Bulletin of the Chartered Institute of Ecology and Environmental Management

CIEEM

inpractice

Issue 86 | December 2014

Training and skills

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Communication skills for ecologists

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Welcome

Training and skills

I write this editorial having just updated my CPD record, a task that was until recently limited to an annual undertaking. Whilst it is easy to limit consideration of training and skills to such tasks, I would argue that they are the key to our individual careers, to the standing of our profession and its future development. The importance of training and skills to ecologists and environmental managers was highlighted to me in two recent conversations.

The first conversation took place whilst I was running a training course for construction professionals on the role of ecology in site development. During the course I was asked *"Why should I pay for habitat surveys? Anyone can survey trees and newts."* This quote highlighted to me the need to convince some outside our profession of the merit of ecological training and the equivalence of ecological skills to other professions. Development of Chartered Ecologist (to sit alongside the existing Chartered Environmentalist award) is a great step forward in raising the external profile of our profession. This is one of many skills and training initiatives undertaken by CIEEM in recent years and summarised in Sally Hayns' article in this issue. CIEEM has also been working with key partners, including Natural England and the Environment Agency, to recognise and support their internal ecological skills training. There is an opportunity for other organisations and individuals to start to more proactively review their skills and training; the CIEEM Competency Framework provides an excellent mechanism for doing this.

It is not just amongst other professions that we need to raise awareness and understanding of the value of ecological training. CIEEM has for two years been professionally accrediting university degrees. Accreditation provides CIEEM with a mechanism for influencing what is taught at universities and is core for dealing with the ecological skills gaps amongst graduates. But the key pressures in universities are on recruitment, research and costs. It is hard to persuade lecturers and teachers of the value of CIEEM membership and even harder to persuade universities of the importance of fieldwork training.

If we are going to influence future entrants to our profession we need to influence how our subjects are taught and perceived not just in universities but also in schools. Ecology at A-level is often unpopular; there is a lack of awareness of our profession amongst teachers and pupils. Entry to specialist undergraduate degrees in our field is declining, courses are closing, and those who do take such programmes are mainly white and middle class. Diversity and recruitment to the profession and coverage of ecology in compulsory education are issues to be tackled.

My second conversation was with two assistant ecologists who after four years studying ecology and two years of volunteering were considering quitting the profession because of their work experience. Surely recent graduates should only undertake protected species surveys having had initial specialist training and junior ecologists should be able go on appropriate training courses? It is easy for us to criticise others for not recognising the level of training and skills needed to be a successful professional ecologist but we also need to ensure that standards are maintained within the profession and that training and skills development are supported.

When budgets are tight it is the training budget that is often the first to be cut. Yet the articles in this edition of *In Practice* demonstrate the importance of training and skills development, both to our profession and to us as individuals in our careers as ecologists and environmental managers. As has always been true, acquiring skills and training makes us ever more employable.

Peter Glaves MCIEEM
Chair, CIEEM Training, Education and Continuing Development Committee

Information

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Merry Christmas & Happy New Year!

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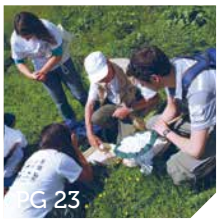

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Defra publish updated guidance and licence application information

Defra have published updated guidance and license application information for a range of protected species on the new www.gov.uk website.

https://www.gov.uk/environmental-management/wildlife-habitat-conservation

MMO issue guidance on costs for licence variations and post consent monitoring work

Since 1st October 2014 the Marine Management Organisation (MMO) has charged for any new licence variation or post-consent work, even if the licence was issued before this date.

https://www.gov.uk/government/publications/marine-licensing-fees/costs-for-licence-variations-and-post-consent-monitoring-work

Northern Ireland Environment Agency launch new water management guide

The Northern Ireland Environment Agency has launched its 'Northern Ireland Water Management, facts and figures' reference guide. It provides information on the condition of Northern Ireland's inland and marine waters.

http://www.doeni.gov.uk/niea/water-home/water_facts_booklet.htm


© Scottish Natural Heritage

New tool to assess noise impact on marine mammals

A new desktop tool – Interim PCOD (Population Consequences of Disturbance) Model – will allow offshore renewable energy developers to assess the likely impacts of their projects on marine mammal populations.

http://www.st-andrews.ac.uk/news/archive/2014/title,248538,en.php

IUCN National Committee UK publishes new report on UK protected areas

Both the full version and the summary document of the report and recommendations from the IUCN NCUK *Putting Nature on the Map* project are now available to download.

http://www.iucn-uk.org/News/LatestNews/tabid/72/default.aspx

Planning (Wales) Bill

The Planning (Wales) Bill introduces a series of legislative changes and aims to deliver reform of the Welsh planning system to ensure that it is fair, resilient and enables development.

http://wales.gov.uk/topics/planning/legislation/planningbill-old/?lang=en

100 million records on the NBN Gateway

The NBN Gateway has reached its 100 millionth record, making it one of the biggest wildlife databases in the world.

http://www.nbn.org.uk/News/Latest-news/100-million-records-on-NBN-Gateway!.aspx

CABI releases rust fungus to control invasive Himalayan balsam

CABI has released a rust fungus at locations in Berkshire, Cornwall and Middlesex as part of field trials to control the non-native, invasive weed Himalayan balsam *(Impatiens glandulifera)* using natural means.

www.cabi.org

Setting up and management of local nature reserves

Natural England and Defra have issued guidance of how local authorities can select a site, and then declare and manage it as a local nature reserve (LNR).

https://www.gov.uk/create-and-manage-local-nature-reserves

Getting accreditation for a country park

Natural England and Defra have published guidance on how to get accredited status for a country park.

https://www.gov.uk/get-accreditation-for-your-country-park

Guidance on community benefits and engagement guidance for onshore wind

DECC has issued guidance on community benefits and engagement for onshore wind farm developers, communities living in the locality of a wind farm and local authorities.

https://www.gov.uk/government/publications/community-benefits-and-engagement-guidance-for-onshore-wind

EIA (Agriculture) regulations: apply to make changes to rural land

Natural England has published guidance on how to request an Environmental Impact Assessment screening decision and get consent to cultivate previously uncultivated land or semi-natural areas, or restructure land features.

https://www.gov.uk/eia-agriculture-regulations-apply-to-make-changes-to-rural-land


© Environment Agency

Ancient woodland and veteran trees: protection, surveys and licences

Natural England and the Forestry Commission have published information for developers about ancient woodland and veteran trees.

https://www.gov.uk/ancient-woodland-and-veteran-trees-protection-surveys-licences

Welsh Cabinet reshuffle

Wales has a new Minister for Natural Resources, following a re-shuffle of Cabinet posts. The new Minister is Carl Sargeant AM who moves from Housing and Regeneration to Natural Resources. Rebecca Evans AM becomes Deputy Minister for Farming and Food (previously Deputy Minister for Agriculture and Fisheries).

http://wales.gov.uk/newsroom/firstminister/2014/140911-cabinet-reshuffle/?lang=en

Badger vaccination scheme launched to curb bovine TB spread

A new badger vaccination scheme has been launched as part of the government's comprehensive strategy to make England bovine TB free. The Badger Edge Vaccination Scheme (BEVS) will support badger vaccination projects in areas outside the bovine TB high risk area including Cheshire, Oxfordshire and Hampshire.

https://www.gov.uk/government/news/badger-vaccination-scheme-launched-to-curb-bovine-tb-spread

England's first Red List for Vascular Plants

The List is a comprehensive and objective analysis of changes in the distribution of England's native flora and identifies the most threatened species.

http://www.bsbi.org.uk/england.html

Online tool launched to help planners assess development issues around SSSIs

Local planning authorities in England will be able to assess whether a proposed development is likely to affect the country's 4,128 SSSIs thanks to a new online tool produced by Natural England.

http://www.naturalengland.org.uk/ourwork/planningdevelopment/impactriskzonesgistoolfeature.aspx

Green Alliance call for greener Britain in manifestos

The Green Alliance has published *Greener Britain: Practical proposals for party manifestos from the environment and conservation sector.*

http://www.greenalliance.org.uk/resources/Greener%20Britain.pdf

New tool in fight against wildlife crime

Scottish Natural Heritage (SNH) will prevent the use of general licences to trap or shoot wild birds on land where there is evidence of wildlife crime against birds.

http://snh.presscentre.com/news-releases/new-tool-in-fight-against-wildlife-crime-137.aspx

Better protection for underwater habitat

An urgent Marine Conservation Order (MCO) has been brought in to protect fragile ecosystems in the South Arran area of the Firth of Clyde. This is the first time these powers in the Marine (Scotland) Act 2010 have been used.

http://news.scotland.gov.uk/News/Better-protection-for-underwater-habitat-10b6.aspx

New squirrelpox research released

New research predicts how the squirrelpox virus could spread in grey squirrel populations in Scotland, and will be useful in planning how best to protect red squirrels. A new SNH report describes the results of disease modelling work carried out on squirrelpox virus.

http://snh.presscentre.com/News-Releases/New-squirrelpox-research-released-today-13a.aspx

Understanding the potential effects of wave energy devices on kelp biotopes

SNH Commissioned Report 783 improves understanding of the potential changes to kelp habitats that could occur as a result of the development of wave energy renewables projects around Scotland's coasts.

http://www.snh.gov.uk/publications-data-and-research/publications/search-the-catalogue/publication-detail/?id=2183

High Court issues landmark ruling on Appropriate Assessment

In the Republic of Ireland, the High Court has recently issued a landmark ruling with significant implications for how Appropriate Assessment (AA) is carried out. In Kelly v An Bord Pleanala (25 July 2014), it quashed two related An Bord Pleanála decisions to grant planning permission on the grounds that the Board had not lawfully conducted an AA and had failed to give adequate reasons for its determination that the development would not adversely affect the integrity of European Sites.

https://docs.google.com/file/d/0B2R5NWhoXQgeaEcwVjliMlU3OFk/edit

World's biggest tidal array to bring energy and jobs to North Scotland

The world's biggest tidal array – the Meygen project – is to be built in North Scotland bringing jobs and energy security to the Pentland Firth region.

https://www.gov.uk/government/news/worlds-biggest-tidal-array-to-bring-energy-and-jobs-boost-to-north-scotland

Forestry Commission issues pest alert

Phytophthora austrocedrae is an aggressive, fungal-like pathogen that poses a serious threat to juniper trees in Britain. *Phytophthora austrocedrae* was first reported in the UK in 2011 and infected trees have now been found at sites across Scotland and the north of England.

http://www.forestry.gov.uk/pdf/FCPH-PA.pdf/$file/FCPH-PA.pdf

Northern Ireland Single Farm Payment Scheme to be replaced

In Northern Ireland, from 2015, the Single Farm Payment Scheme will be replaced by the Basic Payment Scheme, a Greening Payment and a Young Farmer's Scheme. It will be mandatory for applicants to the Basic Payment Scheme to comply with Greening requirements.

www.dardni.gov.uk

New EU Commissioners confirmed

EU President Jean-Claude Juncker has announced his team of Commissioners. Of particular interest to members are:

- Miguel Arias Cañete (Spain) – Climate Action and Energy
- Phil Hogan (Ireland) – Agriculture and Rural Development
- Karmenu Vella (Malta) – Environment, Maritime Affairs and Fisheries

The Commissioner from the UK is Jonathan Hill, who has a portfolio covering Financial Stability, Financial Services and Capital Markets Union.

CIEEM Awards 2015 open for entries

CIEEM is proud of what our profession contributes to a more sustainable environment. There is much to celebrate! The 2015 Awards build on the success of our 2014 celebrations. They reflect the scope and success of our profession and those companies and organisations working to deliver better outcomes for nature and for society.

The Awards Luncheon will take place on Thursday 25th June 2015 at the Birmingham Botanical Gardens and we are pleased to announce that our guest speaker will be CIEEM Patron Tony Juniper.

See www.cieem.net/cieem-awards-2015 for the criteria and entry forms.

Two new Special Interest Groups

CIEEM's Special Interest Groups (SIGs) provide a focus for activity in particular areas of ecology and environmental management. They are informal groups run by volunteers who give their time to hold meetings, arrange events and take part in other activities that are specific to their topic.

Recently, two new SIGs have been set up: Academia and Marine. These new SIGs aim to provide support to members, working in the particular areas of either academia or marine, through networking, providing a focus for sharing good practice and collating feedback on relevant issues.

www.cieem.net/special-interest-groups

Advertise volunteer vacancies for free

This is a reminder to all members that we publish volunteer vacancies on the CIEEM website at no charge.

www.cieem.net/volunteering-opportunities

A New President-Elect

Congratulations to CIEEM Fellow Stephanie Wray, a partner at Peter Brett Associates LLP, who has been elected as our next President at last month's AGM which was held at The John McIntyre Conference Centre in Edinburgh. Currently Vice-President (England), Stephanie will act as President-Elect for a year and then take up the post of President from November 2015. Stephanie's background is as an ecologist, environmental planner and sustainability specialist and she currently heads up Peter Brett's environmental team.

The AGM agenda included a report from the current President, John Box, based on the work of the Committees over the year and priorities for the year ahead; from Sally Hayns, Chief Executive Officer, on the work of the Secretariat, and from Steve Pullan, the Treasurer, on the accounts and outturn for last year.

At the AGM the President gave warm thanks to the following members who were stepping down after long service on Standing Committees:

- Sally Mousley CEnv MCIEEM – standing down after 6 years' service on the Membership Admissions Committee
- Paul Lee CEcol CEnv MCIEEM – standing down after 7 years' service on the Membership Admissions Committee
- Mick Hall CEnv MCIEEM – standing down after 8 years on the Professional Standards Committee, including 6 years as Chair
- Martin Fox CEnv MCIEEM – standing down after 8 years on the Professional Standards Committee including three years as Vice Chair

The unadopted minutes of the AGM are now available online in the members' area of the website.

CIEEM meet with Defra and Natural England to discuss guidance reform

CIEEM's Chief Executive, Sally Hayns, and Policy and Communications Manager, Jason Reeves, recently met with representatives from Defra and Natural England to discuss the reform of guidance and its migration to the new www.gov.uk website. The government position is to retain only enough 'guidance' to ensure that users of that guidance do not break the law. 'Best practice' will need to be hosted elsewhere. Options for alternative arrangements and potential issues were discussed and there is now an ongoing dialogue.

Natural England Protected Species Licencing

CIEEM is continuing to work with Natural England to develop 'Earned Recognition' for consultants who undertake activities requiring a licence. Following a report and recommendations from contractors Peak Ecology Ltd, on the potential for Earned Recognition, the next phase of the project is to support the development of the bat low impact class licence scheme and a bats in churches class licence scheme. CIEEM is developing the details of the relevant sub-themes of the Competency Framework to better define the required competences for the respective class licences prior to helping to design the mandatory training courses for registered consultants.

Policy engagement in Scotland

CIEEM Vice President (Scotland), Kathy Dale, and Policy and Communications Manager, Jason Reeves, took the opportunity whilst in Edinburgh for the Autumn Conference to meet with representatives from Scottish Government, Scottish Natural Heritage (SNH) and Marine Scotland to discuss possible synergies between CIEEM and these organisations. Useful discussions were held on a variety of issues ranging from sharing information to promoting CIEEM membership. CIEEM President John Box also opened up a dialogue with the Scottish Environment Protection Agency (SEPA). We are now following up the actions that arose from these discussions.

Edinburgh Conference

CIEEM held its recent Autumn Conference entitled 'Progress in Effective Habitat Restoration, Translocation and Creation' in Edinburgh on 11-12 November 2014.

Paul Wheelhouse MSP, Minister for Environment and Climate Change, gave one of the opening talks. Kathy Dale, CIEEM Vice President (Scotland), said: *"CIEEM is delighted that the Scottish Minister for Environment and Climate Change, Mr. Paul Wheelhouse MSP, addressed the conference. Mr Wheelhouse is well known to many of us in Scotland and is a very good supporter of the environmental movement. His attendance at the conference is real recognition for the Institute and the profession of ecology and environmental management."*

Professor Bill Sutherland gave the conference keynote address. He stressed that many conservation interventions are not tested and that we need to find way to collectively do this – and publish the results. He added that a lack of access to information is hindering conservation practitioners, but that it is up to conservation practitioners to take forward nature conservation.

An interesting debate was held on rewilding. There are differing views on the topics but the consensus seemed to be that, to whatever extent of rewilding you agree with, we need to engage people in the process.

Dick Balharry gave a rousing after dinner talk in the grandeur of the Playfair Library on the importance of people in nature conservation.

CIEEM Patron David Goode signed copies of his new book *Nature in Towns and Cities* from the New Naturalist series during lunch and coffee breaks.

The conference presentations are available on the CIEEM website.

www.cieem.net/previous-conferences

Minister Paul Wheelhouse addresses conference delegates

Could you inspire the ecologists and environmental managers of the future?

STEMNET (the Science, Technology, Engineering and Mathematics Network), part funded by the Department for Business, Innovation, and Skills, works with thousands of schools and colleges to enable young people of all backgrounds and abilities to meet inspiring role models, understand real world applications of STEM subjects and experience hands-on activities that motivate, inspire and bring learning and career opportunities to life.

Their network of volunteer STEM Ambassadors use their enthusiasm and commitment to open the doors to a world of opportunities and possibilities which come from pursuing STEM subjects and careers. STEM Ambassadors get involved in a huge range of activities including:

- giving careers talks
- supporting projects in the classroom or after-school clubs
- judging school competitions
- speed networking with pupils, parents and teachers
- helping students with mock job interviews

Professionals working in ecology and environmental management roles are underrepresented within STEMNET at present and as a consequence secondary school students throughout the UK are not made aware of potential career opportunities in the sector. To find out more about becoming a STEM Ambassador and inspiring young people to consider a career in our sector visit www.stemnet.org.uk

STEMNET

ENEP side-event highlights challenges for new European Commissioners

The European Network of Environmental Professionals (ENEP), of which CIEEM is a member, held its most recent General Assembly in Brussels on 9-10 October 2014. The first day of the Assembly involved a visit to the European Commission, with an introduction to the Commission and further insights on energy and the environment.

Timing for this meeting was not ideal as it was just prior to Jean-Claude Juncker becoming EU President and announcing his new Commissioners for the 2014-19 term.

Mark Corner discussed some of the changes coming up in the Commission under new President Juncker who took office on 1st November 2014. DG Environment and DG Fisheries and Marine will be amalgamated into DG Environment, Maritime Affairs and Fisheries and will be headed by Commissioner Karmenu Vella from Malta.

William Neale, member of the Cabinet of Commissioner Janez Potočnik for the Environment, spoke about the now former Environment Commissioner's priorities and achievements. Commissioner Potočnik pushed better implementation, efficiency and enforcement rather than introducing new legislation.

In the evening, after-dinner speaker Cedric De Meeus gave his views on the Potočnik legacy. He said that his will be one of evolution rather than revolution, focused on studying the impacts of policies rather than introducing new ones. Looking to the future, it is interesting how the new DGs will be structured with no dedicated Environment Commissioner. Cedric concluded by asking who will be responsible for sustainable development in the new Commission as it is not in any Commissioner's portfolio.

www.cieem.net/news/209/enep-side-event-highlights-challenges-for-new-european-commissioners

ENEP
European Network of Environmental Professionals

Closing the Ecological Skills Gap

Sally Hayns CEcol MCIEEM

Three years ago CIEEM (then IEEM) published the findings of a research project into whether an anecdotally-reported, perceived ecological skills gap existed[1]. Concerns had been expressed that, at a time when the demand for ecological skills and knowledge to reverse the global loss of biodiversity has arguably never been greater, a skills deficit could seriously undermine achievement of the 2020 Aichi targets.

The research identified a number of key findings including skills gaps in:

- Species identification, especially of invertebrates, fish and lower plants;
- Ecological survey, sampling, data analysis and monitoring skills for fish and invertebrates;
- Ecological Impact Assessment and Strategic Environmental Assessment techniques across a range of habitats;
- Habitat creation, restoration and management in marine, coastal and upland environments;
- Techniques to control the spread of invasive species and wildlife diseases;
- The application of environmental economics and the valuation of ecosystems services;
- Freshwater, coastal and marine systems and processes;
- Spatial planning;
- Understanding of environmental legislation and its policy implications; and
- Microbial ecology.

The evidence for an ecological skills gap and skills shortages was (and still is) alarming when there is a need to demonstrate innovative thinking and initiatives to arrest the decline in our natural capital. The report summary Closing the Gap[2], published in July 2011, also identified a number of actions where (C)IEEM could play a leading role to help tackle the problem. So how have we done? Table 1 shows our progress against these objectives.

What next?

Investment in training and skills development has been a high priority for CIEEM and, since the report was published, the Governing Board has already invested significant financial reserves in strategic developments such as the Competency Framework and the Chartered Ecologist Register in order to promote the acquisition and assessment of competence. Further investment in a new online Skills Manager tool will provide opportunities for members to plan, record and assess their development.

Other priorities for CIEEM in the future are:

- Development of strong country-specific partnerships (with government engagement if possible) to develop and deliver strategic initiatives targeting specific skills gaps and skills shortages;
- Support for more time to be dedicated to teaching ecological and environmental understanding throughout the school curriculum;
- Accreditation of specialist degree programmes supporting the acquisition of those areas of knowledge and skills identified as being in strong demand;
- Engagement with employers in the development of graduate training programmes, internal competency frameworks (linked to CIEEM's) and supporting staff in their development of competences leading to chartered status; and
- The endorsement or accreditation of specialist professional development courses delivering the required knowledge and skills.

So there is much to do.

Please send comments, suggestions and feedback direct to Sally at SallyHayns@CIEEM.Net

Notes

1. *Ecological Skills: Shaping the profession for the 21st Century* (2011). Institute of Ecology and Environmental Management, Chichester. http://www.cieem.net/data/files/Resource_Library/Education/Education-Ecological_Skills_Project_Final_Report.pdf

2. *Closing the Gap: Rebuilding ecological skills in the 21st Century* (2011). Institute of Ecology and Environmental Management, Chichester. http://www.cieem.net/data/files/Resource_Library/Education/Education-Closing_The_Gap_Report.pdf

3. Pilcher, K., Skinner, A. & Essery, C. (2014). CIEEM and the Environment Agency working together to support professionalism. *In Practice*, **86**: 10-12.

4. Creedy, J. (2014). Identifying skills gaps, developing expertise and improving capability in Natural England. *In Practice*, **86**: 13-14

Table 1. Recommended Actions to address the ecological skills gaps and skills shortages.

Recommendation	Progress to date
Creation of a government-supported, multi-partner Task Force to oversee delivery of a strategy to address current and future needs.	Little interest from governments during a period of considerable change but some useful partnerships being formed.
Renewed commitment to the promotion of ecology and environmental understanding at primary and secondary school ages.	Ecology and environment issues continue to be 'squeezed' in most national curricula (e.g. the threat to Environmental Studies courses in England). CIEEM needs to spend more time building partnerships with organisations actively involved in school curricula.
Development of a competency framework as an ongoing career planning tool for a range of ecologist and environmental manager roles.	Competency Framework developed in 2012 and published in January 2013. Now used as the basis of CIEEM membership eligibility criteria. Current development of Skills Manager tool for online continuing professional development (CPD) recording and competence self-assessment based on the Competency Framework.
Engagement with higher education institutions and accreditation of undergraduate and postgraduate programmes and research strands that deliver the required knowledge and skills.	Degree accreditation scheme developed in 2012 and launched in January 2013. Thirteen degree programmes (undergraduate and postgraduate) accredited to date. Currently work is underway to develop a method to assess specialist degree programmes that focus on identified skills shortages. The Society of Biology accredits research programmes.
Improvement in careers advice and guidance to highlight the knowledge and skills needs and to promote links to employment opportunities.	New careers material and job profiles have been developed and are available on the CIEEM website. Several Geographic Sections, such as Scotland, West Midlands, and Yorkshire and Humberside, have become very involved in careers promotion.
Investment in high quality and accessible training programmes that target identified skills gaps.	CIEEM's Professional Development Programme has been expanded to include new courses on specific skills gaps such as lower plants, Ecological Impact Assessment, Water Law and Biodiversity Offsetting.
Assessment and certification of knowledge and skills as part of CPD.	CIEEM membership grades linked to Competency Framework levels from April 2014. This provides a career development pathway based on demonstration and assessment of increasing levels of competence (applied knowledge and skills). The launch of the Chartered Ecologist standard (to complement the Chartered Environmentalist award), which is based on the higher levels of the Competency Framework, consolidates this approach.
Engagement from employers in the support and delivery of career structure, on-the-job training and staff development.	The development of an employer-developed postgraduate apprentice scheme supported by CIEEM looked promising but uncertainty over government policies and funding has made this too risky at this time. There has been engagement with some statutory agencies on internal competency frameworks / staff development programmes and this could be expanded. (See Pilcher *et al.*[3] and Creedy[4], this issue.)
Promotion, support for and accreditation of specialist knowledge and skills requirements in ecology and environmental management roles in order to raise standards and drive self-improvement.	CIEEM is investigating ways of both a) endorsing specialist training courses and development programmes that provide the required knowledge and skills, and b) developing appropriate certificated courses.

Kick sampling

CIEEM and the Environment Agency working together to support professionalism

Katharine Pilcher MCIEEM, Ann Skinner CEcol CEnv FCIEEM & Caroline Essery MCIEEM
Environment Agency

The Environment Agency (EA) has developed an award scheme, endorsed by CIEEM, which recognises the level of skill and knowledge within the EA's Biodiversity and Environmental Monitoring workforce and helps to support our professionalism. Staff who have met the criteria described below, can apply for the Environment Agency internal award of "Practising Ecologist". Successful applicants receive a certificate signed by senior managers and can use the title "Practising Ecologist", for example, Joe Bloggs, Monitoring Officer (Practising Ecologist).

This award demonstrates the level of professionalism achieved by Biodiversity and Environmental Monitoring staff within the EA and has three main aims:

- To recognise the skills of staff who have reached a defined level of capability under our organisation's Technical Development Framework, which is very important internally;
- To help staff who have not already joined a professional body to gather evidence to support their application at a suitable grade;
- To help staff who are already members of a professional body on their journey to Chartership.

Thus, the scheme is intended to increase Environment Agency staff membership of CIEEM as well as increase the number of our staff applying for Chartership, therefore benefiting both CIEEM through increased member numbers and the Environment Agency. A similar scheme could be adopted by other organisations to encourage skills assessment and target training amongst their own workforce.

In the Environment Agency, we use a tool known as a Technical Development Framework (TDF) to map the level of knowledge and skill required by staff

Table 1. How the capability requirements of the Environment Agency tie in with CIEEM's competency and theme requirements

CIEEM Theme	Fisheries & Biodiversity TDF capabilities	Environmental Monitoring TDF capabilities
Surveying	Technical ecological knowledge	Data and information management
Environmental management	Management of impacts	Data and information management
Environmental assessment	Legislative knowledge and its application Management of impacts	A candidate wishing to demonstrate this capability would need to provide specific examples from their work.
Environmental governance, legislation and policy	Legislative knowledge and its application Management of impacts	Legislative knowledge
Scientific method	Technical ecological knowledge Data and information management	Data and information management
Formal facilitation, consultation, engagement and partnering	Personal skills	A candidate wishing to demonstrate this capability would need to provide specific examples from their work.
Public awareness and education	This theme is not explicitly assessed through either TDF but raising environmental awareness and understanding is an inherent part of our work. A candidate wishing to demonstrate competence in this theme would need to provide specific examples from their work.	
Professional conduct	The Environment Agency has an established code of conduct that ensures our employees consistently uphold high professional standards of business conduct and behaviour. A candidate working within our TDF and demonstrating level 3 across a range of capabilities would be considered to be meeting an appropriate level of professional conduct.	
Business management	This theme is not explicitly assessed through either TDF but a candidate demonstrating level 3 across a range of capabilities would be applying Business Management skills as part of their day job. Officers are required to apply internal quality assurance protocols, demonstrate a commitment to achieving resource efficiency, contribute to corporate planning targets and provide customer focus as an inherent part of their role.	
Project management	Project and contract management	A candidate wishing to demonstrate this capability would need to provide specific examples from their work.
Information management	Data and information management	Data and information management
People management	This theme is not explicitly assessed through either TDF, but an officer achieving capability level 3 against a range of capabilities would be expected to play a part in people development (through coaching and mentoring) and be able to demonstrate their ability to work as part of a team.	
Self management	Personal Skills. Inherent to Environment Agency core values.	Inherent to Environment Agency core values. An officer wouldn't be expected to achieve TDF level 3 across a range of capabilities unless they were able to demonstrate effective task management, communication, learning and development.
Health and safety	TDF capability "Health and safety".	

working in different roles and at different grades. The TDF sets out what an individual is expected to know, the tasks they should be able to undertake and the expected level of capability. We use a scale of 1 (novice, aware) to 5 (leading authority, national expert), with level 3 representing someone who has enough detailed knowledge to perform the relevant task(s) effectively, consistently and without supervision. The high level capabilities are further broken down into more specific activities. For example the Data and Information Management capability can contain many activities that cover the planning, collection, analysis, evaluation and reporting of data.

The capabilities and activities are very similar to the competencies used by CIEEM for its different levels of membership (Table 1).

Staff who are at level 3 in at least 70% of the activities undertaken in their role are deemed to be fully capable, and support is provided to help them become more capable in the remaining activities. It is

important to note that we do not require all staff to be at capability level 3 in all activities as they may only need to provide a supporting role in some.

Each applicant for Practising Ecologist needs to submit evidence of their TDF scores and a completed application form with brief written examples for each capability, using the STARR format (situation, task, action, result and review). Staff are encouraged to choose examples of work they have carried out to demonstrate their level of capability and competence in each of the CIEEM sub-themes to show the work is directly applicable to the award. Applications are scrutinised by a small panel of national experts in Biodiversity and Environmental Monitoring. Some of the CIEEM competencies, such as "People management" and "Business management" are not explicitly measured through our TDFs as we concentrate on the technical aspects of the roles. However, we have procedures such as internal quality assurance, regular staff appraisal, coaching and mentoring schemes and our code of professional conduct, which ensure that officers working at capability level 3 are meeting these competencies.

We have worked with CIEEM to match the capability requirements of the EA with CIEEM's competency requirements (see Table 1) to ensure that what we require staff to be able to do matches the requirements of CIEEM for each relevant level of membership. We are now able to demonstrate that EA staff who reach prescribed capability levels in our TDF have also attained equivalent competency levels for CIEEM. Staff who are not already CIEEM members will have collected the evidence required to determine which CIEEM membership level is appropriate for them. For staff who are already members of CIEEM, they can use the award to help them work towards either "Chartered Ecologist" or "Chartered Environmentalist" status.

The benefits to staff are many. Becoming a member of a Professional Institution demonstrates to others that they have the credentials to practice in their field. It encourages staff to develop and maintain their technical competence and keeps personal professional development at the forefront of their thinking. As an organisation, it benefits EA through having a demonstrable level of professionalism amongst our staff. The award shows our commitment to staff development, and supports our aim to encourage officers to attain chartered status. This award has been useful in promoting the benefits of CIEEM membership and reminding our staff that the Agency supports membership of professional bodies such as CIEEM.

Our Practising Ecologist award is a "stepping stone" on the journey towards chartered recognition and is intended to complement the work carried out by CIEEM by helping staff collect the evidence they need for their formal membership submission to professional bodies such as CIEEM. At the launch of the scheme, Sally Hayns, CIEEM's Chief Executive Officer, said *"We feel that the Agency's approach to supporting and promoting the training and development of its staff is innovative and robust. We look forward to hearing further about the success of the Practising Ecologist scheme"*.

David Jordan, Environment Agency Executive Director Operations said *"I'm really pleased with this. I attach significant importance to professional endorsement. I look forward to signing certificates for Practising Ecologists."*

Since launching the scheme in autumn 2013 we have approved ten applications across the Biodiversity and Environmental Monitoring teams. These are our frontline teams for ecological work including field and laboratory work, evaluation and reporting, advice, permitting and enhancement work. We regularly receive enquiries from staff interested in applying. Across the organisation we have other similar schemes in place that have been endorsed by the Chartered Institution of Water and Environmental Management, the Geological Society, the Chartered Institution of Wastes Management and the Institute of Environmental Management and Assessment. All schemes have the same aim: to promote professionalism amongst our staff whilst demonstrating to others that we have a highly trained, proficient and skilled workforce and are committed to staff development.

This scheme has been beneficial to both EA and CIEEM as it has enhanced our working relationship and given us a better understanding of what each organisation requires of its ecologists and members respectively. Similar schemes could be easily translated to other organisations to help them outline what they require of their staff. It is beneficial for staff to know what level they should be working at and what they need to do to develop and progress. The TDF (or a similar tool) sets this out in a standard format across the teams. It helps to focus staff and team development on the key areas, enabling us to target limited resources to get the best from staff whilst meeting the aims of our organisation.

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Identifying skills gaps, developing expertise and improving capability in Natural England

John Creedy
Natural England

Natural England has undergone major restructuring over recent years resulting in the loss of key skills and expertise. By implementing a Skills Framework, similar in approach to CIEEM's competency standards, Natural England has been able to identify existing skills among staff, build networks of expertise and target training needs through new initiatives to develop specialist skills and capabilities.

Surveying chalk grassland at Old Winchester Hill NNR. Photo by Dr Simon Duffield, Natural England.

Introduction

One of the main challenges Natural England has faced since being set up in 2006 has been to sustain the skills and expertise it needs to carry out its work. As the Government's adviser on the natural environment it needs to maintain its reputation for expertise and impartiality based on sound evidence. It has a wider remit than any of its predecessors, covering access, recreation and landscape as well as nature conservation. It needs to keep up with new developments and new topics: the ever-growing significance of climate change, the ecosystem approach as ecosystem service. But in common with the rest of the public sector, it faces dwindling resources. How has Natural England responded to this challenge?

Understanding existing skills

Firstly, we needed to know what skills and expertise we have so we can target those that need most development. While our staff base has shrunk in recent years, we still have well over 2000 staff with a wealth of experience and expertise. We needed a tool that would help managers, leaders and experts identify and manage our skills and expertise, and give us a solid base for further action. In 2012 we introduced a Skills Framework for all staff that focussed on two main areas: their transferable skills, underpinning everything they do, and the specialised expertise that they have.

The transferable skills cover a range of activities common to most organisations, such as management, leadership and communications, as well as activities more tailored to our role, such as managing evidence. We also require all staff to record their expertise against a range of business, technical and science-related topics. These include over 80 'environmental specialisms': a pragmatic range of subjects that cover the expertise we need to carry out our statutory role: the major habitat and species groups, landscape, access and recreation, cross-cutting issues such as climate change and the ecosystem approach, and applied topics such as site designation and development planning. Importantly, we require people to record areas of expertise that they have but do not use in their current roles. Natural England's Skills Framework approach is similar in concept and purpose to CIEEM's own professional competence standards.

Secondly, we needed to use this tool to help us act. We now know where we have expertise and where we have gaps. Through the use of our Skills Framework system, our leading national specialists can identify and target colleagues in local teams capable of forming networks of expertise. They can see where gaps in expertise are – and where to target their own training and support.

Practical training at Natural England. Photo by Dr Richard Jefferson FCIEEM, Natural England.

Filling the gaps

At a national level, managers and project leaders can see what expertise is available to fill new roles or deliver new projects – vital when a lack of resources mean that we have very little scope to recruit new staff. Where we have clear evidence of gaps we do not always have the time or resources to develop our own in-house expertise. Mycology is an example where we have contracted in expertise from outside Natural England.

Vital though it is to have networks of national and local experts, our work and our reputation also depend on most of our staff having expertise in the components and process of the natural environment. Gone, though, are the days when we could rely on most of our conservation staff having field experience: organisational change and loss of staff through retirement have meant that we have a significant number of staff without the depth or breadth of expertise that they need.

Our local staff and national experts alike try to find the time and resources to increase field skills and expertise and have done much good work. But there is still a clear unsatisfied need, and our Skills Framework allows us to flag and analyse areas of development need. We are currently using the information we have gained to help us plan a programme of basic learning and development to plug the most urgent gaps in our environmental expertise. We need to ensure that our front-line staff have at least the basic knowledge they need in such topics as field identification, taxonomical classification and understanding of habitats and landscapes.

To supplement this, and drive the improvement in our field skills, a new unit has recently been set up in Natural England comprising a group of individuals who will spend their first year in post focussing intensively on the development of field skills (both their own and others) to address the skills gap.

In boosting our environmental expertise we aim to have the right range and number of staff with skills at basic, practitioner and expert level who can carry out Natural England's programmes today but who also can develop their expertise further to meet tomorrow's challenges.

Transferable skills

But technical expertise is not enough: we need staff with the right transferable skills as well, and our national experts are no exception. For this reason Natural England is about to embark on a programme to develop specialist skills and capabilities to ensure that our experts are adept in topics such as understanding the limitations and uncertainties behind evidence. They must be skilled in a distinctive range of communications so the messages and advice they give, the coaching and training they provide, and the partnerships they form, lead to the decisions and actions that are best for the natural environment.

Conclusion

With continuing pressure on resources, and the range of challenges affecting the natural environment, we continue to keep our Skills Framework under review. Inside Natural England we need to be sure that the system is flexible and that it can respond to changing needs and priorities. An equally big challenge is to build on what we have done to join up more closely with others, whether they are our partner organisations across Government or in the voluntary bodies, or whether they are bodies such as CIEEM with whom we can work ever more closely in improving standards of expertise and practice across the wider environmental sector. We believe our Skills Framework has proved a valuable foundation for this future progress.

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Communication skills for ecologists – to influence policy on biodiversity and ecosystem services we must know our audiences

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Policy and economic decision makers need to understand the impacts of their decisions on the natural environment. Ecologists need to communicate messages in ways that are accessible to non-specialists if we are to influence these decision makers. This article is based on a workshop that investigated how ecologists communicate about biodiversity and ecosystem services. We found that ecologists can tailor their language, but often appear to assume that non-specialists already understand specialist terms – an error that could harm the effectiveness of communication. In this article we provide recommendations on simple ways to communicate more effectively. If ecologists tailor their approach and use language their audience will understand, we can improve the way we engage with one another. This will help society to safeguard biodiversity and healthy ecosystems.

Introduction

Ecosystems are communities of living organisms interacting with non-living factors within their environment. Healthy ecosystems provide services, which benefit humans directly and indirectly. These 'ecosystem services' are interconnected but are broadly categorised into four types: provisioning, supporting, regulating and cultural services (Daily *et al*. 2009). Such services include food and fuel, regulation of clean air and water, soil formation, and recreational activities.

Ecosystem services are fundamental to human well-being and provide significant contributions to worldwide economic activity and employment; however, evidence suggests that approximately 60% of these services has been degraded in the last 50-60 years (Millennium Ecosystem Assessment 2005). Despite their global economic value, estimated to be US$145 trillion per year in total (Costanza *et al*. 2014), ecosystem services are often not accounted for in market economics and policy decisions (Balmford *et al*. 2002, Holzman 2012). Many ecosystem services are considered 'free gifts' because individuals or businesses pay no price for their use. Nevertheless, the loss of ecosystem services can result in huge costs to society.

As Tony Juniper, author of 'What has Nature ever done for us?' (Juniper 2013), said in a recent debate hosted by Atkins, *"The economy is a wholly owned subsidiary of ecology, not the other way around. To see a choice between growing the economy on the one hand and protecting the environment and sustaining nature on the other is perhaps the biggest misconception in history. No nature, no economy. Simple."*

In order to communicate this relationship between nature and the economy clearly, for the benefit of planning and policy decisions, ecologists need to deliver messages that can be readily understood by individuals with political or financial responsibility, as well as those who have a direct role in national and international policy. It is likely that the widespread use of scientific jargon, including terms like 'biodiversity' and 'ecosystem services' that are not widely understood, contributes to the lack of understanding of the role played by the natural environment in the economy.

An international workshop, 'Eco-Futures – Putting the science of ecology into the policy of complex environmental change' held at INTECOL in 2013, investigated how ecologists communicate with people from both scientific and non-scientific

backgrounds. The hypothesis was that there would be clear differences in language between ecologists explaining the terms biodiversity and ecosystem services to an ecology student and to a young child. In addition, we looked for differences between the ways ecologists described the terms to an ecology student and to an adult with less specialist knowledge, and further differences between addressing different groups of adults who are key decision makers such as politicians and investment bankers.

Methodology

The workshop was designed to help ecologists understand the importance of effective communications in influencing policy. It included presentations from speakers about issues relating to ecosystem services and complex environmental change, and was attended by an audience of 81 ecologists from all over the world. On entry to the workshop, each participant was asked to answer three questions on a prompt card:

1. What is biodiversity?
2. What are ecosystem services?
3. How do these two things interact with each other?

tailored to different audiences, either:

A. an ecology student (n=22);
B. a politician (n=18);
C. an investment banker (n=20); or
D. a five-year-old child (n=21).

Card types were distributed equally among the participants who were given 10 minutes to write their responses. Cards were collected and collated, and initial findings were reported back at the end of the workshop.

The answers to the four questions were analysed using word clouds to help visualise patterns. A word cloud shows the frequency of words in a piece of text by making words used more frequently appear larger in the cloud. Word clouds were generated for each question (1-3) using Wordle™ (www.wordle.net) with the colour of each word cloud representing the audience (A-D). Commonly used words are easily identified visually and can be compared for each of the audiences.

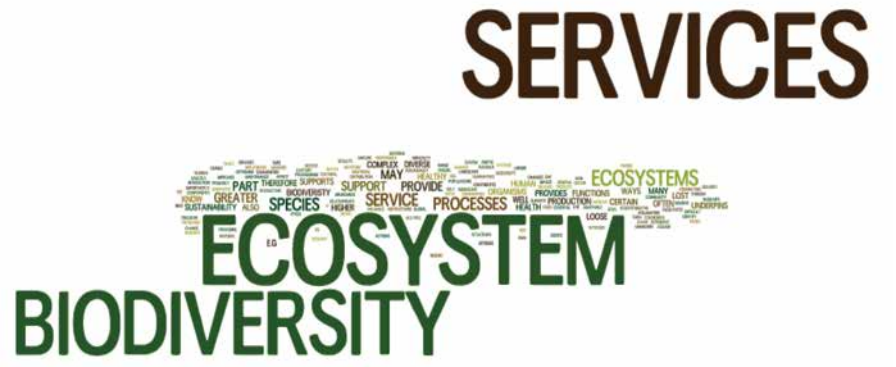
Results

The 81 workshop participants included ecologists from academic institutions and universities, charities, organisations, and industry. Participants came from a wide range of locations across the UK (including London, Leicester, Bristol, Leeds, York, Salford and Liverpool) and internationally (France, Germany, Denmark, New Zealand and Japan). Participants answered all questions apart from two missing responses for question 3, audience C.

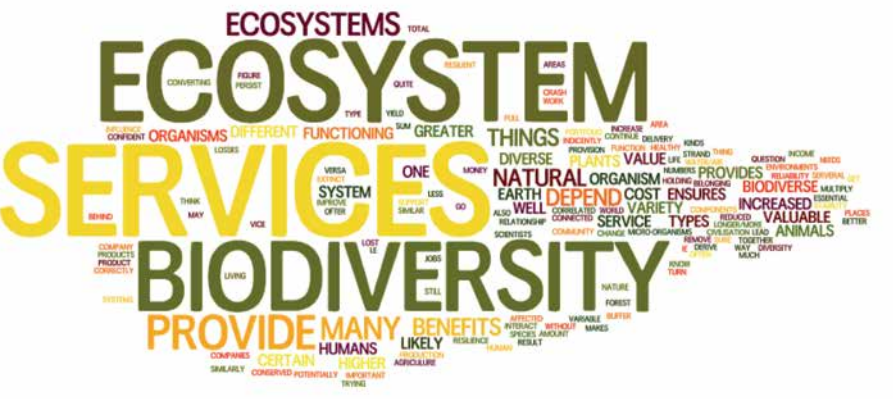
While the sample of 81 people was relatively small, these were all ecologists who had chosen to join the workshop because of their interest in communicating with policy and decision makers. The full set of word clouds and original data can be made available on request as background for a larger scale study.

Examples of the word clouds are shown below. These are the answers to the final question asking how biodiversity and ecosystem services interact with each other. They show very clearly that other than the terms 'biodiversity' and 'ecosystem services' themselves, there was no consistency in the other words used in answers for any adult audiences. The word clouds also show that the words used in talking to a five-year-old were very different from those used for the other audiences, being simpler and more consistent, and generally avoiding re-using the terms themselves.

A. Ecology student



C. Investment banker



Answers to question 3: "How do these two things interact with each other?"

Audiences

A – Ecology student

It seems reasonable for participants to expect ecology students to have a degree of knowledge of ecological terminology. Answers to question 1 'What is biodiversity?' included: *'variety of life from genes to ecosystems, including both the number of types and the abundance of each type'*, *'biodiversity is the diversity of organisms, biological functions, genes, and their interactions'* and *'the variety and richness of species'*. The answers require a degree of biological understanding and contain scientific terminology. Terms such as 'species', 'organisms', and 'genes' were used frequently in answers.

Many of the answers referred to the importance of biodiversity and ecosystem services, along with the benefits they provide humans. Generally, answers indicated an understanding of the relationship between biodiversity and ecosystem services, and discussed the importance of biodiversity for the provision of ecosystem services. Examples of answers to question 3 'How do [biodiversity and ecosystem services] interact with each other?' included: *'biodiversity underpins ecosystem services – no biodiversity, no ecosystem services'*, *'the greater the biodiversity, the more services nature can provide and the greater redundancy for each service'* and *'the biodiversity of a community will determine how well it can support ecosystem services'*. However, some answers to this question featured scientific honesty, for example: *'I'm not sure we know'*, *'importantly and difficulty'*, and *'in complex ways'*. Also, there was wide variety and very little duplication in the terms used to answer this question. In short, ecologists have no consistent answer to use for this question.

B – Politician

When answering the questions as if talking to a politician, with few exceptions, participants fed the word 'ecosystem' back into their answers without defining it in a clearer way that would have meaning to a politician, e.g. *'they allow ecosystems to function and maintain systems'*, *'processes that occur naturally in ecosystems'*, and *'the service provided by the natural functioning of a variety of ecosystems'*. Overall, participants assumed that politicians have the same level of knowledge as an ecology student, although this is unlikely to be the case.

The vast majority of participants talked about 'benefits' when referring to ecosystem services, but very few used terms such as 'essential' or 'fundamental'. Examples of answers to the question 'What are ecosystem services?' included: *'social and economic benefits that the environment and ecosystems give humans for free'*, *'the benefits human beings get from nature'* and *'the benefits that the ecosystem provides (financial, social, etc.) to the community as a whole'*. It was noted that few answers included terms such as 'society' or 'community', or other vocabulary likely to engage a politician.

C – Investment banker

Explanations targeted at investment bankers also tended to re-use the words 'biodiversity' and 'ecosystem'. Participants generally did not alter their language to use terms that might engage their audience and continued to use technical language. Despite the direct financial benefit that ecosystem services can provide, only 25% of answers used terms relating to economics, such as 'investment', 'monetary benefits', and 'cost'. Notable exceptions (where a participant clearly tried to engage with the priorities of their adult audience) were a description of the interaction between biodiversity and ecosystem services as *'the life behind the money'* and *'pollination is worth $200bn per year globally'* but the financial importance of ecosystem services was not mentioned in many responses.

B. Politician

D. Five-year-old child

The first author introducing the exercise at the workshop

D – Five-year-old child

In contrast to the adult target audiences, participants appeared to recognise the child's lower level of knowledge in their responses to a five-year-old child, and kept the message simple. Words that are widely understood by young children, such as 'plants' and 'animals', were used frequently in answers, e.g. [biodiversity is] *'the range of plants and animals on the planet', 'plants, animals and all living things',* and *'many different plants and animals'*.

It was clear that participants considered what might spark the imagination of a child and excite them, using words such as 'creepy crawlies', 'creatures' and 'play'. In addition, participants thought about what might make a child care by touching on the benefits and 'good things' that humans get from the environment. Some examples of answers given to the question 'What are ecosystem services?' included: *'all the good things nature provides', 'benefits people get from wild plants and animals'* and *'good things you can get out of your surroundings'*.

Discussion and Recommendations

First coined over 40 years ago, the term 'biodiversity' now features frequently in scientific papers and policy communications. Use of the term 'ecosystem service' has increased since the publication of the Millennium Ecosystem Assessment in 2005, which defined the concept in detail. Numerous studies have looked into the way in which biodiversity is portrayed, how it is perceived and how its meaning and importance can be communicated effectively to a wider audience. These include studies by Futerra Sustainability Communications (2010) on the idea of a biodiversity 'brand', Christmas *et al*. (2013) on the challenge of 'framing' biodiversity in a way that makes sense to people in relation to their everyday lives, and Fischer & Young (2007) investigating mental constructs of biodiversity.

The INTECOL workshop demonstrated that ecologists simplified their language when talking about biodiversity and ecosystem services with a young child, using words that create associations and provoke interest. In contrast, when communicating with adults such as politicians or investment bankers, technical terms such as 'biodiversity' and 'ecosystem' were not explained effectively but were simply repeated, with the apparent expectation that they would be understood – an assumption that is optimistic at best.

The word clouds substantiate these observations. Figure D is notable for the dominance of simple words such as 'animals', 'plants', 'different', and 'needs'. In contrast, Figures A, B and C look very similar with 'biodiversity', 'ecosystem' and 'services' all prominent. Another interesting result was the willingness to say "I don't know" or "it's complicated" when addressing students but not when addressing other audiences. Worryingly, there was no consistency between participants in their explanations of the link between biodiversity and ecosystem services, even to ecology students.

In order to communicate the relationship between nature and the economy, and influence relevant policy decisions, it is essential that the terms biodiversity

and ecosystem services, and what they represent, are explained in a way that can be understood.

There are many sources of guidance and ways of improving our communication skills. The first step is to recognise that we need to get better at this and that different approaches will be needed for different audiences. We can then learn from media training, communication courses (such as those CIEEM offers), and from reading documents that are tailored to their audiences, such as Tony Juniper's book (Juniper 2013) or Parliamentary POST notes. Above all, we need to practice communicating and we must not be afraid to ask individual non-ecologists for feedback on whether our audience got the message.

At the very simplest level, there is something we can all do, which is to stop and think about our audience for a moment before we start to speak or to write. It is helpful to consider these three simple questions:

- How much can we really expect them to understand?
- What will spark their imagination?
- What will make them care?

The use of a common and widely understood language, understood by professionals from a range of sectors, will improve communication about biodiversity and ecosystem services. Perhaps a future study may show that as a group we ecologists are improving our approach. We certainly need more consistency in our own understanding of the link between biodiversity and ecosystem services. As ecologists we have important messages to deliver, and if these messages are not acted on both people and the natural environment will suffer. If we can grasp that our message must be tailored to the audience's existing knowledge, this will help businesses and governments to better understand human impacts, and our dependence, on the natural world.

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Natural Talent – An innovative response to the ecological skills gap

John McFarlane
The Conservation Volunteers

The Conservation Volunteers (TCV) is the UK's leading practical conservation charity working with people from all sectors of the community in positive action to improve the environment. Our UK-wide Natural Talent programme aims to increase ecological expertise to help protect our less well-known species and create awareness of the habitats that support them. The programme responds to identified skills shortages in the conservation sector by providing trainees with the opportunity to become expert in a specific taxonomic group, habitat or a mixture of both. Natural Talent UK also increases the capacity of volunteers and communities to play an active role in surveying, mapping and management to increase the biodiversity value of local sites.

Introduction

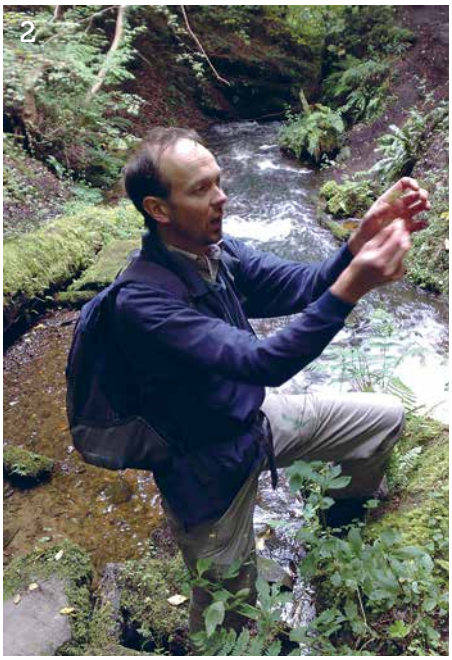
The (C)IEEM report *Ecological Skills: Shaping the profession for the 21st Century* (2011a) states that 'the evidence for an ecological skills gap is compelling and alarming at a time when the demand for knowledge and skills in ecology and environmental management has never been greater'. The report recommends that ongoing skills gaps should be addressed and notes that 'a failure to do so could significantly undermine the UK and Ireland's capacity to meet their post-Nagoya 2020 and 2050 biodiversity targets.'

The (C)IEEM report *Closing the gap, Rebuilding skills in the 21st Century*, (2011b) further suggests that 'at a time when arguably the demand for ecological skills and knowledge has never been greater, those exact same and now critical skills are in decline.' The report notes that 'ecological skills in the UK are in such short supply that, if they are neglected further, they could seriously undermine our capacity to deliver the same environmental mandate that has become critical to us all.'

The Natural Talent training programme was conceived by The Conservation Volunteers (TCV) as a response to the (C)IEEM reports and other national-level strategies that identified a substantial gap in ecological skills across the UK. The latest scheme, Natural Talent UK, is funded through the Esmée Fairbairn Foundation, one of the largest independent grant-makers in the UK, which aims to improve the quality of life for people and communities throughout the UK both now and in the future.

Aims of the schemes

Natural Talent and Natural Talent UK aim to increase expertise across the UK to protect our less well-known species and to create



1. & 2. Bryophyte training course.
3. Grassland mycology trainee surveying North Uist machair.
4. Citizen scientists.
All Photos © John McFarlane

Inspiring a generation

Natural Talent outreach event

Seaweed survey

awareness of the habitats that support them. The current scheme focuses on skills gaps identified by the (C)IEEM in their 2011 reports, including:

- Fieldwork, species identification skills and ecological survey
- Lower plants and invertebrates
- Freshwater, coastal and marine systems
- Habitat creation, restoration and management in marine, coastal and upland environments
- Controlling the spread of invasive species and wildlife diseases
- Mitigation of threats to habitats
- Landscape-scale approaches

To date, Natural Talent has delivered 44 traineeships in areas such as hymenoptera, soil ecology, fungi, bryophytes, lichens, micro-moths, upland ecosystems and coleoptera.

The scheme also provides support and training to increase the capacity of volunteers and communities to play an active role in surveying, mapping and taking action to increase the biodiversity value of local places. In the last six years, Natural Talent UK trainees have been supporting TCV and partner organisations across the UK to engage communities with biodiversity. This element of the programme grew organically, partly responding to a clear need, and also as a result of seeing how greatly the enthusiasm, knowledge and skills of trainees can influence and inspire others. As a result the programme will increase participation in Citizen Science across the UK, working with new audiences and supporting communities to become active citizens.

TCV are particularly proud of recent trainees' involvement in sharing knowledge and skills with excluded individuals and groups, through TCV projects Our Green Places, Discovering Nature and Scotland Counts (Citizen Science). TCV have learned that there is huge potential for the Natural Talent programme to increase understanding of less well-known species and provide engaging opportunities for environmental citizenship.

How it works

Priority topics within the scope of the scheme are identified and researched, often driven by current trends in conservation. The increasing demand for expertise in areas such as the marine environment, soils and invasive non-native species has helped shape traineeships.

Since its inception Natural Talent has developed excellent relations with key partners across the UK including Royal Botanic Garden Edinburgh, Buglife, National Museums Northern Ireland, World Museum Liverpool, Hutton Institute, National Trust Scotland, RSPB, and Scottish Environmental Protection Agency. And new partnerships with Heriot Watt University, Environmental Research Institute, Museum of Natural History at the University of Oxford and National Museum Wales continue to unlock exciting opportunities for Natural Talent to explore.

Traineeships initially last 12 months but placement providers often choose to extend the placement by as much as 6 months due to the high calibre of the trainees. Trainees are awarded a bursary and also receive a budget for equipment, travel and training.

Traineeships focus on an individual taxonomic specialism or specialist habitat management skills, or a mixture of both. In addition, new skills including event planning, project planning, community engagement skills, stakeholder engagement, training and mentoring volunteers are included in the latest generation of traineeships. By equipping trainees with transferrable skills, over and above their specialist skills, trainees are given a competitive edge in the jobs market and a very high proportion of 'graduates' go directly into employment or further studies.

The key elements of a traineeship are:

- Mentoring from specialists/experts to guide development and aid transfer of specialist knowledge.
- Work-based placements for on-the-job learning and to gain practical experience.
- Personal project developed, planned and implemented by the trainee to address a real issue or make a contribution towards a major project.
- Personal study through additional reading and research relating to the project.
- Community engagement and knowledge exchange through training events and outreach.

The scheme accepts applications from anyone who has a passion for protecting and enhancing the Natural Environment and who wishes to gain specialist taxonomic or habitat management skills. Over the years, Natural Talent has employed a broad and eclectic mix of trainees, most of them with degrees, but not always. The most important skills or attributes are passion, enthusiasm and motivation – we can teach the rest.

Unique features of the scheme

Traineeships are unique packages; no two are alike. The trainee's existing skills, interests and experience can often influence the focus of the traineeship. Placement providers adopt a flexible approach to projects and the taxonomic specialisms that a trainee studies, making the scheme very attractive to applicants. A trainee often develops an interest in a particular taxonomic group whilst in post, for example our current Soil Ecology trainee who has specialised in Testate Amoebae, spending time in Siberia as part of her traineeship.

Natural Talent provides 'behind the scenes' opportunities for trainees to learn their craft and put these skills into practice. All trainees receive one-to-one tuition from experts and have access to educational institutes that have a wealth of resources to encourage and support them. The scheme demonstrates how an impressive level of expertise can be attained in a short timeframe given the right training and resources.

Past trainees have championed their areas of expertise at outreach events across the UK, engaging with members of the public, enthusing and enlightening them with their knowledge, passion and enthusiasm

for nature. Natural Talent has expanded the knowledge of thousands of potential citizen scientist – everything from the amazing feeding mechanisms of Odonata to the mites you find on your eyelashes – and hopefully has encouraged the next generation of naturalists. There have even been two new UK records for fungi, both discovered by trainees: *Mycenastrum corium* and *Inocybe monochroa*.

Success so far

The scheme produces environmental professionals who progress into employment and further research in the sector. The outcomes are excellent, with all graduate trainees continuing to use their skills to benefit the UK environmental heritage sector. For example, the majority of the 44 graduates of the scheme to date submit biological records to local and national recording schemes with 70% carrying out regular surveying and monitoring in their current roles. Others hold positions in Natural History societies and some have gone on to complete PhDs. One of the most exciting developments in recent years is that we are now seeing our current cohort of trainees being mentored by previous trainees.

'Our Aquatic Invertebrates trainee has brought specialist invertebrate skills to our team and also developed her invertebrate skills considerably, complementing the skills available in our organisation very well. The work done by her would have been very hard to develop without the Natural Talent scheme, because very few people have these taxonomic skills.'

Mark Hancock, Senior Conservation Scientist, RSPB

Previous and current trainees play a significant role in the development and delivery of biodiversity-focused training at a range of levels including:

- > 30 workshops (beginner & intermediate) on a range of topics including wildflower identification, sawfly identification, lichen identification, and managing brownfield sites for bugs.
- Taxonomy and specialist habitat management workshops as part of TCV training programmes.
- In-house TCV training sessions supporting volunteer involvement in biological recording.
- External training courses for local authorities, placement providers, local communities, NGOs and a wide range of key stakeholders within the sector.
- Free taxonomy training for TCV staff and volunteers.

Where we are now

The UK-wide Natural Talent programme run by TCV provides a practical response to the shortage in ecological skills identified by CIEEM and others. The outcomes have the potential to cascade into the wider environmental sector thereby achieving much greater impact than the traineeships alone. Over the next 24 months, TCV will deliver twelve new, 12-month, fully-funded Natural Talent traineeships including Marine Diatoms, Marine Invasive Non-native Species, Entomology (specialising in Carabid beetles, Spiders and Lepidoptera), Saproxylic Insects, Lichens as Air Quality Indicators, and Colliery Spoil Habitats.

TCV are looking for placement providers, experts and mentors for their 2016 programme. Placement providers contribute in-kind support in the form of deskspace, IT, daily supervision, access to resources and provision of expert tuition. In return, they receive a fully-funded trainee who will very quickly become an integral part of their team and contribute to the protection of our Natural Heritage.

For more information about Natural Talent UK go to:

http://www.tcv.org.uk/naturaltalent

You can also follow us on TWITTER @Natural_Talent or contact John McFarlane, project co-ordinator.

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About the Author

John Mc Farlane has been employed by The Conservation Volunteers (TCV) since 2006, graduating as a mature student from University in the same year, having previously meandered through life as a chef, factory worker and TCV volunteer. He was initially employed as the BRISC (Biological Recording In Scotland) Wildlife Counts Project Officer, a project aimed at encouraging volunteers to record wildlife. He has been the Environment Development Officer with TCV since 2008, co-ordinating a number of projects that encourage communities and volunteers to become better connected to their natural environment, as well as the very successful Natural Talent scheme.

The Conservation Volunteers is one of the largest, most dynamic and effective volunteering organisations in the UK. TCV works together with people and communities to transform their health, prospects and outdoor places for the long term.

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Natural Talent was referenced in the 2008 House of Lords follow-up report on Systematics and Taxonomy as a scheme which: '*aims to address the deficit in skills identified as the "taxonomic impediment to conservation action" in the 'What on Earth' report.*' Natural Talent has also been acknowledged by the Scottish Government in the context of the Initiative for Scottish invertebrates (2008):

'As the experts of the future, Natural Talent apprentices will be involved in implementing this strategy at all levels- from policy to on the ground conservation and education'.

Training in species identification is central to the programme. © NHM

Identification Trainers for the Future – Inspiring the next generation of UK wildlife experts

Stephanie West MCIEEM and John Tweddle
Angela Marmont Centre for UK Biodiversity, Natural History Museum

The Natural History Museum is one of the world's foremost institutions for the advancement of the natural sciences. The Museum's Angela Marmont Centre for UK Biodiversity acts as a centre to promote the appreciation and study of UK natural history and a hub for partnership-based UK natural history engagement, training and research. Through a new project called *Identification Trainers for the Future*, the Centre aims to actively address a critical and growing skills shortage within the UK biodiversity sector: wildlife identification and recording skills. This will be achieved through a number of placements offering early-career ecologists specialist training in species identification and survey, museum curatorial skills, training delivery and broader transferable skills.

Introduction

In recent years CIEEM has been at the forefront of highlighting the ever-increasing skills gap in UK ecological professionals. As we are all aware from *Ecological Skills: Shaping the profession for the 21st Century* (IEEM 2011), species identification skills, and the underpinning understanding of taxonomy and systematics, have been in severe decline within our profession. This is at a time when our natural environment is under extreme pressure from human activities, and the need to monitor change within the UK's biodiversity is increasing. If the UK's wildlife is to be conserved for future generations and important ecosystem functions are to be protected, tremendous challenges must be faced.

Our knowledge of the distribution and abundance of species and habitats, and of how and why these are changing, relies fundamentally on reliable biological recording. In order to document, monitor and understand changes in biodiversity, we need to support people to acquire survey and sampling skills, the ability to accurately identify species, and (for many groups of organisms) techniques for the handling and preservation of reference specimens.

As well as being a major collections infrastructure and visitor attraction, the Natural History Museum is a world-leading scientific research institute. The Angela Marmont Centre for UK Biodiversity provides a focus for core elements of our UK natural history research, public engagement and training activity. With our expertise in UK species identification, scientific communication and education delivery, and a focus on enhancing and supporting development of UK biodiversity understanding, we find ourselves in a unique position to tackle the skills-decline that is highlighted above.

The Heritage Lottery Fund's Skills for the Future programme has generously sponsored a new 3½-year project named *Identification Trainers for the Future*. Over the next three years, 15 trainees will be given the opportunity to develop their career in the UK biodiversity sector by undertaking a 12-month, work-based training placement at the Natural History Museum. Additional training and workplace experience will be provided through partnerships with the Field Studies Council and the National Biodiversity Network Trust.

Alongside the placements, the project will develop a wide range of freely-available resources. These will include video-based identification and field survey master-classes, downloadable training course materials and keys to selected groups of UK insects and plants. We also hope to encourage dialogue and forge stronger practical links across the UK biodiversity sector, so that we can tackle the ecological skills shortage issue together.

Trainees will develop field survey skills. © NHM

© NHM

The placements

Our trainees will undertake an intensive training programme to equip them with the knowledge and ability to identify a broad range of UK taxonomic groups, as well as the skills to survey and monitor wildlife in the field. The training will include museum curatorial skills relating to the handling and storage of reference specimens, in addition to interpretation and public engagement skills. Crucially, the programme will also develop the communications and training skills that will allow our trainees to pass on their knowledge to others.

Trainees will work with Natural History Museum staff from the Centre for UK Biodiversity, curatorial and Learning and Education teams. They will also spend time with the Field Studies Council, either at one of their various field studies centres around the country, or in their head office or publications department, depending on the trainee's particular areas of interest. Transferable skills including first aid training, networking skills and time management will also be taught.

This holistic programme of training and experience will generate skilled, articulate and employable individuals with specific expertise in biological recording and the ability to work across the natural heritage sector.

Our first round of five trainees will start in March 2015 and applications are open until the 12th December 2014. No age limits are being set for the positions, however pre-requisites are that applicants should have a minimum of 3 A-levels (or equivalent), no more than 6 months paid employment in a sector-relevant position, nor have previously been enrolled in a similar traineeship post. Each trainee will receive a £16,500, tax-exempt, bursary to cover their living costs.

For more information on the project, the placements and how to apply, please see our website www.nhm.ac.uk/idtrainers or email us at IDtrainers@nhm.ac.uk. You can also keep up-to-date with the latest developments with the project, including reports on our trainees progress, via our website and the Natural History Museum's Twitter feeds.

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About the Authors

Stephanie West has recently moved to the Natural History Museum as Project Manager for the HLF Identification Trainers for the Future project within the Angela Marmont Centre for UK Biodiversity. Previously Steph worked as Senior Ecologist for Ecological Planning and Research, as a lecturer in Conservation and Wildlife Management and in Local Government. She has been a member of CIEEM for many years, and has previously served on the Committee for the South East Regional Section.

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John Tweddle is also based at the Natural History Museum, where he is Head of the Angela Marmont Centre for UK Biodiversity; a dedicated centre for the collaborative study of UK natural history (www.nhm.ac.uk/ukbiodiversity) and a hub for knowledge exchange between professional scientists, amateur naturalists and other nature enthusiasts. John has previously worked as an ecologist at the Royal Botanic Gardens Kew and as a consultant palaeoecologist.

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The occurrence, causes and consequences of inter-observer variation in identification of Phase 1 and NVC vegetation types

Andrew Cherrill CEnv, MCIEEM

This article reports on the results of a survey of CIEEM members carried out to assess their perceptions of the frequency, causes and consequences of errors in vegetation maps based on Phase 1 survey and the National Vegetation Classification. Perceived cases of misidentification were encountered relatively frequently with a range of negative consequences including the need for further fieldwork and instances in which inappropriate valuation of sites occurred. Members identified a range of possible approaches to improving survey reliability but the most important was an emphasis on surveyor expertise, skill and training. A majority of respondents favoured introduction of an accreditation scheme for surveyors carrying out Phase 1 and NVC surveys.

Introduction

The standard survey tools for describing the vegetation resources of sites in the UK are Phase 1 Habitat Survey (JNCC 1993) and the National Vegetation Classification (NVC) (Rodwell 2006). Inter-observer variation has been identified as a potentially significant problem in the application of these methods (Cherrill & McClean 1995, 1999; Hearn *et al*. 2011). However, the frequency with which environmental professionals actually encounter survey reports that they believe contain questionable identification of vegetation types is unknown. If problems are encountered frequently and the ensuing consequences are severe, then there may be a mandate for modification of survey protocols and/or more rigorous training of surveyors.

At present there is insufficient information available on which to make sensible judgements about the generality of data quality issues in ecological survey reports, the severity of the consequences and what (if anything) should be done. This article describes a questionnaire survey of members of the Chartered Institute of Ecology & Environmental Management (CIEEM) designed to address these questions. The questionnaire included a combination of 'closed' and 'open' questions. In the closed questions members had to select an answer from those provided by the author (see Figures 1 and 2), while in the open questions members had up to 100 words to provide additional information. In the latter the author was responsible for summarising and categorising the responses (see Tables 1 & 2).

The questionnaire was completed by 157 people (although not everyone answered all questions). All but two respondents were members of CIEEM with 78% working as ecological consultants, 6% working for local planning authorities (LPA), 6% for statutory agencies and the remaining 10% for industry, NGOs, government departments or Higher Education. The sample size was relatively small (approximately 3.1% of membership) but reflected the geographic spread of members (England: 75%, Scotland: 16%, Wales: 7%, Other including Ireland and Northern Ireland: 2%). Members completing the questionnaire were relatively well-qualified: Fellows 5% (versus 1% of total membership), Full 80% (vs 63%), Associate 6% (vs 10%), and Graduate 7.0% (vs 16%). The remaining 2% were Student, Affiliate or grade 'not stated'. There were no statistically significant differences between countries, types of employment or membership grades in terms of which questions were answered or the frequency with which misidentification of vegetation types was reported. Therefore data from all respondents have been pooled in this report.

Results of the survey

The proportion of survey reports judged to contain problems with the identification of vegetation types was similar for Phase 1 and NVC survey reports, although marginally fewer problems were perceived with the latter (Figure 1). Overall, relatively few respondents had never encountered errors in survey reports, but equally few reported errors in more than two-thirds of reports. A key issue contributing to the misidentification of vegetation types was that species were misidentified or overlooked in both Phase 1 and NVC surveys (Table 1). In addition, adequate species data (in the form of Target Notes or quadrat data) were often either not recorded or not reported making the rationale for mapping decisions unclear. Maps in Phase 1 surveys were also often drawn at too coarse a spatial resolution so that small parcels of habitat were not identified.

Table 1. Factors identified as contributing to cases of misidentification of vegetation types

Contributory factors	% of respondents	
	Phase 1	NVC
Key indicator species misidentified or overlooked	38.9	39.1
Mapped at insufficient spatial resolution	29.6	10.9
Inadequate number/species content of Target Notes	20.4	n/a
Fieldwork conducted in wrong season	16.7	4.4
Vegetation type not represented within the classification	11.1	15.2
Insufficient breadth/depth of preliminary desk study	11.1	4.4
Mosaics/ecotones difficult to record	9.3	15.2
Errors in location of Target Notes (Phase 1 only) and/or boundaries	9.3	2.2
Insufficient time spent in the field	5.6	10.9
Insufficient use of Dominant Species Codes	3.7	n/a
Site too small for Phase 1 method	3.7	n/a
Survey information too old	1.9	2.2
Insufficient quadrats used and/or species lists either not reported or incomplete	n/a	23.9
Insufficient use of computer keys to identify vegetation types	n/a	23.9
Over-reliance on computer keys to identify vegetation types	n/a	10.9
Inaccurate identification of homogenous stands	n/a	2.2
Number of respondents	*54*	*46*

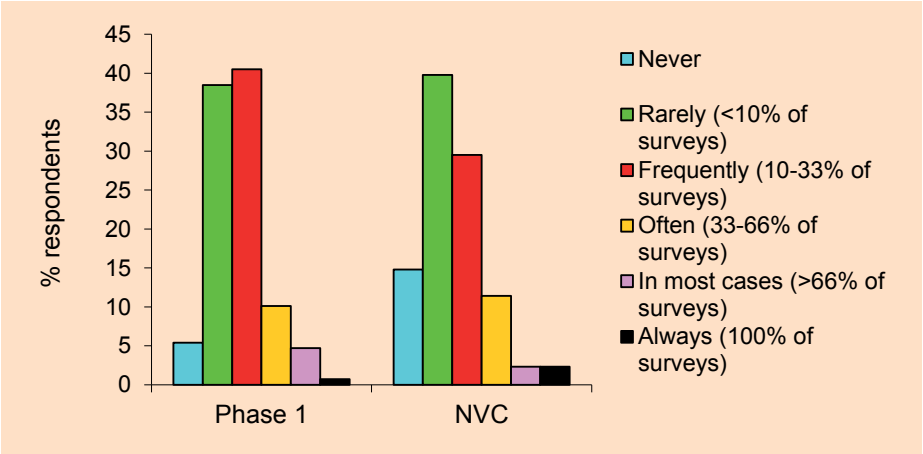

Figure 1. Respondents' perceptions of the frequency with which vegetation types were misidentified in surveys between 2009-2014 (Phase 1, n=148; NVC, n=88).

Suspected cases of misclassification typically involved vegetation types with similar species composition and those frequently encountered as continua and intermediate forms. For both Phase 1 and NVC most cases involved suspected misclassification of grasslands along gradients of agricultural improvement and gradations between wet grasslands, heaths and mires in the uplands. Mosaics and boundaries in complex vegetation also contributed to mapping problems; perhaps related to the issue of spatial resolution identified above. However, problems attributed specifically to locational errors were relatively scarce (Table 1).

For both Phase 1 and NVC, specific vegetation types were identified as being poorly represented in the respective classification resulting in surveyors assigning the vegetation to an inappropriate type. Examples cited in Phase 1 surveys were roadside verges, brownfield sites, and grasslands developing naturally on disturbed agricultural and urban soils. For NVC, problems were identified for certain Welsh grasslands and urban sites.

For NVC, a significant issue appears to be the approach taken to the interpretation of species data. In almost a quarter of cases of suspected misidentification of vegetation types it was suggested that the authors had made insufficient use of computer packages (such as MATCH and TABLEFIT) (Hill 1996, Malloch 1998); yet other respondents suggested that authors had placed too much reliance on this approach (Table 1). Clearly differences in opinion can arise between collection of quantitative quadrat data and identification of a vegetation type.

Other less frequent issues related to aspects of the application of the survey method such as adequacy of preliminary desk studies, time of year, survey effort, and use of mapping codes. Cases specific to Phase 1 included instances where Phase 1 was applied at small sites where NVC might have been more appropriate (given that Phase 1 is designed for rapid survey of large areas). A key step in NVC survey is the recognition of homogenous stands of vegetation within which quadrats are then taken. This was not recognised as a major source of problems, although it was cited by one respondent (Table 1).

In the majority of cases where the classification of vegetation was queried the situation was resolved through discussion with the surveyor (>85% cases) and follow-up field surveys (~70%) (Figure 2). For both Phase 1 and NVC around half of respondents reported that poor quality surveys impacted on their own organisation. This was typically through the need to spend time and money on additional analysis, meetings and fieldwork. It appears that this burden was shouldered primarily by the respondents to the questionnaire rather than the clients (and other partners) with whom they were working. More than 50% of respondents stated that clients and partners did not suffer any negative consequences, neither did they believe there were negative impacts on biodiversity. However, negative outcomes for clients/partners and biodiversity were thought to occur in at least some cases (Figure 2).

Detail on the consequences of errors in surveys was provided by members in an open-ended question. The results are not tabulated in this article but the main finding was that members believed

inaccurate values were placed on sites in 40-45% of cases where either Phase 1 or NVC vegetation types were misidentified. This has the potential to lead to inaccurate impact prediction, inappropriate mitigation, poor project design, project delays and loss of biodiversity. However, these consequences were reported explicitly in only about 5% of cases.

Discussion and recommendations

A number of studies have highlighted the problem of inter-observer variation in Phase 1 and NVC survey but the scale of the problem in professional practice has not been investigated previously (Cherrill 2013). The CIEEM survey reveals that concerns over the misidentification of vegetation are common among members. The majority of these issues appear to be resolved through discussion with surveyors and further fieldwork; however these activities are recognised as being a drain on members' time and finances. In a relatively small number of cases, members reported that perceived weaknesses in surveys have led to inappropriate decisions (including those related to project design and mitigation) and avoidable loss of biodiversity (Figure 2). Factors underlying misidentification of vegetation accord with issues identified in published studies of inter-observer variation (Cherrill & McClean 1995, 1999; Hearn *et al*. 2011). The major contributory factors appear to be weaknesses in the definition of vegetation types within classifications (particularly Phase 1), shortfalls in the spatial resolution and rigour of field data collection (often related to surveyor experience and species misidentification), the inherent complexity of vegetation continua, inadequate documentation of mapping decisions to explain potentially contentious choices of vegetation type within survey reports, and deviation from (or at least variation in) standard practice. Approaches to resolving these issues were suggested directly by members (Table 2), but can also be derived directly from an analysis of their causes (Table 1). Approaches fall under three broad headings: fieldwork and report writing, classification and evaluation of vegetation, and surveyor training.

Table 2. Approaches to reducing misidentification of vegetation types in Phase 1 and NVC survey

Recommendation	% of respondents	
	Phase 1	NVC
Ensure only trained/experienced staff are used	53.5	46.0
More rigorous habitat definitions needed in classification	15.5	2.7
Revise classification to include unrepresented habitats	10.3	18.9
Rewrite Phase 1/NVC manuals* to fit Ecological Appraisal and Ecological Impact Assessment better	8.6	18.9
Better linkage of classification to Biodiversity Action Plan / Priority habitats to aid assessment of conservation value	6.9	2.7
Upgrade in-house Quality Assurance procedures to enhance the level of detail in reports	3.5	5.4
Better guidance on treatment of vegetation mosaics in survey manuals*	3.5	2.7
Revise classification to sub-divide broad habitats into types of differing value	1.7	2.7
Greater use of Remote Sensing in mapping	0	5.4
Number of respondents	*58*	*37*

*JNCC (1993), Rodwell (2006)

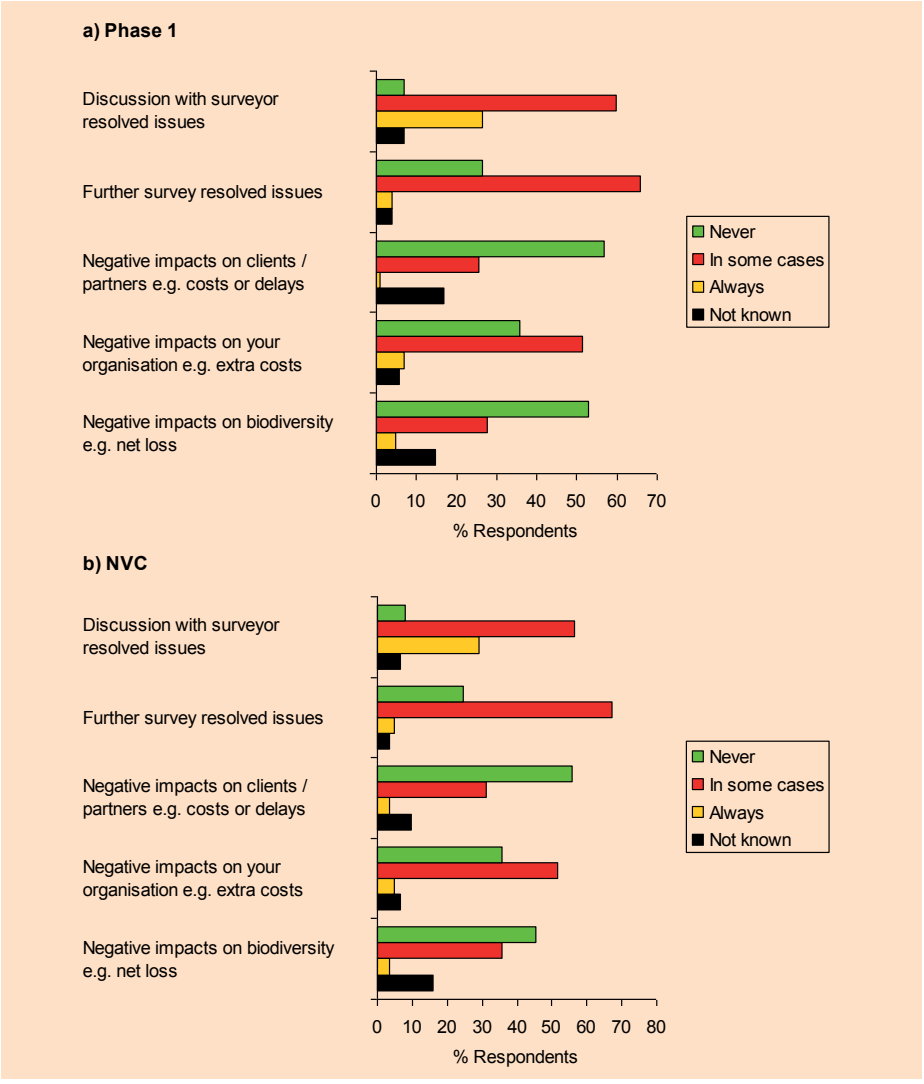

Figure 2. The consequences of perceived misidentifications of vegetation types in survey reports a) Phase 1 (n=103), and b) NVC (n=62).

Fieldwork and report writing

- Surveyors need to have a high level of botanical competence. Indicator species can be overlooked or misidentified when surveyors lack experience in vegetation survey, or if survey time and sampling effort is insufficient (Table 2).
- Appropriate levels of spatial resolution for mapping should be adopted (particularly for complex vegetation ecotones and mosaics) (Table 1). This requirement should be emphasised during the commissioning and planning of surveys. Improved guidance on minimum levels is needed.
- Standard methodologies should be followed in all cases, e.g. surveying at the correct time of year, making greater use of desk studies, Target Notes and Dominant Species Codes (Phase 1), and tabulation of quadrat data in the form of floristic tables (NVC) (Table 1). Definitive guidance on the minimum number of Target Notes and the need for quadrats in NVC surveys is lacking. Whilst there is a place for professional judgement here, professional standards should be drawn up.
- Survey reports should include sufficient species (and environmental) data in the form of Target Notes (Phase 1) and floristic tables (NVC) (Table 1). The report should explain all mapping decisions by reference to a clear evidence-base.
- Computer packages can only provide a preliminary indication of the most likely vegetation type therefore the interpretation of quadrat data using computer packages such as MATCH and TABLEFIT (Hill 1996, Malloch 1998) should be used with care (Table 1). Revised guidance on their application to NVC surveys is needed.

Classification and evaluation of vegetation

Table 2 summaries a number of issues that would require a more substantive review of both Phase 1 and NVC classifications and user manuals, although concerns differ between the methods. Recommendations include:

- Revise the Phase 1 classification to provide 'harder' boundaries between vegetation to improve precision in the definition of habitats, such as improved, semi-improved and unimproved grasslands (Table 2). This should encourage surveyors to interpret the habitat definitions, and the species composition of the vegetation, more consistently thereby reducing inter-observation variation in Phase 1 maps.
- Add additional vegetation types to the existing classifications in Phase 1 and NVC handbooks (JNCC 1993, Rodwell 1991-2000) to provide more comprehensive reference sources. This would address the concern that the present version does not include all distinct vegetation types encountered in the field (Tables 1 and 2).
- Revise the user manuals (JNCC 1993, Rodwell 2006) to explain the linkage between the classifications and Priority and BAP habitats to improve their value for conservation assessments (Table 2). At present, some vegetation types include both valued and less valued variants within the same mapping class making neither approach well suited to conservation assessments and EcIA.
- Revise the user manuals (JNCC 1993, Rodwell 2006) to incorporate sections dealing with application of the methods within the contexts of EcIA and conservation evaluation (Table 2).
- Consider the utility of remote sensing as a tool for vegetation assessment.

Training of surveyors

Surveyors should be experienced and well trained with a good knowledge of British vegetation and an understanding of the relationships between vegetation, management and environmental factors. Training in the application of the Phase 1 and NVC techniques will be useful but needs to be underpinned with extensive experience. A small number of studies have demonstrated that intensive training of surveyors in groups can markedly reduce levels of inter-observer variation in Phase 1 and NVC mapping (Cherrill 2013). However, it is time consuming and expensive, and group training across a large number of small employers is logistically complex. A more workable approach would be to establish an accreditation scheme through which surveyors could gain certification of their competence in species identification, survey techniques and report writing. This approach is supported by CIEEM members (77.3% in favour for Phase 1, n=110; 84.4% in favour for NVC, n=77). CIEEM could potentially play a leading role in establishing an accreditation scheme as a professional service to members.

Members are invited to comment on the issues raised in this article via the associated LinkedIn discussion or directly to the author at the address below. A full version of the results of this survey can be downloaded from the author's webpage: http://www.harper-adams.ac.uk/staff/profile.cfm?id=201254

Acknowledgements

Thanks are due to those who tested the pilot versions of the questionnaire and to all who took part in the survey. Particular thanks are due to Jason Reeves for running the survey online, Sally Hayns for facilitating circulation of the survey to CIEEM members, and Gill Kerby and the editorial team for improving the article.

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Ecological Valuation – a fresh approach?

Bob Edmonds CEnv MCIEEM
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Valuation is a critical part of ecological impact assessment (EcIA) and is occasionally the cause of differences of opinion between professional ecologists. Bob Edmonds, a member of CIEEM's EcIA Technical Review Group, offers a personal opinion on replacing qualitative professional judgements on ecological value with simple metrics. A quantitative approach, which builds upon developments in biodiversity offsetting, may make the assessment of impacts to ecological features more transparent and objective and could assist with ensuring appropriate compensation for biodiversity losses.

Arguably, valuation is the part of ecological impact assessment (EcIA) that causes the most consternation to ecologists. Most professionals agree that we need to make some value judgement during impact assessment in order to demonstrate which habitats and species are important and therefore which impacts are likely to be significant. However, there can be disagreement on the actual 'value', or the approach to valuation, especially if a qualitative approach is used that is based largely on professional judgement.

Ecologists have been trying to create objective classification systems for the ecological valuation of sites for decades: examples include Ratcliffe's criteria[1];

Isolated veteran trees in agricultural landscapes can be awkward to value in biodiversity terms using a geographic frame of reference and may benefit from a simple quantum approach.

SSSI selection guidance[2]; various county level wildlife site criteria and, more recently, biodiversity offsetting metrics[3]. CIEEM first published the "geographic context" approach fourteen years ago[4] and refinements to cover sites, species assemblages and habitats have been widely used ever since. It has even been refined for valuing foraging habitat for bat populations in a landscape[5].

It may be time to consider an alternative that gives more flexibility to EcIA professionals in their assessments. Recently developed methodologies value biodiversity in a quantitative way. For example, a simple metric, e.g. the habitat area x condition x distinctiveness = biodiversity units, is one approach that is supported by DEFRA in the context of biodiversity offsetting[3], and there are other more complex formulae that incorporate other features, ecosystem services or species (e.g. Cousins *et al*. 2014[6]). An EcIA could comprise a quantitative assessment of all important ecological features[7] combined with a separate stage that considers legal and policy implications for designated sites and protected species.

The current CIEEM approach recommends that a geographic scale be assigned to each identified ecological feature, using published criteria and professional judgment. However, this scale can often be confusing, with terms inconsistently applied, because the criteria used are only clearly defined for designated sites at the international, national and county scale. The geographic scale is also often interpreted as a hierarchy, whereby county level ecological features are more important than features of local value. This leads to criticisms that larger developments overlook impacts to locally important ecological features that would be considered important in smaller schemes. It also can lead to confusion when valuing legally protected or BAP (Biodiversity Action Plan) species. For example, although all species of bats are protected at a European level, this does not mean that all populations of all bat species are valuable at a European level.

Outside designated sites, the geographic scale at which an ecological feature is valuable need not necessarily matter. What is critical is that the feature has been identified as "important" and therefore should be considered further by the assessment, with appropriate mitigation and compensation provided to ensure no net loss of that feature.

Most ecologists agree that designated sites, e.g. SPA, SSSI or county designations, are valuable at the international, national and county scales respectively. These sites have been assessed against published criteria that have led to their selection and there is a strong legal and policy framework in place to protect them. Non-designated sites and other ecological features can also be reviewed against published criteria. However, for many EIA projects, and especially non-EIA ecological appraisals, these published criteria do not capture the inherent biodiversity value of many locally important ecological features.

Where ecological features do not meet published international, national or county nature conservation criteria, they could be defined simply as "important ecological features". The subsequent impact assessment would quantify impacts using the best available tools for predicting quantitative change in the area or quality of these features as a result of the project to determine whether an impact on that feature would be significant or not. If the predicted impacts to all ecological features can be balanced by avoidance, mitigation and compensation, then the project can justifiably claim to have met the principal of no net biodiversity loss. As a separate stage in the assessment, the effects and mitigation requirements for protected sites and species clearly must be assessed, in accordance with the relevant guidance and legislation. However, the legal and policy compliance stage of ecological assessment could be seen as a separate process to that assessing biodiversity impacts. After all, a development can be legally compliant, but still lead to a net loss of biodiversity.

It can be argued that this approach accords more closely with recent changes in planning policy and the recently published British Standard for Biodiversity BS42020. CIEEM and its members have a role to play here: the current 2006 Ecological Impact Assessment guidelines[8] are in final review and it is critical that the new guidelines are sufficiently flexible to allow innovation in this area. There may be other, equally valid approaches to biodiversity valuation and impact assessment that are not being used as they have not been promoted in the standard guidance documentation. There should be a space for CIEEM members to develop, trial and publish new approaches to ecological assessment in order that there is a range of tools available for different circumstances.

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7. The term 'ecological features' refers collectively to habitats, species and ecosystems, as defined in CIEEM EcIA Terrestrial Guidelines (2014 Final Draft).

8. http://www.cieem.net/ecia-guidelines-terrestrial-

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The views presented in this article are his own.

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Myotis nattererii hibernating in crevice. Photo credit Daniel Hargreaves.

Safeguarding habitats for protected species at risk from development proposals – are we making the most of our species data?

Jan Collins, Lisa Hundt and Katherine Boughey
Bat Conservation Trust

This article discusses the need for an improved approach to interpreting species records returned from background data searches that are carried out in relation to proposed developments. Using data collected by the Bat Conservation Trust and others, we will refine a new approach to interpreting bat records. CIEEM members can help by contributing evidence from their own work with bats.

It is common industry practice for ecological consultants to request data from Local Records Centres by specifying a radius around a proposed development site within which a search is made for existing records of protected or priority species. The Bat Conservation Trust's (BCT) Bat Surveys: Good Practice Guidelines (Hundt 2012) suggests that the background data search radius should be based on the nature and scale of the project. It should be at least 1 km but could range up to 10 km or more for large-scale or high-impact developments such as a housing or road scheme.

Occasionally, records of species are found within the proposed development site boundary but more often, in our collective experience, the records fall outside this boundary but within the applied background data search radius. Ecologists are required to use their knowledge and professional judgement to interpret the data returned from these searches but there is little guidance on how to do so. In practice, the background data search often becomes a tick box exercise rather than the data actually being used in a meaningful way to design appropriate surveys; provide context for the survey results; and inform the impact assessment and mitigation/ enhancement strategy.

We have identified some limitations relating to this approach. Firstly, the data search results may include records of species that are unlikely to ever be impacted by the development due to their lack of mobility. Secondly, the majority of species records are of 'point' locations, e.g. bat roosts, barn owl nests, great crested newt ponds. The distribution of key

resources within the habitat surrounding these point locations, and the impact of the proposed development upon those resources, is not considered specifically yet is essential if the populations are to persist.

Here we suggest an alternative and more ecologically robust approach for CIEEM members routinely interpreting bat records returned by these searches.

Core sustenance zones

Over the last few years the BCT has digitised thousands of bat records as part of a project funded by the Esmée Fairbairn Foundation (EFF). These bat records have been used to develop resources such as local distribution maps for Bat Groups.

With more recent funding from EFF we developed a project proposal in partnership with other species NGOs and representatives of the planning and development sector (including CIEEM) to create resources to aid developers, consultants, Local Records Centres and Local Planning Authorities involved in planning applications and decisions. We are delighted to announce that funding from EFF has been confirmed and our proposed four-year partnership project can start in early 2015.

Within these projects we have developed (and will continue to develop) the concept of core sustenance zones (CSZ), to facilitate a significant shift towards landscape-scale thinking.

For bats, we have defined the core sustenance zone as the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roost. With reference to planning and development, the core sustenance zone is:

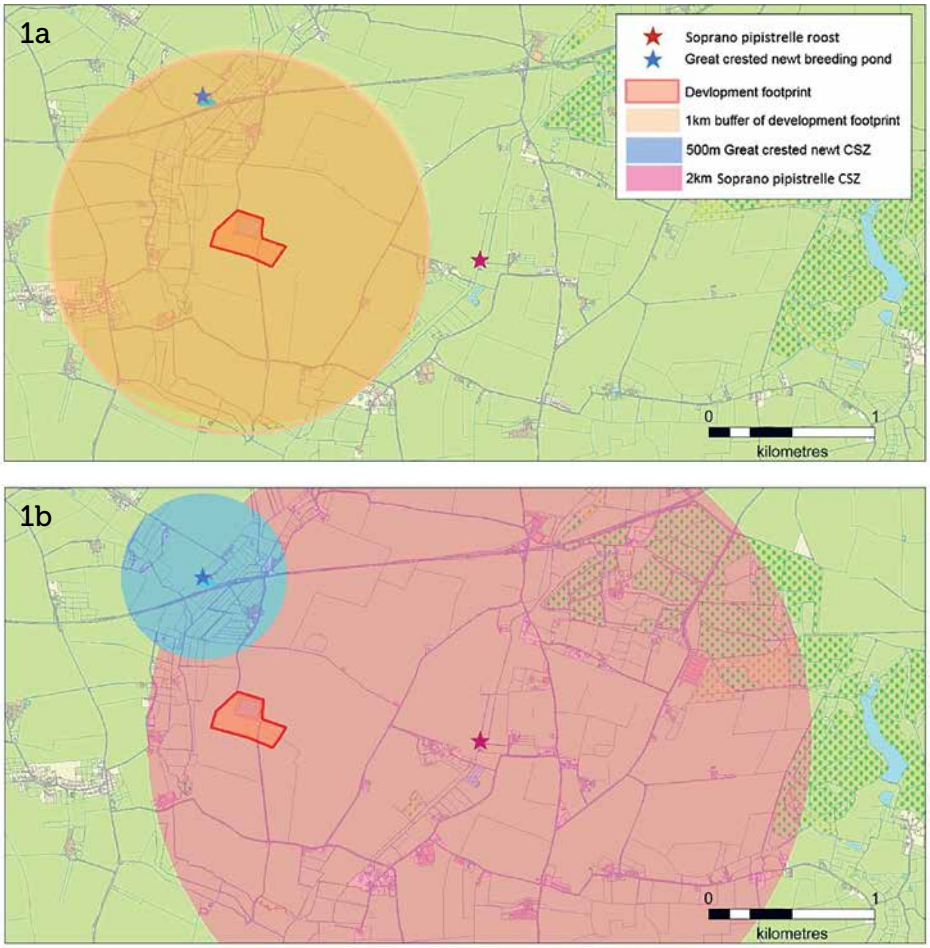
- The area surrounding the roost within which development work could impact the commuting and foraging habitat of bats using the roost. This will highlight the need for species-specific survey techniques where necessary.
- The area within which mitigation measures should ensure no net reduction in the quality and availability of foraging habitat for the colony, in addition to mitigation measures shown to be necessary following ecological survey work.

In order to achieve Lawton's vision for our landscape with respect to wildlife sites (more, bigger, better and more connected; Lawton 2010), this shift towards landscape-scale thinking is essential.

Figure 1a illustrates the standard method of searching for species distribution records when assessing the potential impact of a development on biodiversity. This example shows the use of a 1 km search radius around a theoretical proposed development on agricultural land. This search will return a record of a great crested newt *Triturus cristatus* pond but not a soprano pipistrelle *Pipistrellus pygmaeus* bat roost located just over 1 km from the development.

However, Natural England (2001) recommends that great crested newt surveys may be appropriate where a development site contains a suitable pond or is located within 500 m of a suitable pond and there is suitable terrestrial habitat for this species on site. This is based on the knowledge that great crested newts will rarely travel further than 500 m from a breeding pond in terrestrial habitat. Assuming there are no other ponds in the scenario illustrated in Figure 1a, it is therefore unlikely that great crested newts will travel as far as the proposed development and they are therefore unlikely to be impacted. In contrast, soprano pipistrelles typically will travel up to 2 km from their roost each night and so could be affected. This distance is based on information collected from a systematic review of the literature regarding average distances travelled by different bat species, carried out by BCT[1].

As described above, the results of data searches using the current standard method can give a misleading assessment of the likely impacts of a development on vulnerable species.



Figures 1a and 1b illustrating the differences between the development buffering and core sustenance zone approaches.

A better approach is to take into account the movement ecology of the species by using a distance that represents the typical movement radius of the species. Figure 1b illustrates this using the core sustenance zone approach. It shows a 500 m radius CSZ around the great crested newt pond and a 2 km radius CSZ for the soprano pipistrelle roost. In this example the footprint of the development overlaps the CSZ of the soprano pipistrelle roost, but not the CSZ of the great crested newt breeding pond. This changes the consideration of species in the decision-making process. It shows that it is not necessary to consider great crested newts in this theoretical development because they are unlikely to travel as far as the development site. However, the development falls within the core sustenance zone of the soprano pipistrelle bat roost and so this species could be impacted if habitat removal is proposed. In this example, those involved with the planning process can ensure that the habitat needs of soprano pipistrelle are catered for within the development proposals whereas great crested newts do not need to be considered.

During our partnership project we will be working with consultants, local record centre staff and planners to establish how this approach could be implemented within data searches.

Improving the evidence base

It is important to recognise that there is still work to be done before this approach can be more widely advocated and there are associated constraints that need to be resolved.

In order to increase the evidence base upon which the core sustenance zone radii for bats are based we have a call for evidence on our website (www.bats.org.uk). This provides details of the core sustenance radii we have assigned to each species and how we have calculated these distances using a systematic review of peer-reviewed and grey literature and unpublished data. References are also provided. **If you have data from radio tracking studies of bats that could be used to inform the refinement of these radii then please respond to this consultation.**

We recognise that the core sustenance zone approach can easily be applied to bats but ecological consultants have to consider a wide range of taxa in their work. Through our partnership project we will explore the applicability of this approach to other taxa and consider alternative approaches. The project will culminate in the provision of guidance and training to planning and development professionals, including improved methods of interpreting species data across many taxa.

We acknowledge that a development proposal starts with the site and not the species records and therefore there are questions remaining about how this approach can be applied in practice. Our partnership project will explore these questions.

Finally, this approach is still relatively crude because it does not take into consideration habitat suitability. Our partnership project will explore if, and how, habitat suitability can also be taken into account.

There is a strong need for planning decisions to be underpinned by sound scientific and ecological knowledge so that cohesive decisions are made that will increase the capacity of the landscape to support viable populations of wildlife in the long term; in other words, to achieve favourable conservation status for species. We are confident that this new approach will lead to more meaningful interpretation of data that is led, more logically, by the needs of biodiversity. It provides the opportunity to spatially plan and account for commuting and foraging habitat in mobile species rather than point source breeding sites only.

Note

1. Further details of the systematic review undertaken to inform this approach (for bats) can be found on the BCT website: www.bats.org.uk

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Jan Collins and Lisa Hundt currently job share the role of Head of Biodiversity for the Bat Conservation Trust which involves lobbying on biodiversity issues and wildlife conservation policy and supporting work towards raising professional standards within the ecology profession.

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Dr Katherine Boughey joined BCT in May 2012 as a GIS Technical Assistant. Her interest in bats began during her BSc at the University of East Anglia. During her PhD, also at UEA, she used data generated by the BCT's National Bat Monitoring Programme to investigate how bat distribution is affected by the composition and configuration of the landscape.

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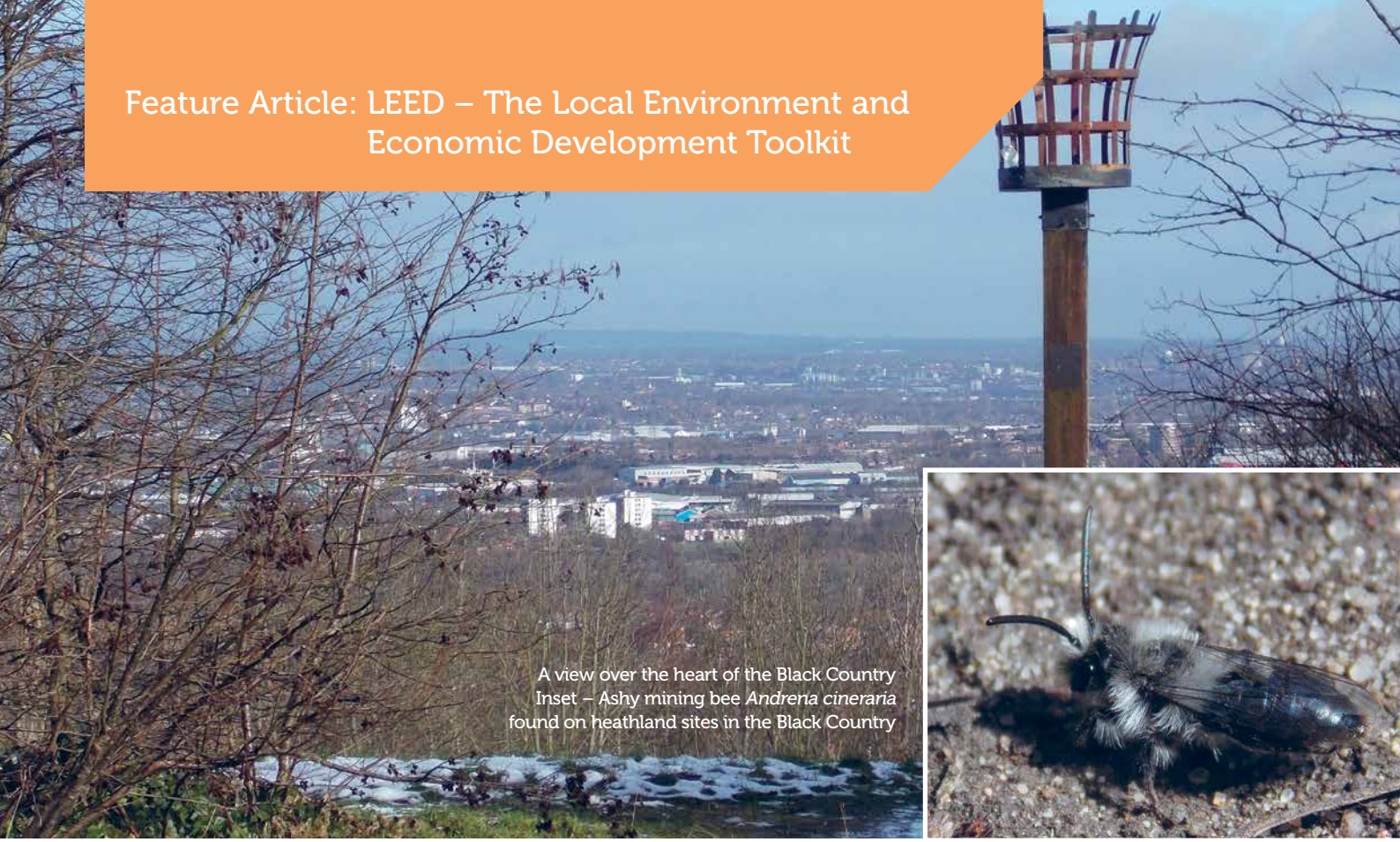


A view over the heart of the Black Country
Inset – Ashy mining bee *Andrena cineraria* found on heathland sites in the Black Country

LEED – The Local Environment and Economic Development Toolkit

Neil Wyatt CEnv MCIEEM
Neil Wyatt Environmental

As the importance of the natural environment to both social and economic regeneration is increasingly recognised, CIEEM members may find themselves applying their knowledge and skills to help place the natural environment in its wider strategic context. The LEED toolkit promises to provide a structured, evidence-based approach to this challenge.

The DEFRA network (Natural England, Forestry Commission and Environment Agency) has developed the Local Environment and Economic Development (LEED) toolkit (Natural England 2014). The toolkit is designed to help local economic partnerships and local authorities (in England) better understand how the environment plays an important role in economic development. It does this by providing a structured, three-level process to assess the role of the environment within local economies and provide robust evidence to support planning and decision-making. Following the success of the programme so far, the DEFRA agencies are preparing to promote its use across England, with a training programme for staff in the three environmental agencies taking place this autumn. This means it is quite likely that you may encounter LEED in one of its guises in the near future. So what does this actually mean for ecologists and environmentalists who might be asked to participate in or facilitate the LEED process?

As our understanding of how the environment contributes to human well-being improves, it has become more and more obvious how much a healthy environment is vital to economic prosperity. Good examples are the contribution natural habitats make to reducing flood risk, or the role of urban greenspace in mitigating the impact of heat island effects. The basic resources of clean air and water, fertile soils and valued landscapes are vital to businesses from heavy industry to tourism. The list goes on and on.

It remains a problem that the difficulties associated with assessing the scale and nature of all these benefits means that they are rarely assessed, and in the absence of a value, they are often undervalued. Even when assessments of the economic value of ecosystem services are made, it can be very hard to really determine their significance. The consequences of this are not just bad for the environment – there are economic and social consequences too.

The LEED Toolkit

In response to this, the LEED Toolkit was produced by the Defra network in partnership with several Local Economic Partnerships (LEPs), local authorities (LAs) and Local Nature Partnerships (LNPs). The co-ordinating role was taken by Natural England. The first pilot of the Toolkit was carried out by the New Anglia Local Economic Partnership. Significantly, the Wild Anglia Local Nature Partnership also took a major role in the exercise. According to Natural England they *"found that it both highlighted important strategic and operational factors which required co-operation between local bodies, and helped build good working relationships"*.

The word 'toolkit' is often used loosely when referring to any process or model that can be used to assist strategic decision-making. In the case of LEED, the Toolkit is a process and a set of templates that lead participants through an iterative process of gathering and assessing information on the role of ecosystem services. The Toolkit can be tailored to suit local needs and the resources available, but it has a basic structure of three stages:

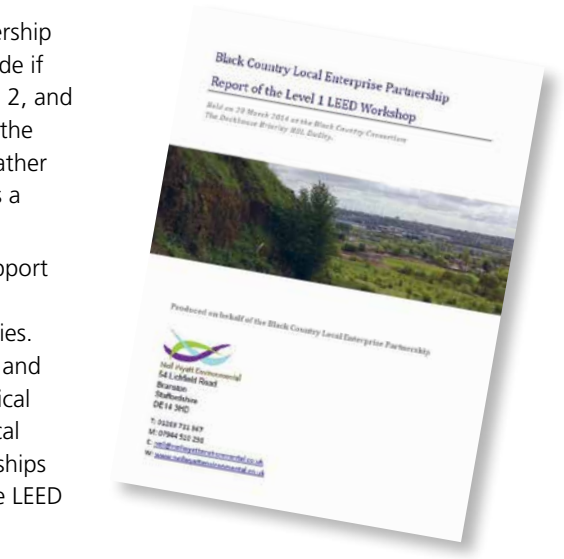
- Level 1 is based around a workshop to produce an initial assessment of threats and opportunities.
- Level 2 uses interviews to develop more sophisticated findings.
- Level 3 focuses on the development of a robust evidence base to support the identification of opportunity and threats and any resulting decisions.

This means a Local Economic Partnership can start with Level 1 and then decide if there is benefit in undertaking Level 2, and then similarly for Level 3. Note that the resources required for Stage 2 are rather greater than Stage 1, and Stage 3 is a significant undertaking.

The chief aim of the Toolkit is to support LEPs in identifying and addressing environmental and economic priorities. Access to a wide range of expertise and perspectives is important so it is critical for other stakeholders, including local authorities and local nature partnerships among others, to be engaged in the LEED process alongside the LEP.

The Level 1 workshop (Step A) is intended to be the first step on the road. Level 2 involves a wider range of stakeholders and gathers a greater level of detail. There are two stages to this: setting up a local consortium of the key partners (Step B) and gathering more detail on opportunities and threats by interviewing the key partners (Step C). Level 3 is more involved. The evidence gathered at Levels 1 and 2 is reviewed and used to complete a detailed *evidence-base template*. The importance and urgency of key issues are scored and a more structured approach to defining opportunities and threats is taken. After further work with stakeholders and experts, the evidence base and a final report can be produced.

In 2013-14 the LEED Toolkit started an initial roll-out, with Natural England supporting the involvement of several Local Economic Partnerships, including the Gloucestershire LEP and Black Country LEP



The 3 stages of LEED. By permission of Natural England.

Black Country case study

The Black Country Level 1 workshop followed the DEFRA guidance (Natural England, Forestry Commission, Environment Agency 2013). A good balance of expertise was achieved through the attendance of senior local authority and Black Country Consortium (a co-operation body that fulfils the role of LEP secretariat) staff, together with members of the Black Country Environmental Forum. The first part of the workshop focused on understanding local economic priorities and determining how these relate to the environment, reinforcing that it was an economy-led exercise. The bulk of the workshop was spent identifying the key local issues and appropriate high-level responses to them. In the final report, fourteen threats and opportunities were identified (Wyatt 2014). The report's findings were used as evidence in the Black Country LEP's Strategic Economic Plan, underlining the value of the process.

In the Black Country, LEED Level 2 is being used to inform production of an Environmental Infrastructure Implementation Plan. A Green Growth Group is focusing on developing a low-carbon economy, and an Environmental Forum is focusing on the natural environment and green infrastructure. This satisfies Step B of the LEED process as these groups involve the key partners, and they have been working closely together since the Level 1 workshop.

A vacant brownfield site in the Black Country – how can it be developed and still contribute to environmental quality?

The Environmental Infrastructure Implementation Plan reflects a determined focus on environmental transformation in the Black Country dating back well over a decade. Considerable additional evidence has been gathered as part of Step C of the LEED process. Most importantly, a number of major new initiatives and opportunities have been identified, and a more coherent overall context and rationale for action is emerging. For example, the need to link urban forestry and brownfield remediation through biomass production has been recognised with biomass processors and consumers creating a new, sustainable market for biomass in the Black Country.

Whether or not the final result fits the criteria for LEED Level 2 is, perhaps, unimportant. What matters is that these stages of the process have greatly assisted the Black Country LEP in incorporating the environment into its major economic

The Black Country's geology is a vital part of its environmental assets. This is Dolerite exposure, Rowley Hills

Sites such as this meadow in Wolverhampton, created by hay strewing, are a vital resource for recreation

strategies – the Strategic Economic Plan, and now the European Strategic Investment Framework. The benefits of this are manifold: the economic plans for the sub-region are stronger; there is much greater synergy between the 'low carbon' agenda and green infrastructure; and greater resources have been identified for managing, creating and improving green infrastructure of all types.

A final workshop is planned to review the work so far and to look at next steps. It will focus on the Environmental Infrastructure Implementation Plan but will also address how LEED can be used in the future, including proceeding to Level 3.

Conclusion

In summary, the LEED Toolkit is reasonably straightforward to follow, although Level 3 is rather technical. The process is one of examining a broad range of evidence, and progressively refining priorities and data. Importantly, the process encourages environmental issues to be documented in ways that can support and inform strategic decision making. Although there is a strong emphasis on information gathering and informing strategy rather than developing action plans, with the right approach, LEED outputs can be used to develop economically-focused environmental actions.

Ultimately, the detail of the LEED process is less important than the debate and discussion it generates. It forces environmentalists to view things from an economic viewpoint, and in doing so enables economists, planners, developers and other professionals working in regeneration to refine their understanding of environmental issues and develop new skills. Above all else, it is a framework for putting things into perspective, from which connections, priorities and actions become almost self-evident.

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About the Author

With nearly thirty years' experience working in nature conservation and land management, Neil Wyatt is a pioneer in the application of the landscape-scale conservation approach to urban areas. A major achievement was leading a partnership of fifty organisations to the successful establishment of England's only totally urban Nature Improvement Area (http://www.bbcwildlife.org.uk/NIA). Neil supported the Black Country Local Economic Partnership through the LEED Level 1 process, assisted by Esther Kieboom, an economist with Cumulus Consultants.

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Ecology Legal Update

The freshwater environment, ecological appraisal and the Water Framework Directive: Why, who and how?

Discussing approaches and the potential for greater integration of ecological appraisal of impacts on freshwaters

Owen Peat
Cain Bio-engineering

Penny Simpson
Freeths LLP

'By 2020, at least 17% of land and inland water, especially areas of particular importance for biodiversity and ecosystem services, conserved through effective, integrated and joined up approaches to safeguard biodiversity and ecosystem services including through management of our existing systems of protected areas and the establishment of nature improvement areas' Biodiversity 2020: A strategy for England's wildlife and ecosystem services – Outcome 1 (c) (Defra 2011).

Introduction

This article focuses[1] on current legal requirements and approaches relating to ecological appraisal of potential impacts on the freshwater environment. It considers how public bodies are currently addressing their responsibilities and how this could be improved.

This is timely to consider because developments in legislation and policy have increased the responsibilities of public bodies in addressing this issue when

Small water bodies may only represent a minor proportion of habitat within a site, but can provide a wide range of ecosystem services

discharging their functions. At the same time there are real challenges for ecologists working within public bodies to know how to approach such an assessment and how to integrate it into their appraisal of impacts of proposals on terrestrial habitats.

This article considers:

1. The legal drivers behind ecological appraisal of impacts on the freshwater environment and those upon whom these legal duties fall;
2. The nature of the assessment of impacts that must be carried out;
3. The potential difficulties in practice that arise for ecologists working within public bodies who are charged with assessing impacts on the freshwater environment;
4. The resources that could assist with assessment of impacts on the freshwater environment, given that many ecologists within public bodies do not specialise in the water environment and yet have to interact with what may seem like a bewildering array of legislation and information; and
5. How ecologists within public bodies might go about approaching such an assessment.

It is not the intention of this article to provide a definitive methodology for environmental assessment of freshwaters. It is rather to provide some pointers as to how this might be approached so as to encourage ecologists to use their existing skills and professional judgement to grasp the opportunity to protect freshwater ecology through environmental appraisal.

The article will be of particular interest to:

- Those working within public bodies whose responsibility is (i) to determine applications regarding environmental or planning consents where there could be impacts on the freshwater environment (e.g. flood defence consents, environmental permits, abstraction licences, impoundment licences, protected species licences, byelaw consents and planning permissions); or (ii) to plan for works or activities which could impact on the freshwater environment; and
- Applicants for the above listed consents (and their professional advisers).

Water bodies are given particular focus where protected species are known to be present, such as great crested newts

Legislation driving the need for assessment of impacts on freshwater ecology

There are various legal drivers for ecological appraisal of impacts on the freshwater environment, as follows (and, apart from the first (WFD) and penultimate (ground water environmental permit) drivers mentioned in the list, these drivers have equal application to the assessment of impacts on the terrestrial environment):

- Duties under (in England and Wales) the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003 ("**2003 Regulations**"); and (in Scotland) the Water Environment and Water Services (Scotland) Act 2003. This legislation implements the EU Water Framework Directive 2000/60/EC ("**WFD**"): these duties are discussed in more detail below and apply to proposals of all sizes (there is no threshold).
- Public authorities' biodiversity duty under (in England and Wales) section 40(1) NERC 2006 *"Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity"*; and under (in Scotland) the Nature Conservation (Scotland) Act 2004 section 1(1) *"It is the duty of every public body and office-holder, in exercising any functions, to further the conservation of biodiversity so far as is consistent with the proper exercise of those functions"*: this duty applies to proposals of all sizes (there is no threshold).
- Environmental impact assessment under the Town & Country Planning (Environmental Impact Assessment) Regulations 2011 (in England), the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (in Wales); and the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 (in Scotland): the requirements here apply only where the project in question is of a sufficient size / impact to trigger the regime.
- Strategic environmental assessment under the Environmental Assessment of Plans and Programmes Regulations 2004 (in England); the Environmental Assessment of Plans and Programmes (Wales) Regulations 2004 (in Wales); and the Environmental Assessment of Plans and Programmes (Scotland) Regulations 2004 and the Environmental Assessment (Scotland) Act 2005 (in Scotland): the requirements here apply only where the plan or programme meets certain criteria to trigger the regime.

- Habitats Regulations Assessment of plans and projects under Part 6 of the Conservation of Habitats and Species Regulations 2010 (in England and Wales); and under the Conservation (Natural Habitats Etc.) Regulations 1994 (in Scotland): these duties apply only where a plan or project is within or in the vicinity of a European site such that impacts on the site could arise.
- Assessment of impacts on European Protected Species (EPS) under regulation 9(3) of the Conservation of Habitats and Species Regulations 2010 (this is the duty on a competent authority, *"in exercising any of their functions, to have regard to the requirements of the Birds and Habitats Directives so far as they may be affected by the exercise of those functions"*) and has been interpreted in relation to planning authorities in particular by the Supreme Court in *Morge vs Hampshire CC* [2011] 1 WLR 268: this duty applies where EPS could be affected by a proposal.
- Groundwater environmental permit hydrogeological assessment under the Environmental Permitting Regulations 2010, schedule 22, paragraph 7: this duty applies to the regulator (the Environment Agency in England and National Resource Wales) who must: in assessing applications ensure that there is an assessment of the hydrogeological conditions of the area concerned; the possible purifying powers of the soil and subsoil; the risk of the pollution and alteration of the quality of the groundwater from the discharge; whether the input of pollutants to groundwater is a satisfactory solution from the point of view of the environment; and ongoing surveillance of groundwater.
- Assessment of impacts on Sites of Special Scientific Interest (SSSI) under Part II of the Wildlife & Countryside Act 1981 (e.g. duties on public bodies as regards SSSIs under sections 28G, 28H and 28I): these duties apply where a proposal is within or in the vicinity of a SSSI.

Ecologists will be familiar with many of the regimes above, particularly as they apply to the terrestrial environment. However perhaps the most challenging item on the list above for the non-water specialist is the first, relating to the WFD. What do the WFD duties mean and how are they to be applied?

Enhancing water bodies in urban areas can present significant challenges, but can potentially deliver significant biodiversity benefits

Water Framework Directive legal duties

The WFD seeks to improve / restore, and prevent further deterioration of, surface water bodies and groundwater bodies and their ecosystems. Its environmental objectives (set out in Article 4(1) of the WFD) include aims to, by 2015, achieve good surface water status in surface water bodies (i.e. meaning good ecological status (or, in the case of heavily modified or artificial surface water bodies, good ecological potential) and good chemical status); and good groundwater status in groundwater bodies (i.e. meaning good quantitative status and good chemical status). The deadline of 2015 can in certain circumstances be extended if certain derogations are met as set out in Article 4. The environmental objectives of Article 4(1) also prohibit, from 2012, deterioration in the status of a surface water or groundwater body.

Under the 2003 Regulations, responsibility rests with the Environment Agency (EA) and Natural Resources Wales (NRW) to characterise River Basin Districts, prepare River Basin Management Plans (RBMPs) for each River Basin District and to set programmes of measures (to be included in the RBMPs) so as to meet these environmental objectives within the appropriate timeframe (i.e. 2015, subject to appropriate application of any derogations).

The RBMPs set out the main significant pressures and impacts of human activities on water bodies within each River Basin District and include the environmental objectives for those water bodies. They describe, at local level, the actions and measures which need to be implemented to achieve the environmental objectives and the timeframes for doing so, where necessary setting out justification for reliance on any of the derogations which permit deferred compliance with the environmental objectives.

There are two key regulations under the 2003 Regulations, which have the effect, indirectly, of driving the need for "WFD assessments" of impacts of proposals on surface water bodies and groundwater bodies. They are regulation 3 and regulation 17:

Regulation 3

(i) *"The Secretary of State, the Assembly, the NRW and the Agency must exercise their relevant functions so as to secure compliance with the requirements of the Water Framework Directive"* (regulation 3(1)).

"The Secretary of State, the Welsh Ministers, the Agency and the NRW must exercise their relevant functions in relation to each river basin district so as best to secure that the requirements of the Directive for the achievement of its environmental objectives, and in

particular programmes of measures, are coordinated for the whole of that district" (regulation 3(2)).

Under regulation 3(3) "relevant functions" are defined as the powers and duties under the 2003 Regulations and also those under a long list of other environmental legislation (listed in Schedule 2 of the 2003 Regulations).

These duties are strong. They refer to "securing compliance" with the WFD. Therefore, when one of the persons listed in the regulation 3(1) duty is, for example, determining an application for an environmental permit, flood defence consent, a byelaw consent, an abstraction licence, an impoundment licence or a planning application (as appropriate), or is discharging any other function (meaning a power or duty), they are required to ensure that the WFD requirements are met.

Regulation 17

(i) *"The Secretary of State, the Assembly, the Agency, the NRW and each public body must, in exercising their functions so far as affecting a river basin district, have regard to (a) the river basin management plan for that district as approved under regulation 14; and (b) any supplementary plan prepared under regulation 16"* (regulation 17).

This regulation 17 duty is less strong. It is not to "secure compliance with the WFD", but rather to "have regard to the RBMP". This duty is more to do with process than requiring a specific outcome. This regulation 17 duty would apply to, for example, local authorities granting / enforcing planning permissions, a lead local flood authority granting / enforcing a flood defence consent, or Natural England granting / enforcing a protected species licence.

It is our view that this "have regard" duty would require public bodies (when exercising functions which could impact on surface or groundwater bodies) to:

(i) consider the contents of the relevant RBMPs, in particular the environmental objectives and programmes of measures;

(ii) consider how these could be affected by the proposal before them;

(iii) consider how the proposal before them could be achieved consistently with the RBMP;

(iv) determine the proposal to deliver consistency with the RBMP; or alternatively and where justified consistently with available derogations (e.g. Article 4(7) under the WFD – see further below);

(v) if (iv) is for some reason not possible, determine the proposal to deliver as great a consistency as possible and provide reasons and justifications for this departure; and

(vi) record in writing this decision-making process.

The EA interprets this duty in their online training guidance entitled "Understanding WFD"[2], giving an example of a lead local flood authority. The EA suggests that there would be a need for the body to show that, in exercising their powers or duties, an audit trail exists to demonstrate that they have considered the RBMP's actions and measures in their activities, that all strategies and proposals are in line with the principles of the Directive, and that where possible the implementation of the mitigation measures in the RBMP has been included in the proposed programme of works.

It is through the need for the appropriate agencies and public authorities to comply with regulations 3 and 17 that the concept of a "WFD assessment" has come about. Clearly in order to comply with their relevant duty (or duties), the public bodies must have information before them to allow them to understand the likely impacts of a proposal on surface and groundwater bodies. Although the WFD legislation does not expressly refer to a "WFD assessment" or require applicants of permits to provide any specific information to the public body, it is clearly in the interest of the applicant to cooperate with, and provide information to, the public body when this is requested, so as to ensure that the determination of the application by the public body is as smooth as possible.

A WFD assessment must be informed by the environmental objectives as set for the relevant bodies of water in the RBMP. It will need to consider whether any of the environmental objectives are likely to be compromised by the relevant proposal. For example it will need to establish whether the proposal will or may cause "deterioration in the status" of the relevant water body and whether the other environmental objectives in respect of the water body will be compromised.

If, for example, any predicted impacts are not sufficiently extensive to have effect at the "water body" level (notwithstanding some minor effects in some discrete part of the water body); or are not sufficiently negative to alter the "status" of the water body (notwithstanding some minor negative impact); or are merely temporary in nature, then it may well be concluded that the water body's environmental objectives will not be compromised.

Mitigation measures to avoid such impacts may in some cases need to be considered. If mitigation measures are not available or will not be effective so that the scheme cannot be implemented in compliance with the water body's environmental objectives then, unless relevant derogations in Article 4 WFD can be relied upon (for

The variation in river typologies requires a range of approaches to assessment and management for biodiversity benefits

example the derogation under Article 4(7) for new sustainable developments / new modifications) the proposal will not be in compliance with the WFD.

Following the interpretation given above of the 2003 Regulations' legal duties, if in such a case the public body involved were the Secretary of State, the Assembly, the EA or NRW (i.e. a body under the regulation 3(1) duty to secure compliance), then they would be legally prohibited from permitting that proposal to proceed. However in such a case where the public body is other than the Secretary of State, the Assembly, the EA or NRW (i.e. and therefore subject only to the duty "to have regard to the RBMP" under regulation 17), then there would be no strict legal prohibition on the proposal proceeding without compliance with the RBMP, as long as it can nevertheless be demonstrated that the public body has had regard to the RBMP (and see above for our interpretation of this duty).

We mentioned above the possible derogation under Article 4(7) of the WFD. Article 4(7) provides that Member States will not be in breach of the WFD when they fail to achieve good groundwater status, good ecological status, or good ecological potential or to prevent deterioration of the status of a surface water body or groundwater, when this is due to physical modifications of surface water bodies or alteration of the level of groundwater. Similarly, Member States will not be in breach when failure to prevent deterioration from high to good status of a surface water body is due to new sustainable developments. This derogation only applies in each circumstance, however, if all four further conditions are additionally met: a) all practicable steps are taken to mitigate adverse effects on status; b) reasons for modifications or alterations are specifically set out in the RBMP; c) reasons for modifications or alterations are for overriding public interest and/or the benefits of the new modifications to society and the environment outweigh those of the WFD objectives; d) the benefit of the new modifications or alterations to the water body cannot be achieved by a better environmental option due to technical infeasibility or disproportionate cost. In addition when applying the Article 4(7) derogation the Member State must ensure that the application of it does not compromise the achievement of the WFD objectives in other water bodies.

Whilst the procedure described above may appear relatively clear so far, putting it into practice is likely to be much more difficult, with the system leaving room for a significant amount of interpretation for the ecologists involved. For example, it is difficult for ecologists who work within or who advise public bodies to know, when requesting a WFD assessment:

- what precise information or methodology to request from applicants of various permits;
- how to advise applicants on combining the terrestrial and fresh water considerations in one appraisal;
- how to tailor the requests made in a manner which is proportionate to the likely impact and / or the size of the relevant water bodies; and
- how, and against what, to judge the information once it is received (for example the survey methodologies behind some of the data relied upon in the RBMPs to classify the status of bodies of water can be very complex and to understand them can be a daunting task for any public body ecologists who do not regularly interact with the process).

Current approach to WFD assessments

The understandable response from public bodies to this perceived complexity in WFD assessments is to minimise engagement with it, potentially resulting in significantly less comprehensive assessment and scrutiny of potential impacts on the freshwater environment and its aquatic habitats as compared with assessments given to terrestrial habitats.

If this were to occur it would amount to a significant missed opportunity to deliver strategic objectives for biodiversity and would be contrary to a significant move towards an integrated approach.

Recent events have highlighted the importance of an integrated approach to managing, and assessing impacts on, freshwater ecology. The flood events of winter 2013/14 in Somerset and elsewhere have brought into the mainstream media the debate of catchment land management for flood prevention and the pros and cons (notably, ecological) of dredging. The potential opportunity to deliver "natural flood risk management" through managing water on a wider catchment scale than seen previously will require careful prioritisation of actions and objectives. Defra has been promoting the Catchment Based Approach (CaBA) on a national scale since June 2013[3] (following two years of pilots). From a broader biodiversity perspective, there has also been a recurring theme of an integrated approach to terrestrial and aquatic ecological considerations, e.g. from the UK Post-2010 Biodiversity Framework[4], through the national strategy level Biodiversity 2020 Strategy (England)[5], the National Planning Policy Framework (and practice guidance)[6] and BS 42020 Biodiversity – Code of practice for planning and development[7]. This integrated approach is presented as part of the move towards a landscape-scale, ecosystems approach to "coherent and resilient ecological networks".

In addition, the uncertainties in putting WFD assessments into practice described above have the potential to lead to considerable variation in approach across different public bodies. This will in turn impact on the level and quality of required information from applicants to support their proposals, which will in turn encourage an absence of any level playing field for the applicants, mainly being developers and other persons whose activities could give rise to impacts on the freshwater environment.

Formal guidance on WFD assessment

These concerns above could potentially be addressed through the provision of formal guidance on conducting WFD assessment.

Our understanding is that Defra and the Environment Agency have indicated that they are not intending to prescribe to other public bodies, such as planning authorities or lead local flood authorities, the approach to be adopted in conducting a WFD assessment. However in order to assist other public bodies in discharging their 2003 Regulations duties, Defra has organised capacity-building training

sessions for lead local flood authorities and the Environment Agency has made available to these authorities its own WFD processes and assessment methodologies. We do not believe these have been made publicly available. Other resources have been made available publicly to assist with WFD assessment[8]. In addition, as mentioned above, the Environment Agency has an online training module on the WFD (see Note 2).

This has the potential to improve consistency in applying WFD requirements and to support robust decision-making. However, the Environment Agency's internal WFD processes and assessment methodologies naturally (due to the EA's role) relate to larger projects such as proposed flood defence schemes on main rivers. It can still therefore be difficult for other public bodies to adapt these processes and assessment methodologies to the smaller-scale projects which they are regularly required to address, e.g. on ordinary watercourses.

Under regulation 20 of the 2003 Regulations, the Secretary of State and the Assembly is empowered to give guidance to the EA / NRW or to "any other public body" with respect to the practical implementation of the WFD; and the body to whom guidance is issued is then under a duty to have regard to it. We would like to encourage Defra to avail itself of this opportunity and to provide more specific written guidance at a national level for local authorities and particularly for lead local flood authorities, so as to assist them in understanding how to conduct or appraise a WFD assessment.

Pointers for ecologists in achieving a balance between engagement and over-complexity when assessing impacts on freshwater ecology, including when making WFD assessments

The following pointers may be of assistance to those within public bodies who are determining permits or licences or who are making plans, in each case with potential impacts on the freshwater environment:

1. It is important to understand at the outset which legal driver(s) apply to the specific assessment you are concerned with (e.g. EPS, Habitats Regulations Assessments, WFD assessment, Environmental Impact Assessment). All have slightly different foci and the assessment will ultimately need to comply with the varying requirements.
2. Despite its apparent complexity, public body ecologists will need to conduct a WFD assessment when surface water bodies or groundwater bodies could be affected by a proposal as per their regulation 17 2003 Regulations duty. It is not appropriate to regard impacts from proposals on water bodies and RBMPs as the remit of only water specialists or non-ecologists. As there is no screening threshold for proposals beneath which a WFD assessment is not needed, a WFD assessment should be conducted in every case. The depth and extent of the assessment can, however, be proportionate to the likely impacts.
3. A good starting place in making any assessment of impacts on terrestrial and freshwater habitats is the CIEEM 2013 Guidelines for Preliminary Ecological Appraisal[9] which specifically identify aquatic habitats, wetlands, fluvial networks and other hydrological networks as being within the scope of the assessment, thereby requiring interpretation of the existing baseline data and appropriate supporting survey information.
4. The availability of detailed records for the water environment, such as those available from the Environment Agency[10], provide an excellent resource of baseline evidence which should not be overlooked or underestimated in its value.
5. Central to a WFD assessment is the relevant RBMP. Applicants and public body ecologists must be familiar with their contents, including their environmental objectives and their programmes of measures.
6. Whilst "status" has a specific defined meaning in the WFD, so that strictly minor deterioration at the water body level might be acceptable if it is not serious enough to trigger a "change in status", it is sensible to look, *as a starting point*, for full mitigation in respect of <u>any</u> potential deterioration in any part of the water body that might occur. This is a failsafe approach which avoids the need for a detailed understanding of water body "status". This approach is also consistent with other impact assessment legal regimes, as listed above, which may be applicable to the proposal. It is acknowledged that, for the reasons already given, some developers may legitimately argue that this "full mitigation" approach is not required by the "no deterioration in status" duty. But we would still suggest that the public body's starting point is to look for full mitigation. The developer can then be encouraged to justify its position if it considers this approach to be over cautious.

Adopting a Catchment Based Approach to achieving Water Framework Directive objectives requires an appreciation of the needs of other stakeholders

Notes

1. The marine environment has not been specifically addressed as part of this discussion, as the opportunities and conflicts which arise are different to those which have driven the issues behind this article. It is recognised nevertheless that the Water Framework Directive applies to coastal waters and that cross-over considerations are especially likely in estuarine (or transitional) areas.
2. *http://learning.environment-agency.gov.uk/capacitybuilding/ http://learning.environment-agency.gov.uk/capacitymodules/ENV420002/lib/html/topic_02.html (accessed on 24.06.2014)*
3. Department for Environment Food and Rural Affairs (2013). *Catchment Based Approach: Improving the quality of our water environment*. (DEFRA – https://www.gov.uk)
4. JNCC and Defra (2012). *UK Post-2010 Biodiversity Framework*. (JNCC - http://jncc.defra.gov.uk)
5. Department for Environment Food and Rural Affairs (2011). *Biodiversity 2020: A strategy for England's wildlife and ecosystem services.* (DEFRA – https://www.gov.uk)
6. Department for Communities and Local Government (2012). *National Planning Policy Framework for England and planning practice guidance.* (DCLG – http://planningguidance.planningportal.gov.uk)
7. BSI (2013). *BS 42020 Biodiversity – Code of practice for planning and development).* (BSI – http://www.bsigroup.com)
8. Environment Agency (2013). *Mitigation Measures Online Manual*. (Environment Agency (archived) – http://evidence.environment-agency.gov.uk/); and http://evidence.environment-agency.gov.uk/FCERM/en/Default/FCRM/Project.aspx?ProjectID=7e8fe097-b416-43c8-b0bf-f897aef654f7&PageID=fcdbadbd-03c9-4263-a8a4-482686506f00
9. Chartered Institute of Ecology and Environmental Management (2013). *Guidelines for Preliminary Ecological Appraisal*. (CIEEM – http://www.cieem.net/)
10. Environment Agency (2014). *Environment Agency DataShare*. (http://www.geostore.com/environment-agency)
11. River Restoration Centre (2013). *Manual of River Restoration Techniques*. (RRC – http://www.therrc.co.uk)
12. The European Centre for River Restoration (2014). *Healthy Catchments: Managing water for flood risk and the Water Framework Directive*. (ECRR – http://www.restorerivers.eu)
13. The Wildfowl & Wetlands Trust & The Royal Society for the Protection of Birds (2012). *Sustainable Drainage Systems: Maximising the potential for people and wildlife. A guide for local authorities and developers.* (WWT – http://www.wwtconsulting.co.uk)
14. CIRIA and partners (2014). *Susdrain – The community for sustainable drainage*. (http://www.susdrain.org/)
15. Department for Environment Food and Rural Affairs (2014). *Statutory guidance: River basin planning guidance.* (DEFRA – https://www.gov.uk)

7. In addition to the "no deterioration in status" duty, consideration must be given to the environmental objectives of "aiming to achieve good status of water bodies". The relevant RBMP's programmes of measures to achieve these objectives must be considered. The good status objective has in many RBMPs been deferred to dates later than 2015, e.g. to 2027 (following certain WFD derogations), and this will be material to any WFD assessment, e.g. a short term impact may not have the effect of compromising these objectives.
8. Potential mitigation and enhancement options can be informed by easily accessed resources. A range of resources has arisen to assist with delivery of the RBMP objectives. Examples are the presentation of water body restoration case studies[11], options for mitigation and enhancement measures for a range of water bodies[12]; and the increasing growth in guidance surrounding the ecological potential of techniques such as Sustainable Drainage Systems (SuDS)[13,14]. These resources can assist both in preparing and in commenting on an assessment of impacts on freshwater environments at a site level.
9. Public bodies should record their WFD assessments / appraisal of the applicant's WFD assessment. They should create a standard format document so as to evidence this appraisal. It is possible that a proposal may need to be assessed against a number of different legal regimes so that other records may also need to be completed (such as written record of a Habitat Regulations Assessment).
10. If it appears that a proposal will lead to non-compliance with the RBMP but reliance is sought on a WFD derogation (e.g. Article 4(7)) then a robust analysis of how the proposal meets the derogation test must be undertaken and recorded.
11. Public bodies would benefit from talking to each other. For any one proposal there may be a number of different consenting bodies. For example, a hydroelectric scheme on an ordinary watercourse may involve a local planning authority, the Environment Agency and a lead local flood authority. All of these bodies will need to undertake a, or appraise the applicant's, WFD assessment. There is no reason why the public bodies should not seek agreement as to how they can share resources and avoid duplication, and recent guidance[15] issued by Defra will need to be put into practice to assist with this engagement.

Conclusions

Ecological appraisal of impacts on freshwaters is a challenge but one that is essential in delivering biodiversity policy aims and ensuring application of environmental legislative regimes. The WFD is complex and WFD assessments of proposals may be difficult to put into practice, particularly in a way which integrates an appraisal of terrestrial impacts. Wider engagement and consistent application of ecological assessment of impacts on freshwater habitats could be achieved through improved formal guidance from Defra, in particular for local authorities and lead local flood agencies. In the meantime we would hope that the pointers set out in this article may give ecologists working within public bodies additional confidence to make and appraise freshwater impact assessments.

About the Authors

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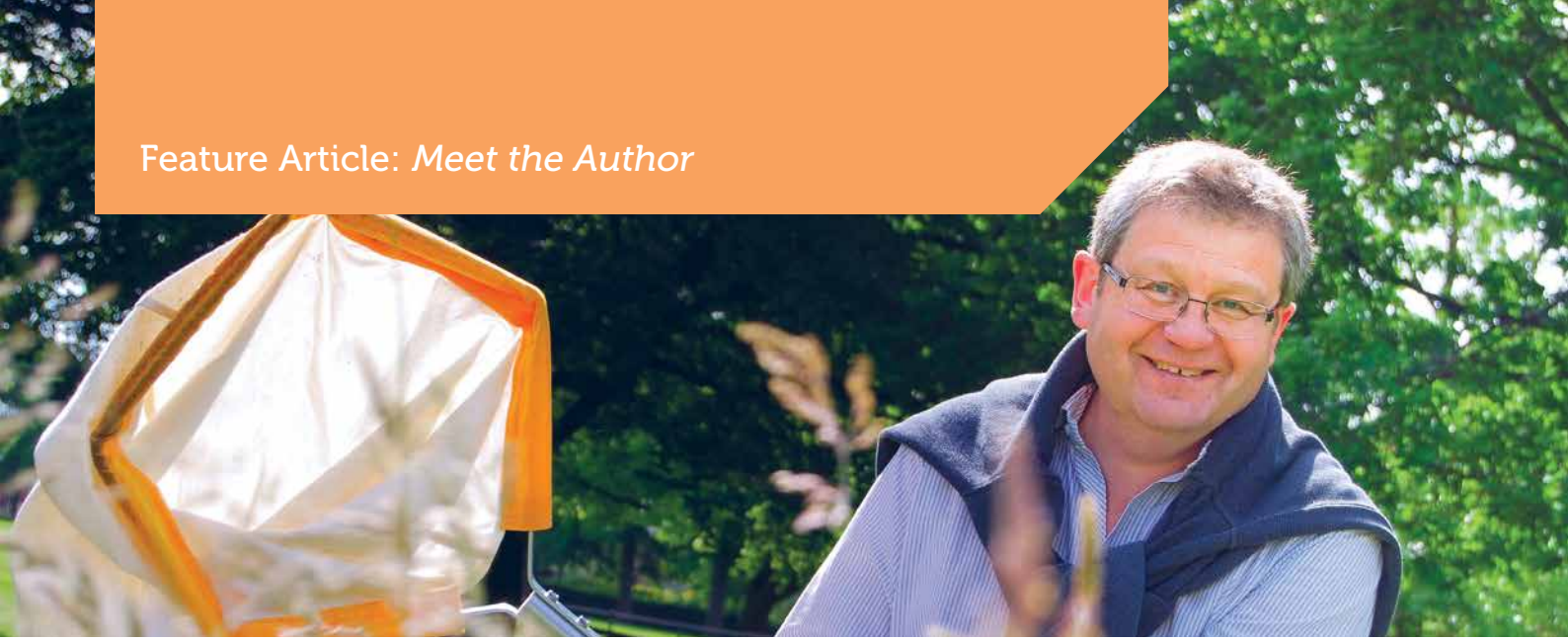

Meet the Author – Andrew Cherrill

What do you do?

I'm a Senior Lecturer in Applied Ecology and Countryside Management at Harper Adams University. That is a broad title but most of my teaching revolves around wildlife conservation science, entomology, field survey skills, land management, and (everyone's favourite) statistics. We run a suite of programmes including the UK's only MSc in Entomology, plus a CIEEM accredited undergraduate degree in Countryside and Environmental Management. In my spare time I am a member of the editorial board of *In Practice*.

What or who first inspired you to get into ecology?

I always enjoyed being outdoors and in the countryside, although to be honest I was not fully aware of what I was getting myself into until I started the BSc Ecology at UEA. It was the first year the course ran and perhaps entry requirements were not as high as they are today! I graduated fascinated by the complexity of natural systems but also by the possibilities of making discoveries and solving problems.

How did you get to where you are today?

After UEA and an entomological PhD with Mike Begon at Liverpool University, I was a post-doctoral researcher at Imperial College, funded by the then Nature Conservation Council, working on conservation of the wart biter bushcricket. I then moved to the University of Newcastle upon Tyne to join a land-use modelling project where I first became aware of the complexities of vegetation mapping, leading a large-scale Phase 1 survey of the Tyne catchment. Thereafter I was a lecturer at Sunderland University for 19 years before moving to Harper Adams University two years ago.

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

For an academic career in ecology, a PhD is essential. These days most PhD candidates will already have an MSc. Enjoying writing and number-crunching are important but often overlooked attributes. Working to hone these skills never stops. Perseverance and an eye for detail are critical – taking a short-cut nearly always results in wasted effort!

What have been the most important steps along the way?

Finding time to research, write and publish has been critical in maintaining momentum and developing skills at all stages of my career. For any post in the university sector, even if it is primarily a teaching role, you are unlikely to be short-listed if you have not published on a regular basis.

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

Obviously joining CIEEM is extremely helpful in terms of forging links between course content and employment opportunities. This applies to both students and tutors! Building a broad knowledge of UK habitats and environmental legislation, alongside specialist species identification skills will make you employable beyond academia, but you will almost certainly have to hone your field and communication skills outside of the formal curriculum through networking and volunteering. If your degree offers a placement, seize it with both hands.

What's the best thing about your job?

Seeing former students employed and moving forward in their careers is very rewarding. I enjoy the diversity of activities and opportunities that come my way.

What's the downside?

Too many things to do and never enough time! It is easy to take on too many roles.

What's next for you?

Starting a new job at Harper Adams has been very refreshing. After years being the only ecologist in a small environment team at Sunderland it is good to be back in an institution where ecology is at the centre of teaching and research. This has given me the opportunity to rekindle my entomological interests. I am also enjoying exploring the region and strengthening links between the university and the West Midlands section of CIEEM.

What is your top tip for success?

Doing something you enjoy is essential to keeping motivated. Keeping an eye on your long-term goals will carry you through the inevitable hard times and help you identify opportunities when they appear.

For further information

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Work on Construction Sites – An Update on CSCS Cards and the ROLO Course

Sally Hayns CEcol MCIEEM
Chief Executive Officer, CIEEM

If you ever work on construction sites this article is for you. Find out how changes in how you can obtain a CSCS card could make your working life easier.

Background to CSCS cards

It is a requirement for anyone in a building trade working on a construction site to have a relevant Construction Skills Certification Scheme (CSCS) Card. This also usually applies to members of other associated trades and professions (*i.e.* CIEEM members) who may also sometimes find themselves working with the construction industry.

The CSCS is a competency-based scheme and was set up to help the construction industry to improve quality and reduce accidents. CSCS cards are therefore increasingly demanded as proof of occupational competence and most contractors and construction clients now insist that workers on their sites hold the appropriate CSCS card for the work they undertake. For instance, a CSCS card is mandatory for anyone working on a National Highway Sector Scheme (NHSS) project.

The cards are intended to provide proof that individuals working on construction sites have the required training and qualifications, and are also familiar with necessary health and safety requirements. There are a range of CSCS cards covering the variety of occupations in the construction industry.

What CSCS card should CIEEM members have?

The type of work a person does, how experienced they are, their qualifications and/or their membership of a professional body, will determine which type of CSCS card they should hold. Currently, to work on construction sites, CIEEM Fellows and Full members should have a '*Professionally Qualified Persons*' Card (a White/Yellow Card), while Graduate and Associate members should have a Graduate Card (a Red Card).

Details of all types of CSCS cards can be found at:

www.bali.org.uk/quality_assurance/liss_cscs/occupations

Where does the ROLO Scheme fit in for ecologists and environmental managers?

Before any CIEEM member can apply for a full CSCS card, they must first attend a one-day Health, Safety and Environment Awareness Course available through the Register of Land-based Operatives (ROLO) Scheme. This scheme is administered by the British Association of Land-Based Industries (BALI) who, as the trade association for the landscape and environmental management sector, is the main point of contact with CSCS.

The course has been designed to increase the profile of health and safety and thereby reduce the number of accidents in the land-based sector. It also takes into account the need to align site work with professional standards (such as the competency framework demanded by the National Highways Sector Scheme 18 (NHSS18) for the Environment and Landscape.

The aims of the ROLO scheme are to:

- keep a record of those in the industry who have achieved a recognised level of competence and to provide a means of identification on site;
- raise the standards of health and safety to reduce the risks and accidents;
- encourage employers to use only LISS/CSCS card holders who have accredited health and safety training;
- provide a recognised route for health and safety training in the National Highways Sector Scheme 18 (NHSS) accreditation; and
- provide an industry specific accredited route to the Land-based Industry Skills Scheme/Construction Skills Certification Scheme (LISS/CSCS).

The ROLO Scheme is open to anyone who works in the land-based industry. On completion of a one-day (7 hour) Land Based Health and Safety Course, a card (including photograph) is issued by BALI/CSCS to the applicant and is valid for 5 years. The ROLO course and the CITB H&S test must be completed less than 2 years before applying for a CSCS card.

The ROLO scheme is currently the only accredited route to a full CSCS Card for CIEEM members, although it also is possible to obtain a provisional card valid for 6 months through an alternative route (see below).

Provisional CSCS Cards valid for 6 months can be obtained at short notice

CIEEM members have reported in the past that, often when a client wants somebody on site at short notice, it can take too long to obtain a full CSCS Card, especially if

they have to book and pass a ROLO course first. A solution is at hand. Since July 2014, CSCS have introduced a red 'Provisional Card', which is valid for 6 months and can usually be obtained at very short notice over the telephone by calling CSCS (the phone number is on the CSCS website homepage). A full CSCS card can then be applied for within the following six months, via the ROLO route described above.

CIEEM have been told that the Provisional CSCS Card should be available for CIEEM members at the start of 2015.

Full details of the Provisional Card can be found at:

http://www.cscs.uk.com/cscs-cards/types-of-card/red-cards/provisional

However, before applying for the Provisional CSCS Card, applicants will first have to take the Construction Industry Training Board (CITB) Health, Safety and Environment Test – this is just a test and does not require the one day of training that forms part of the ROLO course. The CITB course is available at over 50 test centres around the country (the same centres as used for driving tests).

It is important when booking this test to ask to take the 'Managers' Test (as this is what will be required to upgrade the card to the full LISS/CSCS card). This is a touch-screen multiple-choice test that takes about 45 minutes to complete. Fortunately, the CITB Operatives test can also usually be taken at short notice.

How to book a CITB test, and where you can find your nearest test centre, can be found at: www.citb.co.uk/cards-testing/health-safety-environment-test/booking-the-test

Applying for a LISS/CSCS Card

You can apply for a LISS/CSCS card by completing the LISS/CSCS application form and posting it to BALI. You will need to:

- demonstrate that you have achieved the recognised qualifications required for your occupation (e.g. CIEEM membership) (copy of certificate must be enclosed);
- pass the relevant CITB Health, Safety and Environment test at managers level (these are not issued by CSCS but by BALI), or, the ROLO test for the full Professionally Qualified Person valid for 5 years, or, the Graduate card valid for 5 years);
- submit a signed LISS/CSCS application form; and
- pay fees of £17.50 for the test and £38.00 for the card plus the cost of the ROLO course.

CSCS ROLO are evolving to meet CIEEM members' needs

Over recent months, CIEEM has received a number of communications from its members, expressing their concern about the current system of obtaining a CSCS card; principally, in relation to potential delays in obtaining a CSCS card because of the need to first obtain a ROLO course certificate. Hopefully, the introduction of the Provisional CSCS card will now greatly reduce delays in members being able to obtain a card at short notice.

Some CIEEM members, and recent discussion on LinkedIn (http://linkd.in/13CNUTN), have also highlighted that in the past, the ROLO course has not always been relevant to the specific needs and work of ecologists and environmental managers. This also is about to change in 2015, with the introduction of a revised ROLO course that will have bespoke elements tailored to fit the needs of CIEEM members. CIEEM will be working closely with BALI on the detailed content of these more bespoke elements of the course, and the new course should be available as a pilot in the early spring of 2015.

CIEEM is also in discussion with BALI over whether or not the Chartered Institute should become an approved ROLO Training Provider. If CIEEM takes this route, it should be possible for the cost of ROLO courses to be standardised (where there is huge variation among current providers) and thereby kept to a minimum for our members. At the same time, it would also mean that CIEEM remains under the umbrella of BALI and would provide the ROLO course consistently with other landscape professionals, while ensuring that our training providers understand the needs of CIEEM members.

If you have any thoughts on this last proposal, or any other aspect covered in this article, we would be glad to hear from you via our LinkedIn thread on this topic (http://linkd.in/13CNUTN).

Wales Biodiversity Partnership Conference Report

Hannah Powell MCIEEM
Senior Ecologist/Uwch Ecologedd, Powys County Council/Cyngor Sir Powys

The Wales Biodiversity Partnership Conference was held in Cardiff on 10th and 11th September 2014. This year's theme was 'Nature Recovery Planning in Wales – implementation approach to 2020'.

The conference was attended by representatives from the Welsh Government (WG), Natural Resources Wales (NRW), Local Authorities, NFU Cymru, CLA Cymru, National Museum Wales, Biological Record Centres, and conservation organisations including JNCC, RSPB, Buglife, Wildlife Trusts, Marine Conservation Society, Amphibian and Reptile Conservation Trust and Butterfly Conservation.

John Griffiths AM opened the conference by launching the Nature Recovery Plan (NRP) consultation and praised the WG for preparing the document and being at the leading edge of the nature recovery of the countryside and observed that Wales is ahead of the rest of the UK in this regard. CIEEM's Welsh Section co-ordinated a response to the consultation from comments received on the LinkedIn forum.

The WG wants Wales to be the world's leading green economy and the NRP is not about business as usual. It is a new approach to reversing the loss of biodiversity and the more audiences reached, the more understanding of the issues, and the more effective the NRP will be. He urged people to renew their commitment, time and energies into making the NRP a reality on the ground.

NRW estimates that our environment is worth around £8 billion a year to the Welsh economy and as such it is one of our greatest assets. NRW's purpose is to ensure, through joined-up delivery, that our natural resources and environment are sustainably managed, enhanced and used for present and future generations. NRW is tasked with preparing a report on the State of Nature in Wales and an interim report will be published alongside the Environment Bill.

The Keynote speakers, Professor Bill Sutherland of Cambridge University and Matt Shardlow, CEO of Buglife, provided very informative and thought-provoking talks.

Bill Sutherland reiterated the Lawton Review in that we need bigger, better quality and better connected habitat areas and stressed that in order to reverse the loss of biodiversity we need to get the management right on the protected sites that we already have and then expand and connect them. He also advised that we need to change the management of national parks as many have lost their biodiversity and we need to make national parks biodiversity rich. Starting by restoring biodiversity in the areas near to the visitor centres so that people visiting the national parks actually see wildlife, such as wild flowers, curlew and lapwings. He stressed that we know how to do it! Nature Improvement Areas were also discussed and the recently published *Farmland Conservation* book was referenced, which provides evidence that policy- and decision-makers can take into account. These books are a series of Conservation Evidence Handbooks which are free to download on the Conservation Evidence website (www.conservationevidence.com).

Matt Shardlow introduced Buglife Cymru and summarised the importance of invertebrates to us, particularly with regard to food and medical uses. For example, the value of Scampi is greater than cod and pollinators support £18 billion of agriculture as 80% of European crops are insect pollinated. We are only starting to scratch the surface of the usefulness of invertebrates.

Invertebrates provide the experience of 'wonder' for children, whether it's looking underneath a rock or running through a field full of butterflies and chirping grasshoppers.

A number of extremely rare and threatened invertebrates in Wales were highlighted, including the rainbow leaf beetle, barred green colonel hoverfly, white-clawed crayfish and freshwater pearl mussels. Buglife is creating Arksites for white-clawed crayfish. Buglife's future work in Wales will focus on pollinators and freshwaters.

Presentations were focussed on reversing the loss of biodiversity, highlighting rare and threatened species and habitats, Glastir and how it can help halt biodiversity loss, and the value of biodiversity and ecosystem services.

Highlights were:

- Welsh seagrass meadows and their importance as nursery habitats to commercial fish stocks;
- restoring sand dunes and creating pioneer dune habitats to restore dynamic systems to increase habitats for rare pioneer specialists and increase resilience to climate change; and
- the use of DNA to undertake biodiversity assessments of Welsh soils – a global first!

A number of workshops were held and feedback was presented to the delegates.

The presentations can be downloaded from the WBP website at:

www.biodiversitywales.org.uk/97/en-GB/Wales-Biodiversity-Partnership-Conference

CIEEM Chartered Institute of Ecology and Environmental Management

2015 Awards Open for Entries

CIEEM is proud of what our profession contributes to a more sustainable environment. The 2015 Awards reflect the scope and success of our profession and those companies and organisations working to deliver better outcomes for nature and for society.

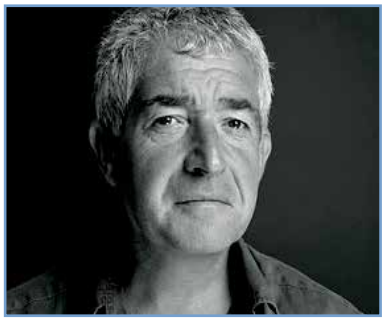
Award Categories:	Deadline for entries:
CIEEM Medal:	Mon 12 Jan 2015
Best Practice Awards:	Mon 2 Feb 2015
Tony Bradshaw Award:	*(all winners of Best Practice Awards considered)*
Promising Professional Award:	Mon 2 Feb 2015
NGO Impact Award:	Mon 2 Feb 215
Corporate Achievement Award:	Mon 2 Feb 2015
Student Project Award:	Mon 12 Jan 2015
In Practice Award:	*(all authors of articles featured in 2014)*

Nominations and entries for the 2015 CIEEM Awards are now open.

www.cieem.net/cieem-awards-2015

The Awards Luncheon will take place on Thursday 25th June 2015 at the Birmingham Botanical Gardens and we are pleased to announce that our guest speaker will be CIEEM Patron Tony Juniper.

Winners of the 2014 Awards



Tony Juniper

Natural England Licencing Update

Brian Davies
Natural England

This short article provides an update on improvements Natural England are putting in place over the short–, medium– and long-term to improve how we do our work in relation to European Protected Species for which we have a licensing role.

Before describing the improvements it is worth just touching on why Natural England has this licensing role. Many species of wild animals and plants in the UK are legally protected from being harmed or disturbed by a range of legislation. (This includes protection of breeding and resting places for many species.) Through a formal agreement between Defra and Natural England, Defra sets wildlife management policy and Natural England implements the policy through the process of wildlife licensing. This is largely by undertaking licensing activities which would, in the absence of a licence, be illegal.

Natural England has a number of improvements in train to how we do our wildlife licensing work because we think they need doing and in response to Hampden and other reviews and also European Commission recommendations. Some of these improvements have happened and others are scheduled. These benefits will take a few months to 'bed-in' and at the same time we are adjusting how we do our work to accommodate an increasing licence demand (10% increase year on year) with fewer resources. These will help address some of the issues we and industry are experiencing. To maximise these improvements we also need to improve the quality of licence applications we receive; this will help us to make a speedy determination.

In addition to the actions we will be implementing over the short- and medium-term, Natural England has put in place a number of immediate actions needed to deal with the current high volume of licence applications.

These actions are happening within a tight project framework ensuring focus and the ability to put in place any further changes. They include implementing streamlined approaches where we can, as well as early communication with applicants to explain the situation and likely timescale for receiving a licence.

The immediate, short- and medium-term actions are over and above ones we have already put in place: expanding organisational and class licences which reduces the need for applications to be made every year; annexed licences to streamline project modifications; project licences to replace the need for multiple applications; organisational licences for surveying or routine maintenance type works. It is worth noting that the job will not be done when these actions are complete. We remain open to new information, such as that emerging from the Great Crested Newt Task Force. We will seek continuous improvement which delivers for our wildlife and our customers.

It is important for Natural England to test intended actions with the industry. We welcome the offer of CIEEM to work with us to both test and potentially support actions through providing joint training opportunities; as well as gain and respond to feedback on other improvements needed.

To keep up to date with European Protected Species licensing the latest copy of Natural England's newsletter can be accessed at: http://www.naturalengland.org.uk/ourwork/regulation/wildlife/species/epsnewsletters.aspx

Improvements over the short-term (by April 2015)

Action	Benefit	Target date
Fixes needed to online licensing application forms addressing a suite of technology issues including duplication of information	When fixed this will be more efficient and speedy for applicants	• Application forms by November 2014. This will include trialling with CIEEM members • Changes to online system by March 2015
Revised licence application pack As well as the application form this will include a new template to guide Reasoned Statement and a clear explanation as to evidence needed and why	This will reduce the burden on certain types of applications; it will speed up others. It will remove the need for a Reasoned Statement for certain cases which meet 'criteria' set by Natural England	January 2015
Advice on how to complete the new bat and dormice method statement templates	The new templates will help standardise information provided and speed up the assessment process	December 2014

Medium-term improvements (April 2015-summer 2015)

Action	Benefit	Target date
Introduce new template for Great Crested Newt method statement(s) which will differentiate between a) impacts which are temporary and/or relate to terrestrial areas, and b) where there are more significant impacts which require more evidence to meet the three tests	This is in response to customer feedback and will reduce complexity and administration burden. It is a more proportionate application process for lower risk activities.	Spring 2015
Low Impact Bat Class licence Introduce a streamlined means of permitting works that have low impacts on bats but which still must be licensed in order to meet legal requirements	This is a more proportionate and streamlined process of licensing works that have low impacts on small numbers of common but strictly protected species in low conservation roosts. The licence will speed up decision-making and reduce delays for customers through a group of Registered Consultants selected on the principle of Earned Recognition	Spring 2015
Introduction of NERC Act agreements for higher impact cases within the application process	These will protect compensation provided for higher impact applications (e.g. receptor site or standalone bat house) and ensure that they remain protected in the long term for the species	Summer 2015
Specific improvements to help manage the impacts of bats on medieval churches and other places of worship. This will draw upon years of research and development and will include a 'toolkit' consisting of guidance, policy and a licensing framework Further work is planned to resource the roll out of the 'toolkit' and to improve the support network for all churches with respect to bats	Reduce the impact of bats in badly affected churches while safeguarding the important bat populations concerned Improve the support network to all churches with respect to bats	'Toolkit' to be delivered by March 2015 with on-going deliverables after this date

Longer-term (from summer 2015)

Action	Benefit	Target date
Provision of class survey licences for sand lizard, smooth snake, natterjack toads Bringing these licences in line with other EPS class survey licensing	Reducing need for annual licence application	Summer 2015
Annexed licensing for sand lizard, smooth snake, natterjack toads mitigation licence applications	Providing a clarity for what is being licensed in the form of an annex which also eases future modifications	Summer and autumn 2015
Earned Recognition joint-funded proposal with CIEEM/Natural England which will mean that those applications from consultants with Earned Recognition due to good practice will only need proportionate scrutiny from Natural England	This will ease burdens and encourage good practice	Summer 2015
Introduction of chargeable training courses after the above changes are in place	To ensure widest possible communication, encourage good practice and provide opportunities for feedback	Summer 2015

For further information please contact brian.davies@naturalengland.org.uk.

Trinity Centre for Biodiversity Research – TCBR

Sven P. Batke and Jane Stout
Trinity College Dublin

Summary

The Trinity Centre for Biodiversity Research (TCBR) is one of Ireland's largest biodiversity research centres. The TCBR facilitates and conducts multidisciplinary and international research on biodiversity-related topics. The TCBR provides a platform to scientists, environmental practitioners, policy-makers and other interested parties, to share knowledge and develop frontier research on key questions related to biodiversity. The TCBR welcomes collaborative partnerships with interested individuals and organisations to facilitate local and international research and the dissemination of such research to an inclusive audience.

About TCBR

The TCBR was launched in 2008 by Sir David Attenborough, with the objective to provide multidisciplinary expertise in biodiversity research. The TCBR provides crucial research for the development of national, European and international policy and strategy recommendations. As economic development, human wellbeing, health, livelihoods and societies depend on biodiversity for the provision of ecosystem services and function, the TCBR aims are to provide an innovative opportunity to consolidate leading research expertise that can advise on the sustainable use and conservation of such services. Currently, three principle areas are covered through the TCBR:

- ***Documenting and describing biodiversity:*** including classical and molecular taxonomy and systematics, field inventory and characterisation of biodiversity, and reconstruction of palaeoecological environments.
- ***Ecology and ecosystem functioning:*** including understanding physiological responses of organisms to environments, community interactions, spatiotemporal relationships, ecosystem functioning and delivery of services, impacts of climate change and other human pressures and predictive modelling under global change scenarios.
- ***Biodiversity and sustainable livelihoods:*** including conservation and management approaches, social and economic aspects, policy, mitigation/control and dissemination.

As part of Trinity College, The University of Dublin (TCD), the TCBR is working closely with existing centres and initiatives in Ireland and further afield, including the National Biodiversity Data Centre, Quercus, the Northern Ireland Research Centre for Biodiversity and Conservation Biology, the Environmental Protection Agency, Teagasc, the National Botanic Gardens, Dublin City Council and other third level institutions in Ireland and overseas.

Currently, over 20 Principle Investigators (PIs), working together with TCBR, were awarded a total of over €7.5 million in research funding (2007-2012). Approximately 65 PhD students are currently working on biodiversity-related topics within the TCBR research group. Current research sites are located around the world (Figure 1). Since 2009, PIs have published over 250 articles in peer-reviewed international journals on topics such as 'Response of farmland biodiversity to bioenergy crops', 'Climate-related changes in peatland carbon accumulation' and 'Impacts of organic and conventional dairy farming on biodiversity'. In addition, the TCBR has been involved in a number of public outreach projects, including the Dublin Biodiversity Audio Tour (DBAT, www.tcd.ie/tcbr/biodiversity-audiotour), which brings together biodiversity stories from around Dublin. The DBAT is a series of short, free-to-download podcast audio clips that takes the visitor on a journey of discovery through different locations around Dublin such as Bull Island, the National Botanic Gardens, the Natural History Museum and many more.

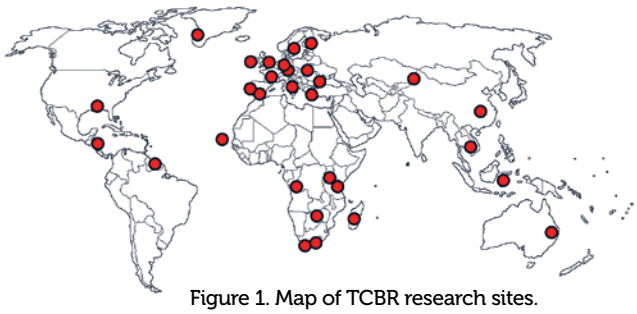


Figure 1. Map of TCBR research sites.

How to get involved

The TCBR invites CIEEM members and the public to join our efforts to safeguard biodiversity and to gain and disseminate frontier knowledge on the sustainable management of biodiversity services. Please visit our website for further details and a list of some of our most recent publications. We welcome contributions of any kind (e.g. research ideas and observations) and we would encourage active participation in this initiative. You can also join our online newsletter, which reports on the most recent TCBR projects (www.tcd.ie/tcbr).

The full article for this summary can be found at www.cieem.net/ireland.

About the Authors

Sven P. Batke is a PhD student at the Botany Department in Trinity College Dublin and is a post-graduate representative for the TCBR. He is currently working on the ecology and distribution of mechanically dependent tropical canopy plants in Honduras.

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Professor Jane Stout is the Director of the TCRB and the coordinator for the national project on biodiversity and ecosystem services (www.simbiosys.ie). She holds a lecturing position at the Botany Department in Trinity College Dublin. Her research expertises are in ecology and human impacts on biodiversity and ecosystem services.

Featured CIEEM Training

Details of all CIEEM's courses and on-line booking can be accessed at:

http://www.cieem.net/training-events

QGIS for Ecologists and Conservation Practitioners

10-11 February, Gloucester
Trainer: Mark O'Connell

5-6 March, Edinburgh
Trainer: Margaret Carlisle

23-24 April, Ireland
Trainer: George Smith MCIEEM

Level: Beginner

Responding to the need for improved training in the use of open source Geographical Information Systems (QGIS) we have set up a series of introductory level QGIS courses for ecologists and conservation practitioners. Over two days, delegates will learn how to use free, open source, Quantum GIS software, to access a variety of environmental data sources. Training will include sessions on creating and querying data layers; how to present species and habitat records; spatial analysis; the preparation of maps for presentation in reports and understanding the limitations of different data sets.

Appropriate Assessment

(12 February, Letterfrack, Co. Galway)

Trainer: Marie Louse Heffernan CEnv MCIEEM

Level: Beginner to Intermediate

This one day course has been specifically designed to provide ecologists with an understanding of the background to the designations, the legislation and the steps in Appropriate Assessment (AA). The training will cover how to carry out a basic assessment and use multiple examples of AA in action as source material to discuss screening, Stage 2 assessments, cumulative impacts and mitigation.

Train the Trainer

(18-19 February, London)

Trainer: Paul Losse MCIEEM

Level: Beginner to Intermediate

If you are interested in using your expertise to deliver a course within CIEEM's Professional Development Programme, this two day training event will help you to gain the teaching skills needed to work as a professional trainer. Specially designed for ecologists and environmental practitioners the training covers techniques for delivering engaging sessions in both the field and classroom. Discover how to focus tuition around the learner's needs, tailor activities for groups with mixed abilities and replace lectures with effective learning sessions. Our trainer is an experienced ecologist and professional trainer.

British Standard BS42020 Biodiversity – Code of Practice for Planning and Development

(19 February, London & 16 April, Birmingham)

Trainer: Mike Oxford CEcol FCIEEM

Level: Intermediate to Advanced

This training aims to familiarise experienced ecologists with the content and structure of BS42020 and its application within the planning process. With sessions led by Mike Oxford, Chair of BSI Technical Committee on Biodiversity and principal author for BS42020, the course will focus on effective ecological input at all five stages of the planning process. The training aims to provide professionals with the confidence to ensure ecology work is compliant with all aspects of this new British Standard, hereby leading to more effective conservation in practice.

Otter Ecology and Surveys

(17 March, Cirencester)

Trainer: Mike Dean CEcol CEnv MCIEEM

Level: Beginner to Intermediate

This course will cover aspects of the background ecology of otters, focusing on the use of resting sites, field survey techniques, legislation and licensing for surveys. The field visit will allow those attending to put the theory into practice, searching for and identifying field signs of otters in different types of habitat. This course is aimed at beginners and those with some previous experience (intermediate level). A second course covering mitigation techniques is planned for summer 2015.

Water Vole Live Trapping, Care and Restoration

(24-25 March, Lifton, Devon)

Trainer: Derek Gow MCIEEM

Level: Intermediate to Advanced

The publication of new guidance on water vole survey and mitigation for developments will introduce additional requirements for the survey, trapping and displacement of water voles. This advanced course aims to familiarise experienced practitioners with the practical elements of water vole trapping, considerations for maintaining water voles in captivity and techniques to assist with successful restoration. This course complements our one day Water Vole Mitigation training.

Article and Feature Writing for Environmental Practitioners

(15 April, Sheffield)

Trainer: Chloe Palmer MCIEEM

Level: Beginner to Intermediate

Would you like to submit a feature to *In Practice* but are unsure how to go about it? Do you want to write articles to appeal to a wider audience? Are you looking to get your message across clearly and make an impact? Aimed at conservation professionals and ecologists this training day will demonstrate how to sell your ideas to an editor, how to present your content (including matching an in house style) and how to format your article to make it readable and eye-catching.

Professional Conduct

Andy Mackenzie MCIEEM
Committee member, CIEEM Professional Standards Committee

A few thoughts on how a professional ecologist or environmental manager should conduct themselves and how we should all try harder to work together for the overall benefit of the environment.

Introduction

We have the CIEEM Code of Professional Conduct; as members of CIEEM, we all enter into a 'contract' to abide by this each time we renew our annual membership (see *In Practice* article, page 47 June 2014). This provides the core behaviours expected of a professional ecologist or environmental manager. We also have the CIEEM Professional Guidance Series which includes the Good Working Practices document (November 2013; see CIEEM website). While this provides a general outline of good practice for both employees and employers, we must also include the category of self-employed, which applies to a significant percentage of the CIEEM membership.

This article highlights a few specific aspects of professional conduct and good working practices. The article is based on personal experience and is written from a consultancy sector perspective.

Competence

As ecologists and environmental managers, we are all continually learning. This continual personal development is one of the things I love about the ecological sciences and the wider natural sciences. Wildlife continually amazes and surprises me: there are regular unexpected situations which arise, being significantly different from that which previous knowledge and experience would suggest. It is easy to forget that the ecological sciences is a young subject and, relatively speaking, we understand very little about it. A good example of this occurred recently with a Nathusius' pipistrelle *Pipistrellus nathusii* that was photographed on St Kilda. The Ranger was reported to have said: *"We haven't got bats at St Kilda. It's too far across the sea for them to fly and we don't think there are any bats resident here."* (BBC News Website, 2014). Recently this migratory species has been shown to have crossed the North Sea and has also been found resting on oil and gas rigs in the recent past. We are always learning and our level of understanding is constantly changing!

It is therefore very important that we have a good appreciation of our limitations and of our relative levels of understanding, knowledge and experience. There is a big difference between widening our knowledge/experience in a controlled way and being 'dropped-in-it'.

Being challenged in a controlled way is quite different from trying to carry out a task without having any prior experience, support and background knowledge to know where to begin.

Support can be provided in a variety of ways; where people are working alone it can be through CIEEM written material and other detailed guidance documents, as well as through direct discussion. A controlled widening of experience may, for example, entail a more experienced colleague overseeing work or giving advice when required, or perhaps a channel of discussion with an external contact who has that experience. Similarly, training from reliable sources such as CIEEM, the Field Studies Council (FSC) or particular known experts can be very valuable. The internet can provide a large pool of knowledge, however, this has to be used carefully and from trusted, reliable sources. Internet-based discussion forums can also be very valuable for specific questions/knowledge building on some specialised topics, for example, CIEEM and the Bat Conservation Trust's (BCT) LinkedIn groups.

Everyone is unique and people have different levels of confidence and ability.

Downloading Environmental Survey Data. © MBEC.

Offshore Surveying, Firth of Forth. © MBEC.

Bridge Inspection for Bats. © MBEC.

Less experienced ecologists and junior environmental managers should always be supported by more senior colleagues when undertaking tasks that they have not done before or when undertaking those which are outside of their comfort zone. Even if such support is simply knowing that senior colleagues are there should you need them for update discussions and that they will check your work once analysed and written up.

As we are all continually learning, advice and support should not just be limited to junior ecologists and environmental managers. We should all be happy to discuss and take advice from others who have more expertise in particular subject areas and situations. Conferences and seminars can play an important and often underrated role in this.

Honesty and Integrity

There is a lot of pressure on ecologists and environmental managers to appear to know everything, perhaps more so than in many other professions.

In my experience a lot of other professionals we work with, and indeed the general public, seem to think they have a good understanding of ecology and environmental management without the education, training or experience we have (a notable exception being expert amateur naturalists and people in closely related careers to ours). I have never managed to work out fully why this is the case but perhaps this external confidence of understanding and lack of awareness of uncertainties is something to do with the media intensive world we live in and/or our historically strong links to our environmental surroundings? I would never dream of telling, for example, a civil engineer how to do their job and yet, in my experience, civil engineers often feel they know enough to tell ecologists how to do their job.

The following is important:

Never be afraid to say: "I don't know but I will find out and get back to you."

It is much better to be honest and say this, then come back with an assured, definitive answer rather than to try and give a half-answer or worse, be a politician and dodge the question. I will never forget a chemistry teacher at school telling our class that science undergraduate and postgraduate education was all about equipping people with the skills they need to be able to learn more in the future. Indeed, one can say this about education as a whole.

External Relationships

There is mention of the professional conduct of ecologists and environmental managers in the CIEEM Professional Guidance Series: Good Working Practices (November 2013). It states the following: *"Individuals should be reminded of their responsibility to: .... protect the reputation of their organisation."*

Similar broad wording is often included in contracts of employment for ecologists and environmental managers but what does it actually mean? It is very easy for junior staff (but in my experience, also more experienced staff who should know better) to be unaware that throw away comments which originate from their personal feelings and perhaps a limited perspective/understanding can be very damaging to wider professional relationships with external contacts. This can even go as far as affecting the awarding of future work and therefore can directly relate to 'the reputation of their organisation'. Such comments should always be thought through prior to being uttered and be carefully qualified.

A good example of this, which crops up frequently, is in relation to construction sites and working hours. Construction site work often requires ecologists to work longer than their normal hours to fit with construction site times and construction timescales. How such working relates to an ecologist's contracted hours, accepted tender prices *etc*. varies and is not covered further here. The key thing is that when in that position always try and do what is required rather than work to hours. In my experience it is fairly common for ecologists to complain about construction site working hours but it will 'cut no mustard' with construction staff when it is often standard practice for construction teams and their engineering managers to work at least 12-hour days during peak activity periods. Negative comments often cause unnecessary bad feeling.

It is important that we all think carefully about how we are presenting ourselves and our organisations to other parties by airing such gripes.

I have always felt that it is important when undertaking construction-related work that I should fit in with the rest of the construction team as best as I can, regardless of what it says in a contract or what my core/paid hours of work are. Experience has taught me that this attitude allows the fostering of good working relationships with construction site staff and ultimately allows wildlife law to be adhered to and impacts to be minimised so far as is within my, and my colleagues', control.

Construction in a Sensitive Location: Glencoe. © MBEC.

In construction situations (or extended fieldwork situations), should an ecologist or environmental manager be faced with the situation of being required on site more than they feel they are physically able to then there are several positive ways to address it. The first is to forward plan as much as possible, to ensure your presence during critical operations and periods, with clear agreements that you are notified as soon as timescales change. Forward planning is not always easy but is worth persevering with and updating on a regular basis. The second is to hold discussions on reasonable working hours only with your direct employer, who can then be asked to make your site hours clear to the key people on the site and organise additional personnel support, where and when required.

Relationships Within Our Profession

There will always be intense competition between consultants because that is the ethos within the tendering system. However, there is a big difference between this legitimate competition and the underhand, unjustified and unproven sniping which can occur. In my experience it is the smaller, often specialised consultancies that tend to be the ones that bear the brunt of such underhand corporate practice but it can occur anywhere within the sector.

Treat others as you wish to be treated yourself.

It will be difficult to eradicate all such sharp practice from consultancy. However, if proof exists in relation to particular instances of underhand practice by any CIEEM members then it should be reported using the CIEEM complaints procedure.

The relationships between different sectors in our profession are important. It is my experience that the relationships between the various ecology and environmental sectors can be an uneasy one. As with all professions, this can sometimes be due to personality clashes and differences of approach and opinion, even developing into mistrust. Such unease can be particularly daunting for less experienced ecologists and environmental managers and at worst sets back the collective goals we are all trying to achieve. We all need to work to make such relationships better. Regardless of which sector we work in – be it research, local authority, central government, statutory body, consultancy or third sector organisations – we should all be working in a way that assists, complements and supports each other.

A good example of the need for collaborative and supportive working can be seen in relation to planning applications. This is explored further below.

Firstly, it is important to be clear that all planning-related consultants (including ecological consultants) exist because developers are required to provide the information and assessment required for their planning applications. An independent consultant working for a developer should be objective and independent in their views. There is often an advantage in working with a developer in this way because the consultant can get access to detailed information with which to fully inform their views on the issues and risks involved.

Using planning applications as an example: if statutory and non-statutory consultees provide a clear set of justifiable ecological requirements in relation to a planning application at an early stage then consultants can take those requirements, discuss and cost them with their clients and aim to provide best practice surveying and reporting (with the obvious caveat of getting agreement on this with their clients). It is important to realise that consultants sometimes only get commissioned from their clients to do the bare minimum rather than the preferred best practice approach. Therefore, a clear and detailed steer from consultees/ stakeholders is really important to facilitate best practice approaches and the later production of adequate information for

Aquatic Surveying. © MBEC.

their needs. External stakeholders are often much more likely to persuade a developer to undertake early and detailed planning application work than an independent ecological consultant.

It is also important to realise that a developer will often take a set of planning application requirements for ecological survey, reporting and assessment (and other required work) and ask for competitive quotes from various consultants. If the requirements are provided at an early stage and sufficiently clear and detailed then all the parties invited to quote will be forced to adopt a reasonably similar minimum level of work. The reality is that frequently this does not happen and consultancies know that they are forced to cut the requirements to the minimum and quote the lowest costs to have the best chance of winning the work. Then, later in the process, consultees and the consultant ecologists involved can often be disappointed and critical of the work produced and the developer is then often asked for further information from the planning authority because what has been provided is inadequate. An unsatisfactory situation all round, which can normally be avoided by working in a more collaborative and supportive way early in the process.

There are other situations where, I would suggest, consultant ecologists need to be more understanding and supportive of other ecology and environmental management sectors. They need to take time to understand better the reasoning behind statutory- and non-statutory-based colleagues' comments and recommendations. Consultants need to try to consider and establish the objective(s) behind such comments and recommendations.

Budgets allocated to local and national authorities, statutory nature conservation bodies and the monies available to many third sector organisations have all been drastically cut over the last few years and unfortunately further cuts are likely. Inevitably, this has led to a severe dilution of resources in these organisations. In my experience this has resulted in larger differences in requirements and inputs between organisations, some requiring more detailed ecological information than previously but unfortunately many not requiring the same rigour as they did in the recent past. In addition, there has been a raft of politically-driven policy changes that have particularly impacted local authorities and statutory nature conservation bodies.

Railway Reinstatement, Stirling-Alloa-Kincardine Line. © MBEC.

Consultants need to be more understanding of the knock-on consequences to all aspects of these organisations' operations from recent changes, particularly in relation to such things as response times, ability to provide detailed advice and licensing.

While there may be several different roles and positions involved in particular projects we should not all be in competition. Rather, we should all be aiming for the same common goals. We should all be aiming to safeguard natural heritage and achieve the best outcomes possible for wildlife and biodiversity, while accepting that a level of future development will occur. The concept of 'real' sustainable development being critical to this *i.e.* sustainability at all levels: ecological, environmental and social, as well as economic. There is a necessary and complementary role for all of us.

We should not be in competition, rather we should all be working towards the same common goals.

About the Author

Dr Andy Mackenzie has been a professional ecologist for over 20 years. He is a founding partner of MBEC, a Scottish-based ecological consultancy practice which has been running for over 10 years. He is a member of the Professional Standards Committee of CIEEM and also serves on the CIEEM Scottish Section Committee.

Contact Andy at:
andy@mbecmail.co.uk

Complaints Update

Breaches of the Code of Professional Conduct

The following people were found to have breached clauses 7.ii and 7.x of the Code of Professional Conduct. These breaches related to failing to provide evidence of having undertaken Continuing Professional Development in accordance with the Chartered Institute's requirements.

- Mark Jackson MCIEEM has been reprimanded with conditions.
- Joseph Kelleher ACIEEM has been reprimanded.
- Adam Kennerley MCIEEM has been reprimanded with conditions.
- Annabel Martin (Member in abeyance) has been reprimanded.
- Fiona Luckhurst MCIEEM has been reprimanded.

How to get the most from recording your CPD Important changes

It is all too easy to view the recording of CPD as a chore and a requirement that must be completed. We hope to convince you there are benefits to be gained that go beyond necessity and which support your professional and personal development if approached effectively.

The current CIEEM CPD recording form includes an important element which was previously missing, the means by which to plan your CPD activities and to highlight gaps in skills and experience to focus on in future. The CIEEM Competency Framework is a powerful tool to use to your advantage when considering CPD opportunities most relevant to your career choices. By becoming familiar with its themes and sub themes you may plan your CPD to enhance professional skills whilst progressing your CIEEM membership in the process. The CPD planner is also a useful means of demonstrating to employers why specific training is justified in the context of your overall development as a practitioner.

CIEEM now requests that CPD is recorded as and when undertaken, so that at any given time (when asked to provide it), your form is up-to-date. This is important to note as some circumstances will result in disciplinary proceedings if you do not comply. You might be asked to provide your CPD record for one of the following reasons:

- As part of the annual audit of members
- Whilst applying for the Professional Directory
- On applying for Chartership status or a position on the Governing Board
- When a complaint is received against you

If regularly updated after a training event or learning activity, it really is a painless exercise that is quick to complete. The other benefit of recording CPD regularly is that it enables you to reflect on what you have just learnt and how you will implement it when back in the workplace, or other setting. By facilitating this recording of follow up actions, along with planning future training, we hope that recording CPD will be an asset to your development both as a member of the Institute and as a professional person.

Another important message to make clear is that recording CPD for CIEEM encompasses a broad range of subjects and there are many different types of learning that are relevant. Recognising this will mean you can clock up CPD hours far more quickly than you might imagine. For example, alongside technical skills considered synonymous with the sector – surveying, impact assessment, scientific method – did you also know that transferable skills such as self management, communication and health and safety are equally valid? Regularly review the Competency Framework (www.cieem.net/competency-framework) to stay mindful of what is appropriate to record.

The kinds of CPD recognised by CIEEM are highly varied for both structured (directed) and unstructured (independent) learning activities. You are updating your CPD right now by reading the latest edition of *In Practice*. There is a long list of relevant activities provided in the CPD guidance on the members' area of the website, along with more information about the requirement for members and how to use the CPD recording form. If in doubt, get in touch with the Secretariat for advice on what to record and how to use the Competency Framework in conjunction with the recording form.

www.cieem.net/cpd

CIEEM Professional Development Programme: Upskilling the profession with your support

Training that meets your needs

Within our professional development programme CIEEM works with a wide range of individual training providers to promote areas of training most relevant to members. Courses delivered for CIEEM must have strong linkages with themes from the **Competency Framework**, which may include transferable skills such as communication and self management. Well defined learning outcomes enable members to clearly identify training that meets their specific needs in terms of topic and appropriate level. The learning outcomes are then used within the course evaluation process, where feedback from participants is assessed to ensure our training meets with expectations and requirements. Trainers must demonstrate they have the relevant expertise to provide training on a given theme as well as the experience and knowledge to delivering training effectively.

Professional development for members, by members

A very high percentage of our training is delivered by CIEEM members, practitioners who are best placed to understand the training needs of our profession. These trainers act as 'dual professionals' who are both specialists in their subject whilst having the skills and experience to provide teaching and learning.

How can *you* contribute to the upskilling of the profession?

Becoming a CIEEM training provider is a rewarding activity enabling you to share your enthusiasm and expertise while diversifying your skill set and contributing to your own professional development. CIEEM's **Train the Trainer courses** are designed to help you make that transition and deliver training that meets with high professional standards.

There are other ways that members can play a role in supporting the professional development of ecologists and environmental managers. Becoming a trainer is the most obvious, but there are other opportunities such as offering a venue where we can deliver training events. Providing a free training space in exchange for **free delegate places** on a course is one example of how this might benefit your organisation.

Please get in touch with the Secretariat (enquiries@cieem.net) if this is something you would like to know more about.

Getting involved with a **Geographic Section Committee** to support local networking activities and learning events is yet another example of how to engage with the professional development for members and prospective members. And for every training event you attend, we are keen to have constructive feedback on your experience, as well as any suggestions for new areas of learning we might provide.

Please contact the **Professional Development Team** if you would like to discuss any of the areas highlighted above, or visit the website for details of current training events, such as Train the Trainer courses.

Email: Lexiemunro@cieem.net or helenboulden@cieem.net

Web: www.cieem.net/training-events

Chartered Institute of Ecology and Environmental Management

CIEEM

2015 Spring Conference

MANAGING CHANGE IN COASTAL HABITATS

March 2015, Location to be confirmed

Call for Papers (deadline 6 January 2015)

CIEEM is planning its Spring conference and we are now inviting the submission of papers. If you are interested in presenting a paper at the conference, please complete the pro-forma and return to enquiries@cieem.net by 6 January 2015, making sure to indicate which of the conference objectives your paper will cover. The pro-forma is available from the website:

www.cieem.net/2015-spring-conference

Conference Objectives:

1. To look at the evidence base for achieving successful outcomes in coastal habitat management in a changing environment
2. To showcase innovative tools and techniques as part of an adaptive management approach
3. To demonstrate the benefits of integrated multi-disciplinary solutions

Chartered Members

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

Chartered Ecologist (CEcol): The Register of Chartered Ecologists recognises the effective application of knowledge and understanding of the science of ecology by professionals committed to the highest standards of practice

Chartered Environmentalist (CEnv): CIEEM is one of 23 professional bodies licensed by the Society for the Environment (SocEnv) to award Chartered Environmentalist status. CEnv is an increasingly recognised standard of good environmental practice.

Following feedback from a recent survey of some of our Chartered Members, many expressed an interest in seeing Chartered Members' career profiles in order to highlight the work of Chartered professionals and raise the profile as well as providing an insight into the kind of roles that these senior ecologists and environmentalists are required for.

Here is our first profile, from Chartered Ecologist, Claire Wansbury. We hope that this may become a regular feature.

Claire Wansbury CEcol CEnv FCIEEM
Associate Director, Water & Environment, Atkins

I am based in central London so with a particular appreciation of the added value provided by urban wildlife. Atkins is a very large engineering and environmental consultancy, but we have a large ecology team spread across the country. I like the fact that this means the ecologists can give each other technical support while we also learn from, and can also educate, our colleagues from other disciplines.

I first joined IEEM in the 1990s, and my original motivation was because training courses were half price for members! As I moved from English Nature (now Natural England) into consultancy I found IEEM membership was great in helping me build contacts and knowledge as I moved from a large organisation whose staff included many international experts to a small specialist company.

I applied for Chartered Status because it demonstrates having reached a skilled level of professionalism, and also to support CIEEM. We are still seen as a young profession and our involvement in projects can sometimes be a grudging one based on the need to 'sort out constraints', a very negative reason, rather than seeing this as just one part of the positive contribution ecologists can make to the design, planning and creation of projects.

I was one of the early 'guinea pigs' in the CEcol assessment process, which was a little daunting, but I found the process relatively straight-forward, and it did give me the added bonus that I can describe myself as "Chartered Ecologist number double O seven". The first piece of advice I would give to anyone considering applying is to start writing well before the deadline. To do yourself justice you need time to think about the questions and the evidence. The next is not to undervalue yourself. Expecting you to be 'accomplished' does not mean CIEEM expects you to be a national expert (although if you are one, you don't have to answer as many different competencies!). My final advice is that if you have been a Full member for a few years do look at the form and guidance and think if you are ready. Chartered status enhances your professional profile and the status of ecology as a profession and should improve your employability. I would hope that in a very few years time job interviewers and project managers looking for experienced Senior Ecologists will automatically look for Chartership on CVs.

To submit your profile – which may be chosen to appear in *In Practice*, on the CIEEM website or in marketing materials to help raise awareness of the Chartered qualifications and the work of Chartered Ecologists and Environmentalists, please provide us with a career profile of between 250-500 words and include some or all of the below (*please complete):

Name* / Current position* / Current employer*
Why you joined CIEEM*
Why you applied for Chartered status*
How you found the process*
Education / Volunteer work / Training courses
The best thing about your job

Please write your profile in the first person and provide a recent image of yourself. Please email these to the Registration Officer, Karen Sanderson, at karensanderson@cieem.net.

Chartered Ecologist application deadlines

CEcol Application due date	CEcol Interviews	Ratification
16 January 2015	W/c 9 March 2015	Early April 2015
6 March 2015	W/c 1 June 2015	Late June 2015

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

A New Look Secretariat

Sally Hayns CEcol MCIEEM
Chief Executive Officer, CIEEM

The past nine months have been difficult ones for the CIEEM Secretariat as we underwent a staff consultation and a restructure to take account of our growth and increasing breadth of activities. Our need to restructure was driven by growth and a desire to provide continued improvement in the support we give our members, but as those of you who have been through your own restructuring processes will know, it is a difficult change process for all those involved.

Along the way we have said goodbye to three long-serving team members, Deputy Chief Executive Officer Linda Yost, Marketing and Communication Systems Officer Nick Jackson and Office and Finance Administrator Carol Best. Linda, Nick and Carol have made very valuable contributions to CIEEM's growth and impact over the years and we have much to be grateful to them for. We wish them well in their future careers.

In our new structure we have four teams. The Policy and Communications team is led by Jason Reeves and includes our new Marketing Officer Emma Kiss.

Our Professional Practice team covers training and professional development, professional standards (including implementation of the disciplinary procedures) and guidance. I am currently overseeing this team pending future recruitment but both Deborah Alexander, our Professional Standards Assistant, and Helen Boulden, our Professional Development Officer, are part of this team along with new recruit Lexie Munro who has taken up the position of Professional Development Coordinator.

Stuart Parks (Membership Manager) and Annie Hall (Membership Administrative Assistant) have joined Sarah Cox (Membership Officer), Sarah Hayward (Assistant Membership Officer) and Karen Sanderson (Registration Officer) in the Membership team. Eventually Vicky Bowskill (Geographic Sections Coordinator) and Mairead Stack (Irish Section Support Officer) will join this team.

Finally John Gordon has joined us as Office and Finance Manager working with Richard Watts (Administrative Officer) and Patricia Hosier (temporary Finance Officer) in the Office and Finance team.

Figure 1 shows a summary of the new structure. Over the next few issues of *In Practice* I will ask each team manager to introduce their staff to you and tell you a little more about how the team works to support CIEEM's members. I am proud of the huge amount of effort that the Secretariat puts in to promote the profession and to support you in your work and I want you to get to know who we are and how we work to help you.

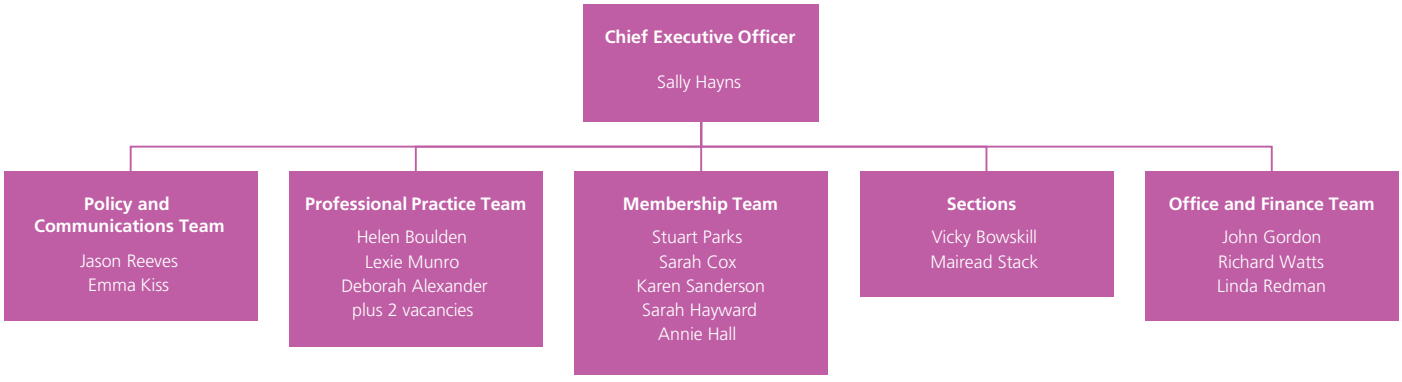


FIGURE 1: New Secretariat Structure

Geographic Section Committees: Who are they?

CIEEM's Geographic Sections are all run by Committees of dedicated volunteers who give their time to organise local events and provide opportunities for our members to network, share knowledge and learn more about the science and practice of our profession. These local events are often free or low cost and complement our formal Professional Development Programme, providing a valuable resource that many readers will have taken part in.

But who are these intrepid volunteers? They are mainly working professionals with busy day jobs or other commitments and the work they do on the Committees is all done in their 'spare' time. So what motivates someone to join a Section Committee?

Name: **Poppy McDonald CEnv MCIEEM**
Occupation: Senior Ecologist, Mott Macdonald
Section: East of England, Secretary
Date Joined: 2010

Prior to joining the East of England Section Committee I had never been on a committee before and thought it would be good experience. I also saw it as a great way of getting to know more about the Institute and the way it works.

It has been great to get to know the other Committee members, meet other members from the region and find out what issues are important at a more local level. Through working together with the other Committee members and attending the events we've organised I have a much better knowledge of locally important habitats, species and wildlife sites. This has been very useful, not just for professional purposes but also for finding interesting places to go at weekends!

For anyone thinking of getting involved with their local Section my advice would be to get stuck in! In return for only a small amount of time you get to learn more about the Institute and your local area, and get to know lots of other passionate, knowledgeable professionals.

Name: **Jess Batchelor ACIEEM**
Occupation: Ecologist, Ove Arup & Partners Ltd
Section: West Midlands, Committee member
Date Joined: 2012

I attended the West Midlands Section AGM as there were some very interesting talks planned for the evening and, as part of the AGM, the Section was asking for a couple more people to join the Committee. I volunteered as I thought it would be a great opportunity to meet more ecologists in the area that I had recently moved to.

I love meeting with fellow ecologists and discussing really interesting and topical subjects that are very relevant to the industry. It's a great opportunity to learn more based on others' experiences, and the discussions always spark new ideas for interesting events to run in the West Midlands region.

Sections are always looking for more ideas and people to help run events, so if you are interested in helping out your support would be very welcome. Just get in touch with the Convenor via the CIEEM website or come along to a Section meeting to see if it's something you fancy getting involved in.

Name: **Brian Minshull CEnv MCIEEM**
Occupation: Principal, BCM Environmental Services Limited
Section: Scotland, Committee member
Date Joined: 2012

My desire to get involved with the Scottish Section Committee was influenced by experiences during the formative years of my career. Two people, both of whom were my bird-ringing trainers, gave up huge amounts of their time, much to my benefit, in what was what I now call my 'apprenticeship'. This contributed greatly to who and what I am now and as such I am very keen to give something back myself.

The most rewarding part of being on the Committee is interacting with other like-minded people and doing my bit to help raise standards and promote the profession of ecology.

My advice to anyone thinking of joining their local Section would be to do it for the best of reasons, and not just because it looks good on your CV. It may take up some of your valuable time, but the rewards for both you and those who benefit from your efforts are well worth it.

Name: **Hugh Dixon MCIEEM**
Occupation: Principal Ecologist, Celtic Ecology
Section: Wales, Convenor
Date Joined: 2012

I initially wanted to get involved with the Welsh Section to help in influencing decision-making on ecological matters in my area. In particular I wanted to work on raising standards, raising the profile of ecology as a profession with other consultancy disciplines and, importantly, raising the profile of CIEEM with NRW (CCW as was) and the Welsh Government.

One of the best things about being involved with the Welsh Section Committee is being able to say my piece and be taken seriously!

My advice to anyone considering getting involved with their local Section is: Enjoy it! But remember that you only get out of it what you put in. You must be prepared to take an active role in the Committee and go the extra mile (even when you're busy at work!). We have the opportunity to influence policy, raise awareness of and help to address issues that are important to us as ecologists, but we have to work together to achieve this. If you are prepared to do your bit then being a part of your local Section can be a very rewarding experience.

Name: **Ben Ralston MCIEEM**
Occupation: Conservation Advisor, Northumbrian Water
Section: North East, Committee member
Date Joined: 2008

I first joined CIEEM as a Student member in 2006 and after attending a few evening talks and field events I began to see what an important role CIEEM would play in my future career path.

Motivated primarily by curiosity and after a bit of encouragement from my tutor, I joined the North East Section Committee in 2008. Initially I felt I had very little to offer, but quickly realised that I could use my contacts at the local universities to promote CIEEM at undergraduate career events.

During my time as a member of the Committee I've seen CIEEM go from strength to strength. Each year we've increased the number of North East Section events, ranging from evening talks to our newly founded North East Section Field Club walks. There is nothing more satisfying than arranging an event that has been well attended and creating the opportunity for members to share knowledge, experience and perspectives.

If you are tempted to get involved with your local Section, my advice is: just go for it! Even in the early stages of your career you can make a real difference, whether it is offering a different perspective or utilising your contacts to organise an interesting event.

Name: **Diana Clark**
Occupation: Senior Ecologist, Baker Consultants
Section: East Midlands, Treasurer
Date Joined: 2014

My interest in joining the East Midlands Committee stemmed from a desire to help with organising events in my local region. I also liked the idea of contributing something back to the world of ecology, close to home.

Being part of a committee of people with similar goals and ambitions to myself is very satisfying. I enjoy being part of a dedicated team and helping to organise events is very useful experience – meeting other ecologists at events is also the perfect opportunity to exchange views and ideas.

Being part of a Section Committee does involve you giving some of your valuable time, so it's important to be clear from the start what you have the capacity to take on. Encourage your colleagues to get involved as well – there is strength in numbers and a larger Committee gives greater scope to organise activities. Above all, enjoy the experience and learn from anything that goes awry – perseverance is the key and it's well worth the effort.

As you can see, the Geographic Sections thrive on the diverse range of experience and perspectives that Committee members bring with them, providing a lively community of regional contacts and activities across the UK and Ireland.

At this time of year most Sections are starting to think about their next AGM and this is the ideal time for new Committee members to get involved. All Section Committee vacancies will now be advertised on the new 'Volunteering Opportunities' page of the CIEEM website (www.cieem.net/volunteering-opportunities) in the run up to their AGM.

If your local Section is not listed here, they may still have some vacancies that will be advertised closer to the time of their AGM. Committees are always glad to hear from potential new volunteers and CIEEM members of all grades are eligible to join, so please do get in touch for further details at vickybowskill@cieem.net.

To find out more about how you can support your Geographic Section please visit www.cieem.net/get-involved.

East Midlands Section News

East Midlands Section Conference and AGM 2015

Technological Advances in Ecology and Environmental Management

29 January 2015, Alfreton

Technology is seen by some as the enemy of skill and expertise, but when all three are used in harmony the possibilities are rather exciting. Whatever sector you work in – be it public, private, government, NGO or voluntary services – advances in technology affect our working lives on a daily basis. Whether this is using precision farm equipment to manage agricultural land more efficiently, using GIS systems to produce geo-spatially accurate maps or just upgrading an old heterodyne bat detector to a more recent model, there is no avoiding technology and the potential it holds to make our work safer, more accurate and of a higher standard.

The East Midlands Section Committee has put together this conference to help all of us gain a better understanding of the broad range of hardware, software and biological survey techniques now available. It is hoped that this event will assist with improving standards across the region by facilitating knowledge-sharing from experts in each subject area.

The morning will provide a programme of presentations, with the afternoon comprising a less formal series of workshops. There will also be plenty of opportunities for networking over tea and coffee.

For further details and to book your place please visit www.cieem.net/geographic-sections.

West Midlands Section News

Water Vole Mitigation and eDNA Testing for Great Crested Newts

Lisa Kerslake CEcol CEnv FCIEEM
West Midlands Section Vice Convenor

This evening event, organised by the West Midlands Section Committee, took place on 20th August at the Worcestershire Wildlife Trust at Hindlip and saw two fascinating talks covering new guidance on mitigation and licensing for water voles and eDNA testing for great crested newts.

Water voles – new guidance in relation to development/ construction activities

Mike Dean CEcol CEnv MCIEEM gave a very interesting presentation on the likely changes to water vole survey guidance and mitigation in relation to development, to be revealed in a forthcoming new guidance document. Consultation is going on at the moment and the new guidance should be published (by the Mammal Society) late 2014/early 2015.

There will be several changes from the previous guidance (as set out in the Water Vole Conservation Handbook), but the key changes will be clearer guidance (and greater restrictions) on the situations in which displacement can be

used as a mitigation technique, details of the proposed new requirement for displacement of water voles to be licensed, and more specific details of the survey methodology and level of survey effort required to inform a planning application.

eDNA testing for Great Crested Newts

Discussion on this topic was led by Aidan Marsh CEnv MCIEEM, with contributions from others who had also used this technique in 2014. Issues had arisen around the practicalities of collecting the samples, but by far the biggest difficulties were the logistics for processing the samples and obtaining the results in a timely manner.

There was debate about the time of year during which samples could potentially be taken and it was generally agreed that it had to be better if samples were taken later in the permissible window (e.g. late May-June) to reduce the chances of false results because newts might not yet have got to the ponds, particularly in the north.

All in all, most were agreed that as it stands the technique will be most useful for certain types of jobs/circumstances; for the vast majority of small scale, short lead-time jobs it is not that applicable unless there are certain changes, such as increasing the length of time over which you can collect samples or speeding up process times. Overall certainly not a panacea, but to be viewed as another technique that is useful in certain circumstances.

For further details of other activities of the happening in the West Midlands region please visit www.cieem.net/west-midlands.

South East England Section News

Wolf Viewing and Bat Walk at the UK Wolf Conservation Trust

Vicky Bowskill
Geographic Sections Coordinator, CIEEM

It was a beautiful autumn afternoon on 27th September as we drove through the gate to the UK Wolf Conservation Trust near Reading. After spending a few moments admiring wolves Torak and Mosi (whose enclosure borders the small car park) and a few of the local red kites scavenging for leftovers, we were welcomed into the Visitor Centre by the very friendly Trust volunteers.

Over 30 CIEEM members and non-members joined us for the evening, which began with a tour of the 10 resident wolves with Trust volunteers Bridget, Andy and Fran. As twilight grew we were treated to the evocative sound of wolves howling across the Berkshire countryside.

Moving into the Education Centre barn we began the second instalment of the evening with a talk by Bridget Parslow of the Berks and South Bucks Bat Group (www.berksbats.org.uk) on the bats that have been found to be living on the Trust estate. Common and soprano pipistrelles and brown long-eared bats have been detected locally, but also some indication of Natterers and Nathusius pipistrelles.

We were then introduced to Rose – a Noctule bat with a damaged wing that has been in care for some 11 years. We took a bit of time to admire Rose's small velvety body and delicate features as she sat in Bridget's gloved hand before heading out into the darkness with bat detectors to see who was about. It wasn't long before we heard the distinctive chirps of the local common pipistrelles hunting along the treeline and we even managed to glimpse a few bats against the darkening sky as they flitted past.

By that time the crepuscular wolves were feeling quite playful and we caught sight of them through the gloom as they skipped about and played chase – and a further chorus of howling was a delightful way to end the evening.

Read more about this and other South East Section events at www.cieem/south-east.

South West England Section News

Visit to Braunton Burrows (29 June 2014)

Eirene Williams CEnv FCIEEM

A dozen CIEEM members from as far afield as Gloucester met on an idyllic Sunday. The excursion was led by John and Mary Breeds and Rupert Hawley. John has had various roles on the Burrows for 30 years or more, during the National Nature Reserve phase, the dedesignation and later under the MOD umbrella. Mary is the expert author of the best illustrated guide to the flora of the Burrows and Rupert is the current education warden for the Christie Estates which owns the Burrows. Between them they filled us in on the convoluted management history, including the Second World War activities which restructured the dunes considerably, the later problems, especially around myxomatosis, the monitoring efforts over the decades, and the current efforts to control scrub using Red Devon cattle in large fenced areas. Higher Level Stewardship had provided for the fencing and some other necessary facilities such as scrapes to provide water for the cattle. All this was against the backdrop of the spectacular dunes and their vegetation.

The orchid populations were stunning in both quantity and quality; we saw 6 species, but the Southern Marsh was probably the most overwhelming with huge numbers of very large specimens. Many other species of plant and animal also caught our interest and the group frequently fragmented as there was so much to see. Lunch on the high dunes and then finally out onto the deserted beach completed the scenic tour through dune seral stages in reverse. Finally we circled back across the strand line, severely eroded in February storms, through the habitats in conventional ecological successional order.

Applicants and Admissions

The decision on admission is usually taken by the Membership Admissions Committee under delegated authority from the Governing Board but may be taken by the Governing Board itself. If any existing member or non-member has any good reason to object to someone being admitted to the Chartered Institute as a Full or Associate Member, based on compliance with the Code of Professional Conduct, they should fill in the membership objection form and return it to the Deputy Chief Executive Officer before 12th January 2015. The objection would be referred to the Professional Standards Committee to be considered according to the Disciplinary Regulations. CIEEM is pleased to welcome applications for Membership from the following:

APPLICANTS

Applications For Full Membership
Dr Natalie Crawley, Mrs Gabrielle Graham

Applications For Associate Membership
Mr Andrew Chick, Mr Charlie Fayers, Miss Rachel Godden, Miss Maeve Maher-McWilliams, Mr Simon Wellock

Applications to Upgrade to Full Membership
Miss Natasha Murray

** Associate members applying to upgrade to Full Membership are not listed here as they have been listed previously for their Associate membership application.*

Applications to Upgrade to Associate Membership
Miss Rachel Folkes

ADMISSIONS

Chartered Ecologists
Mr Henry Andrews, Dr Petronella Billings

Full Members
Miss Helen Archer, Dr Iain Barr, Mr William Bartholomew, Miss Elizabeth Biott, Mr Joseph Bradshaw, Ms Haidrun Breith, Dr Anne-Maria Brennan, Prof Ana Correia, Mr Sean Crossland, Miss Alison Curtis, Ms Susan Falconer, Miss Ceri Griffiths, Miss Samantha Hagon, Mr Geoff Hamilton, Ms Alison Johnston, Mr Nicholas Jones, Miss Alison Jukes, Mr Alistair Lilley, Dr Adrian Macleod, Mr Adam McClure, Ms Rachel McEvan, Ms Ruth Minogue, Miss Joana Rebelo Capela, Dr Rachel Stubbington, Mr Timothy Sykes, Miss Nancy Young

Associate Members
Mr Joe Barnes, Mr Mark Doherty, Ms Nicole Dunn, Miss Kimberley Gallaher, Miss Emma Grubb, Miss Katie Hadwin, Mr Ian Holland, Mr James Humphreys, Dr Rebecca Langton, Ms Lucy Lush, Miss Siobhan Mannion, Mr Benjamen Nelumbu, Mr Jonathan Ramsey, Mr Oliver Smith, Mr Adam Turner, Mr Christopher Turner, Ms Gillian Weyman

Upgrades to Full Membership
Mr Kieren Alexander, Ms Charlotte Billingham, Mr David Clark, Mr Scott Dodd, Ms Beverley Harris, Mr Joseph Lane, Mr Willie-John Macken, Mr Sean McGrogan, Miss Louisa Medland, Mr Innes Muir, Miss Nicola Pyle, Miss Ellen Somerwill, Miss Monique Speksnyder, Mr Jonathon Spencer

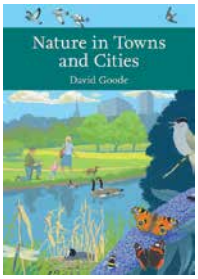
Upgrades to Associate Membership
Mr John Allsopp, Mr William Dommett, Miss Caroline Ford, Mr Richard Gould, Miss Joanna Greetham, Miss Lorna Griffiths, Miss Philippa Hardman, Miss Sara McBride, Miss Tess Pettinger, Miss Donna Popplewell, Ms Patricia Snaith, Mr Etienne Swarts, Mr Morgan Taylor

Graduate Members
Miss Tiffany Aslam, Miss Joanna Dodsworth, Mr Thomas Johnson, Miss Rachel Kennedy, Miss Amber Lewis-Bolton, Mr Josh Mitchell, Mr Jack Parker, Miss Zoe Phillips

Upgrades to Graduate Membership
Mr Peter Cowley, Mr Michael Fray, Miss Rebecca Harrington, Miss Emily Macfarlan

Student Members
Mr James Ayodeji, Miss Sophie Bennett, Jamey Bergman, Mr Darren Bonner, Miss Lucy Boyer, Ms Imogen Cavadino, Miss Jennifer Cox, Miss Louise Edwardes, Miss Georgina Flower, Mr Jay Ghumania, Mr Oliver Glenister, Ms Evlalia Gomez Martin, Mr David Gould, Mr Harvey Greatrex, Mr John Harvey, Mr Vincento Iannuzziello, Mr Tim Jacob, Miss Charlotte Keightley, Mr Daniel Lovatt, Miss Haley Marble, Mr Alexander Meadows, Miss Tali Nachoom, Mr Stuart Noble, Miss Jessica Nott, E. Sedef Orman, Miss Emma Peasland, Mr Jacob Peterken, Miss Alice Pritchard, Mr William Putt, Mr Bernard Randall, Miss Dawn Shaw, Miss Lindsay Stronge, Miss Aditi Subba, Mr Julian Trevino-Villarreal, Miss Laura Villar, Mr Bede West, Miss Amy Williams, Mr Sion Williams, Mr Ian Wilson, Dr Deborah Wright

Qualifying Members
Mr Philip Smith



Nature in Towns and Cities (New Naturalist)

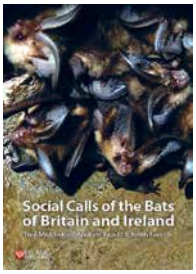
Author: David Goode CEnv FCIEEM

ISBN: 9780007242405

Price: from £35

Available from: www.newnaturalists.com

Not since Richard Fitter's landmark publication in 1945, *London's Natural History* – volume 3 in the New Naturalist series – has there been a comprehensive guide to urban natural history. Since then there have been major advances in the conservation of nature in our towns and cities, and there is even more to say about how animals and plants have adapted, in varying degrees, to urbanisation. But this is not merely an exploration of natural history within the urban environment. CIEEM Past President, Patron and Fellow David Goode uses his knowledge of urban ecology to describe the range of habitats and species which exist within urban areas, and shows how our understanding is being applied to encourage a greater variety of nature into towns and cities. He illustrates how an ecological approach can be incorporated within planning and design to create a range of habitats from tiny oases to extensive new urban woodland and wetlands.



Social Calls of the Bats of Britain and Ireland

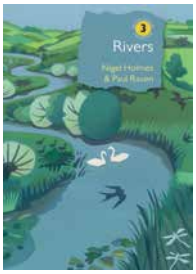
Authors: Neil Middleton ACIEEM, Andrew Froud and Keith French

ISBN: 9781907807978

Price: £29.99

Available from: www.pelagicpublishing.com

This book brings together the current state of knowledge of social calls relating to the bat species occurring within Britain and Ireland, with some additional examples from species represented elsewhere in Europe. It includes access to a downloadable library of calls to be used in conjunction with the book. Social calls are complex and intriguing to listen to; they are after all produced with listeners in mind (other bats). To enjoy and fully appreciate social calls the reader must also have the opportunity to become a listener: each of the presented sonograms in the book is cross-referenced to downloadable 'time expanded' .wav sound files which are contained within a much wider library of calls for you to explore.



Rivers (British Wildlife Collection)

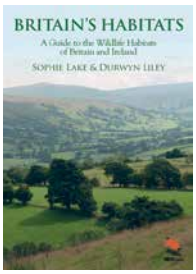
Authors: Nigel Holmes and Paul Raven

ISBN: 9780956490254

Price: £32.50

Available from: www.nhbs.com

Volume 3 in the British Wildlife Collection, *Rivers* is the definitive one-book study of this never-more-topical subject. Including detailed information about each of the huge variety of river-types to be found in Britain and their flora and fauna, discussion of individual examples both large and small, and crucial insights into their maintenance and the dangers – felt so acutely in recent years across the UK – of their mismanagement, this is essential reading for serious conservationist and interested layman alike.



Britain's Habitats: A Guide to the Wildlife Habitats of Britain and Ireland

Authors: Sophie Lake, Durwyn Liley MCIEEM, Robert Still and Andy Swash

ISBN: 9780691158556

Price: £27.95

Available from: http://press.princeton.edu

A photographic guide to habitats, this lavishly illustrated book provides a comprehensive overview of the natural history and conservation landscape of Britain and Ireland. In essence a field guide, the book leads the reader through all the main habitat types, with information on their characteristics, extent, geographical variation, key species, cultural importance, origins and conservation. It aims to help visitors to the countryside recognise the habitats around them, understand how they have evolved and what makes them special, and imagine how they might change in the future. This book is the perfect companion for anyone travelling in Britain and Ireland, and essential reading for all wildlife enthusiasts, professional ecologists and landscape architects.

Satellite remote sensing for applied ecologists: opportunities and challenges

Pettorelli, N. *et al*.

Journal of Applied Ecology 2014, 51: 839–848

The potential for satellite remote sensing (SRS) to provide key data has been highlighted by many researchers, with SRS offering repeatable, standardized and verifiable information on long-term trends in biodiversity indicators. SRS permits one to address questions on scales inaccessible to ground-based methods alone, facilitating the development of an integrated approach to natural resource management, where biodiversity, pressures to biodiversity and consequences of management decisions can all be monitored. The authors provide an interdisciplinary perspective on the prospects of SRS for ecological applications, reviewing established avenues and highlighting new research and technological developments that have a high potential to make a difference in environmental management. The y also discuss current barriers to the ecological application of SRS-based approaches and identify possible ways to overcome some of these limitations.

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Urban cultivation in allotments maintains soil qualities adversely affected by conventional agriculture

Edmondson, J.L. *et al*.

Journal of Applied Ecology, 51: 880–889

The authors compared the main indicators of soil quality; soil organic carbon storage, total nitrogen, C:N ratio and bulk density in urban allotments to soils from the surrounding agricultural region, and between the allotments and other urban greenspaces in a typical UK city. The study establishes that small-scale urban food production can occur without the penalty of soil degradation seen in conventional agriculture, and maintains the high soil quality seen in urban greenspaces.

Correspondence: j.edmondson@sheffield.ac.uk

Exploring restoration options for habitats, species and ecosystem services in the European Union

Egoh, B.N. *et al*.

Journal of Applied Ecology 2014, 51: 899–908

The authors evaluated options that exist for meeting an EU-wide 15% restoration target while conserving habitats and species and enhancing ecosystem services. They explored the effects of different restoration scenarios on the percentage of threatened habitat and species secured. Lastly, they explored the effects of including financial cost into the prioritization procedure. These results suggest that to achieve the greatest benefits, funding for restoration should be directed towards habitats with inadequate conservation status rather than to species. Countries with larger areas of threatened habitat and lower restoration costs may offer better opportunities to meet targets, but including cost at the EU level may result in unequal burden-sharing among countries.

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or benis.egoh@jrc.ec.europa.eu

Environmental DNA surveillance for invertebrate species: advantages and technical limitations to detect invasive crayfish *Procambarus clarkii* in freshwater ponds

Tréguier, A. *et al*.

Journal of Applied Ecology 2014, 51: 871–879

The authors examined the reliability of using eDNA to detect the presence of an invasive freshwater crustacean species, the red swamp crayfish *Procambarus clarkii*. The study methodology was applied to water samples collected in 158 ponds in a French Nature Park, and results were compared to a traditional method using food-baited funnel traps. eDNA had a better detection efficiency but predominantly led to divergent results compared with the trapping method. While habitat features partly explained the failure of crayfish detection by trapping, detection by eDNA was problematic at low crayfish abundances. When *P. clarkii* was detected, the estimated concentrations of crayfish DNA in water samples were always below the limit of quantification for the target DNA sequence. The combination of eDNA and conventional trapping methods is recommended to monitor the invasion by *P. clarkii* in small waterbodies such as ponds. However, the risk of mortality for non-target species, notably amphibians, has to be carefully evaluated before large-scale deployment of traps.

Correspondence: anne.treguier@gmail.com

Long-term changes to the frequency of occurrence of British moths are consistent with opposing and synergistic effects of climate and land-use changes

Fox, R. *et al*.

Journal of Applied Ecology 2014, 51: 949–957

The authors used a dataset of species occurrence records over the period 1970–2010 to assess changes in the frequency of occurrence of 673 macro-moth species in Britain. A diversity of responses was revealed: 260 moth species declined significantly, whereas 160 increased significantly. Overall, frequencies of occurrence declined, mirroring trends in less species-rich, yet more intensively studied taxa. Not all species of a given type behaved similarly, suggesting that complex interactions between species' attributes and different combinations of environmental drivers determine frequency of occurrence changes. The authors suggest that land-use change and climate change are both major drivers of moth biodiversity change, acting independently and in combination. The diverse responses show that multifaceted conservation strategies are needed to minimize negative biodiversity impacts of multiple environmental changes.

Correspondence: rfox@butterfly-conservation.org

Forthcoming Events 2014-15

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

Conferences		
Date	Title	Location
16 December	Overseas Territories Special Interest Group Conference – Lessons to be Learnt from Invasive Species Mitigation and Management in the British Overseas Territories	London

Training Courses		
22 January	Ecological Clerk of Works	Leeds
23 January	Environmental Advisor for Construction Sites	Leeds
27-28 January	Developing Practical Skills in Ecological Impact Assessment (EcIA)	Bristol
29 January	European Protected Species for Consultants	Oxford
3 February	Habitat Regulations Assessment (HRA of Projects)	London
10 February	Advanced Ecological Impact Assessment (EcIA)	Birmingham
17 February	Habitat Regulations Assessment (HRA of Plans)	London
18-19 February	Train the Trainer	London
19 February	Ecological Clerk of Works	Edinburgh
20 February	Environmental Advisor for Construction Sites	Edinburgh
24-25 February	Developing Practical Skills in Ecological Impact Assessment (EcIA)	Reading
27 February	Understanding Wildlife Law	Oxford
4 March	Advanced course in Ecological Impact Assessment (EcIA)	Bristol
9 March	Ecological Clerk of Works	Manchester
10 March	Environmental Advisor for Construction Sites	Manchester
10-11 March	Developing Practical Skills in Ecological Impact Assessment (EcIA)	Birmingham

Geographic Section Events		
29 January	East Midlands Section Conference and AGM	Alfreton
20 February	Welsh Section Conference and AGM	Bangor
16 April	North East England Section Conference	Newcastle

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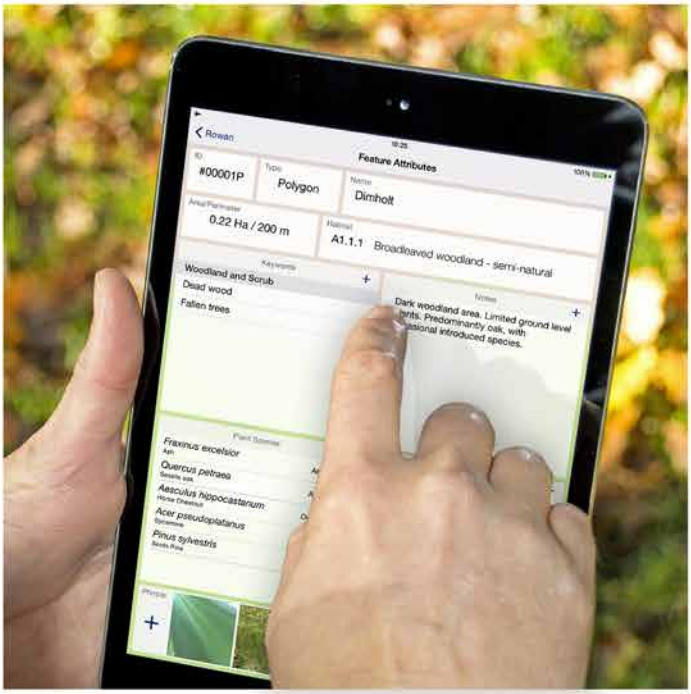
- Simple integration of photos to site records
- Create files for use in GIS programmes
- Export surveys to cloud, email and PC/Mac



For full details and availability visit: **bms.brookes.ac.uk/ceec/hp1toolkit** or call **01865 482891**