Welcome

From the President

**Autumn Conference 2013**
An extremely successful event was held in early November in Southampton with 230 people attending and really excellent presentations. The theme was ‘Ecosystem Services and Rivers – A Framework for Action’. The PowerPoint presentations are on the website and the conference report is on pages 44-45.

**AGM 2013**
The AGM was held during the Southampton conference with reports from the Governing Board and the Secretariat in Winchester. Steve Pullan CEcol CEnv FCIEEM (Treasurer) did his usual magic with a presentation that enlightened the healthy financial accounts of CIEEM. At the time of writing, we have 5,055 members and need you to each persuade at least one more person to join so that we can continue to deliver even more, bigger, better and joined-up services for you (to borrow a phrase from John Lawton’s *Making Space for Nature*). AGM details are on page 37.

**Chartered Ecologist**
The award of Chartered Ecologist (CEcol) is a new professional standard that will be widely recognised and valued. The application process is designed to be thorough, robust and rigorous. The 21 successful applicants from the first round of applications were ratified by the Governing Board in October. The Register of Chartered Ecologists has since opened to Full members who wish to become Chartered. There is more information on page 47.

**Awards 2013**
The winners of our annual Best Practice and People Awards were announced at the Autumn Conference. The awards celebrate individuals, projects and schemes that exemplify best practice, promote innovation and share knowledge in ecology and environmental management:
- The Best Practice Award for outstanding achievement in both the ‘Practical Nature Conservation’ category and the ‘Innovation’ category was presented to Penny Anderson Associates and United Utilities for the Sustainable Catchment Management Programme (SCaMP).

- The Outstanding Individual Award – Simon Boulter CEnv MCIEEM, a Principal Consultant at RSK.
- The New Professional Award – Jessica Batchelor GradCIEEM, a Graduate Ecologist at Arup.
- The CIEEM Medal was presented to David Stubbs CEnv FCIEEM in recognition of his outstanding contribution to the development of ecologically sustainable sports facilities and sports event management, including his role as Head of Sustainability for the London 2012 Olympics.

See pages 48-49 for more information on these Awards.

**Awards 2014**
We have new Awards for 2014. We have the established CIEEM Medal, the Best Practice Awards, the Outstanding Professional Award, and the Promising Professional Award. There are four new awards: the NGO Impact Award, the Corporate Achievement Award, the Student Project Awards, and the *In Practice* Award. See pages 50-51 for more details.

**Irish Section Conference**
We have just held a very successful and completely packed out Irish Section conference in Dublin with speakers including Jimmy Deenihan TD (Minister for Arts, Heritage and Gaeltacht) and Ciaran O’Keeffe (Director, National Parks and Wildlife Service). Special thanks to Jenny Neff CEnv FCIEEM (Vice President for Ireland), Anne Murray MCIEEM (Irish Section Convenor), and Mairead Stack (Irish Section Coordinator) for helping to organise this event. The report of this conference will appear in the March 2014 edition of *In Practice*.

Merry Christmas and Happy New Year!

John Box CEnv FCIEEM
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Information

**In Practice No. 82, September 2013**
ISSN 1754-4882

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*In Practice* is printed on paper using 100% post consumer de-inked waste. This is manufactured by an ISO14001, EMAS accredited company.

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Defra ministerial appointments
As a part of the Government Reshuffle on 7th October 2013, it was announced that David Heath and Richard Benyon would be stepping down from their Ministerial roles at Defra. George Eustice MP and Dan Rogerson MP have been appointed as Defra’s new Ministers. Owen Paterson MP and Lord de Mauley remain in their posts.

High flying birds at greater risk of collision with offshore wind turbines
New research reveals that most seabirds fly near the sea surface, avoiding collision with wind turbines by flying under the blades. Those birds that fly higher above the sea are at greater risk of collision. Building offshore turbines higher above the sea surface, or installing fewer large turbines instead of several smaller turbines, could reduce the number of collisions.

3rd UK Report on Implementation of the EU Habitats Directive
The UK 2013 Habitats Directive Reporting (i.e. Article 17 Reporting) is now available on the JNCC website. This includes all of the information and maps submitted to the European Commission, plus various supporting documents and spreadsheets.
http://jncc.defra.gov.uk/page-6387

Scottish wildlife crime app launched
An app has been launched that will enable people to record and report suspected cases of wildlife crime directly to Police Scotland – but only if you have an iPhone. The app allows users to access basic guidelines on do’s and don’ts at a crime scene, and complete an on-screen form to record the suspected wildlife crime. Users can also attach two photographs which are automatically tagged with a GPS reference of the location. The information is then sent to Police Scotland by email.

Farmland bird numbers continue to fall
The latest official figures on farmland birds released by the UK Government show they are continuing to decline. The Farmland Bird Index – which covers 19 species reliant on the farmed countryside – has seen a five year decline of 8%. Looking back over 40 years the long-term decline in farmland birds is 50%, however the decline has slowed in recent years.

Mammal Society Research Hub – Water Vole Questionnaire
The Mammal Society Research Hub supports and champions mammal research, by providing a platform to share knowledge and information with the wider mammal community. The Research Hub is new and needs submissions. In particular, the hub is looking for submissions on water vole mitigation. UK water vole experts are currently developing a more detailed set of recommendations to complement the existing Conservation Handbook.
The information acquired will be used to inform the production of the updated guidelines.
http://www.mammal.org.uk/research_hub

Bird surveys reveal population changes for mammals
A new study, published in the European Journal of Wildlife Research, looks at the first 18 years’ data collected by Breeding Bird Survey volunteers to investigate how the populations of nine species of common mammal have changed at national and regional scales during this time. Bird surveyors have given the clearest picture yet of how nine of our common mammal species are doing. These are grey squirrel, rabbit, brown hare, mountain hare, red fox, Reeves’ muntjac, red deer, fallow deer and roe deer.
Environmental Audit Committee say biodiversity offsetting proposal too simplistic

Government plans to introduce a system of biodiversity offsetting for new building developments could enhance the way the planning system accounts for the damage done to valuable natural habitats, but the proposals must be improved to properly protect Britain’s wildlife and woodlands. Following an inquiry the Environmental Audit Committee has published its report on biodiversity offsetting. It says that the Government’s Green Paper does not provide an evidence based analysis of how offsetting would deliver “biodiversity gain”.


Natural England’s revised Improvement Plan

Improving the efficiency of regulation to allow businesses to make significant savings is a key commitment in Natural England’s refreshed Improvement Plan. The Improvement Plan document responds to what customers have been asking for, including improved consistency in advice and casework handling, ease of contact, better sharing of data and giving advice earlier in the planning process.


Bird turbine collision reporting

A new email reporting system has been launched by Scottish Natural Heritage (SNH) to make it easier for people to report potential bird strikes at wind turbines. Recent high-profile media reports have highlighted cases in which birds have been killed following strikes with wind turbines, such as the white-throated needletailed swift and several raptor collisions. Now SNH has moved to make the reporting process simpler by creating a new email address Collision.Records@snh.gov.uk to allow people to pass on information. SNH is looking for information such as location grid reference (where possible), date, time, weather, the condition of the bird; species (if unknown then a description or photo), and contact details.


Natural England’s Revised Standing Advice for European Protected Species

Local Planning Authorities (LPAs) and developers will no longer have to wait for 21 days for advice from Natural England on wildlife species covered by European law. The latest improvements follow a wide-ranging review that Natural England has been carrying out to look at how standing advice can be used more widely to help reduce red-tape for LPAs, which has included carrying out pilots in the summer with Cornwall County Council and 60 authorities in the South East. By having access to standing advice on European Protected Species (EPS) on its website, LPAs and developers will be able to consult Natural England less often. The species covered by the new approach are bats, great crested newts, dormice, freshwater fish, higher and lower plants, invertebrates, natterjack toads, otters, sand lizards and smooth snakes. Natural England will continue to provide bespoke advice in situations not covered by the standing advice or where a proposal is likely to result in significant harm. It will also continue to provide bespoke responses to applications which may affect an SSSI, SAC, SPA or Ramsar Site. Natural England’s approach to Nationally Significant Infrastructure Projects (NSIPs) and to Environmental Impact Assessment (EIA) consultations will remain unaffected by the changes.


Largest lake in Britain and Ireland has lost three quarters of winter water birds

The largest lake in Britain and Ireland, Lough Neagh, has lost more than three quarters of its overwintering water birds according to researchers at Queen’s University Belfast. The study by Quercus, Northern Ireland’s Centre for Biodiversity and Conservation Science, found the number of diving ducks migrating to the lake for the winter months has dropped from 100,000 to less than 21,000 in the space of a decade. The research, published in the journal Freshwater Biology, found the ecosystem of the lake has dramatically changed since 2000/01 leading to a huge decline in the numbers of insects and snails living at the bottom of the lake. This combined with the effects of global climate change dramatically affected the numbers of migratory and overwintering water birds, a feature for which the lake is designated a Special Protection Area.


Up-to-date knowledge must be used to assess policy objectives

The most up-to-date knowledge and data must be used to assess policy objectives, new research confirms. Studying air pollution environmental quality targets set by the National Emission Ceilings (NEC) Directive, a new study has shown that if 2001 data are used to assess progress, most such targets appear to have been met. However, more recent and accurate data show that this may not be the case.


New Government figures chart decline of UK wildlife

Wildlife groups have welcomed the publication of new official statistics charting the state of a range of threatened species in the UK. The Government has unveiled a new indicator for priority species. The official statistic uses records dating back 40 years for 210 native species, including birds, bats, moths, butterflies, hares and dormice, to build a picture of the health of our wildlife. The figures show that priority species have declined on average by 58% since 1970.

http://jncc.defra.gov.uk/page-4238
Northern Ireland public ‘most realistic’ about the state of nature

People in Northern Ireland are more aware of the threats facing nature than anywhere else in the UK, according to a recent survey carried out by the RSPB and property website Rightmove. More than 1,500 people across the UK were asked a series of questions relating to gardens and garden wildlife in a bid to get an insight into people’s knowledge and interest in garden wildlife following the launch of the RSPB’s ‘Giving Nature a Home’ campaign. When asked how they would rate the state of wildlife in the UK, almost a quarter of people in Northern Ireland rated it a five – meaning they believe it’s ‘barely surviving’.


New tool to assess effects of global change on water resources

Water resource management needs to adapt to changes in climate, water demand and land use. A new tool has been developed by the LIFE+ Water Change Project to assess these ‘global change’ impacts on water resources and inform decisions on optimal adaptation strategies. A recent study has applied the tool to a river basin in Spain.


Offshore wind farm construction noise can displace harbour porpoises

Noise caused by construction of Germany’s first offshore wind farm caused significant habitat disturbance for harbour porpoises, according to a recent study. Its results suggest that porpoises avoided areas up to 20km from the noise source during construction of the wind farm’s foundations.


Drainage tunnels provide safe road crossings for wildlife

Drainage tunnels running under roads can provide small animals with safe road crossings, mitigating habitat fragmentation, a new study has confirmed. The researchers suggest that the tunnel design can be further improved to aid animal movements, for example, by providing dry ledges to ensure the routes are still available in times of high rainfall.


IUCN revises guidelines on protected area management categories

The International Union for Conservation of Nature (IUCN) has published a revised version of its Guidelines for Applying Protected Area Management Categories, which is meant to support the consistency of reporting by international bodies and national governments on protected areas across a variety of indicators. The Guidelines are a benchmark for defining, recording and classifying protected areas worldwide. In this reprint of the 2008 categories, there is a new section on Recognizing Protected Areas and Assigning Management Categories and Governance Types, drawing on global best practices and extensive consultations. The guidelines also include an assessment of the effectiveness of IUCN categories, an overview of international conservation initiatives, and consideration of special applications of the guidelines to different ecosystems.


CITES announces electronic species checklist

The Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) has announced the availability of an electronic ‘Checklist of CITES Species,’ where users can create a customized species list from scientific or common species names as well as CITES Appendices, countries or regions. The ease of access to and refinement of Checklist data are meant to enable CITES Parties to better ensure legal and sustainable trade in wildlife.

The Farmed Countryside – Maximising the Benefits for Wildlife

Land-Sharing and the Opportunities for Functional Agro-Biodiversity

Debbie Bartlett FCIIEEM
Environmental Consultant and University of Greenwich

The Lawton report, commonly summarised as “more, bigger, better and joined”, and the Natural Environment White Paper The Natural Choice have emphasized the importance of landscape-scale planning and management, and spawned pilot Nature Improvement Areas. The policy framework is clearly steering us firmly down the land-sharing, rather than land-sparing route, away from managing for wildlife in discrete protected areas, but as a component of the working countryside. Focusing on the delivery of environmental benefits from economically viable land management has been an increasingly important part of Common Agricultural Policy support, particularly the Higher Level Stewardship (HLS) scheme, as well as the woodland grant schemes.

About 76% of the UK land area is classified as farmland so the majority of the countryside, including many existing protected areas, is managed by farmers. The lack of closer integration between farming and conservation professionals has always been a mystery to me (and before I get a torrent of email abuse I know lots of you are fantastic at this!). Many – if not most – of our valued priority habitats were created by past economically viable agricultural practices and the best way to maintain them is to continue this; the best people to do this are farmers. This goes for woodland management too, with the traditional management of coppicing still practiced, particularly in the south and southeast of England, benefiting some valued woodland species. It is still economically viable and, for chestnut in particular, there is strong market demand. Those making a living from practical woodland management are highly skilled specialists. Many know far more about the habits of woodland birds, butterflies and dormice, than can be gleaned from a one-off survey visit.
There are many examples of good practice with ecologists working in partnership with those who actually manage the countryside but there is still an ‘us and them’ situation. While many farmers are genuinely interested in wildlife and want to minimise any adverse effects, they are under increasing pressure. Making a living, particularly for small farmers, is hard; supermarkets and bulk buyers control food prices, and input prices go ever upwards. Food security is an emerging global threat and the current policy driver is for ‘sustainable intensification’, a phrase Julian Hosking’s has suggested modifying to ‘optimal maximisation’ to reflect the genuine sustainability realistically achievable in differing situations. Sparing land to be managed specifically for wildlife will always be important for some particularly rare specialist species and there are many reserves protected by private or NGO ownership. There are going to be some significant gains as we try to adapt to environmental change by developing flood storage areas, increasing wetland habitat. However this drive for production will be another factor increasing the pressure for land (without even mentioning development). So the challenge is for us to work more closely with farmers and woodland managers to understand how benefits for both wildlife and commercial production can be combined, not forgetting the need for viable livelihoods for both ecologists and on the ground environmental managers. This lies at the heart of an ecosystem service approach and is the underlying rationale for some important opportunities emerging at the European level. These provide further impetus to explore – and exploit – the potential for what is increasingly being known as ‘agro-ecology’ or ‘functional agro-biodiversity’ (FAB). These are briefly reviewed below.

At the time of writing the details of the proposals to reform the Common Agricultural Policy are still being clarified but three ‘greening’ measures have been established, requiring farmers to establish ecological focus areas, maintain existing permanent grassland, and to encouraging them to grow a diverse range of crops. Establishing what constitutes an ecological focus area is the Sustainable Use Directive (or SUD) which requires all Member States to set out National Action Plans for achieving this. The UK plan was published in February 2013. While this has been criticised for not going far enough, particularly regarding neonicotinoid (or neonic) pesticides and the link to pollinator deaths, this is closely related to Government policy to make the food and farming industry more competitive while protecting the environment. The emphasis is on efficiency to increase food production for economic growth. Use of most neonicotinoid pesticides was suspended in April 2013 for two years starting on 1st December 2013, a ruling that will be effective across the whole of the EU. This is not likely to be widely popular, and our UK representatives voted against this ban. These chemicals were widely used as seed dressing resulting in systemic effects post-germination and during plant growth. As this reduced the need to spray, the advantage in both time and money is clear but it does open the door to wholesale revisiting of alternative approaches.

Integrated pest management (IPM) and the wider focused integrated crop management (ICM) have been around for a long time, practiced to variable extent, and with neonicotinoid seed dressings a common component of both. For IPM/ICM to be really effective requires that farmers understand the agro-ecological processes in their fields and for them to make decisions in this context. The four routes to comply with the SUD and find alternatives to using neonicotinoids are development of new generation pesticides, using bio-pesticides, moving from conventional to organic farming and natural pest control. The last two are based on taking ecological approaches to reducing the problem at source rather than dealing with it when it arrives or, as has been the case with neonicotinoid seed dressing, taking insurance measures to prevent it occurring. Examples of pest suppressive agricultural practice, based on understanding the relationships and interactions between species, are well established and include ‘beetle banks’ to encourage predators, and pollen and nectar strips to attract pollinators. While in Bangladesh a few years ago the Zoology Department of Dhaka University was successfully encouraging a return to the traditional practice of placing perches for

Black drongo on perch provided by the farmer. Photo by Ashrifun Nessa, Mawlana Bhashani University, Bangladesh
insect eating birds, such as the black drongo *Dicrurus macrocercus*, in rice paddies as an alternative to pesticide use. These were then removed as the grain ripened to reduce accessibility for seed eaters.

I cannot see this catching on in the UK but there are similar aspects of traditional knowledge that can – and are – being tested for effectiveness. Biological control is big business, particularly in glasshouses and using earwig shelters in orchards to reduce wooly aphids is becoming well established; I’m keen to promote bat conservation to farmers on grounds of pest control (and it might counteract some of the existing negativity). The European Learning Network on Functional Agro-Biodiversity (ELNFAB) is promoting these approaches, with FAB defined as:

“Biodiversity at the scale of agricultural fields or landscapes, which provides ecosystem services that support sustainable agricultural production and can also have a positive spin-off to the regional and global environment and society as a whole.” (ELNFAB 2010)

This is not the same as biodiversity conservation as we know it, which acknowledges the intrinsic value of the natural world and tends to concentrate effort on specific species, usually because they are rare or endangered, rather than because of their role in the ecosystem. FAB focuses on those organisms and landscape elements that actively underpin the ecosystem services that support agricultural production and farmers’ livelihoods as well as the environment and wider countryside (e.g. Bianchi et al. 2013). Flowering field margin options, as in Stewardship Schemes, are more likely to be effective if these are specifically developed to provide multiple benefits to fit in with crop regimes, soil and climate conditions, and management needs, and that support sustainable production. Researchers in the Netherlands and the UK have compiled a comprehensive database aimed to provide this tailored approach, bringing together information on over 100 plant species, and rating them against 14 criteria. These include suitability to support predators, parasitoids and pollinators as well as flowering time, plant growth type, native range, climate and soil requirements, and seed cost. The potential negative effects, such as for weeds and harbouring pests or crop diseases are also considered. This database provides a unique tool allowing site and crop-specific elements to optimise pest control and pollination services (ELNFAB 2012).

Another European initiative focusing on this area is the Biodiversity Knowledge Network (NoK) set up to bring together the experience of both practitioners and researchers and, importantly, to ensure effective flow of information between biodiversity knowledge holders and users across Europe. My involvement has been with the agriculture and biodiversity test case but this initiative is also considering conservation and the marine environment. The approach is based on a question, framed after discussions with the European Commission DG Environment and DG Agriculture, put to the Network. The wording of this is:

“Which types of landscape/habitat management are effective at maintaining or restoring populations of natural pest control agents?”

This is being tackled firstly by systematic literature review, combining the Collaboration for Environmental Evidence approach developed from Bangor University with the Synopsis of Evidence Initiative based at the University of Cambridge. A huge quantity of published material will need to be synthesised into a form that is suitable for communication to the practical land managers, or ‘biodiversity users’ (as they are referred to by the NoK). This ‘knowledge’ will need to be tested and perhaps the greatest challenge is to acquire information from the land managers about what works for them and integrating this with the published material. Please do get involved – the NoK really does need input from ecologists and environmental managers – the middle ground between academic research and farmers/woodland workers.

A third emerging theme is agricultural biodiversity, often forgotten but likely to be increasingly important in our changing environment. The Convention on Biological Diversity set Biodiversity Targets at the Aichi summit with Target 13 stating:

“By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.”

At European level this is defined as:

“… all components of biological diversity of relevance for food and agriculture, and all components of biological diversity that constitutes the agro-ecosystem.”
Agricultural production is currently dependent on very few species and breeding for specific traits, the merging of seed companies and wider distribution networks have all combined to reduce diversity of plants grown and the loss of older, locally adapted varieties. CIEEM’s South East England Section AGM was held at the Millennium Seed Bank and we learnt about the Wild Crop Plant Relative project, with seeds being collected and stored that may well prove important to breed in resilience to novel pests and diseases as well as to climate change. Similarly traditional, local (often called ‘rare’) breeds of livestock, may prove a vital genetic resource enabling production to be maintained. This is endorsed in the current Biodiversity Strategy for the European Union entitled Our life insurance, our natural capital: an EU biodiversity strategy to 2020. This includes a vision for 2050 focused on the ecosystem services provided by the ‘natural capital’ but also refers directly to the intrinsic value of biodiversity, a relief I suspect to many. Action 10 of the implementation plan is to conserve Europe’s agricultural genetic diversity and, in addition to this being incorporated into agri-environmental measures (presumably an addition to be included in the revisions) member states are encouraged to develop strategies to conserve this aspect of biodiversity, the ‘tame’ as well as the ‘wild’. This is reflected in the UK Strategy which identifies the need for targeted action to conserve agricultural genetic diversity in cultivated plants, farmed animals and wild relatives (Defra 2011, section 2.4). The elephant in the room is, as always, economics. While the idea of maintaining a wide gene pool is obviously sound it is undeniable that the old cattle breeds just do not produce as much milk, it has a higher fat content, the beef cattle have less of the high value cuts, and chickens, although decorative, do not lay as many eggs.

Biodiversity and agricultural production are so closely interlinked that it is – or should be – impossible to consider them separately. Our landscape is the product of millennia of productive management and our food is derived from naturally occurring plants and animals. Maintaining the countryside we value will increasingly depend on our working hand-in-hand with commercial agriculture to develop integrated, adaptable, management plans that can deliver livelihoods, food and wildlife, the ecosystem services on which we all depend.

### Acknowledgements

With thanks to Julian Hosking, and Ben Delbaere and Veronika Mikos of the European Centre for Nature Conservation, for constructive comments on the text.

### Notes

2. During a presentation to the Linnean and Systematic Societies, 18/4/13
6. For case studies and examples see http://www.eln-fab.eu/uploads/ELN_FAB_publication_small.pdf
7. See http://www.biodiversityknowledge.eu/
8. See www.environmentalevidence.org
9. See www.conservationevidence.org
10. See http://www.cbd.int/sp/targets/
11. See http://ec.europa.eu/agriculture/energy/biodiv/

### References


### About the Author

Dr Debbie Bartlett CMLI FCIEEM combines landscape architecture, ecology and rural development consultancy with her role as Principal Lecturer in Environmental Conservation at the University of Greenwich. She is the programme leader for the CIEEM accredited MSc in Environmental Conservation and her research focus is on integration of nature conservation with forestry and farming both in the UK and overseas.

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Creating and Managing Grassland for Breeding Waders on the Lincolnshire Coastal Grazing Marshes

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Lincolnshire Coastal Grazing Marshes Project

Introduction
A three-year study into the reasons for success in attracting breeding waders to sites converted from arable land to grassland in the Lincolnshire Coastal Grazing Marshes (LCGM) has produced results with wide-ranging applications. The low permeability soils and substrates in this area limit lateral groundwater movement to such an extent that wetness of a site depends almost entirely on how successfully water can be retained on the surface, often perched above the groundwater level. The level of water in surrounding ditches has little effect.

Site design is critical. As a result of the low permeability of the soils, it is possible to create scrapes from which water will gradually evaporate and which will be topped up effectively following rainfall. Linear channels, similar to historic patterns of ridge and furrow, provide a greater length of margin with soft ground suitable for waders to feed than do rounder scrapes and pools.

The ability of a site to retain water is also critical and this requires effective sealing of the field drains which enhanced the previous arable land use. Although it might be difficult to find all old drains. If any continue to operate, retaining water in scrapes and other surface features is problematical.

Site management, particularly grazing levels, is also critical as sward height and tussock density is important to breeding success. On fertile sites, the grazing intensity prescribed in agri-environment schemes may not be sufficient to achieve the optimum sward height.

The findings of this study should make a useful contribution to design of new environmental land management schemes and their indicators of success.

Background
The Lincolnshire Coast and Marshes National Character Area runs from the Humber to the Wash. The two estuaries are designated European Marine Sites and are of particular importance for the populations of birds they support, including significant assemblages of wading birds.

Lying between the Lincolnshire Wolds and the North Sea is the coastal plain known as the LCGM. Remnants of historical management are the fine examples of ridge and furrow grassland, which demonstrate a long history of mixed farming. However, until the mid-20th century, grassland predominated.

Water levels within the marshes have been managed for centuries. Sluices and staunches allowed movement of water from the raised main rivers into networks of ditches. The water stimulated grass growth, was used by livestock for drinking, and the ditches acted as wet fences. The first pumps were installed in the 1850s at Gayton Engine, but the modern era began after the 1953 east coast floods. From then on, highly efficient pumps have been installed and the emphasis has switched from provision of additional water for summer grazing to drainage to improve arable productivity. Inflow of water from main rivers ceased in the 1970s, however a legacy is the current practice of slightly raising water levels in Internal Drainage Board watercourses over the summer months for environmental reasons.

Concern over the changing landscape, with loss of grassland and the bird life it supports, led to the formation of the LCGM partnership in 2004. The partnership’s vision is:

“The Lincolnshire Coastal Grazing Marsh will once again have extensive grassland landscapes rich in wildlife, intersected by a distinctive pattern of water courses. Within this landscape, pastoral farming thrives and local communities have a high quality of life. The area is attractive to local people and visitors, with year round opportunities to experience the natural and historic environment through improved access, helping to develop and sustain a vibrant rural economy.” (LCGM 2006)

Since 2004, the partnership has gained funding for research and provision of advice to farmers, culminating in a Landscape Partnership grant from the Heritage Lottery Fund for a £1.7 million project that started in the autumn of 2011. Although the LCGM were not selected as one of the early Environmentally Sensitive Areas, incentives to maintain, restore or
create grazing marsh have been available since the 1990s. One arable reversion site, supported through the Countryside Stewardship Scheme, is of particular interest, with peak numbers exceeding two pairs of breeding waders per hectare and supporting the largest concentration of breeding lapwing in the county.

When Higher Level Stewardship (HLS) was introduced in 2005, evidence supplied by the partnership supported inclusion of the Lincolnshire Coast as a Target Area for breeding and wintering waders and wildfowl. Introduction of HLS resulted in more funding being allocated for ‘creation of wet grassland for waders’ which, in this locality, can be interpreted as restoration or creation of functioning grazing marsh.

**Concerns over allocation of resources to re-establishment of grazing marsh**

The Lindsey Marsh Drainage Board, the main Internal Drainage Board operating in the area, had concerns over the impact of large areas of new grazing marsh on the function of catchments. Raised water levels have the potential to increase flood risk.

In addition, concern was also being expressed that measures taken to create wet grassland for waders were not always successful and questions were being asked about value for money. As a result of these concerns, Natural England supported a research programme; funded through the HLS scheme and undertaken by JBA Consulting between 2009 and 2012.

**The scope of the study**

The JBA study focused on three recently established wet grassland creation sites, two of which were perceived to be ‘successful’ while anecdotal evidence suggested that the third was not attracting wetland birds to the same extent. A control site on arable land was also included. The study was designed to identify the reasons for success and to understand and explain the causes of any identified differences. The findings were expected to inform design of future projects and assess any changes to flood risk.

Monitoring studies were undertaken on all the sites between 2009 and 2012 to look at the following parameters:

- water levels on the sites and in the surrounding drains;
- soil hardness;
- rainfall;
- vegetation height and composition; and
- use of sites by birds, particularly target species.

### The study sites

The four sites – Saltfleetby, Bratoft, Middle Marsh and Control – are all underlain by relatively impermeable clay soils. The three reversion sites differ in their design (i.e. the means by which they were expected to hold water). Earth movement at the Saltfleetby site created features which can be described as wader scrapes with scattered rounded pools; within the Bratoft and Middle Marsh sites a ridge and furrow pattern was created with linear channels, scrapes and pools. The linear channel design collects surface run-off effectively and maintains an extensive wet margin. The Natural England Indicators of Success for the sites differed, but the critical issue was whether the sites were sufficiently

<table>
<thead>
<tr>
<th>Details</th>
<th>Saltfleetby</th>
<th>Bratoft</th>
<th>Middle Marsh</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Size</strong></td>
<td>100ha</td>
<td>23ha</td>
<td>72.5ha</td>
<td>21ha</td>
</tr>
<tr>
<td><strong>General description</strong></td>
<td>Flat, low-lying pasture c.1km from coast at Saltfleet (Humber Estuary Natura 2000 Site)</td>
<td>Flat, low-lying pasture 7.2km from the coast (The Wash and North Norfolk Coast Natura 2000 Site)</td>
<td>Flat, low-lying pasture 3.6km from the coast (The Wash and North Norfolk Coast Natura 2000 Site)</td>
<td>Two fields of arable land, c.1km from the coast at Saltfleet (Humber Estuary Natura 2000 Site).</td>
</tr>
<tr>
<td><strong>Scheme type</strong></td>
<td>HLS</td>
<td>CSS</td>
<td>HLS</td>
<td>N/a</td>
</tr>
<tr>
<td><strong>Description of earth works</strong></td>
<td>Creation of wader scrapes, ranging from small rounded ones to several elongated larger scrapes (maximum length 70m), in a relatively ad hoc arrangement. Field drains were blocked, but some remained intact, allowing continued drainage of the upper layers of soil and the scrapes contained within them.</td>
<td>Creation of a ridge and furrow pattern containing 18 long linear channels/scrapes in a grid and additional pools. Land drains were sealed and concrete sluices fitted to retain water on site.</td>
<td>Creation of a ridge and furrow pattern containing long linear channels/ scrapes and additional pools. The scrapes differ from those at Bratoft by being connected in a tiered system, with 15 discrete hydrological units, connected to a central water channel to direct and control discharges through two outflow weirs. Land drains were sealed.</td>
<td>N/a</td>
</tr>
</tbody>
</table>
wet to attract and retain breeding wetland birds. The sites had the following main features:

Outline of the Studies

The hydrological elements of the study aimed to produce conceptual models to understand how water moves through the sites and produces (or does not produce) suitable habitat conditions for the target bird species. This work involved desk studies, site walk-overs, hand auguring, creation of boreholes, and installation of gauge boards, stilling wells and rain gauge monitoring arrays which collected data over a three-year period.

Soil hardness (as a proxy for ability of beaks of wading birds to penetrate the soil to feed) was measured using a penetrometer. Rain gauges were used to measure rainfall. Vegetation was monitored in fixed quadrats. Bird numbers were monitored using a series of point counts and transects (recording from vehicles to avoid disturbance).

Key findings

Hydrology. The sites are all mostly underlain by low permeability clay or silty clay salt marsh and tidal creek deposits, which limit the rate of lateral groundwater movement. The hydrological conceptual models (see Figure 3) revealed the following key points:

- Because the soil and substrate limits lateral movement, water levels in drainage channels have little influence on groundwater levels within the sites (except very close to channels).
Evapo-transpiration and recharge (primarily rainfall) are the main factors controlling groundwater levels.

Groundwater levels only require small amounts of recharge to rise significantly because of the low specific yield of the clay.

**Flood risk.** Multiple factors influence peak discharges and the report included discussion of changes in run-off path length, changes in overall storage due to scrapes and the degree to which those scrapes are at capacity (i.e. amount of storage available). The way in which individual wetland reversion schemes affect the catchment drainage network, and thus flood risk, will vary depending on the design of the scheme and, to some degree, the position in the catchment.

**Soil hardness.** Except within scrapes where there was standing water, no site had soil damp enough for a six-inch nail to be pushed into the ground with ease between 1st April and 30th June as specified as a positive indicator in current HLS agreements.

**Rainfall.** The study period coincided with a period of climatically atypical, below average rainfall at all four sites. The continuing dry conditions led to the decision in spring 2012 to abstract water from adjacent watercourses (under licence) to fill the low-lying areas of the grassland sites. Without this it was considered that some key wetland birds would not breed successfully. Shortly after the augmentation, a very wet spring and summer commenced (recorded rainfall in April and June at Saltfleetby were 195% and 264% above the average respectively). Despite the atypical records over the study period, it was possible to draw strong conclusions.

**Vegetation.** The results showed that the swards across the three study sites were fairly similar, being mainly MG6 and MG7 type grasslands. The classification did not change much during the recording period, however, there were small-scale changes on an annual basis, probably related to variations in grazing pressure and weather conditions.

**Birds.** The JBA study demonstrated that three target species – lapwing, redshank and snipe – were present in statistically significant greater numbers throughout the three years of the study on the Bratoft and Middle Marsh (ridge and furrow) sites compared with the Saltfleetby and Control sites. Lapwing and redshank bred in significant numbers on the Bratoft and Middle Marsh sites, along with avocet. There were no breeding records for any of these species on the Saltfleetby and Control sites during the three years of the study on the Bratoft and Middle Marsh sites, although avocet was present. The JBA study demonstrated that

**Scheme design**

Because of the low permeability of the substrate, scheme design and earth works are particularly important in terms of the ability of a site to capture and hold water on the surface. Suitably wet conditions for target species cannot be achieved effectively by raising external ditch water levels. Key points for success were:

- The ability to collect rainfall run-off within surface features, retain it within the scrapes and pools and maintain a long wet margin through a range of water levels.
- The most effective design is a linear channel (ridge and furrow) pattern with scrapes (and pools) with a good catchment-size to scrape-size ratio. This creates and maintains a long wet margin due to its shape and cross section, whether full or nearly empty.
- The creation of long margins through a range of different water levels is important in creating and maintaining suitable habitat throughout the wader breeding period.
- The best scrapes were created in very low permeability ground. Where scrapes (and pools) were created in sandy clays (e.g. parts of Middle Marsh) or where there were effective field drains (e.g. parts of Saltfleetby), water within scrapes was more easily lost to the surrounding ground. Where scrapes were in very low permeability ground, water levels in the scrapes could be perched above the surrounding groundwater levels, allowing them to survive longer into the water budget deficit period.
- The nature of the groundwater response to recharge and to water levels within external drains was changed significantly by the presence of effective field drains. These acted to quickly drain the upper layer of the clay (providing water levels in the external drains created a suitable hydraulic gradient).
The findings of this work are likely to be applicable to other wet grassland areas with similar soil types (low permeability soils and substrates). The bird surveys demonstrate that in terms of attracting target species to breed and meeting Environmental Stewardship Indicators of Success, the Bratoft and Middle Marsh sites have been significantly more successful than the Saltfleetby or Control sites. The reasons for this revolve around the dryness of the Saltfleetby site resulting primarily from continued drainage of the upper soil zone and scrapes as field drains remained functional. It is anticipated that implementation of improvements suggested by these studies would result in the Saltfleetby site being colonised by breeding waders.

Site management

Grazing management is also critical to successful breeding by waders. Literature reviews (e.g. Hart et al. 2002) suggest that grazing by livestock throughout the breeding season at low densities – 0.2-0.5 livestock units per hectare (LU/ha) – appeared to maintain the sward and resulted in few nest losses through trampling. Beintema and Muskens’ (1987) model shows that a stocking rate of 0.5LU/ha will allow a hatching success of between 80% and 90% for lapwing, around 70% for oystercatcher and close to 90% for redshank.

Not surprisingly, current HLS agreements specify low stocking densities of 0.75LU/ha during the breeding season, yet local experience shows that on nutrient rich former-arable and intensive grassland sites these guidelines need adjustment. A better measure of the correct stocking rate would be sward height, especially from early-March to late-May. Sites vary as do seasons, but for the target species in this study (particularly lapwing and redshank) a short sward with occasional tussocks appears to produce conditions suitable for successful breeding. To achieve this, stocking rates up to 2LU/ha may be required on some sites.

Indicators of Success

In light of the results of the hydrological conceptualisation of the sites, the suitability of the Higher Level Stewardship Scheme (HLS) Indicators of Success for HK13 -Creation of wet grassland for breeding waders have been reviewed. This review showed that some indicators appear to be based on the concept that conditions for target species will be created through a general raising of groundwater levels across a site. However, suitable conditions were created on the best sites within the study through the collection of run-off into linear scrapes.

With limited lateral groundwater movement, soft soil is confined to scrapes and their fringes. The penetrometer test indicator, developed for peat soils, is unsuitable for low permeability clay sites. Assessments presented in the study report should be informing the development of indicators for new environmental land management schemes.

References


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All three authors have been involved in the Lincolnshire Coastal Grazing Marshes Project since its early days and both Lindsey Marsh Drainage Board and Lincolnshire Wildlife Trust belong to the partnership.

Figure 4. The Middle Marsh study site showing linear channels in a ‘ridge and furrow’ pattern. As water levels drop, the channels retain a long ‘edge’ with soft soil conditions suitable for waders to feed. Cattle maintain a sward height suitable to attract birds in spring and provide the conditions for nesting. Photo by © R. Wardle
Introduction

Interest in biodiversity offsetting is driven by evidence that the planning system has not been as effective as it could be in ensuring that biodiversity resources are protected, conserved and enhanced and where necessary compensated for, as advocated in planning policy.

Biodiversity offsets are activities designed to deliver ben...

Feature Article: Reconstructing Lost Landscapes as a Tool for Ecologists and Environmental Managers: A Case Study from Huntingdonshire

Reconstructing Lost Landscapes as a Tool for Ecologists and Environmental Managers: A Case Study from Huntingdonshire

Jason Peters

As a landscape architect and historic environmentalist with a keen interest in ecology and local history, I wish to share the findings of my research into the Lost Forest of County Huntingdon and my adopted methodology in the hopes that it may assist others around the country in reconstructing our historic environment.

Assessing the antiquity of landscape elements and interpreting the quantifiable evidence to demonstrate location, dynamic extent and historic duration of habitat presence could, I hope, assist in the preservation and conservation of our environmental heritage. Additionally cartographic reconstructions may highlight areas suited for restoration or enhancement based on historical precedence.

My research has enabled me to recreate, for the first time, the history of afforestation of a whole county – Huntingdonshire – and demonstrate that almost all persisting woodland in that county is indeed ancient, as are many of its hedgerows and ditches.

As an offshoot to the original research I have been able to map and date parkland extent, Anglo-Saxon and Norman earthworks, Anglo-Saxon to Plantagenet hedgerows, early Anglo-Saxon woodland pastures, woods and groves; the majority of which remain unprotected and constitute ‘living archaeology’ as they considerably pre-date the perceived 18th century landscape framework resulting from the Acts of Enclosure.

Academic debate in place name analysis, the rich historic record preserved in archives and the application of computer graphic design programmes have enabled fresh interpretation, and a cartographic reconstruction exercise of the Huntingdonshire landscape, revealing lost forests, chases, woods and groves, lost place names, historic habitats and extinct species.

In the 1970s the botanist E. Pollard used species composition of selected Huntingdonshire hedgerows to postulate their antiquity. In the same decade Peter Bigmore in the Landscape of Bedfordshire and Huntingdonshire used Pollard’s research to conclude that most woodland of the Royal Forests of the county of Huntingdonshire (which he considered minor landscape elements) had been grubbed up in the Middle Ages. Does this argument stand up to recent discoveries?

My research questions this conclusion and demonstrates that woodland pasture management persisted across significant swathes of the county at least to the Restoration, and suggests many of the hedgerow and earthwork boundaries within Royal demesne estates are Anglo-Saxon in origin, and potentially re-used Romano-British features.

The Victorian first edition Ordnance Survey quarter sheets at the six inch to the mile...
A county-wide composite Posthumous Plan of mid-Victorian Huntingdonshire, depicting the detail of the first edition Ordnance Survey quarter sheets. In total 198 quarter sheets were digitally spliced and reassembled to create this drawing. © J. Peters (2013)

scale (1st Ed OS), record in great detail the field lines and features of the landscape before the agricultural intensification of the 20th century. The challenge facing the researcher, however, is that one printed quarter sheet representing a few square miles of actual land covers almost a square metre of table top. Study is therefore limited by the physical size of the original documentation.

By digitally scanning such maps, cropping the drawing frame and splicing together adjacent sheets (using Adobe Photoshop), a district, or county-wide composite base plan can be created, and printed, at a size that enables a (single!) desk top study; yet retains all the detail of the original survey sheets. It is therefore possible to create highly detailed maps of any county depicting the Victorian era landscape. Such a composite digital file (or when printed a tangible single plan) reveals many linear features unobservable at the larger scale of the original quarter sheet print-outs, including medieval furlong boundaries, early Anglo-Saxon tribal boundaries, and delineations that excavation may reveal as prehistoric trackways.

Field patterns revealed on the composite plan demonstrate the extent of assarted (grubbed up) woodland as evidenced by clusters of small irregular field patterns. Fields created in open character landscape possess long interrupted boundary lines, as discussed by Oosthuizen et al.

Small irregular field patterns as observed on the composite 1st Ed. OS (Huntingdonshire) clearly agree with the long held axiom that woodland resources were retained on the cold soils of the clay uplands whereas the river valley gravel terraces were cleared of mixed woodland prior to field creation with only willow osiers and holt retained on alluvial margins.

Comparison of the small irregular field patterns, (revealed at the district scale) with persisting estate, tithe and pre-enclosure maps for each village or township in the district or county (again, scanned and digitally overlain as opaque layers on the composite base plan) confirm in place names, field names and furlong names, the evidence of (pre-)historic woodland habitat.

Whilst some field names are obviously recording grubbed-up woodland (e.g. Wood Ground, Grove Field, Wood Furlong), others are more esoteric in nature: Burnt Ground, Stocking Close, possibly even Cold Harbour (which I consider corrupted from the medieval Middle French Cul d’arbour; End of Trees, or in English, 'Wood End').

As a desktop study one can therefore plot the historic extent of persisting Victorian woodland (as depicted on the 1st Ed. OS) and ascertain the removal of pre-Victorian woodland as demonstrated on Tudor to Georgian estate/parish maps within the patchwork zones of small irregular field clusters.

It is therefore a question of when the assarted woodland as recorded in field and furlong names on estate maps were actually grubbed-out, as field names are passed from generation to generation and could record medieval clearances, or could just as easily document contemporary clearance shortly before the Georgian/ Victorian maps were published.
To go further back in medieval history one can refer to assart licenses granted (and dated), aristocratic and ecclesiastic estate records and Royal disafforestation charters. Such primary documentation often lists the woodland by township and owner rather than by the Old English (OE) wood name. A resource for the researcher is thus the comprehensive *Victoria County History* volumes which were systematically published by county in the early decades of the 20th century (and cover most of England) which contain details on the historic owners of parishes and land holdings. This enables the location of ‘woodland by owner and township’ to be plotted on a composite base plan and correlated to wood names or wood place name references.

Huntingdonshire is blessed in respect of surviving historic documents relating to woodland housed in various archival collections recording transactions spanning the reign of King Henry I to Charles II. Medieval forest scribes and monastic clerics dutifully documented the woodland habitat (woods, groves, woodland pastures) by owner and location in dated disafforestation charters, thus providing a critical date at which to assess deforestation (removal of tree cover) and disafforestation (the removal of forest law jurisdiction) providing a physical and a socio-political basis for assessment.

The Forest of County Huntingdon disafforestation ratifications provide pages of woods and groves across the county. Such areas where woodland was grubbed out often became marked with moated homesteads; a focus for ancillary settlements and concentric rings of field patterns cut from the surrounding woodland pastures, providing another physical indicator of medieval woodland clearance and/or coppice management.

By plotting the location of recorded woodlands on the composite base plan using field pattern and place name analysis, one can demonstrate the existence and general extent of woods and groves in the 13th to 14th centuries, and target those areas for on-site research into relic woodland species and ancient hedgerow persistence. Hopefully, a time-saving exercise for field ecologists and conservationists and an exercise that may lead to the future preservation of ancient habitats.

Incredibly for Huntingdonshire, perceived by many as a denuded prairie landscape, around 60% of those medieval woodlands persisted as woodland (with possible incremental reduction) to be recorded on the 1st Ed. OS of the 1890s and many persist to the present as tiny wooded copses or extensive tracts of woodland; medieval to Tudor parkland (arboreal-pastoral) land use has not fared as well with approximately 20% represented in the modern landscape.

The next source of primary documentation and one that enables the tool of a composite highly detailed pre-agricultural intensification base plan to be appreciated, are medieval perambulations, or ‘walk around surveys’ which record in prose the peripheral route of a given holding that spans areas larger than those depicted on a the original quarter sheets.

By locating the topographical features (streams, hills, crossroads, N/S/E/W descriptions which remain constant) and cross-referencing those with persisting place, field and furlong names on later maps and plans, the peripheral route of the recorded landscape feature can be plotted onto the district scale composite plan. This exercise not only demonstrates the antiquity of the re-traced peripheral boundary (i.e. certainly medieval delineations if not earlier) but also locates ‘lost place names’ along the route which often record in the compounded place name a habitat type, such as a meadow, coppice, pasture or woodland, further enlightening the researcher.

For Huntingdonshire, the Plantagenet perambulations that survive describe the three Royal Hays of Weybridge, Sapley and Harthay. The full translation of the text informs us these sites were afforested prior to the first year following the coronation of King Henry II, and remained afforested after the widespread disafforestation of King Edward I. So how was a Royal hay subsequently managed?

These Royal hays that remained afforested in 1301 and had not changed boundaries since 1218 AD containing medieval woodland, meadow and pasture place names were managed as woodland pastures until at least the Restoration as evidenced by annotated estate maps dating from the mid-17th century. This observation disputes Bigmore’s conclusions.
that the Royal Forests were grubbed up in the Middle Ages.

On-site investigations at Sapley and Weybridge retracing the plotted perambulation peripheral route of each ‘hay’ reveal deep, broad earthworks, far larger than usual drainage ditches, topped on either bank with gnarled specimens of *Crataegus monogyna*, *Prunus spinosa* (locally called Buckthorn, interesting given the endemic roe deer) and *Euonymous europaea* (locally very rare). Why was a medieval hay thus enclosed?

The collective term ‘hays’ (*haïs* in the medieval Latin), and the on-site persisting thorn species are significant, as the Plantagenet collective description and place name suffix – *hay* derives from the Old English verb *(ge)hagen*, meaning both to enclose/covert and to cherish/protect.

Hooke et al. suggest that the significance of the place name element *hay*, which she collectively terms ‘haga sites’ have been overlooked, lamenting Oliver Rackham who interprets the term merely as a variant of ‘hedge’ in his *History of the Countryside*. How was a medieval hay used?

Hooke’s investigations suggest a haga site was an Anglo-Saxon enclosure for the shelter, preservation and hunting of game (i.e. an enclosed woodland pasture for locally endemic game species). My own research gleaned from primary documentation relating to Huntingdonshire reaffirms the argument, and as the three Royal haga became deer parks arguably the haga represents a model for the English landscape and garden movements (central lodgings, lawns, drive, woodland belts, field-trees, water pools and hedges).

Place name analysis of Huntingdonshire’s numerous haga sites (compounded most notably with wolf, hart and often with topographical features and historic figures), and additionally place names contained within the perambulation surveys of each haga, demonstrate that the mid Anglo-Saxons, the Danes/Vikings, and the late Anglo-Saxons (re-)used haga sites as privatised hunting preserves with specialist target species. The boundary delineations of these sites persist to the present.

Forest court pleas demonstrate that the haga was a multi-cropping resource for agistment, pannage and other seasonal grazing, production of timber for prestige construction (King’s College, Cambridge etc.), and a multi-cropped resource for fur, faggots and browsewood.

I therefore consider the peripheral earthworks and hedges at Weybridge and Sapley haga to be the deer leaps enclosing woodland pastures used to restrain and coral game for hunting by a royal, and thegny (Anglo-Saxon aristocracy) elite.

Or, as a translation of the medieval Latin text recording the perambulation of the Royal Hays of Huntingdonshire in 1218 suggests, the hay-edge, or ditched hedges, enclosed places “*in which the King’s beasts reside peacefully*”.

Most interestingly, for Huntingdonshire (and my preliminary research suggests elsewhere in England and the Continent), the Anglo-Saxon haga site with its privatised hunting rights became the core of later Norman afforestation.
Forest legal jurisdiction, that is Forest law, extended those privatised hunting rights and a restriction on habitat/resource exploitation to the masses across larger tracts of countryside, removing that land from Common or Canon Law, akin to a ‘modern conservation area cum private shooting estate’.

The result of Norman and Plantagenet forest law, in Huntingdonshire at least, was an Anglo-Saxon Royal haga with existing privatised rights being afforested, around which a dynamic zone of afforestation radiated. This extra-haga zone was usually called a forest or forest bailiwick in its own right, and recorded in primary documentation by the eponymous title of the nearest Royal haga to which it related. Such duplication of the place name relating to the core haga and larger forest zone understandably leads to contemporary confusion in forest reconstruction exercises, and again suggests that the forests of Huntingdonshire were not minor landscape elements as 20th century authors suggest.

In regards to Huntingdonshire, the Victoria County History: Huntingdonshire (VCH:H) published in 1932 has influenced local historians in suggesting that “the whole County lay under forest law between 1155 and 1300.” (Repeated in Bigmore. P. The Bedfordshire and Huntingdonshire Landscape. 1979:78, unreferenced but likely from Victoria County History: Huntingdonshire).

This statement does not stand up to investigation of the available primary documentation which describes Henry II afforesting only the woods and groves of the County of Huntingdon, and, during the

Extract from the Ely Coucher Book held at Gonville and Caius College Lower Library, Cambridge. (The above text inform us: “and so King’s Delph was afforested by Robert Passelwe, [forest] justicar in the time of King Henry (III), father of King Edward who now is [reigns]” (my translation). This demonstrates that not all of Huntingdonshire was afforested from 1155 as reported by 20th Century authors.

Posthumous Plan of the Forest of King’s Delph, part of the dynamic Forest of County Huntingdon. Note the reconstruction of the drained fenland meres, made possible by digitally overlaying and resizing to scale pre-drainage maps of the fens, and taking into account the fossilised boundaries of the meres as delineated by peripheral drainage channels recorded on the 1st Ed. OS. © J. Peters (2013)
minority of Henry III, both the Ely Coucher Book and Ramsey Abbey Cartulary concur that King’s Delph fenland was afforested. Add to this the piecemeal afforestation of assart grants by Henry I, John and Edward I, and the complexity of forest law designated areas becomes apparent!

No wonder the VCH:H editorial notes record that “the whole subject [afforestation] is so difficult that I think it would be wiser to avoid committing ourselves [in VCH:H] to any particular theory.”

Returning to landscape reconstruction, by locating the extent of Royal haga (based on perambulations), and assessing dynamic forest law coverage as evidenced from medieval forest court pleas, assart and imparkment licenses, one can reconstruct zones, fragments and patches of forest law land throughout the Middle Ages to the Restoration, after which time for Huntingdonshire the paper trail runs dry.

Cartographically one can use the habitat references, habitat descriptions and inferred habitat cover from place name evidence to better understand the tapestry of medieval habitats and postulate the causes of their protection or destruction (i.e. retention or removal of forest legislative protection).

For Huntingdonshire, this has enabled me to produce a series of plans that document at specific and successive snapshots in history, the extent of forest law lands, the extent and location of habitats within and without those afforested areas and enabled me to date delineations in the landscape. Surely this is of use for justifying and quantifying the preservation and conservation of our landscape heritage and biodiversity?

The generation of maps that record place name evolution, field names and furlong names (usually describing topography and land cover) on a composite district or county-wide plan are also a useful tool to demonstrate where specific habitats, even specific species, were historically present, and over which periods of our recorded history. Again, such studies provide quantifiable evidence to the antiquity and persistence of habitats for their due preservation and protection, or wise location for re-instatement.

Parkland as a habitat used to cover large areas of medieval to Tudor Huntingdonshire as demonstrated by imparkment licences, estate maps, tithe/enclosure plans and the Victorian Ordnance Surveys, yet this is a habitat type rarely discussed or considered in habitat enhancement or restoration schemes. A shame, as such habitats as a landscape typology suit the urban, residential and recreational developments which the county has endured as a result of being in London’s commuter belt.

It seems, to this researcher at least, that historic reconstruction can add gravitas to the protection of our landscape heritage, can quantify the historic loss of habitat, and hopefully provide reasoning for historically sympathetic, topographically/geo-physically relevant landscape management to aid biodiversity on ancient sites and sites considered for enhancement.

Notes
4 National Records Office, British Library, Huntingdon and Cambridge Archives, Cambridge University, the Norris Museum, St.Ives.
6 National Record Office. MR024 repaired, 8A 417, Forest Proceedings Ancient. Duchy of Lancaster Forest proceedings various dates, including 1218/19 AD in DL 39M.

About the Author
Jason Peters (MA Hons Landscape Architecture, Adv.Dip. Historic Environment, licentiate Member of the Landscape Institute UK) has recently relocated to Enfield, Middlesex, and is now Learning and Conservation Manager for the Forty Hall Estate, run and owned by Enfield Council and undergoing considerable landscape restoration with the assistance and generosity of a Heritage Lottery Funded grant. His Forest of County Huntingdon series of maps are commercially available online at www.posthumousplans.co.uk. The Field and Furlong-Name series and Place-Name Evolution series for Huntingdonshire and the Isle of Wight will be available shortly. Additional research is being conducted into Middlesex and Essex as further study areas. Please join the online mailing list of www.posthumousplans.co.uk be kept informed of map releases. Jason spoke at the British Cartographic Society's annual symposium in September and will be speaking at the Huntingdonshire Flora and Fauna Society's AGM in March 2014.

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A Comparison of the Invertebrate Value of Brownfield Sites with Greenfield Sites and Local Nature Reserves in England and Wales

Jonty Denton MCIEEM
Albion Ecology

Introduction
The problem of developments targeting brownfield sites, and its impact on biodiversity is well known (Buglife 2013), but the scale of the problem is still poorly understood especially on small sites. Over the past 20 years or so, I have been commissioned to carry out invertebrate surveys at over 300 sites in England and Wales. In most cases these were baseline surveys intended to provide the site owners/managers with an idea of what was present on the site and attempt to provide them with some measure of its value both locally and nationally.

It was impracticable to survey all the potential invertebrates on any given site so specific groups of species, which were sufficiently well known so as to provide meaningful comparisons to be made with other sites both locally and nationally, were targeted. Surveys focused on the nationally reviewed invertebrate groups, which have had status classifications assigned to each species based on the current and historic distributions (Ball 1994). These include: Mollusca (slugs and snails), Arachnida (spiders, harvestmen and pseudoscorpions), Isopoda (woodlice), Ephemeroptera (mayflies), Odonata (dragon- and damselflies), Plecoptera (stoneflies), Orthoptera (grasshoppers and crickets), Dictyoptera (cockroaches) Dermaptera (earwigs), Hemiptera-Heteroptera (true bugs), Hemiptera-Homoptera (hoppers), Psocoptera (psocids), Neuroptera (lacewings), Mecoptera (scorpion-flies), Lepidoptera (butterflies and moths), Trichoptera (caddis flies), Diptera (true flies), Aculeate Hymenoptera (ants, bees and wasps), and Coleoptera (beetles).
**Basic Survey Methodology**

**Terrestrial/Arboreal Sampling**

All the terrestrial and arboreal habitat types present within each site were sampled. The methods employed included standard techniques of sweeping grasses, rushes, sedges, herbs and foliage: and beating the foliage, and branches of trees and bushes, especially blossom bearing plants such as hawthorn, rowan, and blackthorn over a beating tray (Kirby 1992). Deadwood was examined by hand and bark removed to reveal bark dwelling (corticolous) species. Fruiting bodies of fungi were also searched for invertebrates. In some cases fungal fruiting bodies and twigs infested with insect larvae were removed and placed in rearing cages and any adult insects emerging were collected in situ. Similarly leaves attacked by leaf mining caterpillars were removed and the occupants reared out in rearing jars and boxes. Active sap-runs were also investigated and insects attracted to the fermenting sap collected in a pooter.

A petrol powered suction sampler was employed to collect terrestrial invertebrates. Surface vegetation, tussocks, and ground litter were sampled and each collection emptied onto a large beating tray, where specimens of interest could be collected. The remainder could then be released unharmed.

**Wetland Sampling**

A 0.5mm GB nets pond net was employed to sample any puddles, pools and streams for invertebrates. Bank-splashing was employed on the muddy/mossy areas around the various water bodies and seepages encountered. This simply involved throwing handfuls of water over the surfaces forcing burrowing beetles to the surface, where they were collected in a pooter. Moss and leaf litter was pushed under the water surface to force out the invertebrates within.

**Results**

**Comparison of Sampled Sites**

I have only included data sets (collected by sampling in ideal conditions in the period May-August) which where subject to a broadly similar sampling effort, and thus of roughly similar dimensions. The exceptions were greenfield sites with extensive arable fields, which were very easy to sample by the methods employed. Typically these sites would be sampled on 1-2 visits only. As a measure of the combined value of each site a **pooled weighted score** was calculated: For a site with 5 Notable Bs (5 x 8 = 40) and 1 RDB3 (1 x 24) the combined score would be 64. To reduce bias this was then divided by the number of survey days. So for a site surveyed over 1.5 days, the pooled weighted score would be 42.6.

Comparison of the three data sets shows that there is a statistically significant difference (analysed using two-tailed t-test, assuming unequal variances) between the mean pooled weighted score of Notable/RDB species recorded per man day between brownfield and LNRs (t=2.035, p<0.0001), but no statistical difference when the same comparison is made between brownfield and LNRs (p>0.2).

**Status Definitions**

**Red Data Book Category 1 (RDB 1) – Endangered.** Taxa in danger of extinction in Great Britain and whose survival is unlikely if the causal factors continue operating. Scoring 32 in species weighting.

**Red Data Book Category 2 (RDB 2) – Vulnerable.** Taxa believed likely to move into the endangered category in the near future if the causal factors continue operating. Scoring 32 in species weighting.

**Red Data Book Category 3 (RDB 3) – Rare.** Taxa with small populations in Great Britain that are not at present endangered or vulnerable, but are at risk. These taxa are usually localised within restricted geographical areas or habitats or are thinly scattered over a more extensive range. Scoring 24 in species weighting.

**Red Data Book Category K (RDB K) - Insufficiently Known.** Taxa in Great Britain that are suspected, but not definitely known, to belong to any of the above categories, because of lack of information. Scoring 24 in species weighting.

**Nationally Scarce Category A - Notable A (Na).** Taxa which do not fall within RDB categories but which are none-the-less uncommon in Great Britain and are thought to occur in 30 or fewer 10km squares of the National Grid or, for less well recorded groups, within seven or fewer vice-counties. Scoring 16 in species weighting.

**Nationally Scarce Category B - Notable B (Nb).** Taxa which do not fall within RDB categories but which are none-the-less uncommon in Great Britain and are thought to occur in between 31 and 100 10km squares of the National Grid or, for less well recorded groups, within eight and twenty vice-counties. Scoring 8 in species weighting.
Table 1. Numbers of nationally scarce and RDB invertebrate taxa found on:-

**Local Nature Reserves**

<table>
<thead>
<tr>
<th>Site, County</th>
<th>Nb</th>
<th>Na</th>
<th>RDB3/K</th>
<th>RDB2/1</th>
<th>Pooled weighted score</th>
<th>Number of sample days</th>
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<tbody>
<tr>
<td><strong>BERKSHIRE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snelsmore Common (heath/wood/mire)</td>
<td>12</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>72</td>
<td>2</td>
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<tr>
<td>Padworth Common (heath)</td>
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<td>2</td>
<td>2</td>
<td>0</td>
<td>92</td>
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<tr>
<td>Pinewood (heath/pine woodland)</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>72</td>
<td>1</td>
</tr>
<tr>
<td><strong>HAMPSHIRE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chappets Copse (ancient woodland)</td>
<td>11</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>80</td>
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<tr>
<td>Shutts Copse (ancient woodland)</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>26.7</td>
<td>1.5</td>
</tr>
<tr>
<td>Micheldever Spoil Heaps (Chalk spoil. Old brownfield!)</td>
<td>11</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>128</td>
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<tr>
<td>Milton Locks (coastal saltmarsh/grassland)</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>32</td>
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<tr>
<td><strong>KENT</strong></td>
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<td>One Tree Hill (ancient woodland)</td>
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<td>3</td>
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<td>0</td>
<td>128</td>
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<tr>
<td>Lower Rainham (old gravel workings/scrub)</td>
<td>8</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>112</td>
<td>1.5</td>
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<tr>
<td><strong>MIDDLESEX</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Glebelands (old gravel workings/scrub)</td>
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<td>1</td>
<td>0</td>
<td>0</td>
<td>72</td>
<td>1</td>
</tr>
<tr>
<td><strong>SURREY</strong></td>
<td></td>
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<td>Bullswater Common (heath)</td>
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<td>1</td>
<td>69.3</td>
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<td>Cobbett Hill Signal Station (heath)</td>
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<td>Cucknell's Wood (ancient woodland)</td>
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<td>Mountain Wood (ancient woodland)</td>
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<td>Nower Wood (ancient woodland)</td>
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<td>1</td>
<td>0</td>
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<tr>
<td>Lammas Land, Godalming (floodplain grassland)</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>Papercourt Meadows (floodplain grassland)</td>
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<td>5</td>
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<td>Vann Lake (lake with reed)</td>
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<td>0</td>
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<td>Sidlesham Mill Road LNR (reed)</td>
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<td>The Severals (Reed beds)</td>
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<td>0</td>
<td>0</td>
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<td>1.5</td>
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**Mean No. of species per category**

<p>| | | | | | | |</p>
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<tr>
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<td>1</td>
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<td>HMS Osprey (Rifle range on limestone)</td>
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<td><strong>ESSEX</strong></td>
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<tr>
<td>Stanway North (sandpit)</td>
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<td>Stanway South (sandpit)</td>
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<td>RDB2/1</td>
<td>Pooled weighted score</td>
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<td>----</td>
<td>--------</td>
<td>--------</td>
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<tr>
<td>HAMPSHIRE</td>
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<td>0</td>
<td>0</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>Darby Green (gravel)</td>
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<td></td>
<td>Farnborough (airfield)</td>
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<td>3</td>
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<td>Southwood (former military)</td>
<td>21</td>
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<td></td>
<td>Locks Heath (allotments)</td>
<td>5</td>
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<td>76</td>
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<td>Bishop's Stortford (sidings on ballast)</td>
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<td>0</td>
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<td>0</td>
<td>40</td>
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<td></td>
<td>Cuxton (chalk pit)</td>
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<td>0</td>
<td>76</td>
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<td></td>
<td>Faversham (chalk pit)</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>32</td>
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<tr>
<td></td>
<td>Woolwich Arsenal (military, ruderal)</td>
<td>10</td>
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<td>2</td>
<td>0</td>
<td>80</td>
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<tr>
<td>MIDDLESEX</td>
<td>Bittacy Hill (gas works, ruderal)</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>0</td>
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<td>Isleworth (allotments)</td>
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<td>2</td>
<td>0</td>
<td>128</td>
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<tr>
<td></td>
<td>Twickenham (allotments)</td>
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<td>1</td>
<td>0</td>
<td>0</td>
<td>80</td>
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<tr>
<td>NORFOLK</td>
<td>Wymondham (gravel)</td>
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<td>0</td>
<td>1</td>
<td>0</td>
<td>48</td>
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<tr>
<td>SURREY</td>
<td>Brooklands (airfield)</td>
<td>21</td>
<td>8</td>
<td>5</td>
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<td>208</td>
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<tr>
<td></td>
<td>Holmethorpe (sandpits)</td>
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<td>0</td>
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<td>0</td>
<td>144</td>
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<td>Newdigate (clay pit/ruderal factory site)</td>
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<td>1</td>
<td>0</td>
<td>1</td>
<td>96</td>
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<tr>
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<td>Surbiton water works (wetland/sandy ruderal)</td>
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<td>SUSSEX</td>
<td>Midhurst Hospital (ruderal on sand)</td>
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<td>1</td>
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<td>0</td>
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<td></td>
<td>Shoreham Hospital (ruderal)</td>
<td>5</td>
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<td>0</td>
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<td>40</td>
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<td>YORKSHIRE</td>
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<td>0</td>
<td>1</td>
<td>0</td>
<td>72</td>
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<tr>
<td></td>
<td>Mean No. of species per category</td>
<td>9.6</td>
<td>1.63</td>
<td>1.32</td>
<td>0.14</td>
<td>1.43</td>
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</tbody>
</table>

**Greenfield Sites (earmarked for development)**

(arable/pasture land still in use for agriculture, or abandoned within previous year)

* = Species found in hedgerows that were retained.

<table>
<thead>
<tr>
<th>Site, County</th>
<th>Nb</th>
<th>Na</th>
<th>RDB3/K</th>
<th>RDB2/1</th>
<th>Pooled weighted score</th>
<th>Number of sample days</th>
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</thead>
<tbody>
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<td>BERKSHIRE</td>
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<td>0</td>
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<tr>
<td>HAMPSHIRE</td>
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<td>0</td>
<td></td>
<td></td>
<td>16</td>
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<tr>
<td>HERTS</td>
<td>4*</td>
<td>1*</td>
<td></td>
<td></td>
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<td>24</td>
<td>1</td>
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<td>WALES</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
<td>16</td>
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</tbody>
</table>

**Mean No. of species per category**

2.4 0.12 0 0 1
Feature Article: A Comparison of the Invertebrate Value of Brownfield/Greenfield Sites and Local Reserves in England and Wales (contd)

Table 2. Comparison of numbers of nationally scarce and RDB invertebrates recorded on different land use types.

<table>
<thead>
<tr>
<th></th>
<th>No. of sites</th>
<th>N/Nb</th>
<th>Na</th>
<th>RDB3/K</th>
<th>RDB2/1</th>
<th>Mean No. of Sample days</th>
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</thead>
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<tr>
<td>BROWNFIELD</td>
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<td>1.63</td>
<td>1.32</td>
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<td>GREENFIELD</td>
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<td>2.4</td>
<td>0.13</td>
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<td>LOCAL NATURE RESERVE</td>
<td>20</td>
<td>7.2</td>
<td>1.42</td>
<td>1</td>
<td>0.3</td>
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</table>

Discussion

Despite the very obvious caveat that the sampling efforts varied and that t-tests were used to analyse data which were not necessarily normally distributed, it is clear that what is generally perceived to be green countryside by the press is markedly less rich in scarce invertebrates than post-industrial/military land. If the scarce taxa found only in hedgerows dividing the arable/pasture are removed from the analysis, the picture is even starker.

The main reason for the differences is that many of the brownfield sites are areas of former mineral extraction providing ample disturbed ground for nesting aculeate Hymenoptera, and ground dwelling spiders, bugs and beetles. The new niches created also favour a more diverse plant assemblage which in turn supports more uncommon phytophagous taxa. Abandoned allotments and airfields offer similar benefits with more emphasis on structural diversity, and the bonus of long-term low intensity management or ‘neglect’.

Given that many LNRs were originally ‘brownfield’ sites, it is not surprising that there was no significant difference in quality between a random sample of dedicated LNRs and more recently disturbed ‘brownfield’ sites. In most cases the only difference is that the latter are not designated! However for standard sampling, brownfield sites still compare favourably (in terms of yielding nationally scarce invertebrates) with old, in some cases ancient, habitats.

Conclusions

The sight of countryside protestors extolling the biodiversity benefits of open arable at the expense of brownfield is clearly unsustainable on invertebrate grounds. Of course there are also sterile low value brownfield sites, but in my experience directing development at sites like long abandoned mineral workings is bound to result in significant losses in biodiversity. Changes to planning law which prevent the automatic restoration of such valuable sites back to former land use (i.e. arable or pasture) would do much to offset the continuing erosion of biodiversity in the face of the pursuit of continued economic growth.

Acknowledgements

Thanks to Dr Giles Groome MCIEEM for help with statistical analysis and proofreading.

References


Kirby, P. (1992). Habitat Management for invertebrates. RSPB.

About the Author

Dr Jonty Denton has been a freelance ecologist for 22 years, and is director of Albion Ecology based in rural Hampshire. He is National Recorder for Camphor, Marsh and Darkling Beetles, and county recorder for Bugs, Spiders and Beetles in Hampshire and Surrey.

Contact Jonty at: jontydenton@aol.com or follow him on http://jontydenton.co.uk.
The Classification of Badger *Meles meles* Setts in the UK: A Review and Guidance for Surveyors

It has been recognised for many years that the standard approach to classification of badger setts in the UK is both a useful convention, and practically problematic (Roper 2010, Neal and Cheeseman 1996). This paper seeks to explore the challenges in using this standard approach, and provides some suggestions for overcoming some of these.
Background

Based largely on his study of the Wytham Woods badgers, Kruuk (1978) defined three types of sett: Main, Annexe and Outlier. Thornton (1988) later added a fourth category: Subsidiary. In the late 1980s this system of classification was employed to good effect on a nation-wide scale by Cresswell et al. (1990), and has been the standard for UK ecologists ever since. Using these studies, a brief definition of each sett category is provided below:

Definitions
Main Sett – The continuously used, breeding and over-wintering sett for a social group of badgers. Only one main sett will exist in each social group’s territory, and will be relatively centrally located within the group’s range.
Annexe sett – An annexe of the main sett, linked by well-used surface paths to the main sett (but not connected underground). Not continuously used.
Subsidiary Sett – Distant from main sett. Several entrances, but with no well-used paths connecting to main sett, and used only seasonally.
Outlying Sett (‘Outlier’) – Distant from the main sett. Small, with one or two entrances only. Used for short periods sporadically, with no obvious, well-used paths connecting to other setts.

Problems with Using the Standard Classification in the Field

1. Sett type is essentially defined by how it is used, but often this must be inferred from the physical evidence alone.

As mammologists, we are often forced to infer types of activity from field signs. Without significant direct monitoring of individual animals over time, such interpretations can only be regarded as working hypotheses, based on a detailed knowledge of the species ecology and behaviour. This can only later be confirmed or refuted by subsequent evidence as it arises. Leibenberg (1990), in his study of traditional animal trackers in southern Africa, draws parallels in tracking and asserts that this may indeed be the origin of scientific thought-process in modern humans. Whilst experienced badger ecologists will often draw accurate conclusions, there is significant scope for misinterpretation, particularly when the field signs are limited or ambiguous.

For setts threatened by impacts, the most important sett to identify in any survey is the main sett, as this is defined as the (normally) continuously occupied, breeding and over-wintering sett. It is therefore much more difficult to mitigate impacts to it through human activity, thus placing more emphasis on impact avoidance. Authors (as cited above) point to a number of physical characteristics that reveal a main sett, notably a relatively large number of entrances (but not always), large fresh spoil heaps at the entrances, a network of well-worn paths between and leading away from the entrances, abundant bedding material at entrances, play/socialising areas outside the sett, and well-marked latrines nearby.

However, it is recognised that in some, albeit rare, instances, main setts (defined by breeding activity) may have only one entrance and/or are not continuously used (Neal and Cheeseman 1996, Lewns 2013 pers. comm.). Yet they are still the main breeding sett for that social group. Unless clear signs of breeding are present at the time of survey (only likely between February and May), then such anomalies could be misclassified as ‘outliers’. This can have serious consequences for a social group if development then fails to sufficiently protect such setts due to their perceived lower status.

Equally, a large subsidiary sett, when surveyed at a time of year when it is subject to heavy use, may be mistaken for a main sett, leading to either a lack of protection for the real main sett, or to unnecessarily expensive mitigation to protect a lower-status sett. (Subsidary setts are also complicated by their similarity in use to annexe setts; discussed further below.)

Regional variation in sett and territory use (see Johnson et al. 2002) can add further complexity and therefore lead to mistaken interpretation of the physical evidence. A surveyor trained and experienced only in lowland England may not have the mental references to correctly interpret Scottish Highlands sett use from the field signs. Therefore reliance on walkover field sign surveys can be problematic within a classification system based on how setts are used by a social group through the year.

2. Sett type is only accurately definable in relation to other setts and territory boundary. Trying to classify a single sett in isolation is highly questionable.

The above examples also begin to highlight how misclassification could easily occur where only a portion of a territory is surveyed. The plasticity of physical characteristics for each type, and the fact that the classification is fundamentally use-based, mean that setts are often only definable in relation to other setts within the same group’s territory. An obvious example here is the annexe sett. By definition, such a sett can only exist (and be identified) in relation to the main sett to which it is ‘annexed’. By convention an annexe must be within 150m of the main sett and linked by clear paths. If one has not found, or has not correctly identified the main sett, then its annexe cannot be confirmed.

A less obvious but perhaps more frequently problematic example is the subsidiary sett. Again, convention states that this must be at least 50m away from the main sett and not connected to it by well-worn badger paths. In every other respect it is similar in use and characteristics to an annexe (Neal and Cheeseman 1996). If the surveyor has not found the true main sett within the same territory, for whatever reason, then
confident and reliable classification of an active subsidiary is very difficult. In the worst case, a subsidiary could be mistaken for a main sett, and the true breeding sett could be missed, or wrongly considered to belong to a neighbouring social group (as each group should only have one main sett).

To confidently identify a subsidiary, one would need to know the whereabouts of a nearby main sett (having accurately classified that first!) and know that the main sett is within the same territory. This second condition is likely to be very challenging, if by definition the subsidiary is not linked by clear paths to the main sett. Until territory analysis can be conducted through (for example) bait-marking survey then the classification of ‘subsidiary’ may only be tentative at best. In fact, the later addition by Thornton (1988) of the ‘subsidiary’ classification has been seen as somewhat unwelcome by some authors (e.g. Neal and Cheeseman 1996), because its function is very similar to the annexe, (distance from main sett possibly only being a function of site suitability), and the ‘absence’ of obvious interconnecting paths is seasonal and subjective. We shall return to related problems with the ‘subsidiary’ classification below.

3. There is considerable overlap in the physical characteristics used to identify each sett type.

The Venn diagram below (Figure 1) demonstrates the considerable overlap in sett characteristics between categories. Very few physical characteristics are exclusive to one sett type. This is not necessarily a problem in itself, as the experienced surveyor will use a variety of characteristics to build an overall picture of sett use. But even so, the overlap can lead to misinterpretation, particularly when only a few characteristics are visible at the time of survey.

The Venn diagram not only shows the substantial overlap in characteristic field signs, but it also serves to illustrate that there is much more that distinguishes main sett from outlier than distinguishes any other combination of setts in comparison. This is verified by Roper (2010) in his appendix on surveys.

The diagram also reveals the difficulty in distinguishing a subsidiary sett, particularly when assessed in isolation. In this analysis, there are no single features that are exclusive to subsidiaries. The diagnostic combination of subsidiary sett features such as ‘more than two entrances’ plus ‘150m distance from main sett’ only works if the group’s territory boundary and main sett is known, as discussed above. Also, the distinction between a large (e.g. 2-entrance) outlier in current use and a small subsidiary is extremely difficult. A subsidiary can be regarded simply as a large, more frequently used outlier sett.

The system also creates an apparent category overlap in distance from the main sett, whereby a large or well-used (secondary) sett within 50-150m of the main sett could be either an annexe or subsidiary. The only visible differentiator then becomes the presence or absence of ‘well-used’ paths linked to the main sett: a feature that is highly subjective and seasonally variable.

Review Conclusions

This review of the challenges facing the surveyor leads one to some general points about the standard classification:

- Classification (as defined by sett use) should only be regarded as tentative until longer-term monitoring can be undertaken, territory boundary has been established and the main sett within the territory has been located. Main setts are best confirmed in the period February to May when breeding activity is likely to be apparent.
- At times, it may be more appropriate to simply distinguish between main setts and non-main, or ‘secondary’, setts as some authors choose to do, particularly in relation to impact mitigation, or until further monitoring can reveal accurate sub-division of secondary setts.

Implications for Badger Walkover Surveys

Search Area

The above points highlight the need for a sufficiently broad survey area, and therefore extensive land access, for walkover surveys. It has been shown that it is essential to locate the main sett, both to adequately mitigate impacts and to have a reasonable chance of correctly classifying other setts in the vicinity. Assuming a large territory in England is around 75 hectares (0.75km²) and a main sett is generally relatively centrally located within that territory, then theoretically one should search at least a 500m radius from any secondary sett to have a reasonable chance of finding the nearby main setts (or vice versa). This equates to a roughly 1km² minimum search area (see Figure 2 overleaf).

This minimum search radius reflects the fact that average distance between main setts in England (and lowland Wales) is approximately 500m and rarely more than 1,000m (Levns pers. comm.). Far better of course would be a 1km search radius from first sett found, which would provide much more assurance of full territory coverage. For lower population density areas such as Scotland, this search radius would need to be extended, as territory size here (c. 1-2km²) is significantly greater (Johnson et al. 2002).
A Systematic Approach to Sett Classification

No system of classification is perfect, and despite the difficulties discussed above, the current system does seem to work reasonably well for experienced surveyors working in high-density badger regions (Roper 2010, Lewns pers. comm.). This fact, combined with the need for standardisation means that getting to grips with the current convention is important.

With this in mind, a structured, systematic approach to interpreting the field signs may be helpful.

Good field-craft reveals that some features (sign/evidence) can be considered conclusive. These are signs that, on their own, allow confident classification without supporting evidence. Clear footprints indicating badger passage are good examples. Other features should only be considered as substantiating (i.e. they help to build and support a robust interpretation but aren’t conclusive on their own, for example, disturbed leaf litter near a sett). For badger sett classification, we find that very few features in isolation are conclusive. However, we can identify certain combinations of features that are conclusive. Figure 3 below is my own summary of these features, based on the current convention for surveys in lowland Britain, but divided into the two sorts of evidence described above: conclusive combinations and substantiating.

An analysis of Figure 3 allows one to devise a logical, step-wise approach to classification of individual setts. The characteristic features suggest that the first and easiest step in the process should be distinguishing between what might be a main sett (main or active subsidiary), and what is almost certainly not (annexe and outlier). This first step can be done with relative reliability. If the sett being assessed is an annexe, one should easily be able to find the main sett by following the obvious paths to the larger sett nearby. Thus the annexe is confirmed. Similarly an outlier is unlikely to be mistaken for any other sett type. It will consist of only one entrance, or at most two, with limited spoil outside, and be unconnected to other setts nearby by obvious paths.

If neither of these applies, then one is left with two choices: main or subsidiary. This can be problematic, especially where large subsidiary setts are in current use. As has been noted above, an active subsidiary sett can only be reliably identified as such in.

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**Figure 2. Recommended minimum survey area or radius (lowland England and Wales)**

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**Figure 3. Summary of features generally used for sett classification based on Kruuk (1978), Thornton (1988) and Cresswell et al. (1990)**

**Main Sett**
- **Conclusive** – Breeding activity apparent (e.g. bedding and play areas) Feb–June; and Permanent occupation (esp. apparent through winter).
- **Substantiating** – Multiple entrances with large spoil heaps.
  - Central within its territory (normally more than 300m from another group’s main sett).

**Annexe Sett**
- **Conclusive** – Within 15 to 150m of main sett; and Obvious, well-worn paths connected to main sett.

**Subsidiary Sett**
- **Conclusive** – Beyond 50m from main sett; and No obvious, well-worn paths connected to main sett; and Multiple entrances with spoil heaps.
- **Substantiating** – Intermittent (seasonal) use.

**Outlier Sett**
- **Conclusive** – One or two entrances; and Small or absent spoil heaps; and
  - No obvious, well-used paths connected to main sett.
- **Substantiating** – Beyond 50m from main sett.
  - Lacking signs of use in winter.

*Conclusive only in combination, otherwise substantiating.*
Figure 4. A key to badger sett classification for walkover surveys based on criteria from Kruuk (1978), Thornton (1988) and Cresswell et al. (1990)

relation to a known main sett within the same territory. The key difference will be evidence of year-round use and breeding activity. Both of these features can only be properly determined in the winter to spring period. Therefore, any classification of a 'main' or (active) 'subsidiary' sett during summer-autumn walkover surveys should remain provisional until further survey can be undertaken the following year. (Or until all setts within a known territory boundary have been found, described and mapped, which normally requires a bait marking study.)

To help the relative novice, and as an aide-memoire for the more experienced surveyor, Figure 4 may prove useful. It is based on the process of step-wise elimination, starting with the low-status secondary sett types, as described above. This diagram is presented as a work-in-progress, and it is hoped that CIEEM members who use it will provide feedback on its utility and suggestions for improvement.

Final thoughts

In providing this simple tool, I am not necessarily recommending the standard classification system in its entirety; I am only seeking to aid the practitioner in its use. Indeed if anything, this paper highlights some of the problems inherent in the standard system. To illustrate: perhaps one needn’t struggle to assign ‘annexe’ or ‘subsidiary’ to an intermittently used, multi-entrance sett located 100m from the main sett. Rather, it may be wiser to recognise that such tenuous distinction is rarely relevant to a badger, nor will it often affect the conclusions or recommendations of an impact study. This example reminds us to always question the reasons why we are collecting certain data and to tailor our methods according to our purpose, rather than blindly follow a set process for its own sake.

Classification is an essential tool in science, and indeed in human understanding generally. However, it is worth remembering that something vital is often lost in any reductive categorisation used to describe the complexity of nature. As long as one recognises this, and suspends strict categorisation when necessary, then standard classification remains valuable and relevant.

Acknowledgement

Thanks to my colleague, Dr Iain Adderton, for providing a valuable review of this paper.

References


About the Author

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NatureSpot – A Web-Based Tool for Supporting Biological Recording and Mapping across the Counties of Leicestershire and Rutland.

James Calow CEnv MCIEEM, David Nicholls and Graham Calow

Wildlife records are vitally important in helping us understand the distribution and abundance of different species, and this data is essential for both protecting sites through the planning system and for conservation management. Climate change and habitat loss are impacting on the distribution and numbers of wildlife populations in all areas of the UK. The picture is constantly changing and we need regular data to allow action to be taken to protect wildlife.

Traditionally most of this data has been gathered by volunteer naturalists, co-ordinated by community and voluntary organisations, and supported by the Local Biological Records Centres (BRCs). There is much concern that the majority of wildlife recorders are an aging group and that there is an urgent need to encourage younger naturalists and in particular to attract a new generation of active volunteers that are fluent in digital recording. In addition many BRCs in some counties cannot continue to provide the same level of biological recording support as in previous years due to budgetary restrictions and enforced cut backs. The BRC for the Counties of Leicestershire and Rutland have encouraged the voluntary recording community to seize the initiative and fill the gaps left by the cuts.

NatureSpot (www.naturespot.org.uk) was founded as a charity (reg. no. 1138852) and has developed a web-based recording system and mapping tool to support biological recording in Leicestershire and Rutland. Its primary aims are:

1. to help the public to identify local wildlife and to learn about the natural environment;
2. to create, with public participation, an online showcase of the wildlife and wild places of Leicestershire and Rutland;
3. to encourage and facilitate biodiversity recording to support conservation needs; and,
4. to encourage more public visitation to local sites of wildlife interest and to provide information which may add to their enjoyment of those sites.

Figure 1. The NatureSpot website
The NatureSpot website was built using the Indicia (http://www.indicia.org.uk/) software platform which is an open source toolkit for developing online biological recording. The Indicia-constructed NatureSpot website was designed for generalist recorders working across diverse taxonomic groups and supported wildlife observation recording forms allow photo uploads, reporting, mapping and verification of the records.

Since its launch in January 2011 the site has documented over 4,000 species with over 37,000 individual records. This has been supported by many people interested in wildlife within the county with 609 registered users and regularly receives over 16,000 unique visits per month to the website.

Despite its success at attracting new members to the wildlife recording community, online recording has not been warmly welcomed by all, and it is easy to see why some are sceptical. After all, if anyone can submit a wildlife record, how can the accuracy of the data be trusted? Many experts have spent a lifetime trying to master the identification of a selected taxon group, building a library of specialised keys and spending countless hours with a microscope. Is it not just asking for trouble to invite records from the ‘public’, who may only have a popular guidebook or a few Google images to base their ID on?

This has provided NatureSpot with an interesting dichotomy: the need to collect reliable and trustworthy data that can contribute to the scientific record whilst at the same time trying to encourage more people into wildlife recording. To try and address these issues NatureSpot has established a verification process and only when the team of volunteer verifiers are confident in the accuracy of a record is it added to the dataset. If the trustees are unsure they seek expert help and receive generous support from many of the County Recorders and other local and national specialists. All records are then later sent to the relevant local and national recording schemes. The County Recorders then have the final say as to which records they accept for the county database.

The majority of records are submitted with accompanying photographs. This isn’t a requirement but it is encouraged. Having such evidence makes verification much easier for many species – though of course not for all. The majority of records submitted tend to be of species that can be relatively easily identified and also reasonably common. Indeed the status of the species is an important factor in deciding how much rigour to apply during the verification process. NatureSpot will generally accept at face value records for common species such as goldfinch Spinus tristis, fox Vulpes vulpes or peacock butterfly Inachis io, with or without image evidence. However, for species that are more challenging and could be confused with other similar species we would expect either photographic evidence, the identification to have been confirmed by a recognised expert or to have sufficient knowledge of the recorder to trust their judgement. If there is any doubt about the certainty of the record it is tagged ‘likely’ and not included in the datasets submitted annually to the VC55 Recorders (though still retained for reference).

From the experience of running the recording scheme over the last two years we have made two key observations. Firstly, rather than receiving records from lots of different, random users, NatureSpot has attracted an expanding core of regular recorders who have submitted the majority of the sites record data. This gives the recorder the opportunity to demonstrate over time that they have the skills and discipline to accurately identify their sightings and gives confidence to the validity of the data that they are submitting. Another interesting observation is that very few users submit a record that they are not confident about. Despite the online recording form being easy and convenient, it still requires precise facts about the date, location and species and it is maybe this formality that discourages speculative records. At the same time, it is encouraging to see regular recorders gradually expand their knowledge and coverage, hopefully as a result of the support they have received and confidence gained from earlier submissions. To further support this broadening skill base, NatureSpot is currently setting up a Mentoring Scheme for regular recorders, specifically to help them develop identification skills in taxon groups they are less familiar with.

NatureSpot has worked with several County Recorders to agree which species are identifiable from a photo and which are definitely not. This guidance is gradually being added to the website using a ‘photo ID’ rating. Together with the image galleries, which feature only photos of species taken in VC55, the site offers useful identification help. There is also a facility to upload photos of unidentified species to share online to see whether other NatureSpot members can help with identification.

Our experience has shown that an online recording service like NatureSpot appeals to naturalists and can bring them into the recording community. We welcome records of both common and rare species – of all taxon groups. It is interesting that the first VC55 (or one of the first) records of the sawfly Cimbex connatus and the moth Mompha langiella have come from people not previously involved in the recording network.

![Figure 2: Mompha langiella the first record for Leicestershire and Rutland](Image 392x411 to 559x411)

Photo by Howard Peacock

It is also a useful way of encouraging people who perhaps already record moths or birds, to extend their recording to other groups without having to track down the ‘right’ person or scheme. From the County Recorder’s, or recording scheme’s, perspective they receive more data, all of which is pre-checked and arrives in a standardised format.
The local wildlife maps developed from the submitted records will constantly evolve as more records and images are uploaded, helping to build an increasingly comprehensive picture of the biodiversity within the county. The maps combine both NatureSpot data and National Biodiversity Network (NBN) data using dynamic links to the NBN Gateway, providing comprehensive known distributions, in both Leicestershire/Rutland and across the UK.

The site also enables individual parishes to develop their own ‘Parish Page’ which include a gallery of wildlife images taken within that parish and lists of species seen there, whilst the ‘Wild Places’ pages showcase sites within Leicestershire and Rutland that are rich in species, giving details about location, access and transport, plus interpretative site information.

The wildlife records submitted to NatureSpot are held on a secure server at the Biological Records Centre based at the Centre for Ecology and Hydrology. All verified records are submitted to the Leicestershire and Rutland Environmental Records Centre, local and national recording schemes, and eventually the NBN. It is hoped that this work will allow conservation bodies to contribute to the biodiversity knowledge-base needed to make appropriate conservation management decisions.

For further information
Contact David Nicholls, Chair, NatureSpot at: dnicholls@naturespot.org.uk

Figure 3. Cimbex conatus record on the NatureSpot website

Figure 4. Example of Local and National Mapping on the NatureSpot site for common lizard Zootoca vivipara. On the Leicestershire and Rutland map above, red = NatureSpot records, green = NBN records.
Issues in Survey Reliability: Launch of a Survey of CIEEM Members

Andrew Cherrill CEnv MCIEEM
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Summary

In the last issue of *In Practice* I reviewed studies of repeatability of vegetation mapping that have used either Phase 1 or National Vegetation Classification (NVC) approaches (Cherrill 2013). These studies reported high levels of inter-observer variation, but, perhaps not surprisingly, that group training of surveyors could improve consistency markedly. The article was accompanied by an online discussion on CIEEM’s LinkedIn pages. In this brief note I reflect on some of the points raised by members and also wish to encourage members to contribute to a follow-up online questionnaire launched this month.

Several posts on LinkedIn argued that a short training course was unlikely to have a great impact on survey consistency for either junior or experienced surveyors. In the former case, a short course will not compensate for the deep understanding of vegetation that can accumulate only over a long career. For experienced surveyors, one or two days of CPD is unlikely to modify deeply engrained behaviours and beliefs about vegetation types. These points seem entirely reasonable but appear to be at odds with the comparisons drawn between quantitative studies of inter-observer variation with and without group training. On reflection it is worth clarifying that the studies involving group-training of surveyors (exemplified by the Countryside Surveys) each involved large-scale projects during which survey teams worked together over periods of months post-training (also engaging in short refresher sessions to maintain consistency). Thus the situations giving rise to high consistency between surveyors are unlike those that might typically apply if surveyors from disparate organisations came together to undertake a one- or two-day course before dispersing to continue their day jobs in relative isolation. Training is clearly beneficial, yet it remains unclear how the lessons of Countryside Survey (and similar) can be applied to the wider environmental sector.

A second point worth mentioning is the potential role of geostatistical datasets and techniques in vegetation survey. My own feeling is that the technology can be extremely helpful; particularly with regard to spatial location. However, most variation between surveyors arises through differences in vegetation classification rather than boundary location. Ultimately, a human making decisions about what he/she sees will always lie at the heart of detailed vegetation mapping and ecological assessment. Here detailed descriptions of the vegetation types embedded within classifications that adequately reflect the full range of variation in UK vegetation are critical in allowing surveyors to make consistent, justifiable decisions. Given that vegetation varies in a more or less continuous manner, rather than with hard boundaries between types, there appears to be a particular need to improve guidance on how to classify vegetation that lies at the interface between two or more types. Thus, for example, provision of floristic detail on the distinctions between improved, semi-improved and unimproved Phase 1 grasslands would be useful and ought to be achievable. A point made by several members in the online LinkedIn forum was that the opportunity to create a hierarchy of classifications (with NVC ‘communities’ nested within Phase 1 ‘habitats’) was missed during the development of NVC and Phase 1. The situation where individual NVC vegetation types can occur in more than one Phase 1 ‘habitat’ illustrates the potential for confusion between closely related ‘habitats’ in the Phase 1 classification. A mismatch between these classifications and those used to define UK Biodiversity Action Plan (BAP) habitats was also raised as an issue for those involved in planning and interpreting field surveys.

The continuum nature of vegetation means that some variation in interpretation between surveyors is inevitable. Indeed, this variation can form the basis for useful discussions between surveyors, enhancing individual understanding and the collective interpretation of a site. However, while such discussion may arise as part of training (or within the artificial context of a study inter-observer variation), it is unclear (at least to me) where, or if, this debate would occur in the context of a site survey relating to a development site and the associated planning process. In general, the absence of a second contemporary survey would preclude a discussion of alternative interpretations. None the less, a healthy debate (albeit retrospective) can be supported by the reporting of detailed target notes and floristic data. We know that there is variation in the practice of both collecting and reporting target notes and quadrat data in Phase 1 and NVC survey respectively. In Phase 1, the numbers and content of target notes recorded by different surveyors varies enormously even for the same site. In NVC, some surveyors record detailed data from quadrats, while others do not. Moreover, the methods used to interpret these floristic data varies between
use of Rodwell’s keys, companies’ own in-house keys, software (MATCH and TABLEFIT) and the application of personal experience. These are, perhaps, key areas where practice could be enhanced and standardised to promote both consistent mapping decisions and documentation of the underpinning evidence. A good example of the benefits of reporting detailed target notes can be seen in my work on Phase 1 mapping with Colin McClean in Northumberland (Cherrill and McClean 1999). Here a pasture, at some stage improved but at that point in time reverting to semi-natural grassland, was mapped as semi-improved acid grassland by one surveyor, but semi-improved neutral by another. Checking the target notes revealed that both surveyors viewed the field as being a patchwork of acid and neutral indicator species. The two surveyors disagreed on the relative balance of species; perhaps because they had taken a different route when walking through the enclosure. Other surveyors viewing the same field opted for different mapping codes and several provided no target notes to enable an interpretation of their decisions. This example is useful because it shows the potential value of detailed field notes when dealing with difficult vegetation close to classification boundaries, but also because it suggests that if such notes were routinely reported there would be less chance of subsequent disagreements, unnecessary follow up surveys, and poor decision-making. That last point is, perhaps, contentious because while there is limited quantitative information on inter-observer variation, there appears to be none (to my knowledge) on the actual consequences of variable survey quality on decision-making and the evaluation of sites. The extent to which a lack of consistency in vegetation survey leads to additional costs and loss of biodiversity is unknown. If negative consequences are rare then arguably there is no need for concern about levels of surveyor experience and qualification or to review survey methodologies. Conversely evidence of negative consequences would provide a mandate for raising standards and updating methods. What do members think?

The review of inter-observer variation in Phase 1 and NVC surveys, alongside the discussion on LinkedIn suggests that the topics raised are of interest to many CIEEM members. I would therefore like to invite members to take part in an online survey launched this month. The questionnaire (see weblink below) seeks your views on the extent to which inter-observer variability impacts on your working lives and what, if anything, should be done to raise standards.

Acknowledgements

I would like to thank those who contributed to the online LinkedIn discussion for highlighting a number of issues and particularly Kevin Honour (Argus Ecology), Robin Cox (Natural Power), Alison Strange (M+R Ecology LLP), Ian Bond (Hartlepool Borough Council), Tom Haynes (NatureBureau), David Matthews (Thomson Ecology) and Phil Wilson for kindly volunteering to read through a draft of this article and the questionnaire (which at the time of writing remains in draft form).

References


Complete the online questionnaire at: https://www.surveymonkey.com/s/VegMap2013
2013 AGM

This year’s AGM was held at the Grand Harbour Hotel in Southampton on the 6th November. CIEEM’s President, John Box, gave a very positive report on behalf of the Governing Board regarding its work over the year and also thanked all the volunteers who serve the Institute in governance roles or in other ways, for their hard work over the year. John also paid tribute to CIEEM Fellow Robin Buxton who was standing down from the Board after many years of service in various roles. The CEO, Sally Hayns, described the main achievements of the Secretariat over the preceding 12 months commenting that it had been another very busy year but with a number of highlights, including the launch of the new degree accreditation scheme and the Register of Chartered Ecologists. CIEEM Treasurer, Steve Pullan, took those present through the main features of the accounts, emphasising how important membership subscriptions are in enabling the Board to invest in new services and initiatives such as the Competency Framework and the degree accreditation scheme.

Membership Renewals

To all members that have already renewed, thank you – we look forward to another year of supporting you!

To all other members, it’s still not too late to renew, but if we haven’t received your renewal by 31st December 2013, your membership will be deemed to have lapsed such that you will not be able to use your post-nominals or take advantage of any other membership benefits. The fastest way to renew your membership is by paying online. Please visit the members area of our website and follow the instructions to “Renew your CIEEM Membership” at www.cieem.net/members-area. A reminder to anyone who is planning to pay their subscription by BACS; please forward an email (remittance) detailing your name, membership number and payment amount to carolbest@cieem.net. Without any remittance it is almost impossible for us to identify where direct payments have come from and what they are for. If you have lost your renewal form or have any questions please do not hesitate to contact the membership team on membership@cieem.net or 01962 868626.

CPD Reminder

A reminder to all Graduate, Associate, Full and Fellow members that your CPD record for the period October 2012 - September 2013 needs to be submitted no later than 31st December 2013. The CPD Recording Form can be downloaded at www.cieem.net/cpd. Please save your completed form with a filename in the following format: ’Surname-Membership Number’ (e.g. Smith-379) and return by email to cpd@cieem.net.

Following the elections the below governance changes were recorded.

<table>
<thead>
<tr>
<th>Role</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vice President (England)</td>
<td>Stephanie Wray CEnv FCIEEM was re-elected for a further three years.</td>
</tr>
<tr>
<td>Honorary Treasurer</td>
<td>Steve Pullan CEcol CEnv FCIEEM was re-elected for a further three years.</td>
</tr>
<tr>
<td>Governing Board</td>
<td>Robin Buxton CEnv FCIEEM stepped down. Richard Handley MCIEEM was re-elected for a further three years. Debbie Bartlett FCIEEM was elected for a first term.</td>
</tr>
<tr>
<td>Advisory Forum</td>
<td>Sue Swales MCIEEM was re-elected for a further three years. Tom Gray MCIEEM was elected for a first term. Pam Nolan CEcol CEnv FCIEEM was elected for a first term.</td>
</tr>
</tbody>
</table>

Robin Buxton (right) thanked by John Box
Advisory Forum and Fellows Forum
Both the Advisory Forum, which met in October, and the Fellows Forum, which met in November, continue to provide the Governing Board and its Standing Committees with invaluable advice and guidance. The notes of both these meetings are on the members’ area of the website but topics covered include:

- What are the priorities for policy engagement and how do we engage more members in our policy work?
- How do we grow our membership, profile and brand?
- Raising standards of professional practice and raising awareness of disciplinary issues.
- Effective partnership working with other professions.
- Improving engagement with higher education institutions.
- The implications for CIEEM of increasing devolution and possible independence.

Biodiversity Offsetting
Like many other organisations, CIEEM responded to the Government’s Green paper on Biodiversity Offsetting in England. The consultation response is on our website. We are grateful to those members who contributed to our response either via the specially-convened workshop held in Birmingham or via our LinkedIn group or directly to our email requests.

Diversity Working Group – Volunteers Wanted!
The Governing Board has established a new working group to look at diversity issues within CIEEM. Chaired by one of our Vice Presidents, Stephanie Wray, the new group will look at how CIEEM can better support women and individuals from black and ethnic minority backgrounds as they seek to progress their careers in ecology and environmental management. The working group will be conducting a survey of CIEEM members in the New Year but, in the meantime, the group is looking for volunteers to help progress its agenda. Most of the discussions will be by teleconference so there is little travel involved but ideas are certainly wanted. If you are interested in being involved please email the secretariat at enquiries@cieem.net.

Good Working Practices Guidance
Following the members’ survey last autumn the Governing Board requested that the Professional Standards Committee oversee the production of new guidance on good working practices for ecologists and environmental managers. The new document is expected to be published very shortly and will cover issues such as working hours and rest periods, travel and subsistence, health and safety and training.

The Value of Planning
CIEEM President John Box gave a presentation on behalf of CIEEM at The Value of Planning seminar organised by The Wildlife Trusts and hosted by Weber Shandwick in London at the end of October. The well-attended seminar was aimed at developers as well as representatives of environmental NGOs and professional bodies engaged with the planning process. The keynote speaker was Nick Boles MP, Parliamentary Under-Secretary of State for Planning at DCLG. Inevitably the discussion turned to biodiversity offsetting and its potential role within the planning system in England. Despite the enthusiasm from the Government there appeared to be a much more cautious response from the developers present alongside the concerns expressed by many NGOs.

RIBA
In October the CEO had a very positive meeting with RIBA regarding ways in which our two professional institutes can work more closely together. Initiatives that are currently being explored including joint Section/Branch events, CPD provision for RIBA members and a joint panel debate in London in 2014 as well as some sharing of policy ideas.

Staff changes
In September we said goodbye to Membership Officer Michelle Nash who left us to rejoin a former employer. We look forward to Sarah Richards joining us in January as her replacement.
Visit to Richmond Park

This visit, on Saturday 26th October, was hosted by Adam Curtis, Deputy Superintendent of the Park, who began the day with coffee and asking everyone what they wanted from the day. A wide range of interests were represented, from arboriculturists to bat ecologists and most of us were just looking forward to a day out learning about the management of the site. We began by visiting some of the veteran trees for which the Park is renowned, followed by meeting the shire horses who play an important role in rolling the bracken and mowing (we were all given an extra large horse shoe as a souvenir). The next visit was to the deer. The red deer stags compete for the hinds with the dominant holding a ‘harem’ keeping a watchful eye on the others who were waiting nearby for an opportunity. In contrast the fallow were more spread out, adopting an ‘exploded lek’ strategy with stags holding adjacent territories, parading along the boundaries. Other points of interest were the challenges posed by managing a site with 4 million visitors a year, the potential conflicts between dogs, cars and deer, and diminishing resources. Many thanks to Adam for a really informative and enjoyable day.

Debbie Bartlett FCIEEM
Vice Convenor, South East England Geographic Section
d.bartlett@gre.ac.uk

Epple Bay Visit

On 22nd September a small, but enthusiastic, group of South East Section members met at Epple Bay, Westgate-on-Sea to hear about Natural England’s work on marine invasive species. Willie McKnight, who leads the volunteer team of ‘coastbusters’ introduced us to the species of concern, explained the impact they were having on the North East Kent Marine Protected Areas (NEKMPA) and the management being undertaken to combat this. It was a very early start, to gain maximum benefit from the exceptionally low tide and, after trying our hands at removing the upper shells of pacific oysters Crassostrea gigas, leaving the turnstones and gulls to finish the task, we moved on to Japanese wireweed Sargassum muticum. This is a more recent arrival and is forming thick mats and shading out everything underneath. The morning ended with discussion and information about the Thanet Coast Project in a cliff-top café.
West Midlands Section News

Veronica Lawrie CEnv MCIEEM
West Midlands Geographic Section

The West Midlands Section has had a busy few months. After the success of our reptile workshop in May, Cody Levine organised a second ‘Reptile Survey and Translocation Workshop’. The event included a visit to a reptile receptor site near Pershore in Worcestershire. The event provided an opportunity to learn more about reptiles in the Midlands and survey and mitigation for them. In the summer we organised a meeting at Tiddesley Wood Nature Reserve, in south Worcestershire, to look at the orchards and discuss management techniques for traditional orchards as well as the BAP species noble chafer *Gnorimus nobilis*.

Our fourth AGM was held on September 10th in Birmingham and it included interesting talks by Michael Morris (Environment Agency) on the Bromsgrove Brooks Project, Dr Jon Russ (bat expert and ecologist) on Nathusius’ pipistrelle and by Nick Mott (Staffordshire Wildlife Trust) on river rehabilitation in Staffordshire. At this event we also welcomed a new committee member to our team Oliver Barnett. We are always glad of more support, so if you would like to get involved and support our work please get in touch with us.

Committee member Aidan Marsh organised an Open Mic discussion on 21st October, which was held at Lower Smite Farm in Worcestershire. This event enabled open discussions as far reaching as people’s experiences of the new great crested newt licence application forms, how the Bat Low Impact class licence has been going, biodiversity offsetting and the new Biodiversity Standard.

Our section has started forging links with Harper Adams University, in Shropshire, with a view to attending their events and supporting the student ecologists and environmental managers of the future.

Looking ahead, we are busy organising a diverse programme of events, which will be announced in the near future. Please come along and contribute to our West Midlands network and we hope you will meet some interesting colleagues and learn from each other. We look forward to seeing you soon.

Open Mic discussion at Lower Smite Farm in Worcestershire

Reptile receptor site near Pershore in Worcestershire
Partnership News

European Network of Environmental Professionals

ENEP Autumn General Assembly

There were a number of important items on the agenda for the latest ENEP General Assembly: a new funding model and business plan was agreed; and a new President was elected along with two new Vice Presidents.

Following some intense discussion, ENEP agreed to increase its membership fee. It should be noted that the membership fee is per individual member of the member association and is paid by the member association, and that this fee has been €1 per individual member since the establishment of ENEP (then EFAEP) in 2002. The membership fee will increase by 25%, from €1 to €1.25 per individual member, from 1st January 2014. The floor and ceiling caps for fees will remain at €250 and €7,000 respectively. It was agreed that this fee increase will be used to fulfil Scenario 2 of the proposed Business Plan (effectively business-as-usual) but with extra activities including knowledge exchange and EU engagement using a bottom-up approach to agree activities. ENEP will also look into options to diversify its income through paid-for services. The membership fee and cap levels will all increase with the EU rate of inflation each year. This will be applied from 1st January 2015 onwards. CIEEM agreed with these proposals, but only on the condition that we will review our membership in 2015 to see if CIEEM and our members are benefiting from this membership.

There was an election for President, which was won by Kristof De Smet. Kristof is a representative for the Belgian environmental professionals association – VLAMEX. Bruno Weinzaeppel (from the French association of environmental professionals – AFITE) was re-elected as a Vice-President, and Adam Donnan (from the UK Institution of Environmental Sciences – IES) and Mario Grosso (from the Italian association of environmental engineers – AIAT) were also elected as Vice-Presidents. Jan Karel, as the outgoing President, was thanked for his generous input and exceptional leadership over the last 8 years. The remaining members of the Executive Committee are Elisa Vignaga (Secretary, also from AIAT) and Herman Jan Wijnants (Treasurer, from the Dutch association for environmental professionals – VVM).

Join the ENEP Newsflash Mailing List

ENEP produces a monthly Newsflash of environmental news from Brussels and around Europe every month. Some interesting news items in the latest edition include:

- Parliament report favours permanent seat in Brussels
- Parliament vote to be held on Green infrastructure resolution, biocides amending proposal and indirect land use change
- European Parliament vote to ensure new shale gas projects will have to pass Environmental Impact Assessment test
- Agriculture MEPs endorse Reform of the Common Agricultural Policy

Set up a profile at www.environmentalprofessionals.eu to receive to Newsflash directly.

Europarc Federation

Annual Conference 2013

Europarc is currently celebrating its 40th Anniversary and this October, its annual conference was held in the Hortobagy National Park in Hungary on the theme of ‘40 Years Working for Nature’.

The highlight of the plenary session was the presentation by Julia Marton-Lefèvre, Director General of IUCN, who gave a general perspective on the world conservation scene. She drew attention to the target agreed at the CBD in Nagoya of 17% of the terrestrial surface of the earth and 11% of the water surface to be equitably managed and conserved by 2020. The ecosystem services provided by protected areas need to be highlighted as was the need to forge better links with business. She mentioned the forthcoming World Parks Congress to be held in Sydney in 2014 on the theme of ‘Parks, People and Planet: inspiring Solutions’.

The Hortobagy National Park attaches great importance to the promotion of local, traditional skills, products and culture. It features the famous Hungarian grey long-horned cattle and the Rascka sheep. Added to this, the alkaline solanetz soils
Chartered Institute Activities

support a number of salt tolerant plant species such as the Hungarian sea lavender closely related to the several British species. There are also populations of white storks, great white egrets and great bustards. At this time of year there are vast flocks of migrating common cranes which made an unforgettable sight on one of the field trips.

The General Assembly which I attended as an observer was, in my view, disappointing. Following a poorly prepared recommendation from Council, the Assembly voted (far from unanimously) in favour of not proceeding with the merger with Eurosite despite this being under serious consideration for over four years. Bearing in mind the considerable similarities of the two organisations, this seemed to be a missed opportunity especially in view of Europarc’s currently reduced levels of membership and income.

A very successful innovation was a parallel youth conference with delegates from all over Europe. It made me wonder whether CIEEM could consider similar activities for some of our younger or student members.

The 2014 Annual Conference will be held in Killarney, supported by the Heritage Council of Ireland, and should be of interest to Irish Members of CIEEM. Details will be posted in due course on the Europarc website.

Jim Thompson CEnv FCIEEM

The highest honour which Europarc can bestow is the Alfred Toepfer Medal, awarded annually. To the very warm approval of the conference, it was awarded to Erica Stanciu, former Europarc President and very active promoter of national parks and conservation in Romania.

spoke about the complex hydrogeology of the Olympic Park and the importance of controlled water risk assessments to assess the impact of historic contamination; Mark Sharpe (WSP Group) outlined the unique challenges presented by the remediation of groundwater at the Olympic Park; and Mike Vaughan (Atkins) explained how the transformation from brownfield wasteland to valuable waterside habitat was achieved.

The delegates, made up of consultants, academics and students, quizzed the panel during the Q&A session and seemed particularly interested in how successful the habitat creation has been, how potential problems such as re-colonisation by invasive plants and silt deposition are going to be addressed, and how the story of the Olympic Park is going to be told on site. They also commented that Mike Vaughan and his team had done a “fantastic job with the wetland planting”.

John Box, who brought the event to a close, said that it had been a “great success” and David Shilston was confident that “there are opportunities for collaborating on future events, perhaps with GSL’s Geoconservation Commission”.

Raczka Sheep, The Hortobagy National Park

Geological Society of London

Sustainable Engineering for the Queen Elizabeth Olympic Park – Past, Present and Future

The challenges and achievements of ecologists and geologists at the Queen Elizabeth Park, home of the London 2012 Olympic Games, were explored at a mini-conference jointly arranged by CIEEM and the Geological Society of London (GSL). The event took place on 17th September 2013 in the impressive surroundings of Burlington House, where GSL are based, and was the brainchild of John Box (President of CIEEM) and David Shilston (President of GSL). John and David were keen to use their presidencies to celebrate multidiscipline working and the Olympic Park project was an obvious choice.

James Apted (Atkins) described the geotechnical aspects of the enabling works (which created the platform on which the venues were built), including earthworks and remediation; Libby Waterfall (Atkins)
Applicants and Admissions

If any existing Member has any good reason to object to someone being admitted to the Institute, especially if this relates to compliance with the Code of Professional Conduct, they must inform the Chief Executive Officer by telephone or letter before 20th January 2014. Any communications will be handled discreetly. The decision on admission is usually taken by the Membership Admissions Committee under delegated authority from the Governing Board but may be taken directly by the Board itself. CIEEM is pleased to welcome applications for membership from the following:

APPLICANTS

Applications For Full Membership
Ms Sabrina Bremner, Miss Emily Cook, Mrs Claire Devson, Miss Claire Hamilton, Mr Peter Haynes, Dr Rhys Jones, Mr Anthony Juniper, Mrs Melissa Lakan, Mrs Julia Quinonez, Mrs Marina Taylor

Applications For Associate Membership
Mrs Aline Brodzinski, Mr Pavel Votapek

Applications to Upgrade to Associate Membership
Mr Douglas Blease, Miss Elizabeth Bryce, Miss Sara Curtis, Miss Jenny Iles, Miss Kathleen Irvine

ADMISSIONS

Full Members
Miss Adrienne Bennett, Mr Craig Carter, Dr Ian Davidson-Watts, Mrs Diane Davidson-Watts, Mr Bryan Deegan, Dr Helen Fearnley, Ms Susan King, Dr Garry Mortimer, Miss Frances Mudd, Mr Peter Nairne, Dr Connie O’Driscoll, Mr Scott Paterson, Mr Ross Preston, Ms Irene Tierney, Mr David West, Dr Patrick White

Associate Members
Mr Phil Bolton, Miss Louise Bunn, Dr Tim Butler, Mr Steven Coyne, Mrs Deborah D’Arcy, Miss Suzannah Forshaw, Miss Charlotte Furnival, Mr Matthew Lawton, Mr Demian Lyle, Mr Stephen McNeely, Miss Sarah Parkin, Miss Blanca Rodriguez, Mr Tim Yardley, Mr Neil Wilkinson, Miss Jane Wright

Upgrades to Full Membership
Mr Mark Bates, Mr David Dowse, Mr Simon Holden, Ms Katie Linehan, Miss Sophie Meredith, Mr Bruce Milne, Miss Claire Parry, Mr Jonathan Reeves, Miss Amy Roberts, Miss Elizabeth Ross, Miss Catherine Taylor

Upgrades to Associate Membership
Mr Thomas Deaney, Mr Willie Macken, Mr Steven Mills, Mr Gregor Neve, Miss Emma Reid, Mr David Spencer, Mr Simon Tapley

Recent Graduate Members
Miss Zoe Bellevue de Sylvia, Mrs Annika Binet, Miss Katie Bott, Mr Gareth Bowen, Mr Michael Bradburn, Mrs Emma Brogden, Miss Jessica Brooks, Miss Alice Brown, Mr Alexander Caldwell, Miss Ellen Christmas, Miss Stephanie Clayton-Green, Mr Terry Coddington, Mr Ben Cooke, Ms Ashling Cronin, Mr George Davies, Mr Colin Davies, Miss Katherine Davies, Ms Emma Downie, Mr Joseph Dyson, Mr Gerrard Eccles, Miss Jennine Evans, Mr Neil Everett, Miss Natasha Firth, Ms Verena Fischer-Harman, Mr Karl Fisher, Mr Stephen Gibbins, Miss Katrina Hall, Mr Karl Harrison, Miss Georgina Hayworth, Miss Laura Hearnden, Miss Anne Heathcote, Mr James Higgs, Mr Dylan Hodkiss, Miss Katherine Holland, Miss Sophia Imite, Mrs Natascha Imlay, Mr Chris Jack, Mr Timothy Kell, Miss Hannah Knight, Mr Radoslaw Kozakiewicz, Mrs Agata Kozlowska, Mr Paul Liptrot, Miss Catriona Love, Mr Babajide Macaulay, Miss Joanne Makin, Miss Rochelle Meah, Miss Amy Molotoks, Miss Emily Moore, Miss Marie Moore, Miss Katherine Morris, Ms Alex Morss, Miss Breanna Mullan, Mr Jonathan Nichols, Mrs Amy Nightingale, Mr John Noonan, Dr Helen Noel, Ms Hayley Oates, Miss Sophie O’Hehir, Miss Brigid O’Leary, Mr Matthew Palmer, Miss Gregor Parris, Mr Anthony Passewey, Miss Alexandra Phillips, Miss Rachael Potter, Mr Conor Reid, Mr Jake Robinson, Miss Andrea Sarkissian, Ms Helen Saunders, Mr Christopher Schofield, Miss Sarah Scott, Miss Sarah Shepperd, Miss Louise Sinnott, Mr Ian Smith, Mr Michael Spawton, Miss Toni Stafford, Mr Fergus Taylor, Mr Matthew Thomas, Miss Helen Thompson, Miss Katherine Thorne, Miss Frances Tobin, Dr Colin Townsley, Miss Lacey Urquhart, Mr Matthew Viner, Miss Bethany Walker, Miss Tania Westrop, Miss Jayne Wilkinson, Mr Gavin Williams, Mr Chris Wing, Mr Thomas Winter, Miss Lynn Wylie

Recent Upgrades to Graduate Members
Miss Emily Eaton, Miss Rachel Hall, Miss Hannah Mitchell, Mr Glenn Moores, Mr Alexander Sams, Mr Matthew Stones, Mr Lewis York, Miss Nicole Youngs

Recent Student Members
Mr Azim Ahmed, Miss Katie Atherton, Miss Rebecca Cartwright, Miss Alexandra Cole, Mr David Gibbs, Miss Bryony Hanlon, Mr Alexander Hannam, Mr Kieran Higgins, Ms Ruth Holland, Miss Kate Isger, Mr Rex Kellett, Ms Victoria King, Miss Hoi-Lee Lam, Ms Cynthia Lawes, Miss Juliette Linford, Mr Richard Little, Mr Kelvin Lofthouse, Miss Abigail Mabey, Miss Rachel Maddison, Mr Robert Monje, Mr David Morris, Mr Luke Murphy, Ms Una Nealon, Miss Sarah O’Loughlin-Inrar, Mr David Orchard, Mr Lutfor Rahman, Mr Thomas Rickman, Miss Gail Robertson, Mr Mohammad Sarker, Miss Alex Saunders, Miss Lindsay Selmes, Miss Sarah Smith, Miss Samantha Tyler, Miss Joanne Underwood, Mr Michael Unsworth, Miss Kayleigh Vining, Miss Rachael Wernmouth, Ms Chrys Wood

Recent Affiliate Members
Miss Vicky Boskwick, Mr Simon Brain, Ms Veronica Bucknell, Mr Alex Hewitt, Mr Adam Rhodes, Mr Denbeigh Vaughan
Our Autumn Conference, attended by over 230 delegates, took place at the Grand Hotel in Southampton on 6-7 November 2013. This sketchnote of the conference was produced by Carlos Abrahams MCIEEM. The presentations from the conference are available at http://www.cieem.net/previous-conferences-2013-autumn-conference-393.
2014 Spring Conference

BIODIVERSITY OFFSETTING:
FROM POLICY TO PRACTICE

18 March 2014, Birmingham

Further details and a full conference programme will be announced shortly.

Bookings will open in January 2014.

In the meantime why not introduce yourself to the subject area by attending our beginner level workshop:

An Introduction to Biodiversity Offsetting
3 March 2014, London

This course is for participants who wish to develop their skills and knowledge of the biodiversity offsetting approach for development, including:

- the theory of offsetting;
- the system being pilot tested in England by Defra;
- the practical application of offsetting for various construction sectors;
- case study examples; and
- the risks of offsetting failing to deliver biodiversity benefits and how these can be overcome.

Further details and booking at www.cieem.net
The Chartered Ecologist Register

CIEEM has established the Register of Chartered Ecologists under powers conferred by the granting of a Royal Charter on 1st April 2013.

Chartered Ecologists are active professionals who use their knowledge, experience and influence to promote and advance ecology as an applied discipline. They may work or have worked in local or national government, consultancy, the voluntary sector, statutory agencies, industry or academia but they are united by three common characteristics:

• their advice and practice is based on a fundamental understanding of ecology and the critical evaluation of scientific evidence;
• they work in accordance with high standards of professional conduct; and
• they can communicate complex ecological concepts and ideas confidently and effectively to a wide range of audiences.

As our natural environment faces ever-increasing pressures and threats there are signs that society is starting to recognise and value the vital life support, provisioning, regulating and cultural services it provides. Chartered Ecologists, in the many different guises that they may be found, are at the forefront of work to protect and enhance the natural environment and to safeguard, manage and restore these services for the benefit of nature and society.

The award of Chartered Ecologist has given us the opportunity to create a new professional standard which will be widely recognised and valued. To that end, the process has been designed to be thorough, robust and rigorous.

In order to establish the Register there have been a number of tasks that needed to be undertaken, including: determining the eligibility criteria, agreeing the competence standard and developing both the assessment and application processes.

The assessment process is a combination of desk-based review of applicant information and a Professional Review Interview. CIEEM Past-Presidents and Fellows were invited to apply first in order to trial the process and also to create the initial pool of assessors necessary as there is no grandparenting process. This trial was a great success with excellent feedback from the applicants resulting in a few small process tweaks only.

We are delighted to announce that all 21 applicants who successfully completed the Chartered Ecologist process were recently ratified by the CIEEM Governing Board. They may now use the post nominals ‘CEcol’. One of the Registrants of this first tranche is CIEEM President, John Box.

The Register opened to CIEEM Full members for the period 30th September-31st October 2013, with interviews for this second batch expected to take place in early December and successful applicants being announced in January 2014. Registrants will be announced on a quarterly basis. Further dates will be announced in due course as will applications from equivalent grade members of certain other licensed professional bodies. For the most up-to-date information, please check the Chartered Ecologist pages on the CIEEM website.

Penny Anderson presents John Box as the first Chartered Ecologist
CIEEM Awards 2013

At our 2013 Autumn Conference, CIEEM announced the winners of our annual Best Practice and People Awards. The awards aim to celebrate individuals, projects and schemes that exemplify best practice, promote innovation and share knowledge in the realm of ecology and environmental management.

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

Penny Anderson said, “It’s absolutely brilliant to have won these awards having worked on this project for more than five years. When we first started in 2005 no one else was really doing this kind of catchment work in the UK. Now we are seeing more and more projects being set up of a similar nature to SCaMP.”

Penny continued, “SCaMP has been innovative in a number of ways. The policies on which it is founded were fundamentally unique when Ofwat first permitted utilities companies to develop and fund catchment management systems at source, rather than end product engineered solutions. The scale of the project over such a large area has been a logistical challenge and the commitment by United Utilities to the ongoing monitoring means we have an archive of data like few other projects of this kind in Britain.”

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

Penny said of receiving the award: “It was fantastic to receive this award and I am so grateful to those who must have worked on the nomination. It is humbling to be put forward for something like this and it makes it even better knowing that the award comes from a great organisation like CIEEM. I really don’t know what makes an individual ‘outstanding’, but I can say that I love what I do and am very lucky to have a job which is basically my hobby and allows me to keep on learning. It is also great to get involved in other groups such as the Badger Trust and Mammal Society, teaches at Reading University and is a devoted badger ecologist, holding position of Director of the Badger Trust and involved with his local Oxfordshire Badger Group, undertaking surveys and aiding vaccination treatment against Bovine TB.”

Simon said of receiving the award: “It was fantastic to receive this award and I am so grateful to those who must have worked on the nomination. It is humbling to be put forward for something like this and it makes it even better knowing that the award comes from a great organisation like CIEEM. I really don’t know what makes an individual ‘outstanding’, but I can say that I love what I do and am very lucky to have a job which is basically my hobby and allows me to keep on learning. It is also great to get involved in other groups such as the Badger Trust and Mammal Society. Taking part allows me to use the skills that I have learnt, develop them (without having to work to tight deadlines) and work with some great friends and ecologists.”

“I was informed that I had won the award several months ago, but was sworn to secrecy. It was extremely difficult to keep quiet about. However, despite having known about the award, collecting it at the conference was still nerve-wracking, but something I won’t forget. It will serve as a great motivation to keep getting involved,
keep enjoying what I do and to remember how much fun it can be to work in the ecological industry.”

The New Professional Award was presented to Jessica Batchelor GradCIEEM, a graduate ecologist at Arup, an independent firm of designers, planners, engineers and consultants dedicated to enhanced sustainability through its design projects. Jessica was nominated by Senior Ecologist and colleague Oliver Barnett. Oliver said “Jess has a positive and infectious can-do attitude and has displayed a depth and breadth of knowledge that is advanced well beyond what is normally expected of a graduate ecologist.” Jessica said of receiving the award: “Receiving an urgent voicemail from Linda Yost, who manages the disciplinary procedures, certainly set my heart pounding, and had me agonising over what I might have done to warrant the call. I was very relieved to get through to Linda two days later, and surprised to learn I had been nominated for and won the 2013 New Professional Award.” “As a graduate looking for a career in ecology, finding a job was a daunting task. I lost count of the number of times I was told how hard it would be to find a job in such a tough market, and the number of voluntary hours and muddy nights I worked to build my experience. The day I was offered my first ‘proper’ job in ecology, I was ecstatic. Someone recognised my passion and took a chance on me, and I resolved to work hard and make the decision to hire me worthwhile.” “I have found the last two years at Arup incredibly hard work, far beyond what I naïvely imagined might consist of catching slow worms and writing the occasional report. Baptism by fire is a saying I can relate to well. It has been a far steeper learning curve than I ever imagined possible although lightened by falling in muddy ponds, being attacked by squirrels or having police dogs called on us for suspected copper theft at 1am.” “Being presented this award at the Autumn Conference gave me the same joy as I had when I was offered my first ecology job. It is so easy for us all to get caught up in the pressures of work, and take what we and our colleagues do for granted. We should not underestimate the value of having our hard work recognised, which is why I think it is fantastic that CIEEM are expanding their awards again this year and recognising even more people for their dedication to the profession.”

Also presented at the conference, although announced in the summer (see September 2013 In Practice, page 56), was the CIEEM Medal. The Medal was presented to David Stubbs in recognition of his outstanding contribution to the development of ecologically sustainable sports facilities and sports event management. David responded to being presented with the Medal by saying that he was especially pleased to have been nominated and recognised by his own peers. He concluded with a plea for members to nominate more women for the Medal in the future.
CIEEM has been presenting annual awards for the past six years, and in 2014 we are building the occasion into a substantially larger event in both scale and profile with lots more award categories to reflect the fantastic achievements made throughout our sector.

### CIEEM Medal

The CIEEM Medal is the Chartered Institute’s highest accolade and is awarded annually in recognition of an outstanding single or life-long contribution to the field of ecology and environmental management.

### Best Practice Award for Practical Nature Conservation

*(Sponsored by Arup)*

Projects should contribute to the conservation and enhancement of biodiversity; contribute to the enhancement of ecosystem function and services; and embody the principles of sustainable development.

### Best Practice Award for Innovation

*(Sponsored by Arup)*

Projects should display innovation in their approach, methods or outcome(s); replicability of the project (and advancement of best practice within the profession); and demonstrate the role of ecologists and environmental managers in delivering sustainable benefits for society.

### Best Practice Award for Knowledge Sharing

*(Sponsored by Arup)*

Projects should successfully communicating their objectives, approaches and findings to both project stakeholders and a wider audience; and have the potential to influence research and policy agendas favouring best practice in ecology and environmental management.

### Best Practice Award for Stakeholder Engagement

*(Sponsored by Arup)*

Projects should have transparent and timely access to information; facilitate dialogue and exchange of information; and allow consensus building and have impartial, accessible and have fair mechanisms for grievance and conflict resolution available to all stakeholders.

### Tony Bradshaw Award

In addition to the above four sub-categories for the Best Practice Awards (above) there is a fifth category, the Tony Bradshaw Award, which recognises exceptional projects that achieve the criteria for two or more of the above categories and set an overall impressively high standard.

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**Full details about the awards can be found**
Outstanding Professional Award
(Sponsored by McParland Finn Ltd)

This individual award recognises the exceptional achievement of a CIEEM member (Full member or Fellow) in consistently delivering high standards of practice and promoting the profession.

Promising Professional Award

This individual award recognises the exceptional achievements of a CIEEM member (Graduate, Associate or Affiliate) during the early stages of their career. The winner will have demonstrated above-average competence and a strong commitment to their professional development.

NGO Impact Award

NEW FOR 2014!

This award recognises the achievement of NGOs in delivering a specified initiative, including campaigns and projects, that has had a major impact in benefiting nature and society.

Corporate Achievement Award
(Sponsored by Atkins)

NEW FOR 2014!

This award recognises the success of a corporate initiative to benefit the natural environment. The criteria include how the initiative is communicated to staff and other stakeholders as well as the practical outcomes of the project ‘on the ground’.

Student Project Awards
(Sponsored by TEP)

NEW FOR 2014!

The Student Project Awards recognise achievement by CIEEM Student (or recently upgraded Graduate) members in planning, undertaking and reporting their project/dissertation in a relevant aspect of ecology or environmental management.

In Practice Award
(Sponsored by Greenhouse Graphics)

NEW FOR 2014!

This award recognises the invaluable contribution to knowledge sharing that authors of feature articles in our members’ bulletin, In Practice, make. The judges will be looking for the most influential and thought-provoking article of the year.

on the CIEEM website www.cieem.net/awards
End of an Era?

If an unfortunate calamity had struck the Lee Wood Hotel in Buxton, Derbyshire on the afternoon of 5th September the future of the UK’s biodiversity could have taken a decided turn for the worse. Many of our leading ecologists and environmental managers were gathered there to applaud the career of former CIEEM President Penny Anderson who was retiring as Managing Director of Penny Anderson Associates.

Guests, who included our current President, John Box, and former Presidents David Parker and David Goode, represented a wide range of backgrounds including fellow consultants, statutory agencies, academia and clients. They heard a fascinating presentation from Penny about her experiences over the 40 years of her career including her work on heaths, dunes, moorlands and peatlands, which has come to typify much of the work that Penny Anderson Associates is renowned for.

Her innovative approach to habitat restoration has inspired countless others in our profession, a point made very clearly by guest speakers Professor Rob Marrs from Liverpool University and Professor David Goode. But what really struck home was the role that Penny has played in shaping the profession that we are proud to be part of today. As both Rob and David pointed out, when Penny’s career started the life of a professional ecologist was very different and female professional ecologists were scarce. Penny has been instrumental in promoting high standards of practice and integrity and has been very generous in encouraging and supporting others trying to build their careers. The large assembly of people gathered to celebrate her career included many whom she had helped along the way.

Of course ecologists do not really retire. They may do a bit more gardening and watch a little more cricket but then there is that trustee board that needs a little bit of time and that project that needs a bit of advice – and for a CIEEM Fellow such as Penny there are always lots of CIEEM jobs to help out with! So we are very pleased that we will continue to have Penny’s involvement and support with CIEEM and its activities just as we are sure that Sacha Rogers, the new Managing Director at Penny Anderson Associates, is very grateful to have Penny’s continuing involvement as a Director and source of expert advice. After all, ecologists never really retire!

Rob Marrs, Penny Anderson, Sacha Rogers and David Goode
Rob Marrs, Penny Anderson, Sacha Rogers and David Goode

John Box CEnv FCIEEM

- no other Flora that I know takes such liberties and so successfully.

Finally, it is great to see the Black Country version of ‘Op (Wild Hop)
The NatureBureau and Pisces Publications have done a fabulous
opening the way for a major heathland restoration programme.
all the heathlands in between across the Black Country and
Chase in Staffordshire to Sutton Park in Birmingham incorporating
UNESCO Biosphere Reserve stretching all the way from Cannock
Slater on the heathlands has revived my idea to try to get a
science is presented elegantly and clearly. The section by Andy
casual reader or to a serious ecologist. The ecology and the
much detailed information and interpretation – whether to a
wider audience than more traditional ones.

Chapter 4 is a real triumph for ecology because it provides so
much detailed information and interpretation – whether to a
casual reader or to a serious ecologist. The ecology and the
science is presented elegantly and clearly. The section by Andy
Slater on the heathlands has revived my idea to try to get a
UNESCO Biosphere Reserve stretching all the way from Cannock
Chase in Staffordshire to Sutton Park in Birmingham incorporating
all the heathlands in between across the Black Country and
opening the way for a major heathland restoration programme.
The NatureBureau and Pisces Publications have done a fabulous
job in producing a beautiful and amazing book.

Finally, it is great to see the Black Country version of ‘Op (Wild Hop)
- no other Flora that I know takes such liberties and so successfully.

John Box CEnv FCIEEM

BS 42020, Biodiversity – Code of practice for planning and development
Price: £100.00
Available from: http://shop.bsigroup.com/

BSI, the business standards company, has recently launched BS 42020,
Biodiversity – Code of practice for planning and development. The
standard will help organisations fulfil their obligation to support
local biodiversity targets. It deals with projects and products
that include planning and development of new buildings, also
extending to changes in land use – and how these activities
impact upon biodiversity.

Strategies to protect wild flora and fauna are in place for England,
Scotland, Northern Ireland and Wales, with the general objective
to halt overall loss of biodiversity by 2020 in line with the European
Biodiversity Strategy for 2020 and the UN Aichi targets. In England,
the streamlined National Planning Policy Framework supersedes
much of the previous guidance around biodiversity, so BS 42020
will play a vital role in helping protect and enhance UK biodiversity.
Its coherent methodology for biodiversity management will provide:

- Guidance on how to produce clear and concise ecological
  information to accompany planning applications.

- Recommendations on professional ethics, conduct,
  competence and judgement to give confidence that proposals
  for biodiversity conservation, and consequent decisions/actions
  taken, are sound and appropriate.

- Direction on effective decision-making in biodiversity management.

- A framework to demonstrate how biodiversity has been
  managed during the development process to minimize impact.

By adopting BS 42020, authorities, developers, planners and local
government ecologists will have the necessary information and
methodology to make sound decisions on biodiversity issues.
The standard was developed by a committee with representatives
from organisations such as the Association of Local Government
Ecologists, the Chartered Institute of Ecology and Environmental
Management, the Landscape Institute, Defra, the Environment
Agency, the Department of the Environment Northern Ireland,
the Scottish Environment Protection Agency, Natural England, the
Civil Engineering Contractors Association, the Countryside Council
for Wales, the Bat Conservation Trust, and the Association of
Wildlife Trusts, as well as experts from the construction industry,
ecologists, ethicists and academics.

David Fatscher, Head of Market Development for Sustainability at
BSI, says: “When we plan and construct new buildings we have
a responsibility towards the biodiversity in that location. Having
a standard like BS 42020 that unifies the reporting procedure for
everyone involved in this area, in a clear and consistent manner,
means that the government directives for biodiversity can be met.
It also demonstrates a real commitment to managing biodiversity
and minimising the impact of development.”

New Publications
EDITORIAL: Ecological science for ecosystem services and the stewardship of Natural Capital.
Hails, R.S. and Ormerod, S.J.
The evidence-base and quantitative understanding of links between biodiversity, ecosystem function and ecosystem services are insufficient to allow informed use and management. Moreover, the concepts of natural capital and ecosystem services are insufficiently mainstream to influence decisions that currently favour the production of food and fibre rather than less tangible services such as climate regulation, air and water purification, pollination or the contributions of environment to health. There are specific challenges in this interdisciplinary endeavour: specifically, to develop frameworks for identifying and monitoring natural capital; to parameterise factors affecting ecosystem services and their resilience to change; to integrate the complexity of ecological systems into ecosystem service valuation; and to characterise the synergies and trade-offs between ecosystem services in different management and policy scenarios.
Correspondence: rha@ceh.ac.uk

REVIEW: Nutrient stripping: the global disparity between food security and soil nutrient stocks.
The authors explore the global extent of unsustainable agricultural systems, with specific emphasis on the failure of macronutrient management (e.g. N, P) to deliver continued improvements in yield and the failure of agriculture to recognise the seriousness of micronutrient depletion (e.g. Cu, Zn, Se). The spatial disconnects caused by the segregation and industrialisation of livestock systems are identified as a major constraint to sustainable nutrient recycling. This study advocates that agricultural sustainability can only be accomplished using a whole-systems approach.
Correspondence: paul.cross@bangor.ac.uk

REVIEW: Managing urban ecosystems for goods and services.
Gaston, K. J., Ávila-Jiménez, M. L. and Edmundson, J. L.
The authors review key challenges to the effective management of ecosystem goods and services within urban areas. These challenges include the structure of green space, its temporal dynamics, spatial constraint on ecosystem service flows, occurrence of novel forms of flows, large numbers of land managers, conflicting management goals, possible differences between perceptions of urban dwellers and the reality of the distribution and flow of ecosystem services, and the ‘wicked’ nature of the problem of ecosystem service management. Applied ecology has a broad range of tools available to assist in determining solutions, including the use of high-resolution remote sensing techniques, landscape ecology principles and theory, and systematic conservation planning approaches.
Correspondence: k.j.gaston@exeter.ac.uk

Mapping ecosystem service and biodiversity changes over 70 years in a rural English county.
Jiang, M., Bullock, J.M. and Hoofman, D.A.P.
The authors mapped changes between the 1930s and 2000 by combining land-use maps with multiple proxies of service delivery for the 10 different Broad Habitats in Dorset. Overall, they found significant increases in agricultural provisioning and large losses in biodiversity over the period. They found no change in Dorset’s carbon store, because carbon lost through land-use intensification was balanced by increases in woodland over the 20th century. The carbon storage and the delivery of provisioning services both became more unequally distributed, indicating a change from relatively homogeneous delivery of services to concentration into hotspots. The maps from the year 2000 showed spatial dissociation of hotspots for carbon, provisioning and biodiversity, which suggests that, compared to the 1930s, modern, intensive land use creates conflicts in delivery of multiple services and biodiversity. Detailed maps of historical changes in location-specific service delivery and biodiversity provide valuable information for land-use planning, highlight trade-offs and help to identify drivers.
Correspondence: dann1@ceh.ac.uk

REVIEW: The role of ecosystems and their management in regulating climate, and soil, water and air quality.
Smith, P., Ashmore, M.R., Black, H.I.J., Burgess, P.J., Evans, C.D., Quine, T.A., Thomson, A.M., Hicks, K. and Orr, H.G.
The authors examine the role of ecosystems in delivering regulating ecosystem services, using the UK as a case study region. They identify some of the main co-benefits and trade-offs of ecosystem management within, and across, the regulating services of climate regulation, and soil, water and air quality regulation, and where relevant, they also describe interactions with other ecosystem services. The authors conclude that although there are some good examples of integrated ecosystem management, some aspects of ecosystem management could be better coordinated to deliver multiple ecosystem services, and that an ecosystem services framework to assess co-benefits and trade-offs would help regulators, policy-makers and ecosystem managers to deliver more coherent ecosystem management strategies.
Correspondence: pete.smith@abdn.ac.uk

PRACTITIONER’S PERSPECTIVE: Sustainable forest management in a time of ecosystem services frameworks: common ground and consequences.
Quine, C.P., Bailey, S.A. and Watts, K.
The authors reflect on the common ground and consider possible consequences for forestry and sustainable forest management of incorporating an ecosystem services approach.
Correspondence: chris.quine@forestry.gsi.gov.uk
This paper is freely available at http://bit.ly/XWS8zw.

Carcass counts from collision of birds and bats with turbines in utility-scale wind farms were conducted to quantify the ‘take’ of protected species need to be corrected for carcass persistence probability (removal by scavengers and decay) and detection probability (searcher efficiency). These probabilities may vary with time since death, because of intrinsic changes in carcass properties with age and of heterogeneity (preferential removal of easy-to-detect carcasses). The authors describe the use of superpopulation capture-recapture models to perform the required corrections to the raw count data and review how to make such models age-specific and to combine trial experiments with carcass searches in order to accommodate the fact that carcasses are stationary (which affects the detection process). The authors derive information about optimal sampling design (proportion of the turbines to sample, number of sampling occasions, interval between sampling occasions) and use simulations to illustrate the expected precision of mortality estimates. The authors analysed data from a small wind farm in New Jersey, in which they found the estimated number of fatalities to be twice the number of carcasses found.

Correspondence: peron.guillaume@yahoo.fr


The authors have developed multi-scale habitat suitability models (HSMs) for bats, a mobile group of mammals, for a geographically varied region of the UK (Lake District National Park). They asked whether the models have sufficient accuracy to contribute to informed decision-making in habitat management and in minimising the impact of climate change and human infrastructural development. The best multi-scale models were selected using fivefold cross-validation, with backwards, stepwise variable removal, whilst minimising residual spatial autocorrelation and sampling bias. Further tests with independent field data indicated good model transferability across the entire National Park. Foraging bats were generally most strongly associated with variables measured at small spatial scales and distance measures. However, each species responded differently across the range of scales, and strong associations were also found at the largest scale of analysis (6,000m). The best models for determining habitat suitability had few variables, making them easy to interpret and use in practical conservation planning. The approach is applicable to any taxa for which reliable presence records are available, providing insight into the potential impacts of land-use and environmental change. Maps identify areas of conservation concern, such as hot spots for diversity, rare or vulnerable species and potential or threatened network corridors, making them useful for EIA of proposed developments, and to conservation managers planning habitat creation or improvement.

Correspondence: j.d.altringham@leeds.ac.uk


Despite detailed knowledge of the behaviour of honeybees and their colonies, there are no suitable tools to explore the resilience mechanisms of this complex system under stress. Empirically testing all combinations of stressors in a systematic fashion is not feasible. The authors therefore suggest a cross-level systems approach, based on mechanistic modelling, to investigate the impacts of (and interactions between) colony and land management. They describe how a new integrated model could be built to simulate multifactorial impacts on the honeybee colony system, using building blocks from reviewed models. The development of such a tool would not only highlight empirical research priorities but also provide an important forecasting tool for policy-makers and beekeepers.

Correspondence: M.A.Becher@exeter.ac.uk


The authors argue that collaborative agri-environment schemes (CAES) — single environmental management agreements for multiple farm units — can benefit biodiversity, and discuss how a shift to this type of scheme may impact upon ecosystem services (ES). Well-designed landscape-scale schemes are likely to be more beneficial than farm-scale schemes for a small but significant number of key farmland species and ES, such as bats, mammals and some important pollinators, while unlikely to harm species operating at smaller scales. The results of this study show that these schemes can be expected to attract widespread participation from landowners.

Correspondence: ailsa.mckenzie@ncl.ac.uk


Three hypotheses about habitat structure were tested at the patch-scale in tributaries of the Rivers Wye and Usk, mid-Wales: (i) greater habitat heterogeneity and surface complexity alter macroinvertebrate assemblage composition and increase diversity, richness and abundance; (ii) the effects of complexity on macroinvertebrates are distinct from those of increased surface area; and (iii) habitat structure (heterogeneity and complexity) is a major determinant of variations in macroinvertebrates among habitat types (bedrock, silt, sand, gravel, pebbles and cobbles). The results support the first two hypotheses, but only in part. Habitat heterogeneity did not affect macroinvertebrates, whilst the effects of complexity were weak. The major implication is that habitat type affects macroinvertebrates through factors other than structure alone and the authors advocate a wider reappraisal of the processes involved.

Correspondence: Ormerod@cardiff.ac.uk
Does it make economic sense to restore rivers for their ecosystem services?

Acuña, V., Diez, J.R., Flores, L., Meleason, M. and Elosegi, A.

The authors examine how adding dead wood to restore stream channel complexity affects the provision and value of selected ecosystem services, mainly related to the retention and transformation of matter and cycling of nutrients, as well as to the effects on aquatic biota. The authors evaluated the cost-effectiveness of stream restoration through a comparative analysis of four reach-scale projects in streams flowing through temperate forest and into a drinking water reservoir and two scenarios of active and passive restoration at the basin scale. Results indicate that the lack of dead wood in streams has an important economic cost because of the effects on fish provisioning, opportunities for recreation and tourism, water purification and erosion control. Active reach-scale restoration resulted in a 10- to 100-fold increase in the monetary benefits provided by streams, accounting as much as €1.80 per metre of restored river length each year. Results of the reach-scale cost–benefit analyses estimated that the time required to recover the active restoration investment ranged from 15 to 20 years in low- to middle-order streams. The benefits in terms of the analysed services surpass the costs of active restoration over realistic timeframes, whereas this was not the case for passive restoration.

Correspondence: vicenc.acuna@icra.cat

The Trojan hives: pollinator pathogens, imported and distributed in bumblebee colonies.

Graystock, P., Yates, K., Evison, S.E.F., Darvill, B., Goulson, D. and Hughes, W.O.H.


The authors used molecular methods to examine the occurrence of parasites in bumblebee colonies that were commercially produced in 2011 and 2012 by three producers. They then used controlled experiments to determine whether any parasites present were infectious and found that 77% of the commercially produced bumblebee colonies from the three producers, which were imported on the basis of being free of parasitic pests, in fact carried microbial parasitic pests, with five different parasites being detected across the total sample of bumblebees and a further three in the pollen supplied with the colonies as food. Controlled experiments showed that at least three of these parasites were infectious to bumblebees with significant negative effects on their health, and that at least four of the parasites carried by commercially produced bumblebees were infectious to honeybees, indicating that they pose a risk to other pollinators as well. The results demonstrate that commercially produced bumblebee colonies carry multiple, infectious parasites that pose a significant risk to other native and managed pollinators.

Correspondence: william.hughes@sussex.ac.uk

Can restoration of afforested peatland regulate pests and disease?

Gilbert, L.


This study tested the impact of restoring peatlands from conifer forestry on Ixodes ricinus tick abundance and explored the likely mechanisms. Large-scale surveys of I. ricinus, vertebrate herbivores and vegetation were conducted in adjacent areas of forest, bog and areas felled 5–13 years previously. Questing tick abundance was greatest in forest and almost absent from blanket bog, with intermediate numbers in felled areas. The likely mechanisms for these variations in tick abundance were deer habitat preferences and ground vegetation height or canopy cover, which are generally associated with alternative tick hosts and micro-climates that aid tick questing and survival. The author suggests that felling conifer forest to restore peatlands could produce a dramatic decline in tick abundance throughout the restoration process, and therefore, a further ecosystem service of peatlands in addition to climate, biodiversity and water regulation is regulating pests and disease.

Correspondence: Lucy.gilbert@hutton.ac.uk

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Forthcoming Events

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

Conferences

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Geographic Section Events

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The Standard seeks to promote transparency and consistency in the quality and appropriateness of ecological information submitted with planning applications and in the way that decisions and actions are made in light of that information.

The content covers: considerations for the design process; issues to address during pre-application discussions; validation and registration of planning applications; sound and robust decision-making; issuing consent and use of appropriate planning conditions and obligations; addressing biodiversity during construction; post-development land management, monitoring and performance review. Also included are a set of Annexes that provide templates, aid memos, checklists and model planning conditions.

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