of inspecting trees for bats, given that bat usage of tree roosts is often transient (within a wider woodland resource) and that signs of bat roosts in tree features can quickly disappear.

Note that neither Chapter 5 nor 6 now provide a table for categorising bat roost potential (i.e. negligible, low, moderate, high). Instead, they both now make reference to the aforementioned Table 4.1 (p35) for assessing the suitability of a site for bats. Also note that although chapters 5 and 6 provide guidance on undertaking 'daytime' surveys, they remind us that professional ecological consultants should hold an appropriate licence on *any* survey where disturbance to bats is possible.

Chapter 7. Emergence /re-entry surveys

Three tables in Chapter 7 are likely to be referenced regularly by users of these new guidelines: Tables 7.1 and 7.2 (p51) provide guidance on the timings and duration of emergence/re-entry surveys, and Table 7.3 (p52) on the recommended number of survey visits in relation to the potential suitability of the 'site' for bats (see above – Table 4.1, p35).

Essentially, the recommendations are for:

- appropriately timed surveys (with the optimal period usually May to August, although this may extend into September);
- adequate time between survey visits (at least two weeks, preferably more);
- accounting for different species' ecology (starting surveys earlier for typically early-emerging species and continuing longer for typically late-emerging species);
- accounting for different roost types (e.g. surveys in April and September/October for 'transitional' roosts or from mid/late summer for mating roosts);
- the appropriate use of pre-dawn re-entry surveys, particularly where two or more survey visits are required (but potentially also on a single survey visit for quiet-echolocating or typically late-emerging bats); and
- the consideration of prevailing weather and site-specific conditions.

Generally, the above is the preferred approach for nocturnal surveys. However, as above, BCT states that there can be flexibility in an approach, providing this can be justified by expert opinion. As such, it is good practice for nocturnal surveys to be designed and carried out, or at least led, by experienced, licensed bat ecologists.

Note that BCT now overtly advocates the use of night-vision/infrared and thermal technologies to augment nocturnal surveys of some structures and trees. In particular, such technologies may be applicable where structures are large, features are poorly illuminated by twilight or are difficult to see, or where quiet-calling or typically late-emerging bats may be present.

Chapter 8. Bat activity and back-tracking surveys

Chapter 8 proposes that using a suite of bat activity and back-tracking surveys should facilitate the collection of robust data that can answer both the generic questions about a site (e.g. are bats present and if so, which species?) as well as questions that are more project-specific. The survey strategy should also be mindful of the scope and limitations of the sampling methods and ensure ecologists are well prepared before heading into the dark! As above, BCT recommends that bat activity and back-tracking surveys are therefore best designed and led by experienced, licensed bat ecologists.

Table 8.3 on page 58 of this chapter provides the framework for bat activity survey effort at a given site, which is based upon an assessment of the overall habitat suitability, again in reference to Table 4.1 (p35). The key recommendations in Chapter 8 are as follows:

- both walked transects and automated static bat detectors should be employed unless there is sound justification not to;
- more bat activity surveys should be undertaken on sites with more favourable habitat for bats;
- surveys should extend from May through to August as a minimum, but include April, September and October in favourable weather and/or dependent upon geographic location; and
- static detectors should always now be deployed for a minimum of five consecutive nights, in favourable weather.

This chapter also now includes guidance on acoustic surveys at 'autumn swarming' sites, which usually refers to surveys for *Myotis*, long-eared and barbastelle bats at underground sites, but may also now apply to Pipistrelle species and large structures in urban environments following recent research by Korsten *et al*. (2015).

Chapter 9. Advanced licensed bat survey techniques

Usually, acoustic surveys are sufficiently effective to answer most questions about bat activity on a site if undertaken properly. However, sometimes it may be necessary to catch bats (using mist nets, harp traps, and sometimes acoustic lures) to enable a better understanding of the assemblages present. Radio-tagging and radio-tracking bats can then also allow us to understand how they use a site. A new chapter in the third edition of the guidelines therefore covers these advanced licensed bat survey techniques (ALBST).

Examples of where catching bats could be appropriate are:

- where it is important to understand the sex, age class and breeding status of bats using a site;
- to identify the presence (or likely absence) and status of scarce, sensitive and strictly protected bat populations such as Bechstein's, barbastelle, grey long-eared or Horseshoe bats (most of which are also very difficult to detect and/or identify acoustically); and
- where there are important species or colonies in a regional context deemed at high risk from a particular development.

Radio-tracking, if appropriate, can then identify important spatial information such as roost sites, key flight-lines and core foraging areas, and the associated temporal data can identify patterns of activity.

Chapter 10. Data analysis and interpretation

Perhaps the primary message from Chapter 10 is the importance of defining 'bat pass' criteria and being consistent with this across data analyses and reporting. Further very important considerations are then as follows:

- any analyses and reporting should be mindful that the number of 'bat passes' represents an index of bat activity (where the detector is) and is not a measure of bat abundance;
- comparisons of activity levels between different bat species and genera should be strongly caveated – or ideally avoided – because of the variance in detectability between different bat species and different equipment;
- call parameters used to identify different bat species (or genera if this is not possible) should be consistent and clearly stated; and
- any automated species identification should always be followed by manual checks by experienced ecologists.

Appendices 7 and 8 then provide information on which statistical analyses may be applicable to the bat data collected, which will vary between projects.

Chapter 11. Writing bat reports

The final chapter provides guidance (and a useful template) on bat survey reports submitted in the context of development proposals. In relation to the applicable bat population(s) and proposals, BCT states that reports should always:

- show what is there and its value and significance;
- how it will be impacted by the development;
- how these impacts can be mitigated; and
- how the development will result in no net loss (and where possible a net gain – particularly for planning purposes).

Generally, reports should always be accurate, clear, accessible to the intended reader(s), and peer reviewed before issue and should also satisfy recent CIEEM *Guidelines for Ecological Report Writing* (CIEEM, 2015).

Other changes

Finally, there are two chapters from the 2012 guidelines omitted in 2016: on surveying major infrastructure projects and onshore wind turbine schemes. For the former, where this is not covered by chapters 6 to 9, we are referred to recent Defra-funded research on bats and linear transport infrastructure undertaken by the University of Leeds (Berthinussen and Altringham, 2015). For the latter, it is understood that this was due to delays with Exeter University's National Bats and Wind Turbines Project report, which is expected soon.

Otherwise, the remaining appendices (not mentioned above) now include several other useful references, such as a table of potential hazards and risks associated with bat survey work (Appendix 3), best practice for collecting bat droppings for DNA analysis (Appendix 4), and on ALBST equipment (Appendices 5 and 6).

To conclude then, the significant effort that BCT has put into the third edition of these guidelines is apparent, including the improved format and enhanced evidence-base. By the time you read this, they should be in widespread use…

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About the Author

Matt is a Senior Ecologist with Baker Consultants with a range of experience over his eight years as a professional consultant. He has worked on a variety of taxa and projects but specialises in bat work where he is licensed to an advanced level. Matt also leads and is involved in several voluntary bat conservation and research projects, including BCT's National Nathusius' Pipistrelle Project.

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Viewpoint: A Step Too Far – The Proposed Weakening of the EPS Mitigation Licensing Process

Andrew S. Waller MCIEEM
Consultant/Principal Ecologist, ASW Ecology

Natural England has recently put out two consultations on proposed changes to the European Protected Species (EPS) Mitigation Licensing process[1], which will clearly impact both great crested newts (GCN) and bats, if it becomes official policy.

Whilst this process requires some further streamlining, the proposed changes are considered to be a step backwards in regards to mitigating biodiversity-related impacts on development sites.

Introduction

I will state from the outset that I still have enormous respect for Natural England, as I did for English Nature. I have had a number of friends working for these organisations in the past, many of whom have now sadly left the organisation. However, the issues of EPS such as GCN on development sites have become political, with an under-resourced Natural England being put under pressure to find ways to speed up development at all costs.

As ecological consultants, we often have to find that delicate balance between protected species conservation and the needs of developers. The proposals from Natural England will unfortunately damage that fine balance that we have worked so hard over the years to find and hence I am taking the unusual step of writing this timely article to ask Natural England to kindly rethink these potential changes.

Great crested newt juvenile © Andrew Waller

Questions for Natural England

I have therefore posed some open questions here for Natural England on these proposals, so as to demonstrate how detrimental these could be in reality, and the potential far reaching consequences for both wildlife and to professional ecological consultants.

Whilst the opportunity to comment on the consultations is much appreciated, and I have replied to both as no doubt many other ecologists have as well, I want to additionally include the important questions below. These questions expand on what I have put into my replies to the

Daubenton's bats © John Dobson

consultations, especially as there was insufficient room for such questions. No doubt, fellow consultant ecologists will have many further questions not listed below.

1. If the proposal for a GCN borough-wide strategic habitat mitigation plan becomes policy and a developer agrees to the habitat compensation element, what happens if GCN are killed in numbers on the development site? Since injuring and killing GCN is still a 'Strict Liability offence' under national law, and since the actual legislation is not changing, does this mean that the developer will be open to prosecution (e.g. by unhappy third parties)?
2. How can it be proved that strategic habitat compensation for GCN will actually benefit the species in the long-term? Have the samples been large enough statistically to make that judgement and will it not take many years of costly monitoring to prove such an objective? What happens if monitoring shows that GCN meta-populations in a given district or borough have not benefitted from efforts to improve habitat connectivity, at the expense of losing unknown numbers of individual newts on development sites?
3. Natural England has proposed that it would license this new controversial approach at certain sites, and admits that certain applications would be expected to "cause mortality" of some GCN on a development site. How many GCN would it be deemed to be acceptable to kill before this has an adverse impact on the newt population and negatively affects their Favourable Conservation Status? How will this "acceptable" level of mortality be established?
4. It is proposed that GCN could be moved much further away than usual from the development site. There would have to be proven connectivity on these new distant sites with regards to other GCN meta-populations. How would this be proved, as compensatory habitat far away may not be ecologically connected to the development site or to other meta-populations? If a GCN population is moved a great distance away, what will the implications be with regards to animal disease and genetics?
5. Has an adequately large and varied sample of developers been asked if they are comfortable with the concept of individual GCN being killed on their sites and the possible public relations implications of this? And will Local Authority Ecologists and Planners be satisfied with GCN being injured or killed despite their continued high level legal protection?
6. With bats, if no presence/absence (e.g. activity) surveys are to be undertaken at a site where both roosting bats and associated bat droppings have been found, how can it be proved that no further species or individuals

are present yet undetected? Bats are frequently concealed in crevices, where they cannot be seen during a daytime inspection. Currently, we also require a certain level of surveying to assess correctly the likely impacts on bats from a development proposal. What would be the criteria for reduced survey effort?

7. The proposals put forward by Natural England in its two consultations imply that this may be rolled out to other EPS. Should it be inferred that hazel dormice may be next where they are present in woodlands to be destroyed for infrastructure projects? Or sand lizards on heathland sites subject to development proposals for new housing?

A Request to Natural England

Based on the above concerns and questions, I would ask Natural England to respectfully put on hold these proposed policy changes, especially if the latter consultation demonstrates that the majority of consultees are unhappy with these proposals, so that further constructive in-depth discussions with professional ecologists and other bodies can occur on finding a suitable compromise solution. Together, we may in fact be able to find new innovative ways to improve this process for developers and consultants, and without killing any animals.

It will be unethical for clients to become judge, jury and executioner, especially in regards to GCN on their sites, and ecologists would be in danger of being labelled as animal killers. I honestly believe that no ecologist enters this sector to deliberately allow animals such as GCN to be killed on development sites. Surely, we are meant to save animals from being killed during development-related works, rather than the opposite.

As has been said previously in this publication that all ecological consultancy work must be undertaken on a sound scientific basis. These proposals will instead be detrimental to protecting biodiversity on our development sites and would also be a damaging blow to our sector of work.

Natural England admits in its second consultation document that businesses in the ecological sector will indeed be impacted by these policy proposals. But just how severe will these impacts be to ecological consultancies that undertake regular professional GCN translocations, or those that suddenly find that less surveying is needed at many of their sites during the course of the year? Could this unfairly push some consultancies into financial hardship or bankruptcy?

Final Comments

It concerns me that the main thrust of the latter consultation's four new policy proposals are clearly to reduce or remove the costs of environmental regulations, as if we, as professional ecologists and the wildlife that happens to be present on development sites, are a burden.

These proposals are not being put forward out of compassion to benefit EPS in any way but are an attempt to make it easier to rapidly develop sites and to generate profit at a high cost to biodiversity. Whilst I am not against developers saving on costs, this must be done sustainably and without sacrificing inspirational native species such as GCN.

As professional ecologists, we are meant to be the voice for nature on development sites since wildlife has no voice. Are we now willing to stand up and be that strong voice when something ethically and scientifically wrong is proposed as potential future policy?

Notes

1 Great Crested Newt Pilot Consultation (Natural England and Woking Borough Council) (closed 10 February 2016); and Proposed New Policies for European Protected Species Licensing (Natural England) (closed 7 April 2016)

About the Author

Andrew S. Waller MCIEEM is the Principal Ecologist at ASW Ecology, based in London. He specialises in ecological assessments and protected species issues as well as having extensive experience of EPS Mitigation Licences. He has been an ecological consultant for 20 years. He also has a particular interest and passion in both bats and birds of prey in the UK and Europe.

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Norman Moore: A Personal Appreciation 24 February 1923 – 21 October 2015

Robin Buxton CEnv FCIEEM

Why do I ask you to celebrate as quite exceptional, and honour as a giant among conservationists, the memory of a man who in 1969 opposed an immediate worldwide ban on DDT? This was the same man who in 1960 had led the establishment of the Toxic Chemicals and Wildlife Section of the Nature Conservancy and the work that demonstrated the devastating impacts of persistent organochlorine insecticides on peregrine falcons and many other birds, and in some cases their accumulation through food-chains.

1971 Norman Moore on coast path of Herm

Norman Moore's own clear precise thought, passion for nature, ecological insight way ahead of published theory, understanding of social and political context, and clarity of language in books, papers and negotiation lie at the heart of his immense influence. In his autobiography, *The Bird of Time: The Science and Politics of Nature Conservation – A Personal Account*, written in 1987, he says of the DDT issue (p206):

> *"At the … meeting of IUCN … in 1969, I found myself … arguing against a recommendation which if acted upon, would have banned the use of DDT throughout the world. Of course we were in favour of getting rid of DDT eventually, but a sudden ban on DDT before adequate substitutes had been found would have had disastrous effects on anti-malarial and other public health campaigns. Nearly all the substitutes for DDT posed a greater risk to those who applied the chemicals and were much more expensive. A total ban on DDT could have led both to the collapse of vector-borne disease control and increased poisoning of workers. Some of the delegates … really did appear to prefer Peregrine Falcons to human beings."*

Conservation happens within the context of society and as conservationists we undermine our influence by ignoring, or worse denying, wider society's legitimate concerns and priorities. In the opening paragraph of *The Bird of Time* he wrote:

> "The need to maintain sustainable yields from our living resources should have introduced a new element into classical economic and political thinking, but it has not done so because conservation is still considered to be trivial and peripheral."

Those words were written 30 years ago, not long after he had to retire from the work he loved and networks that gave him huge reach and influence. He did as much as anyone to put environmental management into the mainstream as a fundamental need of all in society, but Poul Christensen said to me recently: *"Would Norman have been allowed to develop such influence today? Almost certainly not."*

In 2007, *BBC Wildlife* put Norman third, after Prince Charles and David Attenborough in their list of Britain's top 20 living conservationists. He was the last survivor of the great post-War leaders of conservation that included Max Nicholson, Julian Huxley, Peter Scott and Derek Ratcliffe; the generation that rode Churchill's wave of thinking and planning for a better Britain that was catalysed by the War; a better Britain defined in part by intrinsic value in rich and varied countryside and nature enjoyed by the majority for recreation and inspiration. *The Guardian*, *Telegraph* and *Independent* have

2002 Norman by pond © Andy McGeeney

all honoured Norman with full obituaries, listing his immense contributions including:

- As the first South West England Regional Officer of the Nature Conservancy in 1953, he pioneered selection and designation of National Nature Reserves and Sites of Special Scientific Interest and was the author of the guidelines still used for designating SSSIs.
- His, now classic, study on the fragmentation of the Dorset heathlands between 1811 and 1960 by agriculture, afforestation and development, and demonstration that small fragments of heath held fewer specialist species than large fragments, showing that effective conservation of characteristic communities requires a large scale and connectivity of habitat.
- Appointment in 1960 as head of the Toxic Chemicals and Wildlife Division at the Nature Conservancy's Monks Wood research station, investigating and exposing issues ranging from the effects of persistent organochlorine insecticides on birds, to long term risks of persistent chemical poisoning in humans and other long-lived animals from industrial emissions and arguing for effective political and economic responses in the UK and internationally.
- Work on hedges, then dismissed by many naturalists as artificial, initially as a place to focus research on pesticides and wildlife. This led to Max Hooper's now standard method of estimating the age of hedges, and to the New Naturalist book *Hedges*, written with Ernest Pollard and Hooper in 1974.
- He was a world authority on dragonflies, the subject of another New Naturalist book, published in 1960 with Philip Corbet and Cynthia Longfield. His transect survey method for studying their populations was soon adopted for counting butterflies and became the standard butterfly count transects in use today.
- His role in the creation of the Farming and Wildlife Advisory Group (FWAG) was probably much greater than his natural modesty allowed him to claim. He was a key contributor to the 1969 Silsoe Conference that initiated FWAG and was its first Chairman.
- In 1974 he was appointed Chief Advisory Officer of the Nature Conservancy Council (NCC) with initial focus on the impact of agriculture on nature conservation. NCC's 1977 discussion paper, Nature Conservation and Agriculture, included recommendations for better protection of SSSIs, including financial incentives, grant aid for management of habitats in the wider countryside and crucially *"a forward-looking rural strategy for our national resources should be formulated, which recognises among other things that wildlife is a vital part of the real capital wealth and heritage of the nation."* To the end of his life, he remained disappointed that Westminster opposed the idea of a national land-use strategy.

His work to set up FWAG is an example of Norman's vision; vision that located conservation firmly in the mainstream of economic and political life. He understood the pressures on farmers and their businesses and he celebrated the desire he found in many of them to maintain as rich a wildlife on their farms as they could achieve with available skills and time but within the constraints created by the economics and politics of farming in the late 20th Century. Despite this real interest by many farmers, NCC research confirmed that wildlife habitats across the farmed countryside were being destroyed at an alarming rate. Most conservationists felt impotent to address this issue as there was very widespread distrust and sometimes real hostility between conservationists and farmers in the 1960s and 70s. Norman's vision was that FWAG would be the vehicle for replacing hostility with constructive and supportive relationships and to a large extent FWAG achieved this:

> *"Advocates of conservation who are accepted as sensible, balanced people have an especially important role to play in promoting conservation. There is no better advocate than a successful farmer who practises the conservation he preaches."* (*The Bird of Time* p227)

Norman Moore was one of the first Patrons of IEEM (later CIEEM) and applauded the creation of the Institute at a time when many inside and outside Government failed to see the point or were actively dismissive. His importance in shaping the backdrop to the birth of the Institute in the late 1980s cannot be overstated and many of the social and political obstacles he sought solutions to are as relevant to conservation today as they were 30 years ago. In particular his understanding of the indifference, sometimes hostility, not only of people in power, but of much of society, to conservation if it imposes constraints or costs is intensely relevant today:

> *"The difficult part was to explain the necessity for action to people with different points of reference and habits of thought, particularly when immediate self interest made them unwilling to try to understand another point of view."*
>
> *"The challenge facing mankind is new, therefore it has no cultural roots; it is not enshrined in literature, ancient law or custom. We cannot base action on past experience."* (*The Bird of Time* p223)

Much though he mourned the loss of the abundant richness of the countryside of his youth, Norman recognised fundamental and permanent change. He saw a future dominated by human activity and his vision for conservation was set in that future not in denial of it:

> *"Those of us who can remember the rural scene before 1939 have experienced the end product of something which had gradually evolved since the Neolithic period, and we have seen it changed by machines, oil, chemicals, plant and animal breeding and politics into an entirely new system."* (*The Bird of Time* p23)

He took a holistic view of the place of environmental issues in society:

> *"If the true significance of conservation is not appreciated it is easy to make it look elitist, yet conservation properly conceived is closely connected both with feeding the world and providing employment."* (*The Bird of Time* p224)

And he saw the conservationist's role in broad terms:

> *"It is as much the conservationist's job to keep common species common as it is to ensure the survival of rare species. Even if the gene pool could be conserved in nature reserves and SSSI alone, a state of affairs which denied people contact with wildlife in ordinary life and ordinary places would be grossly deficient. For most people, an abundance of the relatively common and conspicuous plants and animals is more important than the conservation of obscure rarities."* (*The Bird of Time* p103)

My own first memory of Norman Moore is standing next to a tall, lean, enthusiastic man on the edge of Poole Harbour, looking out over the magical landscape of heather, marsh and creeks; bright sun reflecting off mud and water. That was in 1956 – I was six years old. My own experience of his huge enthusiasm and support for the Earth Trust in its early years is an experience that was repeated for many people, on a great many nature reserves across the country and beyond. He was a warm friend, role model, mentor, adviser and occasionally critic, always with characteristic old-world gentle charm, modesty and affection. I shall miss his enthusiastic friendship, his immense knowledge and his role as a visionary signpost to the future and how we should approach it.

2010 Norman at Swavesey

I'd like to end with Norman's own words, true now as they were 30 years ago and the implied question for all of us – do others recognise our agendas and do we make it easy for them to engage with us?

"Conservation will get more difficult. It will not be achieved unless it is supported by the majority, and it will not be supported by the majority unless its importance is understood." (*The Bird of Time* p257)

About the Author

Dr Robin Buxton MBE is now 'retired'. His roles in the Earth Trust spanned Warden in 1982 to Chair of Trustees in 2014. Initially technically focused, the Earth Trust has broadened to emphasise education and engagement and the farmed environment. Management and governance are crucial to increasing capacity to do conservation, and his real contribution has been as trustee and director of various conservation, research and consultancy bodies and spells as Secretary, Board Member and Vice-President of CIEEM. Robin now Chairs his late sister's legacy charity, making substantial grants to environmental organisations, and is enjoying reviving his roots as a naturalist.

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The British Ecological Society

At the BES, we are all about collaboration. There's such a crossover between our communities that it's important to work together, which is why this edition we're talking about the myriad ways in which we can engage and interact.

Our *Journal of Applied Ecology* is one of our most popular journals for CIEEM members – and, like all our journals, it's free to all BES members (from £42 per year or £21 for concessions). This journal incorporates *Practitioner Perspectives* and *Policy Directives*, so there's always something useful to read.

Journal of Applied Ecology is actually currently looking for non-academic Assistant Editors to join our team; being an AE is an excellent way to engage with researchers, discover new papers and improve your CV. Chat to Alice (Alice@BritishEcologicalSociety.org) or go to our website (http://bit.ly/JPEAEs).

More generally in our Publications Team, you can apply to join our Book Task and Finish group to let us know which books you'd like us to commission or, indeed, which books you'd like to write! There are vacancies to sit on our Ecological Reviews editorial board, which helps drive the strategy of our book portfolio. We are also looking for people with excellent taxonomic knowledge of British plants for our *Biological Flora* team, too. Chat to Emilie (Emilie@BritishEcologicalSociety.org) about these opportunities.

That's not to say that *Journal of Applied Ecology* is the only journal you should be reading. If you've ever had problems collecting leaf and seed samples from tall tress, watch our *Methods in Ecology and Evolution* video on the arborial throw line (http://bit.ly/1XmJPe6). Or read about 'Ecological effects of native and non-native species and the use of origin to guide management' in *Journal of Ecology* (http://bit.ly/209USqn).

And, to celebrate Endangered Species Day 2016, our journals have compiled a virtual issue (http://bit.ly/1XmJAzz). The papers provide examples of the latest research on endangered species and cover a broad range of plants, animals and insects as well as terrestrial and aquatic systems.

Our Annual Meeting is always a great way to network with us and, with over 1,000 international delegates, it's also the perfect way to build global contacts. We are creating a specific Policy Day, too, so watch our website for updates. #BES2016 will be in Liverpool from 11-14 December and won't just be about talks, posters and top of the field plenary speakers; we place huge emphasis on career development and informal networking – which is why last year we had 16 workshops and a packed diary of social events. All of our Special Interest Groups will be there so, whatever your interest, there's a SIG for it. If you're a budding comic, why not sign up for a slot at our Science Slam comedy night? Watch our Youtube channel for hilarious videos from last year. Email Amelia (Amelia@BritishEcologicalSociety.org) if you'd like to get involved with our Annual Meeting.

If you can't wait till December, we'd love to see you at our *People, Places, Politics* public debate on 21 July; a panel of leading politicians will discuss the possible future of Britain's environmental policy post-EU referendum. We enjoyed seeing many of you at our joint Cambridge Conservation Initiative symposium, 'Improving the Links Between Ecological Research, Policy and Practice'; for more information on the debate and for resources from the symposium, visit our website (http://bit.ly/20agQJM) or contact Ben, our Policy Manager (Ben@BritishEcologicalSociety.org).

We have a strong careers programme and are eager to develop initiatives for people in our early career audience. CIEEM members were instrumental at our Summer School last year as well as in creating our popular *Rooting for a Career* booklet. Email Samina (Samina@BritishEcologicalSociety.org) if you're keen to play a part in our Early Career working group or to help progress our career resources and events.

Many of you will know we offer a generous grant portfolio, but that process is reliant on a committed group of volunteers in our Review College; joining our college is a surefire way to improve your skillset and read about exciting research. Chat to Amy (Amy@BritishEcologicalSociety.org) for more information.

We'd love to hear how we can collaborate, so please get in touch with Richard (Richard@BritishEcologicalSociety.org) or chat with us on Twitter @BritishEcolSoc.

Could You Sponsor a Future CIEEM Member?

Nine Things to Consider

CIEEM members are drawn from across many employment sectors including local authorities, government agencies, NGOs, environmental consultancy, academia and industry. This diversity of membership is our greatest strength, enabling us to take an integrated and holistic approach to furthering the management and enhancement of biodiversity and the ecological processes essential to a fully functional biosphere. It's therefore essential for us not only to continue to grow our body of members but also to focus on sectors that are currently under-represented in order to make the most of an increasingly diverse membership and its differing needs.

One of the key ways in which you can support membership growth is by acting as a sponsor: either for a new applicant; for an existing member's application to upgrade; or for an application for Chartership. CIEEM's application processes have changed significantly since many of you became members, so here's some things to consider if you're thinking of becoming a sponsor:

1. The role of a sponsor is an important one. As a sponsor of an applicant applying to join CIEEM or upgrade their membership, you will play a critical role in upholding the integrity of the standards of membership and making sure that CIEEM continues to be a body that you are proud to be a member of.
2. For the majority of our membership grades there is currently no professional review interview as part of the application process. Sponsor statements are therefore an essential part of the assessment process and contribute significantly to the success or otherwise of an application.
3. Diligent sponsors also help to ensure the quality of applications we receive and can increase the chances of admission. If you're acting as a sponsor, take the time to review the entire application to satisfy yourself that it demonstrates the applicant's competence and professionalism. Does the overall standard of the application give a good impression? Have all the questions been answered? Has the applicant checked for spelling mistakes and grammatical errors?
4. By sponsoring an applicant you are confirming that the information contained in their application form about their competence and professionalism is correct. You **must only** do this if you have sufficient knowledge of the applicant and the quality of their practice as a professional. Sponsoring a poor application will also make it more likely that you'll need to be involved again at a later stage when we have to go back to the applicant for further information.
5. Admission to assessed grades of membership is based on an applicant submitting sufficient evidence of competence in an agreed number of areas taken from CIEEM's Competency Framework. If you've not yet familiarised yourself with the latest revision of the Competency Framework do find the time to do so – not only will it help you plan your own CPD, it will also make you a much better sponsor!
6. We've made some changes to application forms to make it much easier for sponsors to focus their supporting statements on the evidence provided by the applicant – and hopefully therefore a less time-consuming task for sponsors too.
7. Use the resources for sponsors available on the CIEEM website. We've created a document outlining the role and what is required of you as a sponsor, as well as some useful quick links to the Competency Framework, Code of Conduct and other resources you might need to fulfil the role.
8. Have a look at the short instructional video online. It's aimed at applicants but provides a useful summary of the application process that will help you to make sure the applicant has done what they need to do before they send their application.
9. Don't wait to be asked! Many of you will work alongside, line manage or tutor current and potential ecologists and environmental managers that could be an asset to CIEEM and a welcome addition to the membership body. Why not encourage them to consider an application and if you work, or have worked, with them closely enough offer to act as a sponsor for them. For many of our applicants, sourcing suitable sponsors can be a challenge and, for those just starting out in the sector, approaching a potential sponsor can be quite daunting.

We're working hard to make the process of sponsoring an applicant as straightforward as possible. If you have sponsored an applicant recently and have any comments about the process that you'd like to share with the Membership Manager please email stuartparks@cieem.net.

Chartered Members

Fellows and Full Members of CIEEM can develop their skills and gain professional recognition from employers, colleagues and clients by achieving Chartered status. CIEEM offers two Chartership awards:

- Chartered Ecologist (CEcol): The Register of Chartered Ecologists recognises the effective application of knowledge and understanding of the science of ecology by professionals committed to the highest standards of practice.
- Chartered Environmentalist (CEnv): CIEEM is one of 23 professional bodies licensed by the Society for the Environment (SocEnv) to award Chartered Environmentalist status. CEnv is an increasingly recognised standard of good environmental practice.

The following profile highlights the work of Chartered professionals and provides an insight into the kind of roles that these senior ecologists and environmental managers are required for.

New Chartered Members

CIEEM is pleased to announce the following new Chartered members:

Chartered Ecologist	Chartered Environmentalist
Tanith Cook CEcol MCIEEM	Stephanie Boocock CEnv MCIEEM
Robert Fennelly CEcol MCIEEM	Ben Gardner CEnv MCIEEM
Christopher Manning CEcol CEnv MCIEEM	David Harries CEnv MCIEEM
Louise Mapstone CEcol CEnv MCIEEM	Dr Mererid Howells CEnv MCIEEM
Dr Aidan Marsh CEcol CEnv MCIEEM	Laura Mullholland CEnv MCIEEM
Will Woodrow CEcol MCIEEM	Natasha Nixon CEnv MCIEEM
	Ben Ralston CEnv MCIEEM
	Paul Renshaw CEnv MCIEEM
	Joanne Weaver CEnv MCIEEM
	David West CEnv MCIEEM

Chartered Ecologist application deadlines

CEcol Application due date	CEcol Interviews	Ratification
10 June 2016	w/c 26 September 2016	Mid October 2016

Chartered Environmentalist application deadlines

CEnv application due date	CEnv report submission deadline	CEnv Interviews
31 March 2016	23 June 2016	29 Aug – 9 Sept 2016
1 September 2016	24 November 2016	13-24 February 2017

Please note, these dates are subject to the availability of assessors and may change.

If you are interested in submitting your own profile please contact the Registration Officer (RegistrationOfficer@cieem.net).

Chartered Members *(continued)*

Chris Mitchell CEcol CEnv MCIEEM

Associate Ecologist, SLR Consulting Ltd

Why did you join CIEEM?

I became an Associate member back in 2006 when I joined SLR. I had several reasons for joining and I'm pleased these still remain applicable 10 years later. In part it was because my colleagues were already members of (the then) IEEM and I recognised the benefits of being a member which include recognition of ecology as a skilled profession, excellent opportunities for training and regular updates on developments and changes in the profession. It was also important for SLR to ensure the ecology team were members of the recognised professional body.

Why did you apply for Chartered status?

I was pleased when it was announced, through the Royal Charter being awarded to IEEM, that it would be possible to become a Chartered Ecologist. I was already a Chartered Environmentalist at the time, but felt the Register of Chartered Ecologists would be an important milestone for the profession, having been developed specifically to recognise high standards of practice and help raise the profile of ecology amongst other professions. I also felt the competency framework element of the application would provide a good opportunity for me to review my career and achievements.

How did you find the process?

Initially the competency framework was a little daunting, although after a good read through of the supporting documents it was clear to me which sub-themes I felt would be most appropriate to base my application upon and so I set about collating my thoughts. I spent a couple of days in all making sure I had presented the points I felt would demonstrate my competence and ensuring the evidence followed the 'STARE' guidance provided by CIEEM. The stage 2 interview was then a great opportunity to expand on the aspects I had highlighted in the application, and talk about the aspects of my work as an ecologist that didn't quite make it within the word count of the written element.

How has achieving Chartered Status impacted on the types of work you undertake?

It hasn't, although I didn't really apply with any hope or expectation that the nature of my work would suddenly change. I would say that achieving Chartered Ecologist status has already met with my expectations and reasons for applying and I'm sure this will continue, especially as the register grows.

Would you recommend applying for CEcol to your peers and colleagues?

Absolutely, and several are working through the application process at the moment.

What is your education background?

I have a BSc (2:1) in Environmental Biology from the University of Wales Swansea and a University Certificate in Biological Recording and Species Identification from Birmingham University.

What volunteer work have you done?

I am currently Chairman of the Shropshire Bat Group, and a volunteer roost visitor, so am actively involved with bat conservation outside of my work at SLR and fortunate enough to be involved with some exciting projects that are going on in Shropshire at the moment.

What training have you undertaken?

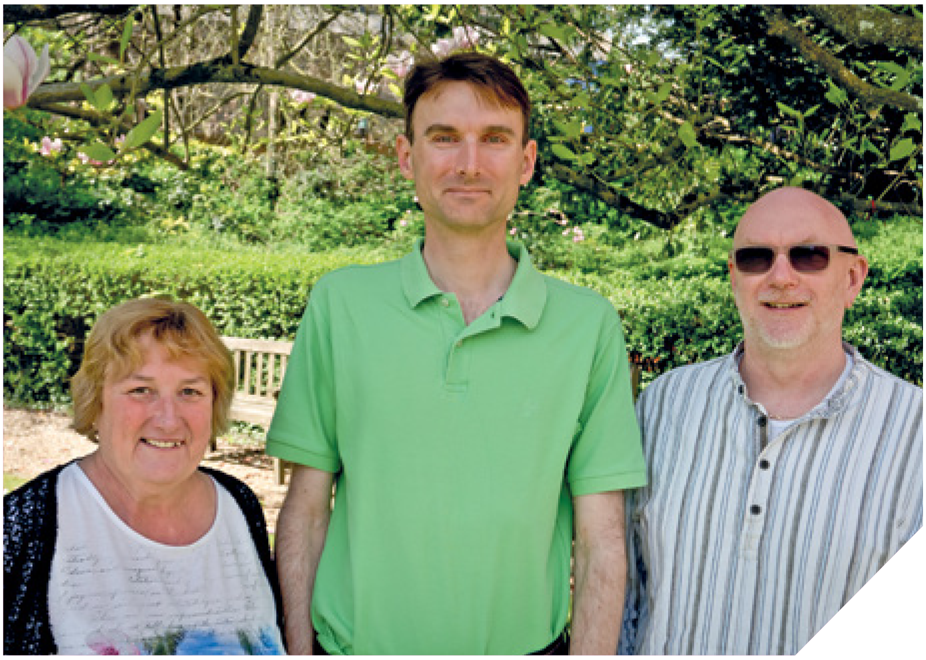
A range of courses from learning vegetative grass identification skills through to advanced bat survey methods, together with the health and safety aspects such as working in confined spaces and first aid.

What is the best thing about your job?

The fact that every day is different and I work with a great team on a range of interesting and challenging projects. Then there is the wider benefit that we, as ecologists, are fortunate enough to experience seeing species and locations that many people might not even know exist!

Meet the Administration and Finance Team

There are three members of the Administration and Finance Team here at CIEEM. The longest standing member of the team is Richard Watts, the Administration Officer. Richard joined CIEEM in 2011 so has seen the Institute's growth and change during that time, perhaps most notably gaining Chartered status in 2013. John Gordon and Linda Redman joined CIEEM in November and December 2014 as the Office and Finance Manager and Finance Officer respectively. This was as part of the restructuring process that was designed to equip the Secretariat at CIEEM to meet the challenges of the future and achieve the organisational goals of raising the profile of professional ecologists and environmental managers and promoting best practice for the benefit of nature and society.



Linda Redman, Richard Watts and John Gordon.

As part of their roles as Administration and Finance Officers, Richard and Linda support the Professional Development team with their programme of workshops, masterclasses and conferences by dealing with bookings, enquires and liaising with venues and trainers.

Richard's time studying History at Sheffield University has proved invaluable when digging through records at CIEEM to discover facts and figures. Richard's previous work at Hampshire County Council and Land Registry has also been useful for working within a professional body. While he is off duty Richard enjoys playing golf and tries to enjoy watching Southampton Football Club.

Before joining CIEEM Linda worked for Hampshire Constabulary where she trained as a selection interviewer and a psychometric test administrator. Linda has worked in accounts/payroll roles since leaving school and is currently studying for her Association of Accounting Technicians level 3 qualification. Home studying is one of Linda's hobbies and she has over the past year completed studies in 'The History of Ancient Greece' and 'An Introduction to Human Physiology'.

John, our Office and Finance Manager looks after the day to day running of the office here at CIEEM HQ, and has a hand in assisting the CEO and the rest of the Management Team to pull together the budget and annual operational plans that the Secretariat tries to implement. This is helped by the fact that John likes to have a spreadsheet for all occasions, and enjoys nothing better than creating new ones. John has a varied work history, after studying Physics with Mathematics at London University he has worked in chemical sales and distribution companies, electronic manufacturing and distribution companies, as well as a watercress grower and a catering company. For several years John was also an aerobics instructor, so as well as keeping CIEEM's finances and operations in shape he could, in theory, keep the Secretariat in shape too.

You can contact the Administration and Finance Team at enquiries@cieem.net.

Member Network News:

CIEEM has two types of Member Networks: **Geographic Sections** and **Special Interest Groups**. Each is run by a committee of members for the benefit of other members, providing opportunities to network, share knowledge and learn more about the science and practice of our profession.

There is also a role to play in promoting professional standards, feeding into consultations and representing the views of members at a local, national and international level.

For further information about Member Networks and how you can get involved, please visit www.cieem.net/get-involved.

SOUTH EAST ENGLAND

Regent's Park Hedgehogs and End of Year Social 2015

11 November 2016, Regent's Park

The last SE Section event of 2015 was held at The Lookout in Hyde Park, thanks to The Royal Park's Foundation. The Foundation along with their scientific advisors (Dr Nigel Reeve and Emeritus Professor of Ecology John Gurnell) delivered a very interesting talk about the hedgehogs of Regent's Park – a fascinating population located right in the centre of London – and the monitoring surveys undertaken to better understand them. The population is estimated to be around 40-50 individuals although numbers recorded were lower in 2015 than 2014, highlighting the vulnerability of the population. The talk was followed by the 2015 Social. It was great to see so many members of the SE Region, providing an opportunity to catch up with old friends and to meet new ones.

Read more at www.cieem.net/sout-east

YORKSHIRE AND HUMBER

Martin on Martens – Pine marten natural history and conservation

26 January 2016, Christchurch

John Martin has devoted his career to working with Pine marten recovery programmes, especially in Galloway. Managing the recovery of an endangered or locally extinct predator is always controversial and never easy. The Pine marten, one of the smaller mustelids, is the only marten native to the UK and was once the UK's most numerous carnivore.

A dedicated recovery programme since the mid-20th century has seen numbers increase dramatically in Scotland and Ireland, but inevitably a creature that many find enchanting, others see as a pest. In parts of Scotland it has taken to nesting under roofs and, being omnivorous, it also helps itself to garden fruits and the odd chicken.

Read more about this fascinating event at www.cieem.net/yorkshire-and-the-humber

WEST MIDLANDS

Proposed changes for EPS Licensing: your views

22 March 2016, Hindlip

This event provided a really useful opportunity for local members to inform a broad and balanced view on how to respond to the Natural England Public Consultation, and stimulated all members present to engage with the consultation and respond in a positive manner.

To read more about the West Midlands Section visit http://www.cieem.net/west-midlands.

EAST MIDLANDS

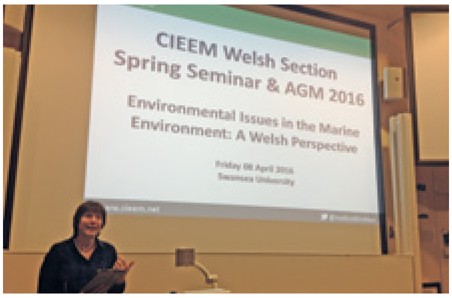
East Midlands AGM 2016: The Beginning of Rutland Water and Flying Home for Spring

14 April 2016, Rutland Water

East Midlands members gathered at the Anglian Birdwatching Centre at Rutland Water on a Thursday evening for their Section AGM and began the evening with a walk out to a bird hide on recently-constructed Lagoon 4. Armed with binoculars we were quickly rewarded with sight of Osprey 51 perched on the far side, obligingly awaiting his keen audience.

Read more about this event at www.cieem.net/east-midlands

Rutland Ospreys © John Wright



WALES

Welsh Section Spring Seminar & AGM 2016

Environmental Issues in the Marine Environment: A Welsh Perspective

8 April 2016, Swansea

Over 30 people joined the Welsh Section Committee at Swansea University for this half day seminar. A fascinating set of talks covered Welsh topics from seagrass to grey seals and prompted some interesting discussions. The seminar was followed by the Welsh Section AGM, an excellent opportunity to hear about the exciting developments planned for Wales over the year ahead.

Read more and access the speaker presentations at www.cieem.net/wales

WALES

Inspiring students at Swansea University

22 February 2016

Harriett Webb of the Welsh Section Committee went along to talk to students at Swansea University about careers in ecology and the environment. Students were pleased with the valuable information provided and hopefully we have managed to inspire some CIEEM members for the future.

UK OVERSEAS TERRITORIES AND MARINE & COASTAL

CALL FOR PAPERS

2016 Conference: Protecting marine and coastal areas in the UK and Overseas Territories

21 September 2016, London

Managing our natural resources through the use of marine spatial planning and marine protected areas is fundamental in ensuring biodiversity and sustainability for generations to come. This is an evolving topic, with initiatives globally as well as at an EU and UK level.

This one-day conference, organised jointly by CIEEM's UK Overseas Territories and Marine & Coastal Special Interest Groups, aims to bring together a range of experts and interested participants working in the UK and the overseas territories to protect important marine and coastal resources through mechanisms such as marine protected areas.

We welcome abstracts for suitable presentations by 30 June 2016. For further details please visit http://www.cieem.net/events/1195/uk-overseas-territories-and-marine-coastal-group-conference-2016

ACADEMIA

CIEEM and Medway STEM Student Conference 2016

Future Opportunities in Ecology and Environmental Management

13 July 2016, University of Greenwich

This free event is aimed at Year 12 students about to make their UCAS selections. Speakers, most in the early stages of their careers, will give brief presentations to demonstrate the wide range of job opportunities in ecology and environmental management.

Read more at http://www.cieem.net/student-conference-jointly-organised-by-stem-and-cieem-

New Style Elections and Annual Members' Meetings

Members may have noticed over the last few months that we have moved to an online format for all of your Member Network elections. Elections now include candidate information and an online poll, providing greater transparency and accessibility for all members. You will see further changes coming into effect from this autumn, when elections will be held for all of our Member Networks in one batch, to be repeated annually each autumn.

There will still be a separate Annual Members' Meeting held by every Geographic Section Committee, providing a great opportunity for members to network and hear from their Committee.

Don't miss your opportunity to participate in your local elections – look out for more information over the summer.

To find out what is happening in your area visit www.cieem.net/member-networks.

For information on vacancies in your Member Network committees visit www.cieem.net/cieem-committee-vacancies.

New Members

The decision on admission is usually taken by the Membership Admissions Committee under delegated authority from the Governing Board but may be taken by the Governing Board itself.

CIEEM is pleased to welcome the following individuals as new members:

ADMISSIONS

Full Members

Dr Efiriaendi Agbeotu, Noel Bergin, Dr Matthew Davies, Victoria Griffin, Dr Timothy Reed, Elen Richards, Dr Rachel Saunders, Richard Sobey

Upgrades to Full Membership

Colin Davies, Ben Jervis, Cassie Needham, Anna Parry, Amy Prendergast, Barnaby Scott, Claire Wilson

Associate Members

Dr Ida Bailey, Timothy Bailey, Andrew Bone, Jane Cole, Jennifer Fincham, Heather Lafferty, Helen Lucas, Glenn Norris, Verity Roberts, Matthew Slaymaker, Rebecca Taubert

Upgrades to Associate Membership

Zoe Costas-Michael, Elizabeth Else, Jack Fenwick, Rachel Hall, Sophie Lancaster, Katherine May, Sophia Punteney, Sara Toule, David Watts, Jessica Williams, Hayley Wiswell

Graduate Members

Holly Brown, Ryan Clark, Niall Crawford, Mateja Dankova, Lynette Deacon, Claire Dunphy, Thomas Elliott, Rebecca Falkingham, Elliott Hails, Amy Horn-Norris, Benjamin Jones, Muhammad Junaideen, Clare Knight, Alastair Krzyzosiak, Lauri Leivers, Oliver Mackrill, Dr Dermot McKee, Callum McLaren, John Mellor, Huw Morgan, Sophie Moy, Catherine Oliver, Kathryn Oliver, Lindsay Overstall, Bryony Paul, Rosamund Pope, Michael Procter, Kate Rooney, Roberto Rozzi, Thomas Richards, Jenny Sharman, Jonathan Siberry, Amy Skuce, Jessica Stuart-Smith, Katie Swindley, Maria Thompson, Hugh Turner, Rebecca Vowler, Jaclyn Walker, Max Ward, Samuel White, Helen Williams, Emma Woodrow

Upgrades to Graduate Membership

Rachel Bamford, Thomas Clemence, Donya Davidson, Nathan Jenkinson, Jaqueline Jobes, Tom Nitti, Jennifer Pullen, Alan Sumnall

Qualifying Members

Thomas Cox, Jade Flear O'Rourke, Russell Hoyle, Jake Jackson, William Taylor, Thomas Witty

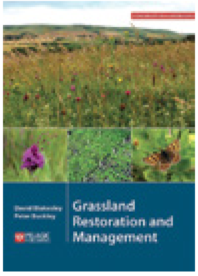
Supporter Members

Andrew Hollis

Student Members

Verena Aedo, Abbas Agbaje, Roy Allen, Justus Amayo, Chantal Attfield, Grant Bishop, Shane Brien, Wilmie Burton, Nicole Butler, Jessica Cole, Katharine Coope, Stuart Dunlop, Stuart Dunlop (on a CIEEM accredited degree), Danielle Eccleshall-Johnson, George England, Carlie Evans, Charles Geary, Helen Giddings, Tina Godbolt, Rosemary Greensmith, Jonathan Hall, Victoria Harrison, Bethan Harry, Edward Hornsby, Robert Hutchinson, Gruffydd Jones, Gabriella Kenworthy, Ben Lappage, Alasdair Lemon, James Longley, Elizabeth Mattison, Jason McNeill, Leo Nutter, Angel Olivares Espinosa, Sam Paplauskas, Ben Payne, Lucie Provaznikova, Michele Quarta, Martin Rann, Richard Rickell, Matthew Snelling, Richard Spiers, Chloe Stephenson, Joseph Stevens, Hadden Turner, Laura Vint, Miles Watchman, Neil Watkin, Charlotte Williams, Lindsay Williams

Recent Publications



Grassland Restoration and Management

Authors: David Blakesley and Peter Buckley

ISBN: 9781784270780

Price: £34.99

Available from: www.pelagicpublishing.com

Following the destruction of 95% of meadows during the 20th century, there is an urgent need to understand what little unspoiled habitat remains in order to plan the management and restoration of existing sites, as well as re-creating future grassland habitats. This book is a much-needed guide to grassland restoration and management. Providing a thorough overview of recent research on grassland restoration and its implications for practical grassland restoration and management, it introduces grassland communities and the wildlife they support, including examples of species of conservation concern, and considers the management of semi-natural grassland habitats with particular emphasis on drier grassland habitats.

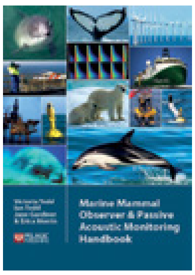
Plant identification for Phase 1 habitat survey: grassland and marsh

Authors: Wallace, Duffell and Harper

Price: £3.00

Available from: www.field-studies-council.org

This guide is designed to help you identify the indicator species needed to carry out a Phase 1 habitat survey of grassland and marsh habitats, following the guidelines set out in the JNCC Handbook.



Marine Mammal Observer and Passive Acoustic Monitoring Handbook

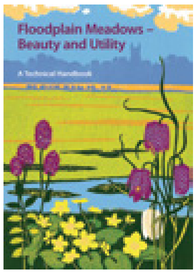
Authors: Victoria Todd, Ian Todd, Jane Gardiner and Erica Morrin

ISBN: CODE: 9781907807664

Price: Price: £39.99

Available from: www.pelagicpublishing.com

Based on more than two decades of offshore experience, and a decade of supplying MMO and PAM services (commercial and scientific), the Handbook is a long-overdue reference guide that seeks to improve standards worldwide for marine operations such as seismic and drilling exploration, wind farm piling, civil engineering, dredging, rock-dumping, and hydrographical surveys. Topics include worldwide legislation, compliance, anthropogenic noise sources and potential effects, training, offshore life, visual and acoustic monitoring (theory and practice), marine mammal distribution, hearing and vocalisations, and report writing. Advice is provided on implementing sensible and practical mitigation techniques, appropriate technologies, data collection, client and regulator liaison, and project kick-off meetings.



Floodplain Meadows – Beauty and Utility. A Technical Handbook

Principal Editors: Emma Rothero, Sophie Lake, David Gowing

ISBN: 978-1-4730-2067-2

Price: free download

Available from: http://www.floodplainmeadows.org.uk/floodplain-meadow-technical-handbook

A brand new handbook on species-rich floodplain meadows. Comprehensive and beautifully illustrated, the handbook covers everything you need to know about the history, management, restoration and creation of this vitally important, yet threatened, habitat. This book is aimed at anyone managing, restoring, or re-creating floodplain meadows, and those with a general interest in rural history and how it has influenced the floodplain wildlife we have today.

The Water Vole: The story of one of Britain's most endangered mammals

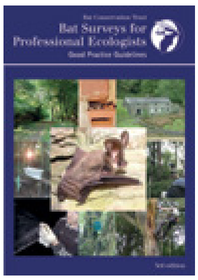
Author: Christine Gregory

ISBN: 978-1-910240-54-0

Price: £16.99

Available from: www.v-publishing.co.uk

This once ever-present mammal, like so many others, is now in danger – during the 1990s Britain's water vole population declined by over 80%, and it is now fully protected by law in England and Wales. Christine Gregory tells the story of the water vole, past, present and future, principally through its history in the waterways of Derbyshire. Having spent several years studying Derbyshire's water vole population and habitats, and capturing their behaviour intimately through her photography, Christine has developed a relationship with many of the custodians of the county's waterways, who are vital to the survival of the water vole.



Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition)

Authors: Bat Conservation Trust

ISBN: 9781872745961

Price: NHBS for £29.99 or free dwnload

Available from: Hardcopy from www.nhbs.com or free non-printable PDF from http://www.bats.org.uk/pages/batsurveyguide.html

Following extensive feedback from different user groups the Bat Conservation Trust has produced *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edition). The guidelines were revised, updated and reviewed by experts and feature new chapters and content. This is the essential reference guide for professional ecologists working with bats. See page 53 of this edition of *In Practice* for further information.

Forest community response to invasive pathogens: the case of ash dieback in a British woodland

Needham, J. *et al*.

Journal of Ecology 2016, 104: 315–330. doi: 10.1111/1365-2745.12545

In the last two decades, ash dieback disease has swept through Europe causing widespread mortality of *Fraxinus excelsior* L. (European ash) across much of its distribution. In the UK, *F. excelsior* is an abundant and ecologically important species.

Using demographic data from an 18ha plot in Wytham Woods, Oxfordshire, the authors built models that forecast the response of this forest plot to the loss of *F. excelsior*. They combined integral projection models and individual-based models to link models of growth, survival and fecundity to population dynamics. They demonstrated likely responses in Wytham by comparing projections under different levels of *F. excelsior* mortality. To extrapolate results to other systems, and tested hypotheses regarding the role of abundance, spatial structure and demographic differences between species in determining community response to disease disturbance.

The study shows that the outcome of succession is determined largely by the differing demographic strategies and starting abundances of competing species. Spatial associations between species were shown to have little effect on community dynamics at the spatial scale of this plot.

Correspondence: jessica.needham@plants.ox.ac.uk

http://onlinelibrary.wiley.com/wol1/doi/10.1111/1365-2745.12545/full

Resolving patterns of population genetic and phylogeographic structure to inform control and eradication initiatives for brown rats *Rattus norvegicus* on South Georgia

Piertney, S.B. *et al*.

Journal of Applied Ecology 2016, 53: 332–339. doi: 10.1111/1365-2664.12589

The South Georgia rat eradication programme is facilitated by the potential that rat populations are effectively isolated by glacial barriers. This allows for localised eradication effort at manageable scales, leading to sequential eradication of individual populations with minimal risk of incursion from neighbouring areas.

The authors used the levels of population genetic divergence to examine whether rat populations from nine glacially isolated areas on South Georgia are genetically distinct and so can be treated as independent eradication units.

Bayesian clustering of individuals identified seven different genetic groups, which potentially represent individual targets in baiting operations. Two mitochondrial DNA haplotypes were resolved across South Georgia, a consequence of two separate historical colonisation events.

The authors show that molecular markers are a valuable tool in species management and pest eradication.

Correspondence: s.piertney@abdn.ac.uk

Resolving large-scale pressures on species and ecosystems: propensity modelling identifies agricultural effects on streams

Pearson, C.E. *et al*.

Journal of Applied Ecology 2016, 53: 408–417. doi: 10.1111/1365-2664.12586

This study used monitoring data from over 3000 English and Welsh river reaches to assess the effects of intensive agricultural land cover (arable and pastoral) on stream habitat, water chemistry and invertebrates.

Macroinvertebrate richness was significantly greater at sites with a higher proportion of improved pasture in their catchment or riparian zone, with these effects probably mediated by increased algal production from mild nutrient enrichment. In contrast, macroinvertebrate richness did not change with arable land cover, although sensitive species representation was lower under higher proportions of arable land cover, probably due to greatly elevated nutrient concentrations.

Propensity modelling has great potential to address questions about pressures on ecosystems and organisms at the large spatial extents relevant to land-use policy, where experimental approaches are not feasible and broad environmental changes often covary. On this specific issue, the data and analysis support the use of riparian or catchment-scale measures to reduce nutrient delivery to sensitive water bodies.

Correspondence: PearsonCE@cardiff.ac.uk

http://onlinelibrary.wiley.com/doi/10.1111/1365-2664.12586/full

Quantifying turnover in biodiversity of British breeding birds

Harrison, P.J. *et al*.

Journal of Applied Ecology 2016, 53: 469–478. doi: 10.1111/1365-2664.12539

The authors investigated three measures for quantifying turnover based on species proportions, and estimated how each varies across Great Britain using data from the BTO's Breeding Bird Survey.

All three measures identified high turnover associated with loss of biodiversity in the south-east of England. This seems to be driven by changes in the farmland bird community, and by turnover in the scarcer species of the woodland bird community. The measures also showed evidence of high turnover in the west of Scotland; these changes may be linked to climate change, although precision in the measures for this region is relatively poor due to low survey effort.

Turnover in ecological communities may be quantified by modelling species abundance, and measuring how resulting species proportions change over time. When used alongside estimated temporal trends in biodiversity, these can identify areas and communities showing greatest evidence for change. How, or whether, society should respond to such changes depends on further investigation into the causes of the changes. For those communities with adequate survey data, the authors recommend that these methods augment the suite of measures used for routine assessment of change.

Correspondence: steve@st-andrews.ac.uk

Forthcoming Events 2016

For information on these events please see *www.cieem.net.*

Conferences		
Date	Title	Location
28 June 2016	Summer Conference 2016 – Linear Infrastructure and Biodiversity: Impacts and Opportunities	Birmingham
21 September 2016	Overseas Territories and Marine & Coastal SIG Conference 2016 – Protecting marine and coastal areas in the UK and Overseas Territories	London
12 October 2016	West Midlands Section Conference and AGM 2016 – Ecology and the Historic Environment	Ashby-de-la-Zouch
1-2 November 2016	Autumn Conference 2016 – Developing Your Skills for the Future: Understanding the Impacts of New Tools, Techniques and Policies	Nottingham

Training Courses		
11 June 2016	Bat Handling and Identification	Herne Bay
13-14 June 2016	Low Impact Class Licence Training for Great Crested Newts	Reading
16 June 2016	Barn Owl – Ecology, Surveying and Mitigation	Tamworth
21 June 2016	Otter Ecology and Surveys	Cannock
22 June 2016	Otter Mitigation	Cannock
22 June 2016	Coastal Habitats and Coastal Change: Shingle, Lagoons and Saltmarsh	Walberswick
22 June 2016	Using Indicator Species for Habitat Assessment (Phase I and NVC) – Grasslands	Salisbury
23 June 2016	Using Indicator Species for Habitat Assessment (Phase I and NVC) – Heathlands and Acid Grasslands	New Forest
23-24 June 2016	Low Impact Class Licence Training for Great Crested Newts	Peterborough
29 June 2016	Beginners Guide to the National Vegetation Classification (NVC)	Carlisle
30 June - 1 July 2016	Low Impact Class Licence Training for Great Crested Newts	York
1 July 2016	Camera Trapping for Ecologists	Stockton-on-Tees
7-8 July 2016	Reptile Mitigation	Basildon
12 July 2016	An Introduction to Coastal NVC Communities	Newcastle
12 July 2016	Water Vole Ecology and Surveys	Ilkeston
13 July 2016	Water Vole Mitigation	Ilkeston
15 July 2016	Introduction to White-Clawed Crayfish, Field Techniques, Licensing and Conservation	Settle
21-22 July 2016	Working with Crayfish – Survey Methods, Ecology, Mitigation, Licensing and Invasive Species	Settle
22 July 2016	Wildflower Identification for Improvers – Daisies and Umbellifers	Wirskworth
23 July 2016	Bat Handling and Identification	Herne Bay
26 July 2016	Introduction to Hydrological Monitoring	Shrewsbury
27 July 2016	Introduction to Wetland Habitats, NVC and Hydrology	Shrewsbury
27 July 2016	Hazel Dormouse-Handling and Survey Methods	Herne Bay
29 July 2016	Grasses for Beginners	Durham
8-9 August 2016	Surveying for Bats in Woodlands	Wotton-under-Edge
31 August 2016	Hazel Dormouse-Handling and Survey Methods	Herne Bay
8-9 September 2016	Introduction to Phase 1 Habitat Mapping and Plant Identification	Newark
8 September 2016	Preliminary Ecological Appraisal – An Applied Approach	Lewes
8 September 2016	Using the 'Vegetative Key to the British Flora'	Southampton
10 September 2016	Bat Handling and Identification	Herne Bay
13 September 2016	Water Vole Ecology and Surveys	Cirencester
14 September 2016	Water Vole Mitigation	Cirencester
14 September 2016	Livestock Management in the Uplands	Malham
15 September 2016	Introduction to Phase 1 Habitat Survey	Sudbury
16 September 2016	Green Infrastructure	London
21 September 2016	Introduction to Bats and Bat Surveys	Dunblane
22 September 2016	Bat Impacts and Mitigation	Dunblane
29 September 2016	Introduction to Bats and Bat Surveys	London