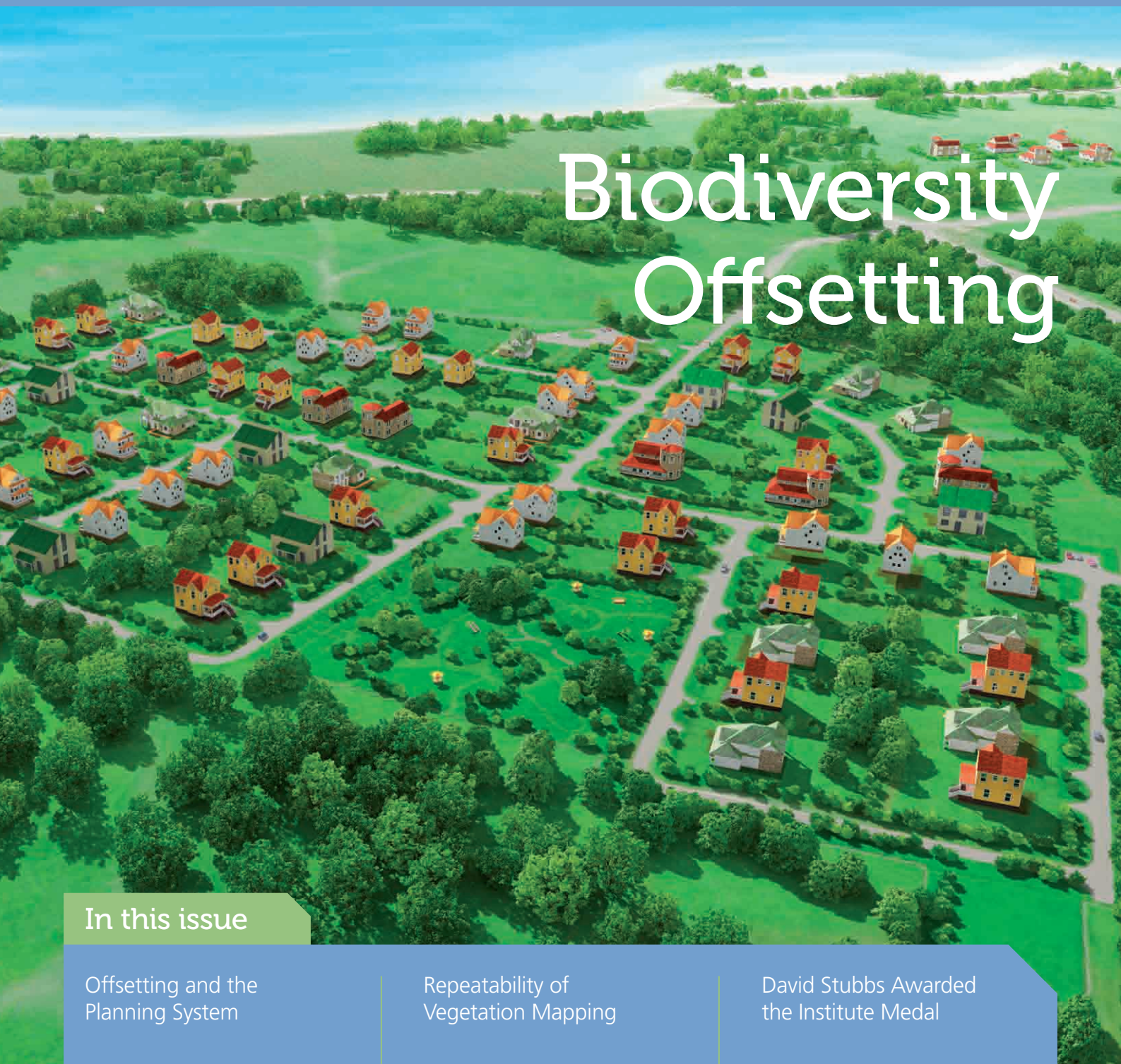
Bulletin of the Chartered Institute of Ecology and Environmental Management

CIEEM

inpractice

Issue 81 | September 2013



Biodiversity Offsetting

In this issue

Welcome

Biodiversity Needs Powerful Narratives, Good Stories and the Right Words

The recent *State of Nature* report by 25 conservation and research organisations demonstrates the ongoing losses of biodiversity in the UK. The EU Biodiversity Strategy to 2020 has a target of halting the loss of biodiversity and the degradation of ecosystem services by 2020. Three key things are needed to stop the loss of biodiversity and the degradation of ecosystems.

1. A Deliverable Vision and Mechanisms to Deliver the Vision
The overall vision and strategy is John Lawton's *Making Space for Nature* report. This recognises the importance of ecosystem services and sets out the future as needing to be coherent and made up of resilient ecological networks and More, Bigger, Better and Joined-up sites. Green and blue infrastructure is a fundamental part of these ecological networks that intersperse and join up villages, towns and cities.

The Landscape Institute (LI) has recently revised its Green Infrastructure position statement. Green and blue infrastructure was the subject of the extremely successful joint CIEEM-LI conference in Birmingham in early July. Our Patron, Tony Juniper, offered the challenge to divert 1% of the national health budget to green infrastructure and ecological restoration. Gary Grant came up with memorable phrases such as "*cool green roofs solving the urban heat island effect*". Pam Warhurst talked about her incredible edible gardens and 'propaganda' raised beds on the pavements that are expanding from the streets of her home town of Todmorden all across the UK.

The RSPB, RTPI and CIEEM have just launched the *Planning Naturally* document that sets out 12 principles of planning and biodiversity in the overall context of sustainable development. Backed by examples from across the UK and further afield, it sets out how we can achieve growth in housing, infrastructure and industry and maintain the habitats which support our threatened species.

2. People to Deliver the Vision
A huge range of people are needed to deliver the vision. The ecologists and environmental managers working to high professional standards. The enthusiastic supporters of local wildlife groups, County Wildlife Trusts or key bodies like the RSPB, Bat Conservation Trust and Buglife. The planners and landscape practitioners in both the public sector and the private sector who deal with biodiversity issues. The general public who generate the pressure on Parliament for an effective legislative framework for biodiversity and who are steadily increasing the membership of the voluntary bodies. The RSPB now has one million members and the combined membership of the Wildlife Trusts is around one million.

3. Working with Developers – Both Private and Public Sector
Biodiversity losses can be avoided, mitigated, compensated, or can be subject to biodiversity offsetting in the right circumstances. Nature is adaptable, species can be reintroduced, habitats can be restored. Biodiversity losses to developments are for the life of the development. But it is rare to find a change of use from built development to a nature reserve, which means mitigation and compensation measures have to be in perpetuity.

We must find more effective and innovative ways of using the Community Infrastructure Levy and Section 106 Agreements in England and Wales, and the equivalents in Scotland and Ireland, to obtain long-term funding commitments for biodiversity. Can money for biodiversity be obtained from the increase in land values that go with obtaining many planning permissions? Recycling a proportion of such gains back to local communities is consistent with the economic, social and environmental dimensions of sustainable development.

Conclusion
One of the outcomes of the 2013 CIEEM-LI conference on green infrastructure was the need for a narrative and for words that all can understand. We need to create clear narratives and good stories to explain to both the public and to professionals why biodiversity is crucial to our health and well-being. It is crucial to raise the awareness of developers and of the general public regarding the importance of biodiversity both in its own right and for enhancing the quality of life for everyone. A good story and the right words may well be why pollinators have become such a topical issue with the public this year in the context of two issues – banning neonicotinoid insecticides and cutting road verges.

John Box CEnv FCIEEM
President
@Johnbox_ecology

Information

In Practice No. 81, September 2013
ISSN 1754-4882

CIEEM Office
43 Southgate Street, Winchester, Hampshire, SO23 9EH, UK

T: 01962 868626
E: enquiries@cieem.net
W: www.cieem.net

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

Contents

Biodiversity Offsetting
David Hill CEnv FCIEEM

An Overview of Biodiversity Offsetting Within the Planning System
David Pape MCIEEM and David Tyldesley FCIEEM

Biodiversity Offsetting: A View from The Wildlife Trusts
Stephanie Hillborne

Is it Possible to Offset Loss of Habitat in the Marine Environment?
Roger Morris CEnv FCIEEM

Ecology Legal Update
Penny Simpson

Ecology in Australia
Neil Harwood CEnv MCIEEM

Repeatability of Vegetation Mapping in Phase 1 and NVC Approached: Implications for Professional Practice and Surveyors' Training Requirements
Andrew Cherrill CEnv MCIEEM

The Changing Face of Britain's Landscapes
Marion O'Sullivan

Defra delay biodiversity offsetting consultation

The Defra Biodiversity Offsetting consultation that was due to be published in July has been delayed until the autumn. The reason for the delay appears to be Defra wishing to further consult with stakeholders.

Environment suffers again in Spending Review

Chancellor George Osborne announced on 26th June in the 2013 Spending Review that Defra will see a further 10% reduction in its budget for spending in 2015-16. However this is likely to see nature conservation spending slashed even further as spending on flood defences is protected.

www.gov.uk/government/speeches/spending-round-2013-speech

www.gov.uk/government/publications/spending-round-2013-documents

Defra Review of the Major Infrastructure and Environment Unit published

The Major Infrastructure and Environment Unit (MIEU) was set up by Defra in April 2012 following the Habitats and Wild Birds Directives Implementation Review (March 2012). It is designed to improve implementation of the Directives of major infrastructure projects while helping avoid unnecessary costs and delays to developers.

www.gov.uk/government/publications/review-of-the-major-infrastructure-and-environment-unit

POSTnote published on the Selection of Marine Conservation Zones

Marine Conservation Zones may contribute to the protection and recovery of the marine environment. This POSTnote examines the process and approach used to select and designate zones, and difficulties in identifying and managing suitable areas.

www.parliament.uk/briefing-papers/POST-PN-437

Progress on implementation of the Habitats Directive Implementation Review

The Review looked at how the Directives are implemented in England and relevant UK waters. It was found that implementation generally works well, but identified room for improvement in four areas. Twenty-eight measures were announced to improve implementation across these areas. The Review set out a detailed timetable for delivery and 25 of the 28 measures have been implemented.

www.gov.uk/government/publications/progress-of-the-habitats-directive-implementation-review

POSTnote published on the Environmental Impact of Tidal Barrages

A tidal energy barrage across the Severn Estuary could produce up to 5% of the UK's electricity demand. It would help meet renewable energy targets but would have significant environmental impacts. This POSTnote summarises evidence on environmental impacts associated with the operation of tidal energy barrages and the effectiveness of compensatory measures.

www.parliament.uk/briefing-papers/POST-PN-435

BCT launch Boxplot

Boxplot is a web form to collect location information on installed integrated bat boxes as a means to gather evidence of their success or not.

www.bats.org.uk/boxplot

Update from the Forestry Regulation Task Force

Defra has published a one year update on the Government Response to the Forestry Regulation Task Force. The update states that good progress is being made in delivering the commitments the Government made in response to the Forestry Regulation Task Force's report in October 2011.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/206931/pb13947-frtf-update-20130614.pdf


© Jason Reeves

Latest woodland statistics published

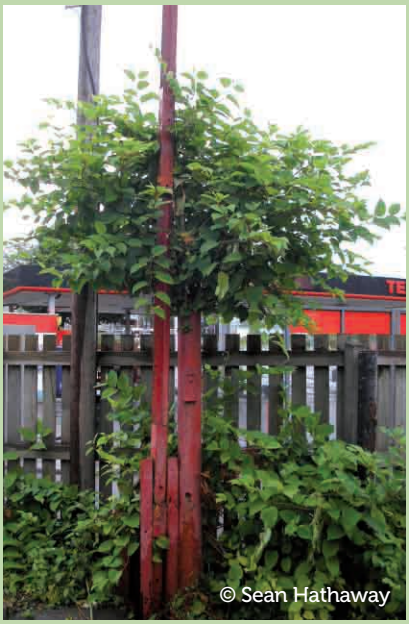
Provisional results for woodland area and certified woodland area at 31 March 2013, and new planting and restocking in 2012-13, were published in *Woodland Area, Planting and restocking: 2013 Edition* on 13 June 2013. The publication includes information on the sources and methodology used to produce the figures. *Forestry Statistics 2013* (to be published on 26 September 2013) will provide final figures at 31 March 2013. Summary results will be available in *Forestry Facts & Figures 2013* (to be published on the same date). A detailed woodland map of Great Britain has been produced using data from National Forest Inventory (NFI).

http://www.forestry.gov.uk/forestry/infd-7aqknx

Defra publish Catchment Based Approach report

Defra has published the report *Catchment Based Approach: Improving the Quality of Our Water Environment*. The report sets out a policy framework to encourage the wider adoption of an integrated catchment-based approach to improving the quality of the water environment. The aim is to deliver improved water quality and more ambitious River Basin Management Plans that contribute to meeting the UK's targets under the European Framework Directive.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/204231/pb13934-water-environment-catchment-based-approach.pdf


© Sean Hathaway

Updated guidance on Japanese knotweed control

The Environment Agency has updated its Code of Practice on Managing Japanese Knotweed on Development Sites. The Code has been updated to reflect changes in legislation since its publication in 2006.

http://bit.ly/11SAIBl

Natural England and Environment Agency to be retained as separate bodies

The Defra Triennial Review considered how the Environment Agency and Natural England can continue to deliver the government's priorities for the environment with improved resilience in the face of current and future environmental and economic challenges. The review concluded that the EA and NE should be retained as separate public bodies with separate purposes and functions, but that both bodies should continue to reform how they deliver their services to their customers and drive further efficiencies.

https://www.gov.uk/government/publications/triennial-review-of-the-environment-agency-ea-and-natural-england-ne

Natural Resources Wales steps up fight against larch disease

Natural Resources Wales has committed more than £2 million into the fight to deal with a disease which is attacking Britain's larch trees. The new body is to invest £500,000 straight away to combat *Phytophthora ramorum* by cutting down trees around the edges of infected areas to try to stop it from spreading further.

The urgent strategy also includes a groundbreaking trial to see if injecting trees with a common herbicide could be effective in slowing the spread of the disease. Natural Resources Wales will spend a further £1.7 million to remove infected trees, replant those areas and to build forest roads so that new areas can be cleared.

http://naturalresourceswales.gov.uk/our-work/news/natural-resources-wales-steps-up-fight-against-larch-disease/?lang=en

Scottish Wildlife Trust calls for green connections at heart of planning

The Scottish Wildlife Trust has called on MSPs to recognise the need for the National Planning Framework 3 (NPF3) and Scottish Planning Policy (SPP) to deliver quality places where people in Scotland want to live and do business. MSPs debated the issues facing the draft NPF3 and SSP on Wednesday 12th June 2013.

http://scottishwildlifetrust.org.uk/news/msps-urged-to-make-green-connections-at-the-heart-of-planning/

EU Environment Action Programme to 2020

The EU has agreed a new Environment Action Programme to 2020. The programme identifies nine priority objectives for the period up to 2020, including protecting nature and strengthening ecological resilience.

http://ec.europa.eu/environment/newprg/proposal.htm


© Jason Reeves

Northern Ireland issues consultation on Marine Protected Areas

The Department for the Environment has issued a consultation on a draft Strategy for Marine Protected Areas in the Northern Ireland Inshore Region, which closes on 30th September 2013.

www.doeni.gov.uk/marine_policy

Scottish plan to halt species loss published

An ambitious plan to protect and restore Scotland's environment has been launched by Environment Minister Paul Wheelhouse. The 2020 Challenge for Scotland's Biodiversity aims to:

- To protect and restore biodiversity on land and in our seas, and to support healthier ecosystems.
- Connect people with the natural world, for their health and wellbeing and to involve them more in decisions about their environment.
- Maximise the benefits for Scotland and of a diverse natural environment and the services it provides, contributing to a sustainable economic growth.

http://www.scotland.gov.uk/Resource/0042/00425276.pdf

CIEEM, the British Ecological Society and the Scottish Government Biodiversity Strategy Group are holding a joint meeting on the new strategy on 19-20 September 2013 in Edinburgh.

http://www.cieem.net/events/542/the-scottish-biodiversity-strategy-opportunities-and-challenges-for-science

Northern Ireland introduces new planning policy to protect natural heritage

Northern Ireland Environment Minister Alex Attwood has issued a new planning policy for the protection of nature conservation and protected landscapes. Planning Policy Statement 2 'Natural Heritage' (PPS2) aims to conserve, protect and enhance the diversity of natural heritage. The policy updates the protection of designated sites in the North in line with legislative change at European and domestic level. PPS2 will encourage protection of natural heritage by:

- Ensuring a proportionate approach to allow development without causing harm to NI's rich natural heritage assets.
- Contributing towards halting biodiversity loss and furthering the Government's commitment to sustainable development.
- Promoting well-being through the protection of the natural environment and providing opportunities for sensitive economic growth.

www.doeni.gov.uk/news_Details.htm?newsRef=2771

CAP deal is bad news for wildlife

The Common Agricultural Policy (CAP) deal agreed on 26th June 2013 in Brussels fails to support more sustainable and wildlife-friendly farming.

On greening measures, the compromise package:

- Exempts farms of under 15ha from new requirements to create ecological focus areas (EFAs) – land that is to be set aside to promote biodiversity and help absorb farm runoff. Initially, the requirement will apply to 5% of farmland in 2015, re-writing the Commission's original proposal to require a minimum 7%. Environmentalists, who wanted a 10% minimum, said the new standards mean little since the new CAP would exempt more than a third of all farmland and 89% of farmers from the rules.
- Exempts farms under 10ha – a third of EU farms – from new crop diversification rules that are aimed to improve soil quality. Farmers with 10-30ha would have to plant two crops, while those over 30ha would be required to plant three.
- Exempts farmers from some EU environmental and water pollution laws, defeating efforts by the Commission and some MEPs to bring agriculture in line with other industries.
- Takes a step back from Commission proposals for EU-wide environmental mandates by giving member states flexibility to apply standards, options that environmental groups say will lead to uneven enforcement.

http://www.euractiv.com/cap/damn-tough-deal-cap-leaves-celeb-news-528909

https://www.gov.uk/government/news/uk-votes-on-common-agricultural-policy-reform

GLOBE launches Natural Capital Legislation Study

The study reviews international efforts to value ecosystem services and assesses the measures that eight countries are taking to integrate the value of natural capital into policy and economic decision-making.

http://www.globeinternational.org/index.php/legislation-policy/studies/natcapstudyintegration/research/newsalert/pdf/332na5.pdf

World Bank Report on Biodiversity and National Accounting

The World Bank has published a policy research working paper on *Biodiversity and National Accounting*. The paper explores the extent to which biodiversity and changes in biodiversity could be measured within the existing structure of the System of National Accounts, as well as assessing how the System of National Accounts could be extended to include a broader portion of the value of biodiversity.

http://elibrary.worldbank.org/content/workingpaper/10.1596/1813-9450-6441

Climate change impact on species

Research published in the journal *Nature Climate Change* has concluded that climate change could reduce the geographic ranges of thousands of common plant and animal species during this century. The study looked at nearly 50,000 globally widespread and common species and found that more than half of the plants and over a third of animal species could lose more than half of their climatic range by 2080 if greenhouse gas emissions are not reduced.

http://www.nature.com/nclimate/journal/v3/n7/full/nclimate1887.html

CIEEM represented on GCN working group

Chris Gleed-Owen MCIEEM has been representing CIEEM on the Defra GCN Task Force, which has been looking at how to encourage consistent, competent and timely decision-making in the planning process where great crested newts (GCN) are a factor. The working group has been looking at how the planning system works at the moment, and what could be improved in order to support growth without adversely affecting the conservation status of GCN.

Effects of shale gas development on water quality: experiences from Pennsylvania

The impact of shale gas development on surface water quality has been explored in a recent study. Focusing on the Pennsylvania portion of the Marcellus Shale formation (which stretches from West Virginia to the Canadian border), the researchers conclude that shale gas wells and the treatment of shale gas extraction waste have measurable impacts on downstream surface water quality. The study revealed that downstream concentrations of chloride increased when there were more wastewater plants treating and releasing shale gas waste in an area. High levels of chloride can damage aquatic ecosystems, and also trigger the release of other pollutants, such as heavy metals and phosphates, from sediment.

http://ec.europa.eu/environment/

CIEEM represented on ICE offsetting group

Roger Morris CEnv FCIEEM has been representing CIEEM on the Institute of Civil Engineers' (ICE) working group on coastal and estuarine biodiversity offsetting. ICE believes that biodiversity offsetting has the potential to make a significant contribution to delivering no net loss of important coastal and estuarine habitats through win-win projects which also offer an opportunity for the landowner. However, they also consider that the additional certainty provided by a consistent policy framework will be important in helping to secure the delivery of such benefits. ICE has however highlighted some of the challenges that will need to be addressed if biodiversity offsetting is to achieve its full potential at the coast. ICE has encouraged Defra to take explicit account of coast-specific issues in developing the forthcoming Green Paper.

Aquatic fern added to invasive species list

The Giant Salvinia *Salvinia molesta* has been added to the list of 100 of the World's Worst Invasive Alien Species. The aquatic fern replaces the rinderpest virus, which was declared eradicated in the wild in 2010.

http://www.issg.org/database/species/search.asp?st=100ss&fr=1&str=&lang=EN

Biodiversity Offsetting

Arable field © C Webster

David Hill CEnv FCIEEM
Chairman, Environment Bank

Background

Back in 2004 I gave a Fellows lecture at the annual conference entitled 'Mitigation: what will we leave behind?'. Three things crystallised in my mind at that time. First, after 20 years in the ecological consultancy world I had become dismayed at the general failure of mitigation schemes to do little more than secure a planning permission. Second, reading the papers of Jo Treweek and Stewart Thompson published in 1997 on the efficacy of ecology within environmental statements, reinforced my view that mitigation design was often, or even largely, a fudge based on almost no science or evidence. Third, I realised I was not getting any younger and all around me I saw that the wildlife I had known in abundance as a child in the 1960s was disappearing rapidly. The causes are now well known and are mainly due to agricultural intensification and development. I just couldn't justify carrying on this way. So I began to research an alternative means of at least capturing the real cost of the use of land – one that included the impact on wildlife and conservation.

Before I describe how I developed my thoughts on offsetting, I would like to outline why I think on-site mitigation has often, or even largely, failed to account for biodiversity value. I think there are three problems.

First, when presented with a planning application from a developer and his/her consultants the planning authority assesses the impacts based on what the consultants say. Usually a range of on-site mitigation options are proposed – in theory at least following the 'mitigation hierarchy', avoidance being the first objective. But generally, let's be honest, there is hardly any metric-based science around the impacts of the development on species populations and habitats, and so the mitigation that is designed is very much a compromise. So the first problem is a lack of application of ecological knowledge and understanding to quantifying the scale of impact or mitigation.

Second, the planning authority only has jurisdiction in most cases to affect mitigation design and extent within the 'red line' boundary of the application. Often, more mitigation 'habitat' is requested within the site boundary in order to get as much as possible from the development, and in the process reducing the net developable area, without proper consideration of whether this will be valuable and useful habitat. I have seen so many situations where mitigation has been squeezed into a development scheme which doesn't have a hope in hell of maintaining the biodiversity resource, let alone making a net contribution to conservation for the future. We have all seen the fragments of trees called woodland, the patch of grass called neutral hay meadow, the tiny pond called a wetland – I could go on.

The third issue is long-term governance. The developer may go bust or sell the site on when, or even before, it is developed. There is unlikely to be any monitoring of the value of the mitigation habitat, nor any enforcement, because even after spending a considerable amount of time writing the Section 106 agreement or planning condition, the will and capacity to enforce non-compliance seems to evaporate. Added to which the consultant often has a difficult job, having built up a good relationship with the developers' project manager, only for that person to move on with a new broom put in place who has no interest in delivering biodiversity objectives or a management plan for the development site. This has happened to me frequently and it is hugely discouraging.

All of these thoughts crystallised for me when, in 2008, I asked over 400 ecologists in the audience at an IEEM conference how many could take me to see a mitigation scheme that had fully worked in accordance with the design within the Environmental Statement (ES), demonstrating how biodiversity was retained, enhanced and managed for the long-term. Not one person put up their hand – not one. So it should come as no surprise to find that a very recent revisit to environmental statements by Kat Drayson and Stewart Thompson, showed that there has been no improvement in the way ecology and biodiversity conservation is treated within ESs. Their analysis suggested that only 30% of mitigation schemes are ever implemented, that implementation plans are rarely good enough anyway, that there is no risk management for unsuccessful implementation, that there are hardly any monitoring recommendations and, where there are, there are very few monitoring commitments made[1]. Defra's own

Local connections to nature © Gordon Howe

research[2] undertaken by David Tyldesley and Associates reporting in 2012 analysed 570 planning applications and showed that Planning Policy Statement 9 (PPS9) objectives are not being delivered because of weak local development frameworks, inconsistency across Local Planning Authorities (LPAs), a lack of ecological capacity within LPAs to determine impacts and understand how to mitigate them, and the fact that conditions and obligations are not monitored or enforced. It showed that LPA planners frequently do not seek compensation because current delivery mechanisms are too complex and they feel unable to enforce conditions themselves. They consider suitable compensation land difficult to find because it would often require *in perpetuity* developer involvement (where the developer owns the compensation site), whereas developers do not want to be tied into a long-term mitigation liability. The Tyldesley study also concluded that if offset sites are located and managed well, the biodiversity value of the offset land will be higher than the value of the habitats lost, giving a net benefit to the natural environment.

So in 2008 I decided to try and do something different. I brought the idea of habitat banking and biodiversity offsetting to the UK having read a lot about how it works in the United States and Australia. Many people back then thought it was not a good idea, I know, but the potential that biodiversity offsetting, done properly, brings for delivering real environmental gain, truly sustainable development, has become clear. I have discussed offsetting with a huge number of people, across the full range of professions involved in the planning and development control 'industry', and those involved in the land-based sectors, and recognition of its potential has grown to the extent that Government introduced it as a policy mechanism in the Natural Environment White Paper in 2011.

Biodiversity as a Benefit

We need to recognise that what we have been doing at the interface of conservation, planning and development has not worked – certainly not as well as it should have done. So we need to explore approaches where a healthy natural environment and a healthy economy go hand in hand. We need to make the case that sustainable development, the golden thread running through the National Planning Policy Framework, can only occur where the 'value' of the natural environment is fully embedded within the planning system; not a luxury or 'nice to have' where the environment is simply treated as a charitable exercise, nor indeed a constraint or problem. Biodiversity offsetting facilitates, for the first time, proper evaluation of nature using agreed metrics, enabling us to more accurately quantify impacts and calculate the proper cost of offsetting those impacts and delivering net gain. Using offsetting metrics enables planning policy to consider treating biodiversity as a **benefit** of a development which can be weighed against other more conventional benefits such as need, traffic considerations, contribution to local communities, value to jobs and the local and national economy – the very things developers spend a lot of time trying to convince sceptics and objectors about. Then the development sector will see that taking account of biodiversity, and offsetting it where impacts cannot be avoided or mitigated – by purchasing conservation credits which are then spent on receptor site creation and management – will be a benefit of their scheme that can substantially influence its likelihood of success. That would revolutionise the way biodiversity is considered in the planning system. So the big idea here is for us to seek ways of using offsetting to influence a policy shift to see biodiversity conservation as a benefit of a development not a constraint. We should work up how to assess the weighting to be given to biodiversity relative to other benefits or disbenefits of development.

Biodiversity Offsetting in Context

By now many of you will have read about biodiversity offsetting. It has become one of the Governments main themes for contributing to both economic and environmental recovery - it is important to put into context what has been happening in environmental policy over recent years. There have been five major initiatives into which offsetting plays.

First, there was the impressive TEEB (The Economics of Ecosystems and Biodiversity) work and associated reports which aimed to enable the 'valuation' of nature at individual, societal and corporate levels. For the first time the economic value of 'ecosystem services' was spelt out and the necessity of accounting for environmental loss agreed – unless we realise nature has a cost and hence a 'price' it will simply not be valued in a way that enables it to be properly weighted against competing claims on funds. The main thrust of TEEB was to make nature economically visible rather than invisible as it is currently viewed. Our reliance just on intrinsic value has not been sufficient to prevent catastrophic declines in biodiversity in the past 50 years.

Second, the Government set up the National Ecosystem Assessment, an excellent collation of our current knowledge, published last year by Defra, which illustrates the impact of the decline in our nation's ecosystem services. With few exceptions there has been a widespread decline in the provision of nature's goods and services, with highly important socio-economic implications. This catalysed the term 'ecosystem services' into everyday parlance, making the point that we must take an ecosystem approach to the way in which we manage land. Easy to say, difficult to implement, but we are starting to try.

Third, John Lawton's *Making Space for Nature* work showed the substantial importance of not simply allocating constrained funds into protected sites and species, but to take a bigger, more holistic view of nature in the wider countryside. It argued that to establish an ecologically coherent functional network of protected areas, there would need to be an annual spend of around £1.2 billion – i.e. three times the amount of money currently spent on the whole agri-environment programme. Let's be realistic – none of this will be possible in the absence of a new major source of funding.

Fourth, the Government set up, as a deliverable from the Natural Environment White Paper, the Ecosystem Markets Taskforce (EMTF) – comprising a group of business people who were tasked with coming up with a range of recommendations around 'markets' for nature.

Fifth, the Government established the Natural Capital Committee (NCC) which seeks to find ways for individuals and corporates to fully account for the impacts of their business and their supply chains, on biodiversity and ecosystems.

The above have and continue to demonstrate why nature is economically as well as intrinsically important, why biodiversity decline must be reversed, and how 'markets for nature' could provide the investment needed to pay for that reversal. And in parallel to these initiatives, there has been an increasing emphasis placed on the value of biodiversity offsetting to bring forward that investment into the natural environment. The EMTF report made five priority recommendations, one of which was to make biodiversity offsetting mandatory in the UK. This would be achieved by requiring local planning authorities simply to apply the offsetting metrics developed by Defra to all developments, and those for which a residual impact remains would be required to offset that impact by buying 'conservation credits' according to the biodiversity offset units affected by the development.

What is Biodiversity Offsetting?

Biodiversity offsets are "*conservation activities designed to deliver biodiversity benefits in one place to compensate for losses in another, in a measurable way*". Essentially, development impact in one place can be offset by environmental gain (habitat creation or restoration) in another. Offsetting transforms the existing situation where there is biodiversity loss, into one where there is overall biodiversity gain. For example, a housing development that partially destroys an area of grassland in one place could provide compensation by paying for the creation of a new area of grassland somewhere else (but close by, with the proximity determined by what is ecologically coherent and correct). Although compensation of this sort through the planning system has, in effect, been happening for some time, biodiversity offsets are distinguished by the requirement for measurable and transparent outcomes: the losses resulting from the impact of the development and the gains achieved through an offset are measured in the same way.

If a developer and LPA recognise that a development, despite implementation of all the usual on-site mitigation measures, still has some net residual impact on the environment, then the developer may purchase 'conservation credits' that offset this damage. The monies paid to buy the conservation credits are then used to fund long-term environmental management, which delivers biodiversity gain at 'receptor' sites elsewhere.

The aim of biodiversity offsetting is to produce real environmental gain; offsetting will allow development that delivers houses and jobs to proceed, whilst ensuring that the environmental impact of that development is recognised and compensated for through large-scale and long-term habitat creation – i.e. truly sustainable development.

Formalised offsetting, using Defra metrics to assess loss and gain, is new in this country and some seem to think it could be a 'licence to trash' for developers who will be able to damage sensitive wildlife sites. The Environment Bank recognises these concerns but offsetting is tried and tested around the world and there are extensive guidelines and principles to determine how it should best operate here. Biodiversity offsetting has been used for 30 or so years across the world, particularly in the USA and, over the last decade, in Australia. International experience has been collated, analysed and summarised by BBOP (Business and Biodiversity Offsetting Programme) – a consortium of environmental NGOs, businesses and statutory authorities with experience of biodiversity offsetting. BBOP has published 10 international 'guiding principles' for offsetting; if these principles are followed then biodiversity gain, and hence truly sustainable development, is assured. These principles expand on the mitigation hierarchy and what can and can't be offset, they require no net loss (and preferably net gain) of biodiversity, they require additionality at offset sites, stakeholder participation and equity, long-term outcomes, transparency and accountability in calculations and delivery, and best use of science and local knowledge. The Environment Bank is a member of the BBOP family and sits on the BBOP Advisory Committee.

Enforcement of these principles ensures offsetting could never be a 'licence to trash' for statutory sites. Indeed, offsetting places very real 'costs' on the destruction of all habitats of environmental value, and the higher the ecological value the higher the credit score and the higher the cost. Faced with two otherwise equal sites, one of high ecological value and the other of low ecological value, the developer now has a clear financial driver (which is much more effective than the current 'consideration' that some LPA planning committees give to local wildlife sites) to avoid damaging the good site. In short, offsetting is the opposite of a 'licence to trash' – it is a powerful 'incentive to avoid trashing'.

LPAs are accustomed to following the mitigation hierarchy when considering potential environmental damage from development. Initially, any potential damage must be avoided if at all possible; if it cannot be avoided then it must be reduced (mitigated) as much as possible. If damage remains after avoidance and mitigation, then it must be compensated for as much as possible on-site (although this must be done with rigour – on-site compensation has, to date, often been both expensive and ineffective). Only after avoidance, mitigation and effective on-site compensation, can any residual environmental damage be considered for compensation off-site through biodiversity offsetting. There will be limits as to what can be offset and when; a rule of thumb would be that offsetting does not apply in situations where there is damage to a protected statutory wildlife site. The existing legislation to protect nationally important sites is there for good reason and biodiversity offsetting should not be used to circumvent that. Furthermore, there are some habitats where offsetting is not appropriate even if they are outside a protected area – habitats that are impossible to re-create – with ancient woodland being a good example. For the most highly protected habitats and sites – Natura 2000 sites that are designated under the European nature directives – off-site compensation is already enshrined in legislation. In these special cases though, the process applies only for 'imperative reasons of over-riding public interest' and must be agreed by the Secretary of State. At present these matters are outside the remit of biodiversity offsetting.

'Additionality' is a key principle for offsetting – funds generated through

offsetting must only be used to deliver land management that is extra to what is already happening. But offsetting can be used to buffer existing Sites of Scientific Interest (SSSIs) or increase the coherence of the SSSI network through the creation of habitat corridors or stepping stones. Although offset funds would not be used to pay for management covered by Higher Level Stewardship agreements via agri-environment payments, there is nothing to stop landowners from receiving funding for projects that deliver conservation outcomes that are additional to their agri-environment schemes on the same land.

What Would Constitute an Effective Offsetting System?

I therefore believe we need to use offsetting to properly account for the environmental impact of development, to create greater levels of investment into the environment, and put this investment into the hands of land managers, be they farmers or conservation bodies, with the expertise and the desire to deliver real long-term environmental gain.

What would be needed for an effective system? At the Environment Bank we have been working up an effective business model which involves:

a. Making the application of the Defra metrics mandatory to all developments and those which have a residual impact would be required to purchase conservation credits which would be used to create and manage new and enhance existing receptor sites.

b. A trading system – which provides a market-based mechanism through which developers would purchase conservation credits. We have set up the Environmental Markets Exchange (EME) for that purpose and we are currently populating it with potential receptor sites on a national scale (landowners, farmers and conservation bodies can now register land on the EME to receive offset funding).

c. Delivery systems – we have established contracts for the purchase of conservation credits and contracts for the proper delivery of offset receptor sites including securing their long-term management and monitoring.

Benefits of Offsetting

There are a number of important benefits of biodiversity offsetting to developers, landowners, farmers, nature conservation bodies and planning authorities.

Offsetting will provide much greater clarity to developers in navigating the planning system, saving programme time and money with predictable and fixed one-off costs. The liability for mitigation and compensation delivery would be discharged in one go with the purchase of offset credits from, for example, the Environment Bank, so there is no long-term management liability for the developer. There would be potential for increased net developable areas at the same time as a transparent demonstration of a better treatment of biodiversity in the development project.

Benefits to landowners, farmers and conservation bodies are that offsetting provides long-term and assured income in return for appropriate land management. Site owners also retain ownership of their land, which is essential for most landowners – they don't want to sell to a developer to meet their mitigation obligations, they want to keep the land in the family. In the process, larger and higher quality sites are delivered and at a landscape-scale such that 'Lawtonian' conservation could be achieved.

The benefits to planning authorities include a more transparent and auditable system, reduced burdens of enforcement and compliance monitoring and more predictable and accountable outcomes. Biodiversity offsetting would provide public bodies with a clear and auditable way of discharging their biodiversity duty. Finally, there would be huge opportunities for the consultancy profession to evaluate the metrics for development sites, to bring forward receptor sites for registering, and to produce management and monitoring plans for receptor sites to secure funding.

Conclusion

I believe biodiversity offsetting provides a new, better and simpler means of investing in the natural environment – in the right place and at the right scale. It enables nature to be properly valued and accounted for. It enables development and enhancement of nature to go hand-in-hand. The decision-making is retained by the Planning Authorities, but the systems (metrics, brokering, legal and fiscal risk management) are delivered by bodies such as the Environment Bank, and the long-term land management is delivered by willing participants with the expertise, desire and capacity for large-scale long-term habitat creation. We have put a lot of thought into how to build the foundations of an effective system – what we need now is cross-sectoral commitment to steadily and surely implement a proper, robust and accountable mechanism that is not overly complex, that does not lead to increased net costs – in short, a system that is truly a win-win for both the environment and the economy.

Further Information

www.environmentbank.com – see our newsletters and what's new

Environmental Markets Exchange – become a signed up member

www.environmentbank.mmearth.com

Notes

1. Drayson, K. and Thompson, S. (2013). Ecological mitigation measures in English Environmental Impact Assessment. *Journal of Environmental Management* **119:** 103-110.

2. Defra (2012). Planning Policy and Biodiversity Offsets. Report on Phase I Research. Desk study on the effectiveness of PPS9 in delivering the policy of no net loss. Defra, February 2012. David Tyldesley and Associates (2012a). Planning Policy and Biodiversity Offsets. Report on Phase II Research. Effectiveness of the application of current planning policy in the Town and Country Planning System. Defra, March 2012. David Tyldesley and Associates (2012b). Planning Policy and Biodiversity Offsets. Report on Phase III Research. Application of a new biodiversity offsetting metric to an existing sample of real-life historic cases. Defra, May 2012.

About the Author

David Hill is a Fellow and Past President of the Institute, Chairman of The Environment Bank and Deputy Chair of Natural England. Over the past 4 years he has been actively promoting environmental markets to provide new and innovative ways of mitigating for impacts on ecosystem services and the natural environment arising from development, industry and corporate businesses. David is also a member of RSPB, BTO, Norfolk Wildlife Trust and a life member of the National Trust.

Contact David at:
dhill@davidhillecology.com

An Overview of Biodiversity Offsetting Within the Planning System

David Pape MCIEEM
Director, NatureConsult Ltd

David Tyldesley FRTPI FCIEEM FRSA
Principal, David Tyldesley and Associates

Introduction

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

Biodiversity offsets are activities designed to deliver benefits for wildlife species and habitats to compensate for any residual losses arising from development, after appropriate prevention and mitigation measures have been taken. The goal of biodiversity offsets is to achieve no net loss of biodiversity and preferably a gain in biodiversity with its associated benefits provided to society and the economy.

Government commitment to investigate the potential application of biodiversity offsetting was set out in the Natural Environment White Paper 2011[1]. Establishing an offsetting system requires detailed planning and preparation – from a metric for measuring loss and compensation to institutional structures for trading credits and debits and a transparent process within the planning system. Defra is implementing a phased research programme which includes the current pilots investigating the practical application of offsetting[2]. Analysis of practice from abroad is proving useful and the process is being assisted by enterprise, involving the Environment Bank[3], progressive local authorities and partnerships.

Momentum on offsetting is building. The Ecosystems Market Task Force, established by Government to review business opportunities that arise from valuing nature, published its report in March 2013. One of the five key recommendations is that "*Government should clearly signal its intention to mandate a national system of biodiversity offsetting across England*"[4]. Government will probably have issued its response to this recommendation and a consultation on the topic by the time this edition of *In Practice* is published.

This article draws on our experience in supporting Defra with its research on planning policy and biodiversity offsets and our experience of the planning process. It provides an overview of how offsetting fits within the planning system and the issues to be addressed if this is to be successfully achieved.

Offsetting and Planning Policy

The National Planning Policy Framework (NPPF)[5] maintains the sequential approach to considering biodiversity that was established under the previous Planning Policy Statement 9 (PPS9) – avoiding ecological impact, mitigating impacts and compensating residual impacts: "*if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused.*" (NPPF para. 118).

Importantly, the NPPF also advocates "*moving from net loss of biodiversity to achieving net gains for nature*". (NPPF para. 9).

However, our research for Defra has shown that under PPS9[6] (and no doubt continuing under the new planning framework) the planning system is not delivering the compensation and biodiversity enhancements required – see Box 1.

Box 1. The planning system is not adequately addressing national planning policy for biodiversity: some findings from research reports for Defra on Planning Policy and Biodiversity Offsets

Report for Defra (2011). Effectiveness of the application of current planning policy in the Town and Country Planning System[7]

- About 8% of the 'major' development cases 'overlooked' biodiversity or were judged to have addressed PPS9 principles inadequately.
- There is generally a poor understanding of the distinction between mitigation and compensation.
- Planning officers often preferred to impose conditions as mitigation, rather than refuse permission, but may refuse permission in preference to negotiating complex compensation.
- Wider ecological networks, connectivity and non-designated features important for biodiversity were infrequently considered and related opportunities usually overlooked.
- A few examples were found that involved enhancement of habitats but these were limited in number, scale and distribution.

Report for Defra (2012). Application of a new biodiversity offsetting metric to an existing sample of real-life historic cases[8]

- Of 23 cases involving measurable loss of habitat, 16 required offsetting and in 12 of these the gross loss was the loss to be compensated, because no offsetting was provided by the development.

Wind farm © David Kilbey

Biodiversity offsetting has the potential to provide a very effective mechanism for helping to ensure that NPPF aspirations are implemented, by its structured approach to measuring and compensating unavoidable residual impacts and securing environmental gain.

Measuring Offset Requirements

Defra, with support from Natural England and others, have developed a metric[9] that allows biodiversity losses and compensation to be measured and which could provide a consistent and equitable framework for applying compensation requirements across development. The metric is summarised in Box 2.

Box 2. The metric for calculating biodiversity losses and offsets

The metric is used to calculate:

- the loss of habitat (measured in units of biodiversity)
- the offset required to compensate for residual loss (in hectares of habitat restoration or creation required to compensate for the units of biodiversity lost)

The metric calculates the value of biodiversity lost in units by multiplying values of distinctiveness and condition of the habitat lost and the area of habitat lost (distinctiveness x condition x area).

The area of habitat restoration or creation to be provided to offset loss is determined by calculating the area of the chosen habitat restoration / creation that would provide biodiversity units that are equivalent to the units of biodiversity lost.

Multipliers are applied to this area to reflect circumstances such as difficulty in achieving condition of created habitat or time taken to create or restore the habitat. This increases the area of compensation to be provided.

However, when calculating offsets provided the calculation starts with a given area of habitat creation or restoration. To determine the number of biodiversity units that this is worth, the area is divided by the multipliers (effectively reducing the number of units it is worth) in order to take account of the time lag or difficulty in achieving the target condition of this area.

Tree planting © Phil Welton

Our research for Defra[8] on applying this metric to past planning cases has helped test its efficacy. We consider the metric is generally fit for purpose and its use is being further tested in the offset pilots. Care is required when using the metric: its application requires professional judgements by ecologists and there are circumstances governing when and how the metric should be used. Some of the findings of applying the metric are set out in Box 3.

Box 3. Applying the metric: some findings from applying the metric to a sample of past planning applications[8]

- It is likely that the metric will be used to offset the loss of widespread habitats of low biodiversity value, more than it will be used to offset the loss of habitats of high biodiversity value.
- The metric requires a number of judgements and choices to be made. These should be made by experienced ecologists who are familiar with the planning system and the effects of development on the natural environment. The more skilled and experienced the ecologists are, the more effective, impartial and fair will be the application of the metric.
- It is important to generate a template or proforma to apply the metric in a systematic, open and transparent way where all calculations, judgements and assumptions can be recorded and checked.
- The lower the target condition of offsets the greater the area of offset required. Choosing a lower condition target can therefore inflate costs if applied on an area (per hectare) basis and costs are not adjusted to reflect lower restoration/ creation inputs. In reality lower inputs would not be expected as offsets are generally required to be managed 'in perpetuity'.
- The use of multipliers is a valid approach, but their effect can substantially change the requirements for new or restored habitats.
- The metric cannot be used in isolation as a method whereby local planning authorities might attempt to determine planning applications, for example, by calculating losses and comparing these with compensation to be provided by the developer. In two cases studied, permission was refused for good biodiversity reasons, despite the fact that the number of biodiversity units being proposed by the developer, as compensation for the losses on the site, were higher than the units calculated to be lost.
- The metric does not consider the position and function of habitats on a site, in their wider context, or their role in contributing to wider ecosystem services, when calculating loss, even though some of these aspects are taken into account as a multiplier when calculating the offset to be provided.
- Although a matter of opinion, and not taking account of any new benefits that could have been negotiated under PPS9, it is concluded that the application of the metric would have been likely to deliver more biodiversity value, in terms of more effective offsetting for development, than the compensation that would have been provided by full application of the principles of PPS9.
- Multipliers are used to counteract the difficulties of habitat creation or restoration and to take account of reduced values spatially and temporally. However, although a matter of opinion, in the long-term, if offset sites are located and managed well the likelihood is that the biodiversity value of the offset land (as it would be measured by the metric) will be higher than the biodiversity value of the habitats lost (as measured in this study by the metric). In other words, although the objective is to be confident that loss will be compensated or offset, the result is likely to be a net benefit for biodiversity conservation, in relation to the effects of development.

Location and Supply of Offsets

There are good arguments for locating offsets as near to the area of loss as possible – for example to maintain public access to nature in urban areas. However there are also advantages to targeting offsets to locations that may be removed from the impact, but which are a particular priority for environmental enhancement – for example to maintain and build ecological networks.

There is also the potential to combine the offsets required from several developments into a single offset, maximising the gain in a particular area through a larger enhancement. Conversely, it may be difficult to offset the range of impacts of a particular development in a single location. An offset may therefore have to be divided across more than one location. Pooling and targeting of offsets requires co-ordination of provision (see 'administrative framework' below).

Location of offsets requires careful consideration including targeting, zoning and restriction on the geographic area within which offsets are provided, sensitive to local circumstances. Offsetting strategies produced by Local Nature Partnerships (LNPs) data from Local Record Centres (LRCs) and consideration across local authority boundaries will be important.

Potential offset providers include developers, landowners and conservation organisations. A habitat banking system, where credits can be created and stored ready for future purchase and a 'broker' is used to manage arrangements between developers and offset providers, is essential for an offsetting system.

Biodiversity offsetting has the potential to stimulate a market for biodiversity provision. But for providers to invest in providing offsets they will need a degree of certainty that there will be a return on their investment. It is unlikely that a strong market will be generated unless offsetting becomes mandatory.

The Costs of Offsetting

By applying the metric to a range of past planning cases[8] we have assisted Defra with evaluating the cost of offsetting in comparison with costs of fully applying existing planning policy (set out in

PPS9). This involved comparing planning obligations with the cost of creating/managing offset habitat, but did not include administrative costs attached to either the current planning system or an offsetting system.

Subject to the limitations of the study, the cost of offsetting was found to be lower than the cost of applying the principles of PPS9 under the current planning system, except where the offset provider would need to include the cost of land acquisition. See Box 4.

Box 4. Comparison of costs of offsetting with the costs of implementing current planning policy: some findings from applying the metric to a sample of past planning applications[8]

The study calculated that the average cost of fully applying the principles of PPS9 in the 24 study cases would be £407 per dwelling unit. This is approximately:

- five times higher than the average additional cost of £81 per dwelling unit, resulting from the application of the metric for a lowland meadow habitat restoration on land already owned by an offset provider with profit foregone on alternative use of that land;
- 61% higher than the average additional cost of £252 per dwelling unit, resulting from the application of the metric for a new lowland meadow habitat creation on land owned by the offset provider but including the cost of profit foregone; and
- 74% of the average additional cost of £550 per dwelling unit, using the metric calculations to create new lowland meadow habitat on land which had to be purchased by the offset provider, taking account of the cost of land acquisition and assuming profit would be foregone.

The costs of offsetting, as calculated in this study, generated unit costs (per dwelling) which are not so high, when compared to other costs per unit in a planning obligation in the same timeframe, that they might be regarded by a Local Planning Authority (LPA) as unreasonable to impose.

Some of the benefits of an offsetting system for developers to be weighed against the cost of offsets include:

- Greater clarity of what is required through the planning system
- Removal of protracted negotiations and uncertainties
- Up-front calculation of costs and planning of the development
- Compensation off-site allowing increased area available for development
- Avoidance of compromised compensation measures on-site which are poor value for money
- Ongoing offset management obligations discharged to the offset provider

Securing Offsets Within Planning Permission

The promotion of offsetting has coincided with a time of change and uncertainty in the use of established mechanisms for achieving the delivery of infrastructure and ecological mitigation and compensation measures in planning. There remains a degree of hesitancy about how far a planning authority can go in seeking enhancement, despite the policy mandate in the NPPF.

Offsetting measures are generally considered to fall outside the definition of 'infrastructure' to which the Community Infrastructure Levy (CIL) Regulations[10] can apply. Restrictions on the use of 'section 106 planning obligations' are already in place and, nationally from April 2014[11] it will not be possible to use five or more obligations to fund any one project or type of infrastructure entered into after 6th April 2010.

At present it does not look as though offsetting measures will be deliverable through the CIL. Planning obligations will be legitimate mechanisms for bespoke offset solutions relating to one or a small number of related developments. But the way forward for most planning applications, and the general provision for offsetting, may have to be through the use of conditions imposed on planning permissions. These may include the use of 'negative' or 'Grampian' type conditions, prohibiting commencement of development until a specific offsetting arrangement has been approved by the planning authority for that development. To ensure that the condition passes the 'six tests' long ago set by case law and policy[12], a firm policy basis or, better still, a mandatory requirement, may be necessary. In the meantime, pre-application discussion is the time to embed offsetting as a fundamental element of a development proposal. Once incorporated as a firm commitment into the proposals that are actually submitted, the use of conditions can be safely relied upon to guarantee delivery.

The Administrative Framework

Introducing offsetting at an appropriate scale will require operational changes associated with the planning system:

- Habitat banking is needed where offset credits are registered and made available for purchase, with the support of a broker to help developers source offsets and manage arrangements between developers and offset providers.
- A standard metric is required to measure debits and credits and a clear method of documenting the calculations so that offset requirements, provision and transactions are transparent.
- A national registry of accredited offsets (identifying those purchased or available for sale) would assist regulation to avoid any repeated use of the same offset for more than one impact.
- Local authorities will need to be able to verify the quantification of losses and that the offset provided by the developer meets the compensation required (whether calculated by the developer or a broker) as well as ensuring any local offset strategy requirements are met, before development is allowed to proceed.

- Responsibility for management of offsets (preferably in perpetuity) will lie with the offset provider and this will require appropriate agreements and monitoring.
- Brokers/habitat bankers would benefit from being accredited and offset delivery will require monitoring. A range of standards need to be put in place for an effective and robust offsetting system. A specific organisation needs to have responsibility for managing standards, accreditation and offset delivery.

Should Offsetting be Mandatory?

There are two basic approaches to delivering offsetting within the planning system:

- A statutory requirement.
- A strong policy framework that is a material consideration in every relevant planning application decision.

For the latter we believe it needs to be more explicitly set out as an expectation rather than as an aspiration in national policy.

We think the NPPF would need to be strengthened to be the sole provider of the policy context. In the absence of a firm and explicit national policy, if offsetting is to rely on a policy approach, then every Local Plan would need a policy for it. Even if promoted at high level in national policy there is still a danger that local delivery will vary widely and lead to uneven and potentially unfair inconsistencies of application.

To be applied efficiently, effectively and fairly we need a national policy framework and national 'how to apply it' guidance, but that would seem to run counter to present Government inclinations to cut guidance to a minimum.

In other words unless a statutory basis is introduced there are some potentially serious impediments to delivery through policy.

Unless biodiversity offsetting becomes mandatory, providing confidence in a demand for offsets, potential offset providers are unlikely to come forward and the huge potential market investment in biodiversity will not materialise.

David Tyldesley is currently running a series of Masterclasses for CIEEM on HRA of projects and plans. See the CIEEM website for more details.

Overview

- Offsetting provides a robust mechanism for securing planning policy objectives for biodiversity, which are currently not being met.
- Offsetting provides a very wide range of benefits, across Government objectives.
- Offsetting is a cost effective mechanism for developers (in terms of compensation provision, discharge of responsibility for managing compensation land and up-front certainty of the requirements of the planning process).
- The offsetting metric is fit for purpose, but using the metric requires the professional judgement of an ecologist.
- The metric cannot be used in isolation – LPA decisions on planning proposals require professional ecological judgement on the applicability of offsetting.
- LPA ecologists, LRCs and LNPs have a key role to play in implementing an offsetting system.
- A robust institutional framework for brokering offsets, registration of offsets and monitoring offset provision is required.
- Offsetting needs to be mandatory to ensure that the planning system is equitable and to ensure potential offset providers have confidence in the market for environmental enhancement.

About the Authors

David Pape MCIEEM is Director of NatureConsult Ltd an environmental consultancy supporting the public sector and their partners in land-use planning, research, policy and programme development. He has undertaken research on biodiversity offsetting for Defra with David Tyldesley. For many years David was Head of Ecology for Hampshire County Council.

Contact David at:
david.pape@natureconsult.co.uk

David Tyldesley FRTPI FCIEEM FRSA is principal of a consultancy working at the interface of planning for landscape and nature conservation since 1983. He led two Defra research projects on offsetting 2010-2012. He is co-director of DTA Publications Limited publishing the online Habitats Regulations Handbook and Journal.

Contact David at:
david@dt-a.co.uk

References

1 HMSO (2011). Natural Environment White Paper – *The Natural Choice: securing the value of nature*.

http://www.official-documents.gov.uk/document/cm80/8082/8082.pdf

2 Information on biodiversity offsetting pilots available at https://www.gov.uk/biodiversity-offsetting#biodiversity-offsetting-pilots-and-schemes

3 Information on the Environment Bank and biodiversity offsetting available at http://www.environmentbank.com/biodiversity-offsetting.html

4 Ecosystems Markets Task Force (2013). *Realising Nature's Value: The Final Report of the Ecosystems Markets Task Force*.

http://www.defra.gov.uk/ecosystem-markets/work/publications-reports/

5 DCLG (2012). National Planning Policy Framework.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

6 ODPM (2005). Planning Policy Statement 9: Biodiversity and Geological Conservation. http://www.planningportal.gov.uk/planning/planningpolicyandlegislation/previousenglishpolicy/ppgpps/pps9

7 David Tyldesley and Associates (2011). *Effectiveness of the Application of Current Planning Policy in the Town and Country Planning System*. Report to the Department for Environment, Food and Rural Affairs.

http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=17509&FromSearch=Y&Publisher=1&SearchText=biodiversity%20offsets&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description

8 Tyldesley, D., Lomax, P., Pape, D. and Oxford, M. (2012). *Application of a New Biodiversity Offsetting Metric to an Existing Sample of Real-Life Historic Cases*. Report to the Department for Environment, Food and Rural Affairs.

http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=17831

9 Defra (2012). Technical Paper: *The metric for the biodiversity offsetting pilot in England*.

https://www.gov.uk/government/publications/technical-paper-the-metric-for-the-biodiversity-offsetting-pilot-in-england

10 The Community Infrastructure Levy Regulations 2010 as amended. http://www.legislation.gov.uk/ukdsi/2010/9780111492390/contents

11 DCLG (2013). Community Infrastructure Levy guidance, para. 89.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/197687/Community_Infrastructure_Levy_2013.pdf

12 DCLG (2012). National Planning Policy Framework, para. 206. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

Improving the Mitigation Hierarchy and Getting to No Net Loss: International Developments and the Challenge for Biodiversity Professionals

Kerry ten Kate
Forest Trends

This article summarises a number of recent developments in the field of biodiversity offsetting, highlights some common elements of measures for no net loss of biodiversity and remaining challenges, and points to the likely demands upon professionals in the field of ecological and environmental management.

1. Introduction

With its White Paper commitment to a 'net gain of biodiversity', England is one among a number of countries – Sweden, Canada, New Zealand, South Africa, Peru, Colombia and Papua New Guinea are others – currently developing policy aimed at ensuring no net loss or better in the context of development projects. These countries are designing contemporary approaches to the thorough application of the mitigation hierarchy (see Figure 1), including biodiversity offsets. They are lucky to be able to learn lessons from the original pioneers, such as the United States, Australia and Germany, and more recent protagonists such as France.

Box 1. Definition of biodiversity offsets, according to the Principles for Biodiversity Offsets supported by all the members of the BBOP Advisory Group[1]

Biodiversity offsets are measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development[2] after appropriate prevention and mitigation measures have been taken. The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure, ecosystem function and people's use and cultural values associated with biodiversity.

Regulatory measures are just one of the drivers for developers to improve their performance and demonstrate no net loss or a net gain of biodiversity for their projects. Access to finance, the business case for voluntary approaches and new standards on biodiversity offsets are also influential motivations for best practice.

2. Recent developments on No Net Loss: what is the motivation for developers?

For decades, developers around the world have been accustomed to planning a variety of measures to mitigate the environmental impact of proposed projects, including loss of biodiversity and ecosystem services. However, policy, financial and business drivers have changed substantially over the last few years, ushering in a more rigorous approach to the mitigation hierarchy, and marking a new social compact. In the past, society was prepared to accept projects' residual social and environmental impacts in exchange for the economic benefits of jobs and revenue that accompanied them. The contemporary expectation is for net social, environmental and economic gains, demonstrated by a more rigorous approach to the quantification of impacts and benefits.

There are three principal motivations for developers to demonstrate no net loss or a net gain of biodiversity: to comply with the legal requirements for offsets or compensation now found in over 30 countries[3] and Environmental Impact Assessment (EIA) and planning laws in many more; the voluntary business case for no net loss; and to meet investor requirements.

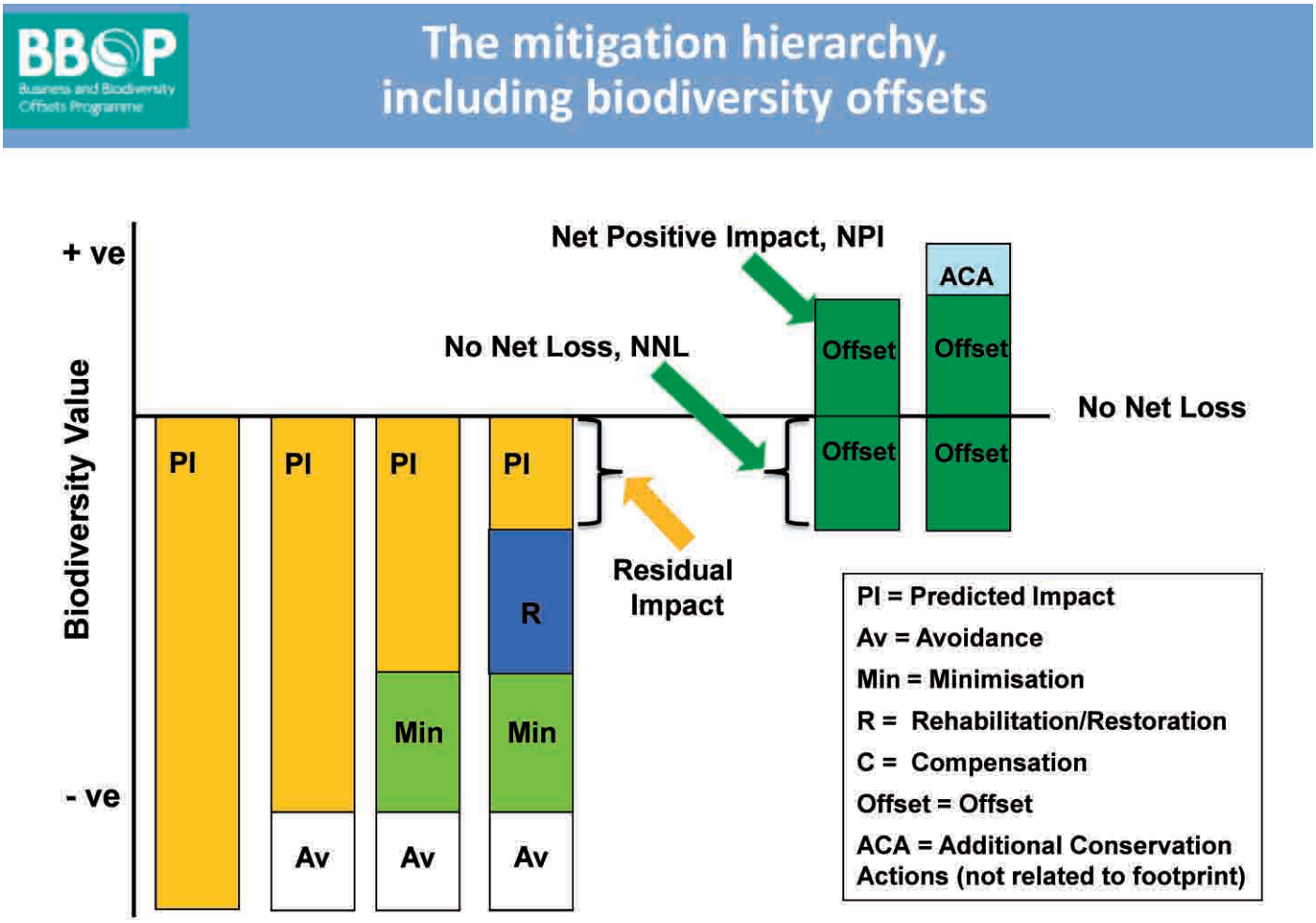


Figure 1. The Mitigation Hierarchy

The business case for best practice in following the mitigation hierarchy with respect to biodiversity is often summarised as follows:

- Access to land, sea and related natural resources (directly, or through supply chains).
- Legal and social (functional) license to operate.
- Access to markets for products (old and new).
- Access to human capital.
- A seat at policy development table.
- Access to capital and insurance.

Some 38 companies have adopted corporate commitments to no net loss or similar outcomes, including 15 from the mining and aggregates sectors.[4]

In addition, a major driver for biodiversity offsets is the International Finance Corporation's (IFC) revised Performance Standard 6 (PS6), which came into effect on 1st January 2012 and is summarised in Box 2. PS6 is now a condition of project finance from the over 78 financial institutions that have adopted the Equator Principles, and thus apply the IFC's Performance Standards.[5]

The Business and Biodiversity Offsets Programme (BBOP), established by Forest Trends, is a collaboration between some 80 organisations (companies, government agencies, conservation organisations and financial institutions) from around the world[6], as well as some independent experts. Its aim is to develop shared views and experience of best practice in following the mitigation hierarchy and demonstrating 'no net loss' or a 'net gain' of biodiversity, including through the use of biodiversity offsets. Between 2004 and 2009, the initial 40 members of BBOP's Advisory Group developed methodologies to support best practice in voluntary biodiversity offsets, tested in a series of pilot projects. Chief among the group's products is a set of basic principles which members of the Advisory Group unanimously support. They hope that other companies, governments and civil society will also adopt the principles (set out in Box 3) as a sound basis for ensuring high quality biodiversity offsets.

When BBOP embarked on its second phase of work (2009-2012), members felt that what was needed was an agreed standard on biodiversity offsets, allowing companies to demonstrate in a credible way that their approach to the mitigation hierarchy reflected best practice. The Standard on Biodiversity Offsets ('the Standard') (http://bbop.forest-trends.org/guidelines/Standard.pdf) and the accompanying supporting materials, released in January 2012, are the product of seven years of experimentation and negotiation among over 80 companies, governments, civil

Box 2. IFC Performance Standard 6

The IFC's updated Sustainability Framework took effect on 1st January 2012, including the IFC's 8 Performance Standards. Performance Standard 6: Biodiversity Management and Sustainable Management of Living Natural Resources, places certain requirements on clients whose projects will impact 'natural' or 'critical' habitat, among other issues.

'Natural Habitat': The client will not significantly convert or degrade natural habitats, unless:

- No other viable alternatives within the region exist for development of the project on modified habitat.
- Consultation has established the views of stakeholders on the conversion and degradation.
- Any conversion or degradation is mitigated according to the mitigation hierarchy.
- Mitigation measures are designed to achieve **no net loss of biodiversity** where feasible. Appropriate actions include: avoiding impacts on biodiversity through the identification and protection of set-asides; implementing measures to minimise habitat fragmentation, such as biological corridors; restoring habitats during and/or after operations; and implementing biodiversity offsets.

'Critical Habitat': In areas of 'critical habitat', there shall be no project unless the client has demonstrated that:

- no other viable alternatives within the region exist for development of the project on modified or natural habitats that are not critical;
- the project does not lead to measurable adverse impacts on biodiversity values for which critical habitat is designated and on ecological processes supporting them;
- the project does not lead to net reduction in the global and/or national/regional population of any Critically Endangered or Endangered species over a reasonable period of time; and
- a robust, appropriately designed, and long-term biodiversity monitoring and evaluation programme is integrated into the client's management programme.

In cases where a client can meet these requirements, the project's mitigation strategy will be described in a Biodiversity Action Plan and will be designed to achieve **net gains** of those biodiversity values for which critical habitat was designated.

The design of the offset must be carried out in alignment with best available information and current practices. External experts with knowledge in offset design and implementation must be involved. IFC Guidance Note 6 (which accompanies PS6) references the BBOP Principles as an internationally recognized standard in biodiversity offset design.

Clients are also obliged to undertake a systematic review (with the participation of affected communities) to identify priority ecosystem services which the project is likely to impact, resulting in adverse impacts to affected communities, and ecosystem services on which the project is directly dependent for operations. The client is to avoid and minimise impacts on priority ecosystem services and implement mitigation measures that increase resource efficiency of their operations.

See: http://www.ifc.org/ifcext/policyreview.nsf

Box 3. Principles on Biodiversity Offsets supported by all the members of the BBOP Advisory Group

These principles establish a framework for designing and implementing biodiversity offsets and verifying their success. Biodiversity offsets should be designed to comply with all relevant national and international law, and planned and implemented in accordance with the Convention on Biological Diversity and its ecosystem approach, as articulated in National Biodiversity Strategies and Action Plans.

1. ***Adherence to the mitigation hierarchy:*** A biodiversity offset is a commitment to compensate for significant residual adverse impacts on biodiversity identified after appropriate avoidance, minimization and on-site rehabilitation measures have been taken according to the mitigation hierarchy.
2. ***Limits to what can be offset:*** There are situations where residual impacts cannot be fully compensated for by a biodiversity offset because of the irreplaceability or vulnerability of the biodiversity affected.
3. ***Landscape context:*** A biodiversity offset should be designed and implemented in a landscape context to achieve the expected measurable conservation outcomes taking into account available information on the full range of biological, social and cultural values of biodiversity and supporting an ecosystem approach.
4. ***No net loss:*** A biodiversity offset should be designed and implemented to achieve in situ, measurable conservation outcomes that can reasonably be expected to result in no net loss and preferably a net gain of biodiversity.
5. ***Additional conservation outcomes:*** A biodiversity offset should achieve conservation outcomes above

Box 3 continued

and beyond results that would have occurred if the offset had not taken place. Offset design and implementation should avoid displacing activities harmful to biodiversity to other locations.

6. ***Stakeholder participation:*** In areas affected by the project and by the biodiversity offset, the effective participation of stakeholders should be ensured in decision-making about biodiversity offsets, including their evaluation, selection, design, and implementation and monitoring.

7. ***Equity:*** A biodiversity offset should be designed and implemented in an equitable manner, which means the sharing among stakeholders of the rights and responsibilities, risks and rewards associated with a project and offset in a fair and balanced way, respecting legal and customary arrangements. Special consideration should be given to respecting both internationally and nationally recognized rights of indigenous peoples and local communities.

8. ***Long-term outcomes:*** The design and implementation of a biodiversity offset should be based on an adaptive management approach, incorporating monitoring and evaluation, with the objective of securing outcomes that last at least as long as the project's impacts and preferably in perpetuity.

9. ***Transparency:*** The design and implementation of a biodiversity offset, and communication of its results to the public, should be undertaken in a transparent and timely manner.

10. ***Science and traditional knowledge:*** The design and implementation of a biodiversity offset should be a documented process informed by sound science, including an appropriate consideration of traditional knowledge.

* While biodiversity offsets are defined here in terms of specific development projects (such as a road or a mine), they could also be used to compensate for the broader effects of programmes and plans.

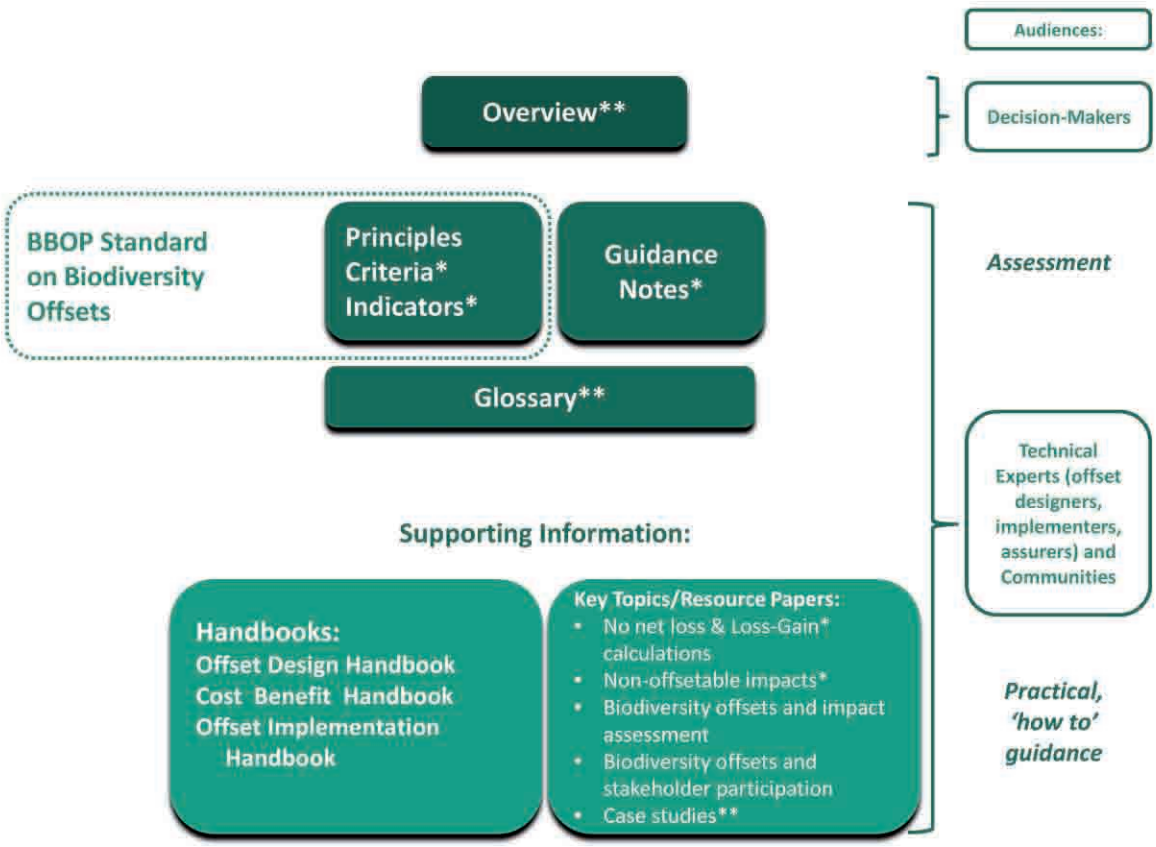


Figure 2. BBOP Standard on Biodiversity Offsets and Associated Material available on http://bbop.forest-trends.org/pages/guidelines
Note: Documents published in 2009, unless marked as follows: * First prepared in 2012; ** Updated 2012

society organisations, research groups and financial institutions from around the world, as well as public consultations. Their aim was to help companies and their auditors and investors determine whether international best practice has been followed in avoiding and minimising impacts on biodiversity, undertaking restoration, and ultimately offsetting any residual impacts in order to demonstrate no net loss, or preferably a net gain, of biodiversity. The Standard presents criteria and indicators that build on the set of 10 principles on biodiversity offsets set out in Box 3 that define best practice in biodiversity offsets. It is accompanied by guidance notes for assessors and a glossary. The BBOP Standard complements other standards on carbon, and water, and guidelines on alleviation of poverty and helps companies show they meet safeguards such as those established by the World Bank and the International Finance Corporation.

Certain elements of the approach by financial institutions and the BBOP Principles and Standard described in Boxes 2 and 3 are found in policies and regulations in countries around the world related to biodiversity offsets and compensation. Common features of governments' policies on biodiversity offsets and compensation include:

- **Policy goal and desired outcome:** for instance, no net loss or a net gain.
- **Levels:** Whether different requirements obtain for biodiversity of varying levels of conservation priority: for instance, as in PS6, no net loss for natural habitats and net gain for critical habitats.
- **Scope:** whether the policy covers all biodiversity or particular components (e.g. native vegetation, or habitat types such as wetlands), and whether it covers ecosystem services.
- **Principles and Standards:** core principles such as additionality, permanence, ecological equivalence, no net loss, etc. Standards for offset design and delivery (e.g. for use of metrics and offset design, and for offset implementation). (See Box 3. BBOP Principles and Standard.)
- **Trigger and process:** the circumstances in which offsets are required, and whether and how this is tied to the environmental impact assessment, permitting and planning processes.
- **Limits and thresholds:** Description of circumstances in which impacts are so severe (for instance, when they are on particularly vulnerable and irreplaceable biodiversity) that no net loss is not an appropriate approach and thus offsets are not feasible, and what alternative is envisaged (e.g. presumption against project and/or compensation that does not achieve no net loss).
- **Exchange rules:** 'Like for like or better' criteria for the kind of biodiversity affected by the project and provided by the offset. These may be set such that a close match is required for the offset while for losses of lower conservation significant the criteria may be quite flexible, allowing 'trading up' to a wider range of biodiversity types of higher conservation value.
- **Mapping, data and landscape level planning:** Tools for assessing the regional significance of projects' impacts, mapping natural and critical habitat, for applying the mitigation hierarchy (eg identifying areas where development should be avoided) and basis for establishing priority locations for offset activities (promoting connectivity, for instance).
- **Metrics:** An accounting system and set of metrics covering habitats and species and how to quantify residual losses (after avoidance, minimization and restoration/rehabilitation) and commensurate offset gains so as to calculate the scale and nature of activities needed to achieve no net loss. May include temporal elements (e.g. time discounting).
- **What counts as gain:** Provisions describing the activities that are accepted as generating the offset gains to balance projects' losses. These usually entail restoration activities and/or 'averted loss' offsets (e.g. introducing new levels of legal protection and addressing the underlying causes of loss of biodiversity to arrest loss and degradation).
- **Implementation options:** Description of whether the long-term conservation outcomes involved in the mitigation measures and offsets are to be undertaken by the developer itself, by partners acting on its behalf (e.g. NGOs or local authorities), or through systems of conservation banking.
- **Monitoring and enforcement:** How the implementation of the mitigation measures and offset activities will be monitored and enforced over the long term (at least as long as the impacts endure).

A number of lessons emerge from past experience of offset systems put in place by governments. In terms of the ecology of biodiversity offsets, some older and more biologically specialised components (for instance, veteran trees in an ancient woodland) are more difficult to replicate or replace. There are species whose habitat may be impossible to re-create, some compensatory approaches may never succeed[7], evidence of ecological restoration to deliver offsets remains sparse[8], and the likelihood that offset areas based on re-creation will follow a predicted ecological path is questionable in some circumstances, for instance where there may be stochastic events[9]. The time scales required for restored sites to match the target state can be extremely long, in some cases ranging from several decades to centuries[10].

There is always a tension in offset systems between scientific rigour – necessitating time and investment in fieldwork – and the pragmatism needed to meet developers' expectations for quick and simple planning processes. The metrics used to quantify losses and gains for biodiversity offsets have their limitations, often because of the need to limit their complexity to achieve an operationally practical process[11]. Simple metrics that do not capture the complexities of biodiversity can result in the failure to protect biodiversity.[12] Without great care, surrogate measures of biodiversity can obscure what is exchanged, allowing the loss of biodiversity that is rare and difficult to conserve and its replacement by more commonplace biodiversity.

When it comes to the practical realities of delivering no net loss of biodiversity, offset policies can be compromised by inadequate implementation. Offset outcomes are heavily dependent on the long-term management and protection of the offset site. Adequate standards,

monitoring and compliance are critical to success. Non-compliance can lead to significant failure rates for offsets[13]. The more successful offset systems involve performance-based, periodic payments.

There is now enough experience of these common challenges that offset systems can be designed in such a way as to avoid and address them to the extent possible.

Ecological and environmental management is at the centre of successful offset design and implementation. The next section explores the new requirements of professionals in the field.

3. Implications for the practitioner community and conclusions

Policy-makers, companies and banks alike will turn to ecologists and environmental managers to help with the design and implementation of individual offsets and national offset systems. Environmental professionals are likely to have a number of roles:

- Managing environmental and social impact assessments that are reformed to integrate planning for no net loss of biodiversity, and scoping and undertaking the baseline studies involved, including a broader landscape view that enables the regional significance of the biodiversity components affected to be assessed.
- Assessing direct, indirect and cumulative impacts of projects on biodiversity and ecosystem services.
- Advising companies on the application of the mitigation hierarchy for particular projects, and documenting the measures taken for each step of the hierarchy.
- Mapping critical and natural habitat, helping companies and governments prepare the maps of habitat types and condition classes and assessing and mapping populations of species.
- Establishing the scientific basis for 'like for like or better' approaches to ecological equivalence.
- Selecting or designing suitable 'area x condition' and/or species- based metrics for loss-gain calculations, and using these to quantify residual impacts and incremental potential offset gains.
- Comparing potential offset sites and selecting the optimum set of offset activities and sites for a project to demonstrate no net loss or a net gain of biodiversity.
- Preparing Biodiversity Offset Management Plans (BOMPs)[14].
- Within conservation banking and conservation credit systems, assessing, on behalf of regulators, the nature and number of 'credits' needed by a particular developer (using the metrics and exchange rules agreed for the system in question) and the nature and number of credits that landowners could generate on their land and sell into the system, and later, periodic assessments as to whether offset providers' land management is indeed delivering the conservation credits transacted.
- Auditing and verification of mitigation measures including biodiversity offsets: initially, pre-feasibilty assessments of whether proposed projects are likely be able to demonstrate no net loss; later, validation of BOMPs against agreed Standards such as the BBOP Standard on Biodiversity Offsets; and ultimately periodic verification of whether the BOMPs are being implemented and achieving their predicted outcomes according to plan.
- Being part of a governance body for conservation trust funds established to govern biodiversity offsets and disburse funds over the long term for their implementation.
- Taking part in consultation processes as governments develop offset policy, and helping to improve the biodiversity data and design of national offset systems, including landscape-level planning, exchange rules and metrics.

Presently, there is a bottleneck in the system: there are too few qualified practitioners trained to use the new best practices in the range of activities described above and who can work internationally to a high standard in local languages. An intense period of capacity building and training is needed to ensure that regulators and developers can readily find the expertise needed to support their activities. Ultimately, this area of environmental practice may follow others and operate through a system of accreditation of certified practitioners.

As a contribution towards addressing this need, BBOP is conducting a range of training programmes for companies, consultants, investors, conservation experts and government representatives, covering the range of issues discussed in this paper. The group also manages a 'Community of Practice' providing a network and forum for the growing number of organizations and individuals (whether BBOP members or not) who wish to share practical experiences, skills and lessons learned. BBOP also plans to refine the Standard based on growing experience and practice[15].

Designing development projects to result in no net loss or a net gain of biodiversity is demanding. Reconciling financial, environmental and social timelines and budgets is not easy. When they are not designed, implemented and enforced to a high standard, mitigation measures including offsets can result in significant losses of biodiversity and create risk for developers, communities and policy-makers alike. However, the current planning system, largely without offsets, results in a significant, cumulative loss of biodiversity. In England, for example, this is the fate of 'death by a thousand cuts'. The current international wave of new policy requirements, conditions of project finance and voluntary best practice represents a tremendous opportunity to draw on experience gained around the world over the last thirty years to improve significantly on the status quo.

Ecologists and environmental managers are at the heart of wise land-use planning, mitigation practice and conservation prioritisation and delivery. Their competence and expertise will be essential to maintain the integrity of approaches intended to demonstrate no net loss and preferably a net gain of biodiversity.

Notes

1 http://bbop.forest-trends.org/pages/advisory_group

2 While biodiversity offsets are defined here in terms of specific development projects (such as a road or a mine), they could also be used to compensate for the broader effects of programmes and plans.

3 Madsen *et al*. 2010 and 2011. The Biodiversity Consultancy (2012a).

4 The Biodiversity Consultancy (2012b).

5 http://www.equator-principles.com/

6 http://bbop.forest-trends.org/pages/advisory_group

7 Morris *et al*. 2006

8 Maron *et al*. 2012

9 Hilderbrand *et al*. 2005

10 Wilkins *et al*. 2003

11 McCarthy *et al*. 2004

12 Walker *et al*. 2009

13 Race and Fonseca (1996)

14 See recommended contents of Biodiversity Offset Management Plans at http://www.forest-trends.org/documents/files/doc_3078.pdf

15 The BBOP Secretariat (served by Forest Trends and the Wildlife Conservation Society) is looking for organisations willing to try using the Standard and offer feedback on its strengths and weaknesses, so welcomes participation and feedback from any interested organisation. To learn more about the programme and how to get involved please **See:** http://bbop.forest-trends.org and **Contact:** bbop@forest-trends.org.

About the Author

Kerry ten Kate is Director of the Biodiversity Initiative at Forest Trends, and also Director of the Business and Biodiversity Offsets Programme (BBOP). This article presents the personal opinions of the author and does not aim to represent the views of the 80 organisations and individuals which are members of BBOP.

Contact Kerry at:
kerrytenkate@hotmail.com

References

Business and Biodiversity Offsets Programme (BBOP). (2012). Standard on Biodiversity Offsets. ISBN (paperback) 978-1-932928-45-7; ISBN (pdf) 978-1-932928-44-0. Available from http://bbop.forest-trends.org/guidelines/Standard.pdf

Business and Biodiversity Offsets Programme (BBOP). (2012). Guidance Notes to the Standard on Biodiversity Offsets. ISBN (paperback) 978-1-932928-46-1; ISBN (pdf) 978-1-932928-47-1. Available from http://bbop.forest-trends.org/guidelines/Standard_Guidance_Notes.pdf

Business and Biodiversity Offsets Programme (BBOP). (2012). Business and Biodiversity Offsets Programme (BBOP). 2012. Resource Paper: Limits to What Can Be Offset. ISBN (pdf) 978-1-932928-48-8. Available from http://bbop.forest-trends.org/guidelines/Resource_Paper_Limits.pdf.

Business and Biodiversity Offsets Programme (BBOP). (2012). Business and Biodiversity Offsets Programme (BBOP). 2012. Resource Paper: No Net Loss and Loss-Gain Calculations in Biodiversity Offsets. ISBN 978-1-932928-49-5 (pdf). Available from: http://bbop.forest-trends.org/guidelines/Resource_Paper_NNL.pdf

Business and Biodiversity Offsets Programme (BBOP). (2009). Principles on Biodiversity Offsets Supported by the BBOP Advisory Committee (2009). Available at: http://bbop.forest-trends.org/guidelines/index.php

Business and Biodiversity Offsets Programme (BBOP). (2009). Biodiversity Offset Design Handbook and Appendices (ODH, 2009). Available at: http://bbop.forest-trends.org/guidelines/index.php

Business and Biodiversity Offsets Programme (BBOP). (2009). Biodiversity Offset Implementation Handbook (OIH, 2009). Available at: http://bbop.forest-trends.org/guidelines/index.php

Business and Biodiversity Offsets Programme (BBOP). (2009). Biodiversity Offset Cost-Benefit Handbook (CBH, 2009). Available at: http://bbop.forest-trends.org/guidelines/index.php

Business and Biodiversity Offsets Programme (BBOP). (2009). Business, Biodiversity Offsets and BBOP – An Overview (2009). Available at: http://bbop.forest-trends.org/guidelines/index.php

Business and Biodiversity Offsets Programme (BBOP). (2009). The Relationship between Biodiversity Offsets and Impact Assessment (EIA, 2009). Available at: http://bbop.forest-trends.org/guidelines/index.php

Crowe, Michael and ten Kate, Kerry. (2010). Biodiversity Offsets: Policy options for governments. Forest Trends. October 2010. http://www.forest-trends.org/publication_details.php?publicationID=3079

Hilderbrand, R.H., Watts, A.C., Randle, A.M., (2005). The myths of restoration ecology. *Ecology and Society* **10:** 19.

IFC (International Finance Corporation). (August 2011). Updated Performance Standard 6, Biodiversity Conservation and Sustainable Management of Living Natural Resources (2011). http://www.ifc. org/ifcext/policyreview.nsf

Madsen, B., Carroll, N. and Moore Brands, K. (2010). State of Biodiversity Markets Report: Offset and Compensation Programs Worldwide. Available at: http://www.forest-trends.org/documents/files/doc_2388.pdf

Madsen, B., Carroll, N., Kandy, D. and Bennett, G. (2011). Update: State of Biodiversity Markets. Washington, DC: Forest Trends, 2011. Available at: http://www.forest-trends.org/documents/files/doc_2848.pdf

The Biodiversity Consultancy (2012a). Industry Briefing Paper: Government policies on biodiversity offsets. http://www.thebiodiversityconsultancy.com/wp-content/uploads/2012/07/Government-policies-on-biodiversity-offsets.pdf

The Biodiversity Consultancy (2012b). Industry Briefing Paper: Private sector No Net Loss commitments. http://www.thebiodiversityconsultancy.com/wp-content/uploads/2012/07/Private-Sector-No-Net-Loss-commitments.pdf

Maron, M., Hobbs, R.J., Moilanen, A., Matthews, J.W., Christie, K., Gardner, T.A., Keither, D.A. and McAlpine, C.A. (2012). Faustian bargains? Restoration realities in the context of biodiversity offset policies. *Biological Conservation* **155:** 141–148.

McCarthy, M.A., Parris, K, van der Ree, R, McDonnell, M.J., Burgman, M.A., Williams, N.S.G., McLean, N., Harper, M.J., Meyer, R., Hahs, A. and Coates, T. (2004). The habitat hectares approach to vegetation assessment: An evaluation and suggestions for improvement. *Ecological Management and Restoration* **5:** 24-27.

Morris, R.K.A., Alonso, I., Jefferson, R.G. and Kirby, K.J. (2006). The creation of compensatory habitat – can it secure sustainable development? *Journal for Nature Conservation* **14:** 106–116.

Walker, S., Brower, A.L., Stephens, R.T.T. and Lee, W.G. (2009). Why bartering biodiversity fails. *Conservation Letters* **2:** 149–157.

Wilkins, S., Keith, D.A. and Adam, P. (2003). Measuring success: evaluating the restoration of a grassy eucalypt woodland on the Cumberland Plain, Sydney, Australia. *Restoration Ecology* **11:** 489–503.

Biodiversity Offsetting: A View from The Wildlife Trusts

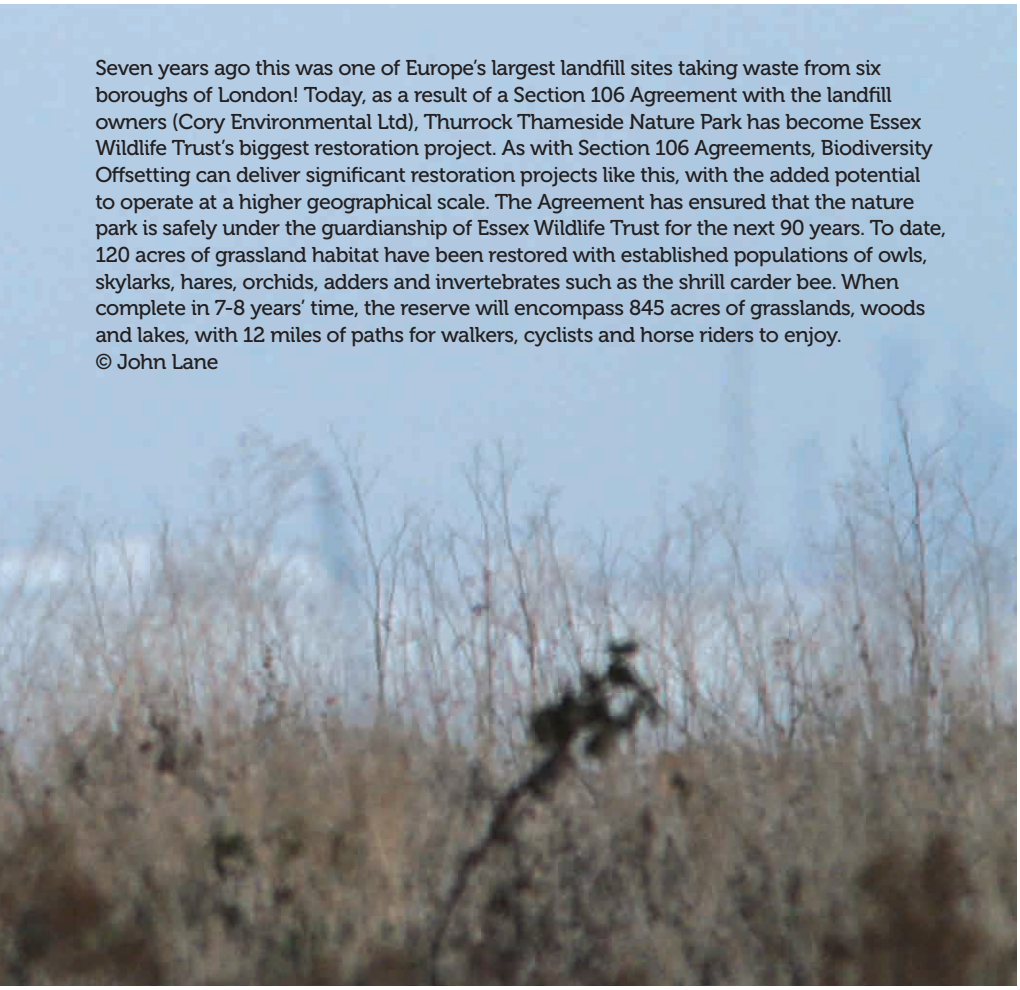
Stephanie Hillborne
Chief Executive Officer, The Wildlife Trusts

Nature in Crisis

In May 2013 a report was launched. Like numerous reports preceding it over recent years, it spoke of the increasingly perilous condition of habitats, and catalogued disturbing declines in species diversity and abundance across the board of taxa. Like other reports, it warned how the continued erosion of the natural environment and loss of biological diversity is already causing very real problems for our human population, and will continue to affect our economy and communities into the future. Like many reports, it will probably have passed unnoticed by many. But the *State of Nature* report was different – it marked a watershed, a shift to a new, collaborative approach amongst the conservation community, which will see more organisations working together for the sake of nature, society and economy.

In recognition that change for nature can only come if we start doing things differently, the report extends an invitation to everyone to get involved in whatever way they can.

If the *State of Nature* is a call for change, then the shout back is: *What can we do differently?* The impact each of us can have on the land is limited only by our knowledge, our appetite for change and



Seven years ago this was one of Europe's largest landfill sites taking waste from six boroughs of London! Today, as a result of a Section 106 Agreement with the landfill owners (Cory Environmental Ltd), Thurrock Thameside Nature Park has become Essex Wildlife Trust's biggest restoration project. As with Section 106 Agreements, Biodiversity Offsetting can deliver significant restoration projects like this, with the added potential to operate at a higher geographical scale. The Agreement has ensured that the nature park is safely under the guardianship of Essex Wildlife Trust for the next 90 years. To date, 120 acres of grassland habitat have been restored with established populations of owls, skylarks, hares, orchids, adders and invertebrates such as the shrill carder bee. When complete in 7-8 years' time, the reserve will encompass 845 acres of grasslands, woods and lakes, with 12 miles of paths for walkers, cyclists and horse riders to enjoy.
© John Lane

the systems to facilitate that change. For most conservationists, the latter point is usually the confounding foil. Despite sustained conservation efforts, special sites, habitats and species are still being destroyed, depleted and displaced thanks to systems and processes that prioritise short-term growth and production ahead of long-term environmental condition and ecological security.

The planning system tends to come in for blame here from conservationists and communities alike. That's hardly a surprising reaction when the consequences – good and bad – of the planning system are inescapably all around us, immediately obvious and built into the very fabric of our environment. It's perhaps not an entirely fair reaction however. Since its adoption post World War II, our planning system is not inherently flawed; indeed, it has been a saving grace over the last century. For one of the most densely populated countries in the world we still have a relatively attractive pattern of village and countryside which residents, visitors and investors all value enormously. Nor is development in itself bad; there are exceptional developments across the country, testament to the vision, ambition and willingness of developers and planners to work with the environment, for nature, and for people. Rather, the problem lies in market failure and a system that does not account for natural capital or measure the change in natural assets as they are liquidated. Development has been and is still done badly in too many instances because (in common with the rest of our systems) the planning system fails to value the natural environment.

Turning Things Around

Nature's true value needs to be recognised and incorporated into the planning system, putting it on an equal footing with the other essential infrastructure when there is a new development. If not, myopic short-termism stands to leave us, and nature, bankrupt. It's not just the conservation sector propounding this view. The 2012 Confederation of British Industry (CBI) report into green business, *The Colour of Growth*, considers growth at the cost of the environment a false economy. Long-term economic prosperity goes hand in hand with protecting and restoring our natural capital. Without natural assets, the health of our economy and society looks bleak. This supports the findings of the National Ecosystem Assessment and policy measures in the Natural Environment White paper.

Addressing the mismatch between how the planning system currently values nature and how a growing body of evidence recommends nature should be valued is the challenge of the moment. Wildlife Trusts have worked with developers, planners and the public over many decades, and we have largely overcome the negative view of nature as a barrier to development. Together we have shown the opposite, that nature is of benefit to development and developers – and one which can be measured at the bottom line. It's a fact borne out by the developers who market their properties on proximity to woodlands and meadows, and manifested in the price people are willing to pay to live in a green and pleasant environment, vibrant and alive with wildlife. There is still some way to go, however, if this view of nature as an asset is to become mainstream; recently there has been a re-emergence of Government rhetoric around nature as an impediment to development, which places the Government out of step with the experiences of Wildlife Trusts and developers on the ground.

The security of our natural environment and the many public goods and services

it provides us with cannot simply be left to the goodwill of developers, nor to the voluntary efforts of Wildlife Trust staff, volunteers, members and the public who regularly stand up for wildlife through the planning system. For this reason, there has been cautious welcoming of news that Government is considering the merits of biodiversity offsetting as a means of tackling ongoing environmental issues in the planning system. Pilot schemes around the country are currently testing out whether offsetting is a mechanism which will help nature to recover, and initial observations are providing insight into some of the likely challenges it will throw up. At its best, offsetting could be a chance to address the chronic market failure around nature; an opportunity to even the field upon which development management is played out. At its worst, it could permit the damage or destruction of those pockets of wildlife species and habitats that remain. It is certainly not a panacea, but one of a number of tools we could use to make land use and land management more ecologically sustainable.

Planning for Offsetting

The basic rationale for biodiversity offsetting is seemingly sound: where an otherwise sustainable development has exhausted all realistic opportunities to avoid and mitigate ecological harm, new habitat creation can be offered as a means of compensating for these unavoidable residual impacts; it's a means of making good on any ecological impacts that are still outstanding. What makes an offset more controversial than other habitat compensation schemes is that the extent of compensatory habitat to be delivered is calculated using defined metrics which assign a value to natural assets. Superficially, it appears an elegant solution to an intractable problem, but as with most things in life, it's not as simple as it sounds.

The Wildlife Trusts are treading cautiously when it comes to biodiversity offsetting. We are acutely aware of the fact that the present framework of legislation, regulation and policy for nature conservation is vital to stop further loss but is not yet delivering the results our environment, society and economy need, and we do want to see a change for the better. We know the planning system has a fundamental role to play in addressing the state of nature, but have a firm belief that for offsetting to deliver positively for nature and development, it must be done for the right reasons, in the right way, with the right regulatory framework supporting it.

Government would do well to listen to the cautious note we and other conservation NGOs sound. Public perception of biodiversity offsetting seems best encapsulated by the phrase 'licence to trash', and letters from our members tell of fears for the survival of woodland in a system where the price of everything and value of nothing is known. Whilst it may seem tempting to dismiss such concerns as 'nimbyism', they underline the emotional attachment people have to nature. No one has worked out yet how you value the enjoyment felt by people experiencing nature, and therefore the cynicism expressed about offsetting is understandable. The conservation community stands firm in its view that there is no room for poorly conceived or badly executed biodiversity offsetting in this country. Offsetting done in the wrong way for the wrong reasons is something nature can't take, people won't accept, and our country can't afford.

If biodiversity offsetting is to be considered a serious potential addition to the tools that local authorities, developers, communities and conservationists have available to deliver better outcomes for nature, what are the factors that should be considered, and where lie the lines that should not be crossed? These questions can be answered to a degree by examining the experiences of other countries where biodiversity offsetting programmes have already been implemented, and through the work of the Business and Biodiversity Offsets Programme. We can also get a sense of what might work in England from the pilot offsetting schemes currently underway, and which are now beginning to report on their preliminary findings. We can also look at what is working well and not so well in the planning system as it stands.

The Knowledge Base

Applying our knowledge and understanding of the natural environment, its processes and systems will be essential in building an effective biodiversity offsetting process. This is good in the terrestrial environment compared to many countries but not comprehensive. There are some gaps in our knowledge base, and in our recording and monitoring. These gaps are particularly apparent for less obvious species and habitats. Invertebrates, lower plants and soil microbiota are good examples of unobtrusive, under-recorded organisms that nonetheless play an important role in supporting a healthy, functioning natural environment. Accounting for key species such as these in an offsetting system will be important, but fitting this with a planning system and conservation policy framework that takes a reductionist approach to biodiversity presents a challenge. Much less is known about the marine environment so particular caution is required here. New skills will need to be developed by ecologists and volunteer recorders if we are to build a body of relevant data to inform not only a sound offsetting process but good offsetting decisions too. Similarly, local authorities will need to ensure that they have access to the right people to plan for nature and are supporting the collation of the right environmental and ecological data.

Getting the Process Right

We believe that for an offsetting programme to be successful, it will need to be mandatory, feature a universally adopted metric which is applied as early in the planning process as possible, and then only as a last resort rather than as a

Cambourne, a village nine miles west of Cambridge, is an example of wildlife gains designed into a new development in partnership with The Wildlife Trust for Bedfordshire, Cambridgeshire & Northamptonshire. Half of the land across the site is green space, making the village more attractive to wildlife and giving local people a better environment to live in. (© Matthew Roberts)

means of making ecologically unsustainable developments happen. Offsetting must be established in policy with guidance supporting its implementation, and a framework for monitoring its impact because nature doesn't respect our administrative boundaries; therefore, a voluntary approach which could see neighbouring local authorities taking a different stance on the value and protection of shared assets would be more damaging than helpful. Furthermore, a situation where planning authorities around the country value biodiversity and calculate offset provision differently would prevent the establishment of a stable trading platform and market. The point in the planning process at which offsets are considered is critical too. The planning application stage is too late really: like all infrastructure considerations, natural assets need to be identified, valued, and protected at the plan-making stage. This way, high nature value sites can be screened out of strategic development, and designated for local protection, reducing the potential for biodiversity and natural asset damage. Sites with low ecological sensitivity and interest can then be considered for development, and an offset calculated once a hierarchy of impact avoidance, minimisation and mitigation has been gone through to resolve potential ecological issues by design. Offsetting must always be viewed as a last resort: our knowledge will at best be practical, habitat creation is fraught with uncertainties as its results are not guaranteed, and therefore enhancing what we have ought to be the first step on the path to rebuilding biodiversity.

Thus offsets should only be relevant to the residual negative impacts, but the system must also provide for genuine gain. Unless we only live within the existing developments of our cities, towns and villages, loss of wildlife to development is unavoidable. Not just loss of wildlife to development but loss of potential land that could have supported more wildlife. Both of these losses need to be compensated for genuinely and opportunities to achieve gains found, ideally, before the damage occurs. The Wildlife Trusts believe firmly that offsetting must deliver net gain and that this cannot be achieved if an offsetting system does not require the creation of new, nature-rich areas that are strategically located.

The protection currently afforded to wildlife sites and species is an essential minimum in any offsetting framework and this must be respected and reinforced through an avoid-reduce-mitigate-compensate hierarchy in which offsetting is always the last port of call. We have to avoid harming what natural capital we have left as it is from this core reserve that we seek to re-establish wildlife across our landscapes. A development that destroys or damages a European, nationally or locally significant site is a backward step: the loss of established habitats and associated suites of species simply reduces our assets and lessens the potential to revitalise our natural environment. Similarly, the offsetting process must recognise the irreplaceability of some habitats, species and systems. It is not possible to recreate habitats whose ecological value lies in their longevity, nor is it possible to create the conditions suitable for species with complex life cycles. Ancient woodlands and migratory birds are two obvious examples of this, and there are many more.

Offsetting cannot be used as justification to permit development in ecologically important places, to say nothing of those natural spaces with cultural significance.

It is not acceptable to destroy habitats and displace species in one county and then try to recreate something of equal or greater value elsewhere. Biodiversity loss and gains need to balance on the social scales as well as the scientific, and intrinsic to this is the proximity principle. There is growing concern around the lack of opportunity people have to experience nature on their doorstep and society is already experiencing the health, well-being and economic consequences of what has been termed 'nature deficit disorder'. Exporting offset delivery away from the communities hosting new development is only going to compound this. As getting out into nature is now widely accepted as a good move for people, an offsetting process that further removes us from nature would be entirely self-defeating. An exporting approach might satisfy the market and the scientists but if it's causing people to miss out on nature is it really the right approach? An additional consequence of the exporting approach is that we lose the community policing and care of the newly established offset area. The value of this should not be underestimated.

Delivering on the Ground for Nature

To be successful, offsetting would need to know where to target habitat expansion and creation local to the development site in order to bolster important wildlife areas and reconnect these across a landscape. Conservation charities throughout England know where key sites and local opportunities lie. They have voluntary schemes like Living Landscapes, burgeoning Nature Improvement Areas, and ecological network mapping which identifies what it will take to restore, recreate and reconnect our natural capital. There are local strategies developed by partnerships and communities to focus on-the-ground action for nature. Such local knowledge is essential to the successful delivery of offsets, both in terms of getting the best fit for nature and securing community buy-in to the long-term management of the offset site. It is possible to expand habitats and create the conditions for new habitats to form and species to colonise, but it is not quick. It requires real knowledge of the areas and it matters where and how you do it.

Investing in long-term management of offsets is key, and this is why when deciding who delivers and manages offsets, wider considerations need to be taken into account. It is likely to maximise wildlife gain if you use charities like The Wildlife Trusts with established charitable purposes and a recognised regulatory framework. Such bodies are largely self-enforcing, being committed to delivery by ethics and rules. Endowment funds held directly by these charities for long-term management of a site enable the organisation to grow capacity and any surpluses go to further wildlife gain rather than shareholders or bonuses. Equipping charities and communities to look after nature, to care for this public good, is a step towards realising a truly sustainable society.

As the offsetting debate gathers momentum we are keen to play our part in making sure the right offsetting system emerges, and this article has touched on but a few of the headline issues we are now considering. Whilst offsetting has the potential to deliver biodiversity gains its practical application is all important and there are red lines. Ultimately, offsetting will only be of help to nature if it forms part of a wider social change towards restoration of our natural capital: an ambitious long-term strategy to revitalise our natural environment, supported by new legal and institutional frameworks and corporate accounting. And we make this change in the recognition that the costs of today's failing policies are borne by tomorrow's generation: offsetting poorly delivered now will be paid for 25 years hence. Offsetting done in the wrong way for the wrong reasons and with the wrong expectations could be absolutely the last thing wildlife, society and our economy needs. It could set back relations between developers and local communities many decades and could erode our remaining natural capital even further. Offsets done in the right way, with the right aims and right institutions might just help with nature's recovery. Let's make the right choice, because nature can't afford for us to get it wrong.

About the Author

Driven by concern for the future of the natural environment, Stephanie Hillborne's conviction is that The Wildlife Trusts, which have more than 800,000 members, have a key role to play in its recovery. The Wildlife Trusts comprise 47 individual Wildlife Trusts collectively managing more than 2,000 nature reserves in the UK. Uniquely placed in local communities, Wildlife Trusts (in England) last year provided management advice to more than 5,000 landowners and reviewed over 70,000 planning applications. It was the only conservation organisation actively involved in all four stakeholder groups set up to consult on where Marine Conservation Zones should be sited around England. Stephanie secured a BSc in Biology and MSc in Conservation and went on to facilitate the national coalition Wildlife & Countryside Link before joining Nottinghamshire Wildlife Trust in 1998 and becoming Chief Executive of The Wildlife Trusts in 2004.

Contact Stephanie at:
cmartin@wildlifetrusts.org

Is it Possible to Offset Loss of Habitat in the Marine Environment?

Roger Morris CEnv FCIEEM
Bright Angel Coastal Consultants

A recent proposal by Able UK for Marine Energy Park development at North Killingholme on the south bank of the Humber Estuary raises important questions about offsetting measures for loss of marine habitats.

The proposal includes a port development that will result in the loss of a 2km section of mudflat. These mudflats are exceptionally important for the Icelandic race of black-tailed godwits *Limosa limosa islandica* that use them as a feeding, loafing and roosting area during the autumn moult. When I first knew the site in 1994, only around 60 birds stopped at the Humber Estuary. Today, that number has risen to between 4,000 and 5,000 birds and around 2,600 birds use the North Killingholme mudflats. This is in the order of 8-10% of the Icelandic sub-population. North Killingholme supports over 50% of the birds and is therefore internationally important in its own right!

Able UK proposed to offset the impact by undertaking managed realignment on a 100ha site on the north bank of the Humber (almost directly opposite the development). An area of wet grassland on the north bank some miles inland was also included in the package. It follows that if such a large proportion of a single species is expected to be displaced, the offsetting measures must work; and if managed realignment is used to offset losses does it replace the functionality of the mudflat in question? The answer lies in the way mudflats form and are maintained.

Characteristics of Mudflat and Saltmarshes

Mudflats occupy the tidal frame between extreme low water and the elevation where tidal exposure allows plants to become established. Regular inundation and exposure over part of the rising and falling tide is essential. Some mudflats may not be inundated on every tide or they may only be exposed on a few days every fortnight (on spring tides). If they are not exposed they are 'sub-tidal' but the number of inundations at the top of the tide will determine whether they turn into saltmarsh or not (saltmarsh will develop below about 500 inundations per year).

The tidal range of the estuary, combined with the effects of local currents and wave climates will determine their topography. In estuaries with a big tidal range (e.g. the Humber or Severn) mudflats will usually drop steeply towards low water but can extend over many hundreds or perhaps thousands of metres. In estuaries with a small tidal range (e.g. Breydon Water or Poole Harbour) the profile will be much shallower. Regardless of tidal range, these mudflats share important common features:

- They are regularly inundated and exposed.
- Mud is gradually exposed and covered, providing a continually changing feeding ground for waterbirds that often follow the falling tide in search of prey items (ranging from molluscs to various worms).
- Superficial mud is generally not greatly consolidated (except in areas of significant wave erosion) and this suits the prey items that are sought by waterbirds whose bills are adapted to probing at various depths.
- Exposure to extreme heat and cold is limited by tidal inundation (although they are not immune from these impacts).
- Sight lines are long and birds are able to follow the tide over long distances.

Conversely, saltmarshes lie higher in the tidal frame and are exposed for much more of the tidal cycle. This allows sediment to dewater and to consolidate, and of course for plants to become established. This offers a different set of characteristics:

- They are relatively infrequently inundated. Frequency of inundation will determine the composition of the plant assemblage.
- The sediments are more consolidated and are bound by plant roots.
- Fewer and different prey items exist.
- There is greater exposure to extreme heat or cold, with associated impacts on invertebrates.
- Sight lines are limited and the topography is unsuited to birds that follow the tides. However, they may be important waterbird roosts if the vegetation is short.

Basics of Managed Realignment

Managed realignment sites lie relatively high in the tidal frame because they usually originate as saltmarsh claimed from the sea decades or centuries ago. Their precise position in the tidal frame will vary according to the timescale over which they have been farmed. In general, the oldest areas lie at the back of an estuary and the youngest are closest to the sea wall. It is the latter that are usually used as realignment sites. Their elevation will be governed by a mixture of de-watering, oxidation and ploughing, all of which mean that they lie below the level where vegetation would naturally develop in tidal locations. However, they do lie in the zone that naturally accretes because incoming wave and tidal energy is weakest and least likely to re-mobilise fine sediment.

Managed realignment will fill with sediment and will gradually revert to saltmarsh (see Figures 1 and 2). The timescales involved depend upon levels of suspended sediments in the water column. Breach design also plays an important part in the process. In general, breaches are designed to minimise scour from ebbing currents and to prevent currents entering and departing sites from causing a navigation hazard or causing scour in the main channels of the adjacent estuary. This design allows water to ingress relatively quickly and to depart comparatively slowly; conditions that naturally promote sedimentation.

Evidence from a range of managed realignment schemes in the Humber and elsewhere shows that once they gain sufficient elevation saltmarsh develops. The question is whether the timescales involved are acceptable? The high sediment load of the Humber Estuary means that realignment rapidly turns to saltmarsh such that within less than a decade the site will contain very little open mud (Morris 2013) (see Photographs 1-3).

Effective Compensation?

The characteristics of managed realignment, in particular its performance in the Humber, mean that it is not a viable means of compensating for loss of mudflat at North Killingholme. This raises the question of whether it is possible to limit sedimentation rates and to better replicate the process of rising and falling tides. Moreover, is it really possible to create sustainable mudflats?

Able UK claim to have resolved this problem using 'regulated tidal exchange' in which tidal ingress/egress is controlled by a series of flap valves (Figure 3). This in turn limits the volume of tidal water entering and departing the site, which places a brake upon volumes of sediment entering the basin and slows but does not prevent sediment levels rising to the point where saltmarsh develops. To counter this, Able UK propose to reduce the elevation of mudflats within the Regulated Tidal Exchange at intervals (i.e. effectively to flush out the sediment). The question is: *Will it work?* If it does, then it offers a possible way of offsetting carrying capacity for birds affected by land-take of intertidal for new ports and other developments. If it fails, the

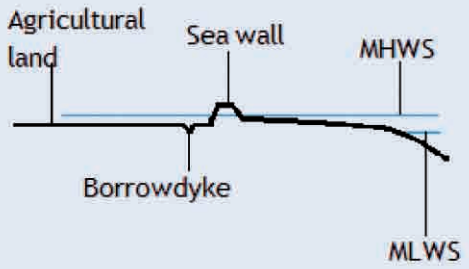


Figure 1. Relative positions of managed realignment land and the rising and falling tides before breaching.

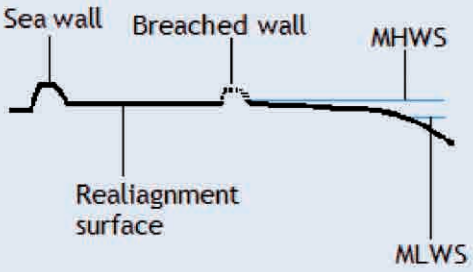


Figure 2. Relative positions of managed realignment land and the rising and falling tides after breaching.

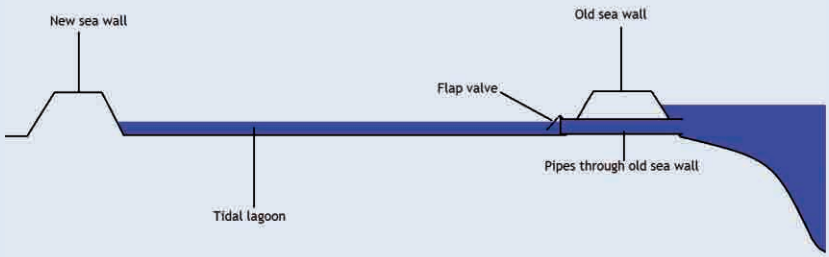


Figure 3. Schematic representation of Regulated Tidal Exchange. The exchange basin is surrounded by a hardened bank to prevent erosion of the clay walls by internally generated wind-driven waves.

Photograph 1. Managed realignment at Chowderness in 2007. Looking east towards South Ferriby. Note the extent of unvegetated wet mud.

Photograph 2. Managed realignment at Chowderness in 2012. Looking east towards South Ferriby. Note extensive beds of sea club rush.

Photograph 3. Managed realignment at Chowderness in 2012. The mud is cracked because it has been exposed for several tides and has dried out.

impact on the black-tailed godwits will only become apparent after the port has been developed and there is no way back!

The potential of Regulated Tidal Exchange (RTE) as compensation for the functionality of mudflats must be doubted. There are several reasons for this:

- It has been used successfully on a very few occasions to create waterfowl habitat, but it has not been used specifically to create feeding grounds for black-tailed godwits.
- RTE lies high in the tidal prism and consequently it is already at the point where sedimentation will promote saltmarsh development.
- Controlling saltmarsh development is reliant upon maintaining sufficient tidal flushing and inundation to prevent saltmarsh development.
- However, the more tides that enter the site, the more sediment that is imported.
- To avoid high sedimentation rates, the volumes of water entering and departing the site can be controlled by adjusting the time that tidal water is impounded.
- But, if tidal water is impounded for long periods, especially in the summer, there is a risk that evaporation will lead to hypersaline conditions. And, in extreme heat, water temperatures can be raised to the point where invertebrates are affected by both heat and lack of oxygen.
- Conversely, in winter, regulating water levels may be compromised by freezing, which can cause the death of in-fauna.

Nobody can say with any level of confidence that Regulated Tidal Exchange (RTE) will be an effective form of compensation, and quite clearly it will not resolve all of the regulatory issues. For example, the Humber Estuary is a Special Area of Conservation (SAC) and its mudflats are an important component of the special interest features. It would be difficult to argue that RTE represents the same functionality as a natural mudflat. Consequently, use of RTE as compensatory

habitat would represent a bold decision on the parts of both regulators and conservation advisers that has yet to be tested in a European protected site context.

Part of a Bigger Problem

Whilst the loss of intertidal habitat may be offset by managed realignment that may, or may not deliver comparable functionality, a much bigger question arises when losses are sub-tidal. Managed realignment generally fails to create sustainable sub-tidal habitat because wave and tidal forcing pressures are weak, and the void will fill with sediment over time, even if it starts as sub-tidal habitat.

So, how can we create new sub-tidal habitat and sustainable mudflats? Is this at all possible? At this point it is difficult to offer an obvious way forward without looking at measures on a scale that have been hitherto untested. One obvious possibility is to restore tidal influences to sections of the coast that are currently defended by a short sea wall (see Figure 1). In such cases, the natural geometry of the coast would allow tidal influences to develop new mudflats and saltmarshes together with a central channel that may be maintained as sub-tidal habitat. The effectiveness of such a measure is entirely dependent upon the size of the site, and there are likely to be a very few possibilities for such measures, but they are technically possible. The proposed 'creek' associated with the failed Dibden Bay development is conceptually similar to this idea and I suspect would have been effective because Southampton Water has a highly depleted sediment budget.

Another possibility is to use existing canalised water bodies to create new habitat (Figure 2). This is a highly theoretical and potentially controversial option that draws on the sedimentation patterns in estuaries such as Breydon Water, the Blyth and Alde-Ore estuaries (Morris 2012).

In these estuaries the constricted mouth combined with regular mobilisation of sediments by major storms combine to export sediment at a sufficient pace that mudflats fail to develop into saltmarshes, even though in theory they should.

Both of the suggested optionsare highly conceptual and would need to be developed further, but they offer a possible mechanism for creating sustainable mudflats, especially in areas where the local sediment environment is at sufficiently low levels to allow remobilisation by wind driven waves to help flush and adjust the elevation of exposed mud. Neither really solves the problem of how to offset the loss of sub-tidal habitat and at the moment that remains a conundrum.

Concluding Remarks

Until the Able Marine Energy Park project was promoted, managed realignment was regarded as a satisfactory means of compensating for port developments (Morris & Gibson 2008, Morris 2011). This case raises very important and largely unanswered questions about the practicalities of genuinely offsetting the loss of internationally important habitat. It is an issue that deserves attention because pressure for new developments in estuaries such as the Humber, Thames or Southampton Water will not cease.

Projects such as these must to be on a scale that is largely untested in the UK or northern Europe and are therefore expensive. There are numerous obstacles to making such concepts work. The most significant is likely to be local public opinion and resistance to major changes to the local environment. The key is to look for a demonstration project that can test concepts using conventional modelling before applying lessons to an actual project.

References

Morris, R. and Gibson, C. (2007). Port development and nature conservation – Experiences in England between 1994 and 2005. *Ocean & Coastal Management* **50:** 443-462.

Morris, R.K.A. (2011). The application of the Habitats Directive in the UK: compliance or gold plating? *Land Use Policy* **28:** 361-369.Morris, R.K.A. (2012). Managed realignment: a sediment management perspective. *Ocean & Coastal Management* **65:** 59-66.

Morris, R.K.A. (2013). Managed realignment as a tool for compensatory habitat creation - a re-appraisal. *Ocean & Coastal Management* **73:** 82-91.

About the Author

Roger Morris is Principal at Bright Angel Coastal Consultants Ltd (www.bacoastal.co.uk). He specialises in the application of geomorphological principles and managed realignment in the UK and northern Europe.

Contact Roger at:
brightangel.coastal@gmail.com

Ecology Legal Update

Penny Simpson
Partner, Freeth Cartwright LLP

Those working in the natural environment field need to be aware of a number of recent legal developments relating to this area of law. This article covers:

- European site caselaw: the *Sweetman* case
- European Protected Species (EPS): updates since *Morge*
- Habitat Regulations Assessment of development plans
- Biodiversity offsetting, new Wild Birds Directive duties and 'conservation covenants'

1. European site caselaw: *Sweetman*

Public authorities undertaking their own projects or granting consents to others' projects may well from time to time need to grapple with the complex and strict regulation which protects European sites (also known as Natura 2000 sites). These are designated in particular in upland, heathland and coastal areas. The protection regime, which derives from the Habitats and Birds Directives, requires careful attention of the public authority involved and can create significant hurdles for the developer in the delivery of such projects.

The *Sweetman vs As Bord Pleanala* decision from the Court of Justice of the European Union on 11th April 2013 (C-258/11) is important in relation to these projects. It considered what is meant by the Habitats Directive test of "*adverse effect on integrity of the site*". Under the European site protection regime (and subject to an initial screening test), a relevant authority may only grant consent for a project or adopt a plan where it is sure that the project/plan "*will not have an adverse effect on the integrity of the site*" unless three onerous derogation tests are met.

The Court looked at whether it would be possible for a road development to remove permanently a very small part of the designated habitat (in this case it was limestone pavement) from within a European site and yet for there still to be a conclusion of *"no adverse effect on the integrity of the site"*. The answer was *"no"*.

The Court made clear that:

a. The "*integrity*" of the site meant that the site had to be preserved at a favourable conservation status. This meant there had to be "*lasting preservation*" of the characteristics of the site connected to the feature for which the site was designated. The authority has to be certain that the project would not have lasting adverse effects on those characteristics.

b. The assessment must be very robust. It cannot have *lacunae* (gaps) and must contain complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effect of the proposed works.

c. Where there is lasting and irreparable loss of part of the natural habitat type for which the site is designated the project will adversely affect the integrity of the site (note that the Court asserted here that there will be an adverse effect, not merely that there was uncertainty that there would not be).

The Court has clearly put the bar very high as regards any developer promoting a scheme which would remove static designated features from within the boundary of the European site.

Situations where there may still be some limited flexibility are as follows:

- Where any impacts are temporary only, for example, digging a pipeline trench across a European site and reinstating the land once the pipe is laid. Such a project may well not have an adverse impact on the integrity of the site. This was an example specifically provided by the Advocate General whose advice the Court took into account when deciding the case.
- Where a part of the site to be affected is not supporting the particular feature for which it is designated – i.e. it is not functional from an ecological point of view. Opportunities for this approach are likely to be very limited.
- Where a small amount of functional site habitat will be lost but this can be mitigated through enhancement of other areas within the site. Again opportunities for this approach are likely to be limited. This has some support from an earlier Scottish wind farm decision of the Inner House (the Scottish court of appeal) in *Bagmoor Wind Ltd v*

Scottish Minsters [2012] CSIH 93. Here it was held that the Scottish Minsters were entitled to refuse planning permission for a 14 wind turbine development within a European site since there was a risk of an adverse effect on the integrity of the site designated for golden eagles. The court noted that the applicant was proposing to offset the impact in part through enhancement of land within the Special Protection Area (SPA). Importantly the court had no 'in principle' objection to this as a form of mitigation. Instead however the mitigation was rejected because Ministers were simply not convinced that it would be effective in this case due to evidence from another similar site.

- In cases of sites designated for mobile bird/animal species (rather than static plants or natural habitats as per *Sweetman*) it is not certain how the Court would define 'integrity'. The *Sweetman* test of lasting preservation 'of the characteristics of the site connected to the feature for which the site was designated' if applied to a site designated for a mobile species would appear to give insufficient prominence to the species itself. The *Bagmoor* windfarm case did not seek to define 'adverse effect on integrity' but nevertheless found that a small (1%) collision risk and a risk of the eagles' displacement/disturbance from the construction of the 14 wind turbines could amount to risk of an 'adverse effect on site integrity' because of the loss of foraging ground and the evidence that the mitigation offered would not be effective.
- In cases where a project's impact on mobile species takes effect outside the boundary of the site (e.g. loss of bat/bird foraging habitat outside the site), a developer should be able to avoid any 'adverse effect on integrity of the site' by providing offsetting habitat outside the site boundary. This approach is supported by caselaw.

2. European protected species: follow up from *Morge*

The regulation around EPS (such as bats, great crested newts, otters, dormice) is complex and has been causing Local Planning Authorities (LPAs) and other public authorities headaches over the last few years. There have been a number of recent cases which have developed further the manner in which EPS should be dealt with by LPAs:

A softer touch from LPAs

Case law has developed since 2009 from a position where it seemed that LPAs had to effectively duplicate Natural England's EPS licensing role when making their planning decisions, to a situation now where we are back at a more 'hands off' approach.

Starting with the key Supreme Court judgment in *Morge* [2011] UKSC 2, there have been a number of cases (*Elliott and Payne* [2012] EWHC 1574, *William Grant and Sons* [2012] CSOH 98 and now *Prideaux* [2013] EWHC 1054) from which the following conclusions can now be drawn:

1. LPAs, as other public bodies, do have a duty (regulation 9(3) Conservation of Habitats and Species Regulations 2010) to 'have regard' to EPS when discharging their functions, including when granting planning permissions.
2. This duty should not be interpreted as onerous when Natural England (or Scottish Natural Heritage/Natural Resources Wales) is fully engaged as a consultee in a planning application.

Where this is so, as long as the consultee does not raise any concerns as regards EPS or is silent on the point, then the LPA can assume that there is no EPS issue and should not rely on EPS as a reason to refuse planning permission. There is no need for the LPA to receive a statement from the nature conservation body that it has no objection as regards EPS; and the LPA need not itself duplicate consideration of the EPS issues. The presumption is that if the statutory nature conservation body is engaged in the planning process it can be relied upon to make any EPS concerns known.

3. The extent of the LPA duty is however less clear where the nature conservation body does not fully engage as a consultee in a planning application and instead (for example) merely sends a pro-forma letter advising the LPA to refer to its standing advice. This is the case in the majority of planning applications in England (Natural England, and indeed the other nature conservation bodies, is only a statutory consultee in relation to development projects with potential impacts on Sites of Special Scientific Interest (SSSIs) and European sites). Here it may be argued from the caselaw that the LPA should do more to satisfy itself as to (i) whether offences against EPS will arise; and if so (ii) whether an EPS licence is likely to be granted following the grant of planning permission. However the case law is not as yet clear on this point.
4. Since the Courts are consistently assuming that where the statutory nature conservation body is engaged in a planning application it is giving meaningful thought to EPS issues, this is what the body needs to do. The pro-forma letter approach currently adopted by Natural England would therefore benefit from review.
5. Other decisions of local authorities and decisions of other public bodies are also subject to regulation 9(3). They may not trigger any consultation with Natural England (or another statutory nature conservation body). If that is so such a public body cannot rely on the nature conservation body's advice so as to discharge its regulation 9(3) duty. An example may be where a LPA issues a planning enforcement notice against a person whose development does not have planning permission and where bats are present. Where there is no support from the nature conservation body then a greater degree of scrutiny will be required from that body in order to discharge its regulation 9(3) duty.

If no EPS offence is triggered, then no licence is required

Given the uncertainty in the case law as noted above, some LPAs may still wish to scrutinise EPS aspects of planning applications in some detail (especially where the statutory nature conservation body is not fully engaged) to assess (i) whether offences against EPS will arise; and if so (ii) whether a licence is likely to be granted by Natural England following the grant of planning permission.

If this is so *William Grant and Sons [2012]* CSOH 98 has provided further clarity. It states that the LPA need only consider the second question (i.e. whether a licence is likely to be granted) if, having taken into account the proposed mitigation measures, it concludes that a criminal offence against EPS is likely to be triggered by the activity.

3. Habitats Regulations Assessment of development plans

There has been recent case law on the difficult issue of how to go about reconciling two apparently incompatible matters: i.e. (i) the certainty needed (following European case law) by the public authority as to the absence of adverse effects when assessing and adopting a 'plan' under Article 6(3)-(4) Habitats Directive (as implemented by regulation 102 and 103 of the Conservation of Habitats and Species Regulations 2010); and (ii) the fact that 'plans' are typically not sufficiently detailed to allow a full/certain assessment.

It seems that the solution is to find a form of words which can be inserted into the plan so as to qualify and limit the actions/activities envisaged by the plan so as to ensure adverse effects on European sites are avoided down the line. The plan must ensure that a future project that might be harmful to site integrity, as understood at the plan stage, cannot be approved under the plan.

The key case is *Feeney v Oxford City Council* [2011] EWHC 2699. This was a challenge to an Oxford Core Strategy policy identifying Northern Gateway as a "*strategic location to provide a modern employment-led site with supporting*

infrastructure and complementary amenities". There was concern about impacts on the Oxford Meadows Special Area of Conservation (SAC). The Council adopted an appropriate assessment identifying possible 'in combination' effects but concluding "*no likely significant effects*". The Council subsequently agreed a joint statement with Natural England and the local Wildlife Trust, acknowledging that draft Northern Gateway policy did not "*provide certainty*" that adverse effects on site integrity would be avoided, and agreeing qualifying wording covering issues of hydrology and air quality. The wording indicated that Northern Gateway proposals would be brought forward by means of an Area Action Plan supported by "*a full hydrological risk appraisal to demonstrate that there will be no change in the hydrological regime of Oxford Meadows SAC*" and "*more detailed air quality modelling and analysis to show that there will not be any localised adverse effects on the integrity of the SAC resulting from construction or increased road trips...*".

The High Court held that in the light of the high level nature of a core strategy, this approach sufficiently discharged the authority's duty to "*ensure prospectively that no harm will arise in the future*", and so the appropriate assessment undertaken at the plan stage was adequate given the lack of site-specific detail.

In Scotland a similar case has been decided but with perhaps an even more lenient approach: *Cairngorms Campaign v Cairngorms National Park Authority* [2012] CSOH 153. It has however been appealed and the appeal judgment is awaited.

This was a challenge mounted by a campaign group against the decision of the Cairngorms National Park Authority to adopt the Cairngorms National Park Local Plan 2010. The campaigners asserted that, among other grounds, the authorities had not had proper regard to the requirements of the Conservation Regulations 1994 so as to properly assess the potential impact of the plan on European sites when making their decision.

The local plan comprised various development policies including the allocation of dwelling houses and business units at certain sites within the park to address the "*chronic housing shortage*" apparently suffered within the park as a whole. Certain of the proposed sites were either in or adjacent to European sites, and the appellants argued that the authorities did not have sufficient evidence to be entirely certain that development at these sites would not adversely affect their integrity both during and after the construction phase.

The local plan contained policies relating to European sites, protected species and biodiversity, which mirrored the contents of the Conservation Regulations 1994. These policies would need to be adhered to when considering any subsequent planning applications. However, the local plan failed to address in detail development-specific measures that would need to be put in place in order to protect the integrity of the European sites. The appellants argued that this left ample room for doubt about the effects the proposed developments might have on the integrity of the European sites in question, and that the plan therefore did not comply with the requirements of the Conservation Regulations.

The Court decided that it was not a requirement of the Conservation Regulations that development-specific measures be set out in detail at the local plan stage. The Court further submitted that the mechanics of the local plan, by dint of the policies contained within it, provided that any planning application would be carefully scrutinised to ensure that it was compliant with the Regulations. The challenge was refused by the Court.

4. Biodiversity offsetting, new Birds Directive duties and 'conservation covenants'

A number of LPAs around the country are piloting (until 2014) 'biodiversity offsetting' schemes under a Defra initiative. The concept is that developers whose proposals will have a biodiversity impact may offer to offset those impacts by making use of the Defra biodiversity offsetting toolkit (which was made available online in 2012). The toolkit enables a calculation to be made as to the value of the loss and the appropriate gain that ought be delivered to offset it.

One of the current weaknesses of the system is the absence of a legal/policy-based requirement on developers to provide offsetting habitat. Some local plans contain policy approximating to a 'no net biodiversity loss' requirement but even then a planning decision will have to take into account other competing policies and biodiversity protection may not ultimately figure strongly. Furthermore some local plans do not have a 'no net loss' objective; and the legal biodiversity duty on public bodies found in s40 Natural Environment and Rural Communities Act 2006 ("*to have regard ... to the purpose of conserving biodiversity*") is likely to be insufficiently strong to require offsetting from developers. Finally, whilst the National Planning Policy Framework talks about no net loss of biodiversity, its specific provisions on biodiversity do not go on to deliver this clearly.

Another weakness has been the absence of clarity as to the legal mechanism for securing the delivery/protection of any offsetting habitat provided.

Many have pointed to the use of planning obligations under s106 of the Town and Country Planning Act 1990. These may work in some cases but their use has been constrained by the requirement in the Community Infrastructure Levy (CIL) Regulations 2010 (regulation 122) under which an obligation must be (a) necessary to make the development acceptable in planning terms; (b) directly related to the development; and (c) fairly and reasonably related in scale and kind to the development. If the offsetting habitat proposed by a developer is, for example, far away from the development site or

quite different to the type of habitat being lost (both these are possibilities under the biodiversity offsetting scheme envisaged by Defra) then this mechanism may not work. Also where lots of developers wish to contribute to one large centralised offsetting project, this may be constrained by the CIL Regulations 2010 which prevent more than five pooled s106 contributions in relation to any one item of 'infrastructure' (which includes 'open space' and which may therefore cover offsetting habitat) which the LPA has decided (locally) is not to be funded by CIL.

Others suggest that the CIL system can be used. But there are questions over whether infrastructure ('open space') would include habitat provided for nature conservation purposes; and a further problem is that the Levy is only payable in respect of construction/modification of buildings (so, for example, the development of a new golf course would not trigger the Levy).

In terms of the first concern (lack of a strong legal/policy basis), two new Birds Directive duties have been introduced (in August 2012) into the Conservation of Habitats and Species Regulations 2010. These are found in new regulation 9A. One of the duties requires a 'competent authority' (i.e. any public body) in exercising any function in or in relation to the UK "*to use all reasonable endeavours to avoid any pollution or deterioration of habitats of wild birds*". As regards wild birds only, this would therefore appear to provide a further legal hook on which a planning authority could seeks its request for offsetting habitat. The provision has not been tested legally to date and developers will no doubt point to the need for "*reasonableness*". The other duty requires local authorities, the Environment Agency and a few other categories of public body to "*preserve, maintain and re-establish a sufficient diversity and area of habitat for wild birds in the UK*". Guidance must be provided on this latter duty by the Secretary of State and is awaited. The guidance will throw further light on this.

In terms of the second concern (legal mechanism to secure offsetting) the Law Commission has published a consultation document on 'conservation covenants'. If this lead to new legislation as the Law Commission envisages (likely to be a number of years from now), it could provide a better mechanism to allow offsetting projects to be secured. In essence a conservation covenant is a private agreement giving rise to public interest benefits. It consists of a voluntary agreement between a person who has an interest in land and an eligible 'holder' (e.g. a statutory body/local authority/charitable organisation nominated by the Secretary of State), which provides for management of the land for a conservation purpose, but where the obligations relating to the land run with the land – i.e. continue into the future even if the original landowner disposes of the land. It gives the 'holder' of the conservation covenant a guarantee that the conservation obligations will continue to be performed after any change of ownership (so where for example the biodiversity offset site changes ownership in the future, conservation covenants could make it possible to ensure that the offsetting is maintained). Under existing and complex principles of land law this is not possible to achieve.

There will be a lot to discuss and debate with regard to this proposal, including whether there should be some circumstances in which the covenant should be broken so as to unlock land for development.

Penny is currently delivering a series of Legal Masterclasses as part of CIEEM's professional development programme. See the CIEEM website for more details.

About the Author

Penny Simpson is a partner within Freeth Cartwright LLP's Planning & Environment Group and a specialist in natural environment legal issues. She advises both private and public sector clients on a wide range of issues including protected sites, protected species, water issues, planning issues, prosecution, wildlife licensing and compliance issues.

Contact Penny at:
0845 017 1133, 07918 767811 or
penny.simpson@freethcartwright.co.uk

Ecology in Australia

Neil Harwood CEnv MCIEEM
Principal Ecologist, GHD (Australia)

In the article below, Neil talks of his experiences so far in Australia and provides a perspective on working as an ecologist overseas.

A Day in the Life

We depart immediately prior to dawn; soon the sun rises and slowly filters across the water. Bouncing along at a pace, we stay cautious of the still low level of the tide and any possibility of grounding the boat. I liberally apply insect repellent in a futile attempt to stave off the sand-flies and take another couple of swigs of water as the heat begins to build.

The field lead and I step ashore, slipping and sliding up the steep bank, with thick mud building on our boots. The biggest carpet python I've seen to date (3m) slithers effortlessly back into its hollow log home. We work between great stands of pencil-thin flooded mangrove forest and flush a small bat (most likely a little bentwing bat). The two of us arrive at our survey site and immediately locate and count several hundred sandplovers, red-necked stints and tattlers, as they jostle about on the high shingle bars away from the incoming tide.

Ten minutes later and we're back in the boat. We bounce along to our second site, when the skipper spins us round and frantically points downwards at the sea, as a 2.5m hammerhead shark glides alongside and then under us. I think twice about stepping into the water as we arrive at our destination.

Despite the excitement and the wonderful environments described, not every day in the life of an ecologist in Australia is quite this dramatic...

The Australian Approach

As would be expected, there are a number of key differences between ecological survey and assessment work in Australia and that of the UK, and the political framework within which this work is carried out. The most apparent, within the context of Queensland, are summarised below.

Policy and Legislation

Australia operates a three-tier system of government – Commonwealth, State and Local – and there are three principal pieces of legislation that guide ecological assessment in Queensland – the (Commonwealth) Environment Protection and Biodiversity Conservation Act and the (State) Nature Conservation and Vegetation Management Acts. There are varying obligations under each of these Acts and projects and their proponents must meet them all, individually and in combination.

To add to the complexity, there are significant differences in the legislation between States and the levels of detail and sophistication contained within. Queensland is generally viewed as being somewhat behind the times, when compared to its New South Wales and Victoria counterparts. Inter-state differences (in environment, as well as legislation and policy) often restrict the transferability of assessment processes, skills and knowledge, which means that the experience of many professionals is limited to State level only.

Policy is also complex and rapidly evolving and consultants need to work hard to keep on top of frequent changes, particularly in the field of approvals. Offset policies provide a good example, whereby the Commonwealth and State operate separate (and potentially conflicting) offset policies and, within the State policy, there are three issue-specific policies (on marine fish habitat, koala habitat and vegetation management), with more to be developed. This process is embryonic in Queensland, whereas

Carpet python

Surveyors at work

Central Queensland open woodland community

Eastern grey kangaroo

New South Wales has a well-established system of bio-banking (note that it is not called offsetting!). The Commonwealth overhauled its previous offset policy late in 2012 (which proponents and consultants are still working to understand) and there are rumours that the Commonwealth is now seeking to combine all State policies into a single Australia-wide approach.

Planning and Politics

The construction and development industries are both highly dynamic and reactive, creating a boom-bust economy for all involved. Within the last 12 months oil and gas interests have slotted straight into the top spot previously occupied by the flailing mining industry. At the same time a recent inquiry into the cumulative impacts of projected developments on the Great Barrier Reef World Heritage Area, involving a visit from a delegation of the IUCN, resulted in a significant and ongoing stall to major development applications in Queensland. The discussions between industry and government, in an attempt to find an appropriate balance between development and conservation, have not been helped by the fact that Commonwealth and State do not see eye to eye on many of the key issues involved. Workloads continue to be unpredictable as projects go on hold, or are shelved altogether, whilst those already in the system compete in a crucial race to the finish line.

Environmental Impact Statements (EISs) are typically carried out earlier in the process of project development than a UK-based Environmental Impact Assessment (EIA) would be. For a major piece of linear infrastructure, for example, it is not unusual to carry out a full assessment based upon an indicative 500m-wide corridor within which a final 100m alignment will eventually be developed. As a result, much of the detail (and the assessment of that detail) is pushed to the supplementary (SEIS) stage, after an initial planning application is lodged. Clearly this presents a number of problems in accurately understanding the likely impacts of that eventual alignment and many matters are regularly deferred and conditioned on the basis of adaptive and corrective management that will appropriately mitigate any issues arising. This carries risk, not least to the ecological resources and features that the legislative framework seeks to protect.

However, there are recent signs of change, for example, with the Commonwealth government updating their application requirements such that offset packages must now be presented alongside the EIS, rather than subsequent to it. Furthermore, competing consultancies are now selling themselves on the basis of having negotiated projects with few conditions attached. There is an observable movement (welcomed by all but the proponents) towards bringing forward the consideration of matters that up until recently would have been readily deferred.

Scope, Survey and Assessment

The main driver of the earliest piece of Queensland legislation, the 1979 Vegetation Management Act, was the prevention of clearance of large tracts of native bushland. Less than 8% of the original extent[1] of brigalow forest community *Acacia harpophylla* is thought to remain within the State[2], for example. As a result many of the most developed assessment requirements, as well as survey techniques, focus on the understanding of vegetation. Advanced botanical skills are highly prized in Queensland are a built around the need to ground-truth a system of government-mapped regional ecosystems (REs).

Information on the presence of fauna species, on the other hand, is most often derived from a series of representative habitat assessments within a given study area and a subsequent 'likelihood of occurrence' assessment. Most surveys (usually undertaken once in the dry season and again immediately following the wet season) will only reveal a very small part of the overall faunal assemblage present, even where techniques such as trapping and active searching are employed.

Recently-published survey guidelines[3] (Queensland government) have attempted to bolster the level of effort requirements, particularly around difficult to locate threatened species such as the brigalow scaly-foot *Paradelma orientalis* and yakka skink *Egernia rugosa*, but the scale of many project areas renders

these guidelines unachievable. By way of example, the guidance requires a generic level of search effort (active searching) of 1.5 hours per hectare of suitable habitat for such threatened species. Based on the RE mapping it would not be unusual to identify an area of 1,000ha of suitable habitat within a typical 20,000ha study area (for a major infrastructure project). This area would therefore require the attention of a team of four for 20 working days (4 weeks in effect), doing nothing but active searching. Most projects (even ones of this scale) would typically support a team of four heading out for a maximum of two weeks and they would be expected to gather the full suite of information required within this time (RE confirmations, flora transects and surveys, habitat assessments, trapping, bird counts, spotlighting, call playback and active searches). At most, active searches would constitute one fifth of the time spent in the field (assumed maximum of two hours per day). Trapping, in particular, is a highly labour-intensive and time-consuming survey technique. The two sets of expectations are far from matching at this time.

The reality of the situation is that the mapped REs are often inaccurate (having been based on coarse-scale aerial imagery only) and detailed information on the presence of fauna species is largely absent, or based only on 'best guess' predictions. Habitat is often modelled and mapped as of potential for threatened species. The little ground-truthed information that is out there means that professional experience and judgement becomes paramount, with a notable (and commendable) recent drive for gathering data focusing on habitat condition on site, to allow for comparative assessments between otherwise (seemingly) identical landscape-scale communities.

In Summary

All of the above makes for an extremely challenging (and rewarding) work environment. The focus of my attention for the next few months could well be the development of a detailed, long-term management and monitoring framework for an endangered bird species – the black-throated finch *Poephila cincta* – set to lose thousands of hectares of potentially-suitable breeding and foraging habitat. Who knows what next year may bring…

Notes

1. Pre-European occupation
2. Based on 2003 figures
3. Eyre, T.J., Ferguson, D.J., Hourigan, C.L., Smith, G.C., Mathieson, M.T., Kelly, A.L., Venz, M.F. and Hogan, L.D. (2012). *Terrestrial Vertebrate Fauna Survey Assessment Guidelines for Queensland*. Department of Science, Information Technology, Innovation and the Arts, Queensland Government, Brisbane.

About the Author

Neil Harwood is a Principal Ecologist with GHD in Brisbane, Australia. He moved to Australia from the UK in 2011.

Contact Neil at:
neil.harwood@ghd.com

Repeatability of Vegetation Mapping Using Phase 1 and NVC Approaches: Implications for Professional Practice and Surveyors' Training Requirements

Andrew Cherrill CEnv MCIEEM
Harper Adams University

Summary

Studies on inter-observer variation using the National Vegetation Classification (NVC) and Phase 1 mapping have reported repeatability in the range of 30-50% in the absence of group training of surveyors. Other mapping studies which have incorporated a standardised training regime have achieved repeatability of 70-90%. The evidence raises questions about the extent of unreported inter-observer variation in professional practice, consequences for biodiversity and clients, and the training needs of surveyors.

Good decision-making requires reliable information. Numerous factors determine the quality of ecological data yet quantitative assessments of accuracy rarely accompany survey reports. The academic literature reports a range of studies on inter-observer variability in plant species lists obtained from fixed quadrats (e.g. Vittoz and Guisan 2007). Studies on vegetation mapping are less frequent.

Identifying woodland flora © James Constant

This is regrettable because vegetation mapping presents far greater challenges. The surveyor may record species lists from defined areas (quadrats, plots or specific fields), but this is an intermediate step in allocating vegetation to a type (land cover or community) within a classification system. Logically, rigorous training, especially in groups, must have the potential to reduce inter-observer variance and boost survey repeatability. However to my knowledge there are no studies which have explicitly examined this question for mapping using Phase 1 or the National Vegetation Classification (NVC). However, a number of studies of survey repeatability have involved group-training of surveyors, whereas others have not. It is therefore possible to contrast the levels of repeatability achieved with and without a standardised training programme by comparing across studies. In this article my objectives are to review the evidence and reflect on the implications of inter-observer variation for biodiversity, clients commissioning surveys, and the training requirements of surveyors.

Quantifying Inter-Observer Variation in Habitat Mapping

Opportunities for investigating inter-observer variation arise when the same area is mapped independently by two or more surveyors. The situation can arise either as part of a Quality Assurance (QA) process or, more rarely, by chance. Correspondence between maps can be quantified by overlaying the maps within a Geographical Information System (GIS) to derive an estimate of agreement based on the area which has the same mapping class in both maps.

Inter-observer variation is of two types: spatial and classificatory. In the former, surveyors recognise the same vegetation type but record its boundaries differently. In the latter, surveyors observe the same point-location but classify the vegetation differently.

The hierarchical nature of most vegetation classifications provides a way of assessing the extent of confusion between mapping classes with similar species composition. Thus, if we aggregate similar vegetation types into broader classes the impact of relatively minor inter-observer differences in classification can be assessed by re-calculating agreement between maps. Spatial precision can be assessed using a GIS line-buffering technique to identify land within a specified distance either side of a boundary. This land can be omitted from overlay analyses and calculation of spatial agreement; thereby allowing an estimate of agreement taking into account lack of spatial precision. The width of line-buffers can be varied to assess the scale of spatial error.

An alternative approach to these 'area-based' estimates is to superimpose a representative sample of widely-spaced points on the maps (rather than using the entire mapped area). Correspondence is then estimated as the percentage of points at which there is agreement between land covers in the two maps. Spatial error can be estimated by 'flagging' mismatches which are in close proximity to a boundary with the correct (matching) land cover.

Temporal separation of repeat surveys can be a confusing factor because genuine changes may occur between surveys. However, differences between maps can be categorised according to their likelihood of having arisen through land management. Thus, for example, semi-improved acid grassland will not change into unimproved acid grassland between surveys separated by one week, but this may occur after an interval of several years. At a simplistic level it is possible to categorise changes between pairs of land cover as either 'possible' or 'impossible' within the appropriate time frame. This knowledge can aid the interpretation of matrices of correspondence between maps.

Five Case Studies

Five studies are considered in detail in this article. Three studies were based on Phase 1 mapping while two used the NVC. In each study, different surveyors independently mapped the same area providing a basis for assessment of precision. In two studies, using Phase 1 survey, the visits were widely separated (12 months in a study across sites in Northumberland National Park and up to six years in the lowland Habitat Survey of Wales (HSW) conducted by Countryside Commission for Wales (CCW) (Cherrill and McClean 1995, Stevens *et al*. 2004). Each of these studies involved a single repeat visit giving rise to one pair-wise comparison per study. The other three studies involved multiple pair-wise comparisons between maps and also controlled for genuine change between repeat visits by having short repeat survey intervals. In a Phase 1 study at Redesdale in Northumberland (Cherrill and McClean 1999a, 1999b, 2000), and NVC studies in North Wales (Hearn *et al*. 2011) and Scotland (Robertson and Grieve 2010) between six and 35 surveyors were employed.

An overview of four of the studies is shown in Table 1, along with citations to the published sources (which for brevity are not repeated below). The NVC study in Scotland is unpublished and is described in more general terms in the text below (based on a summary kindly provided by Paddy Robertson, Quality Assurance Officer, Native Woodland Survey of Scotland).

Northumberland National Park Survey

The study covered an area of approximately 25km^2 across 29 non-contiguous 1km^2 grid-squares. The opportunity to conduct the study arose by chance when it was discovered retrospectively that the same areas had been mapped by different organisations in consecutive years. Both surveys used the Phase 1 methodology but there had been no opportunity to conduct group training with surveyors across the two organisations. Spatial errors were a relatively minor cause of differences between maps (as indicated by line-buffering), while confusion between similar vegetation types was more common. Aggregation of similar land covers reduced the number of mapping classes from 39 to 17 and raised agreement between surveys from 52% to 71%. The latter is an underestimate because, while it was possible to correct for potential change when using the unaggregated land covers, this could not be achieved for the aggregated cover types.

Redesdale Upland Farm Survey

The Phase 1 study involved six surveyors mapping independently an area of approximately 4km^2 over a five-week period. Surveyors were also asked to identify areas of potential conservation interest that warranted a more detailed follow-up survey. No group training was undertaken because the intention was to capture inter-observer variation under 'typical' working conditions. Mean agreement between pairs of maps was 26%. Use of 25m line-buffers raised mean agreement by 2-3%, while aggregation of the original 36 mapping classes to 12 broader classes raised mean agreement to 56% (59% with buffering). There was considerable variation in agreement between pairs of maps, yet maximum agreement without aggregation of similar cover types and without buffering was only 39%. One survey recommended further survey for a locally scarce plant. All survey reports highlighted a wood as worthy of more detailed study, although only one

identified that it was listed in the Ancient Woodland Inventory. Further investigation of a stream corridor and a second wood was recommended by four surveys (but not the same four for each). One survey recommended more detailed survey of all areas of unenclosed rough grazing, while discrete features each identified in single reports were: a third wood, enclosed semi-improved neutral grasslands, wet heath, blanket bog and lichen assemblages on drystone walls. Overall, there was little consistency in either the location or identity of features recommended as targets for follow-up survey.

Snowdonia Survey

The NVC mapping exercise was conducted across a 43ha upland site. As in the Redesdale study, the intention was to capture repeatability under typical working conditions and hence there was no group training of surveyors. Repeatability was assessed with and without 5m line-buffers and at three levels of resolution within the NVC: sub-community, community and habitat. Spatial errors again proved to be a relatively minor issue. At the NVC community level mean agreement between pairs of unbuffered maps was 34% with a range of 5-70%. The major source of variation between maps was lack of repeatability in classification. Mean agreement at the greatest level of aggregation across vegetation types was 78%, but this was using only five mapping classes.

Lowland Habitat Survey of Wales

This study was conducted as part of a Quality Assurance (QA) exercise to check the reliability of Phase 1 data mapping in a countrywide survey of lowland habitats. Surveyors involved in the original and repeat surveys had undertaken a training programme to standardise behaviour. The QA exercise used re-assessment at 300 widely-spaced points located in a stratified random design. There was agreement between surveys for 63% of points. Excluding mismatches attributed to probable land use change between visits gave a revised agreement of 72%. Omitting mismatched points in close proximity to boundaries (a process analogous to using buffers in GIS) boosted agreement by 2% to 3%. Overall, differences in classification (24%) were more frequent than spatial errors (5%). Aggregation of Phase 1 mapping classes to Broad Habitats reduced the number of land covers from 32 to 15 and gave a correspondence of 82% (with minor spatial errors omitted). The overall level of correspondence between surveys was relatively high.

Native Woodland Survey of Scotland (NWSS)

This large scale survey has been running since 2006 and will be complete in late 2013. The NWSS incorporates rigorous training and QA protocols to ensure consistency of survey using the NVC (Robertson and Grieve 2010). At 6-9 month intervals all surveyors have been brought together to survey the same areas of woodland. These QA events have involved between 15 and 35 surveyors mapping areas (typically 15-20ha) using approximately 25 NVC types (including sub-communities of Biodiversity Action Plan importance). Repeatability has been analysed using GIS overlay. Preliminary results show pairwise agreement between surveyors' maps and a 'benchmark map' produced by the QA Officer to consistently exceed 80% (Robertson, pers. comm.). Differences have typically been found to be between closely related woodland types (or typographical errors in data entry), while spatial errors are relatively rare. Surveyors deviating from the benchmark have been required to undergo retraining and pass an assessment before being permitted to continue. Results of the NWSS QA process are due to be published later this year.

What Can We Conclude From These Five Studies?

Overall, the extent of repeatability was highly variable and often worryingly low in the absence of group training of surveyors (Table 1). Comparison across studies highlights some methodological issues. First, when comparing across studies it is important to consider the level of resolution at which the contrast is made. Aggregation of mapping classes inevitably raises measures of correspondence and so it is important to compare 'like with like' in terms of the number of mapping classes used in different studies. Second, the mix of vegetation types present in the survey area has an influence on levels of agreement. Studies found more confusion between semi-natural vegetation types compared to between highly modified vegetation types. Studies of repeatability in intensively managed lowland areas are therefore likely to report higher levels of agreement than those in upland areas. This may, in part, explain the higher level of agreement reported in the lowland HSW, although Stevens *et al*. (2004) attributed the result primarily to the standardised in-house training undertaken by surveyors in both the original and repeat surveys.

What Do Other Studies Tell Us?

The national ITE/CEH Countryside Surveys (CS) of 1990, 2000 and 2007 used bespoke in-house habitat classifications and included repeat-survey of samples areas as a QA measure. Surveyors undertook in-house training and were also visited periodically by supervisors during the survey to enhance consistency. These surveys therefore provide a useful source of information on survey repeatability, albeit using mapping approaches different from those in Phase 1 and the NVC.

In the Northern Ireland CS2000, agreement between original and repeat QA surveys was 91% at the level of UK Broad Habitats (with 14 classes), while agreement at a finer level of mapping with over 40 CS mapping classes was 70% (Kershaw and Bunce 1998). At the UK level, correspondence of original and re-surveyed sample areas within CS1990 was 84% using the numerous CS mapping classes (Barr *et al*. 1993). Resurvey of sample areas during CS2000 and CS2007 yielded correspondence of 73% and 88% respectively (in both cases using 28 mapping classes in the analysis) (Barr *et al*. 2003, Norton *et al*. 2008, Prosser and Wallace 1999). These overall figures subsume some variation between landscapes and vegetation types. Thus,

in CS1990 overall correspondence in QA checks was 95% in the lowlands and 71% in the uplands.

Overall, an impressive feature of the Countryside Survey QA exercises was the high level of repeatability achieved. This reinforces the results of QA assessments in the lowland HSW and NWSS; namely that inter-observer variation can be reduced significantly when surveyors undergo a standardised training programme. Low levels of repeatability, in the range 30%-50%, were observed in Phase 1 and NVC surveys without a standard training regime, compared to 70% to 90% in Phase 1, NVC and Countryside Surveys with co-ordinated surveyor training.

Does Low Repeatability Matter?

Poor information may lead to poor decisions, loss of biodiversity and/or unnecessary further survey and mitigation work. However, whether errors in habitat mapping actually lead to negative consequences for clients and wildlife in practice is unclear. Only one of the studies reviewed went beyond an analysis of repeatability of mapping to examine the consistency of recommendations for further survey. The impacts of inter-observer variation will depend on the context within which the survey data are used, but there are clearly potential risks associated with using Phase 1 and NVC mapping for resource inventory, monitoring habitat change and within Ecological Impact Assessment. Low survey repeatability carries risks of reputational damage for individuals and the profession at large, but more research is needed.

Is the Evidence of Low Repeatability in Phase 1 and NVC Survey Representative of Professional Practice?

The answer to this question is unclear. It is important that low levels of repeatability are not seen simply as an attack on the professionalism of the surveyors involved. Surveyors undoubtedly vary in expertise and experience, but most surveyors work alone and lack opportunities to share experience with peers working for other employers. Divergence in behaviour between small isolated populations is something which ecologists can easily relate to. Moreover, a key contributory factor in low repeatability (particularly with Phase 1) may well be inadequacies in habitat descriptions rather than the behaviour of surveyors *per se*. Again further research is required.

Next Steps

Inter-observer variation is a largely hidden and potentially sensitive issue. CIEEM is ideally placed to help answer the questions raised above by providing a forum for members to share evidence based on their experience and in-house QA processes. Recognition of a problem is a necessary first step to identifying solutions and members could undoubtedly make valuable recommendations for addressing weaknesses in Phase 1 and NVC methodologies. Looking further ahead there may be a need for guidance on the training and CPD requirements of surveyors undertaking Phase 1 or NVC surveys. The evidence presented in this article suggests that a single standardised training regime, suitably agreed by statutory and non-statutory stakeholders, would have the potential to increase the repeatability of survey. Whether such a step is warranted, or even feasible, is open to debate. As a first step I am interested in hearing members' views and particularly if you have quantitative information on survey repeatability that you are willing to share. To facilitate discussion an online survey of members will be launched later in the year.

Acknowledgements

I thank Gordon Haycock and Paddy Robertson (NWSS Quality Assurance Officer) for helpful discussions and information on the Native Woodland Survey of Scotland.

Table 1. A summary of the per cent agreement reported from pair-wise comparison between vegetation maps in four studies. Where the number of pair-wise comparisons >1 the figures are means (with ranges in parentheses).

Survey method		Phase 1			Phase 1		
Study		Lowland Habitat Survey of Wales (Stevens *et al*. 2004)			Northumberland NP (Cherrill and McClean 1995)		
With group training?		Yes			No		
Number of surveys		2			2		
Treatment of mapping classes		Unaggregated		Aggregated[1]	Unaggregated		Aggregated[2]
Number of mapping classes		32		15	39		17
Number of pair-wise contrasts		1		1	1		1
Controlling for change between visits?		No	Yes	Yes	No	Yes[6]	No
Overall agreement		63	72	-	44	52	71
Spatial error omitted	'Minor'	65	75	82	-	-	-
	5m buffer	-	-	-	46	54	74
	25m buffer	-	-	-	53	60	80

Notes

1 Phase 1 land cover types were aggregated to Broad Habitat Types

2 Aggregation was based on the hierarchical framework of the Phase 1 classification (and the authors' personal judgement)

3 NVC sub-communities

4 NVC communities

5 NVC habitat types: Calcareous grasslands (CG), Heath (H), Mire (M), Acid grassland (U), plus Boulders/rock/scree

6 Figures in this column were calculated from Table 6 in Cherrill and McClean (1995)

About the Author

Andrew Cherrill has recently moved to Harper Adams University as Senior Lecturer in Applied Ecology after 18 years at the University of Sunderland. He is a member of the Editorial Board of *In Practice* and has wide ranging teaching and research interests in ecology.

Contact Andrew at:
pacherrill@harper-adams.ac.uk

	Phase 1		NVC		
	Redesdale (Cherrill and McClean 1999a,1999b, 2000)		Snowdonia, Wales (Hearn *et al*. 2011)		
	No		No		
	6		7 (including 4 at sub-community level)		
	Unaggregated	Aggregated[2]	Unaggregated	Aggregated	
	36	12	34[3]	20[4]	5[5]
	15	15	6	21	21
	Yes	Yes	Yes	Yes	Yes
	26 (17 – 39)	56 (38 – 75)	19 (9 – 29)	34 (5 – 70)	78 (67 – 89)
	-	-	-	-	-
	-	-	25 (10 – 43)	39 (3 – 79)	89 (76 – 98)
	28 (19 – 43)	59 (40 – 79)	-	-	-

References

Barr, C., Bunce, R., Clarke, R., Firbank, L., Gillespie, M., Howard, D., Petit, S., Smart, S., Stuart, R. and Watkins, J. (2003). *Methodology of the Countryside Survey 2000 Module 1: Survey of Broad Habitats and landscape features*. Centre for Ecology and Hydrology.

Barr, C., Bunce, R., Clarke, R., Fuller, R., Furse, M., Gilespie, M., Groom, G., Hallam, C., Hornung, M., Howard, D. and Ness, M. (1993). *Countryside Survey 1990 Main Report*. Department of the Environment.

Cherrill, A.J. and McClean, C. (1995). An investigation of uncertainty in field habitat mapping and the implications for detecting land cover change. *Landscape Ecology* **10:** 5-21.

Cherrill, A.J. and McClean, C. (1999a). Between observer variation in the application of a standard method of habitat mapping by environmental consultants in the UK. *Journal of Applied Ecology* **36:** 989-1008.

Cherrill, A.J. and McClean, C. (1999b). The reliability of Phase 1 habitat mapping in the UK: the extent and types of observer bias. *Landscape and Urban Planning* **45:** 131-143.

Cherrill, A.J. and McClean, C. (2000). Lack of precision in mapping upland habitats and preliminary conservation assessments. In *Aspects of Applied Biology 58, Vegetation management in changing landscapes*. (Ed. Boatman, N. *et al.*), pp. 167-172, Association of Applied Biologists, Wellesbourne.

Hearn, S., Healey, J., McDonald, M., Turner, A., Wong, J. and Stewart, G. (2011). The repeatability of vegetation classification and mapping. *Journal of Environmental Management* **92:** 1174-1184.

Joint Nature Conservation Committee (1993). *Handbook for Phase 1 Survey – A technique for environmental audit*. JNCC, Peterborough.

Kershaw, D. and Bunce, R. (1998). *Northern Ireland Countryside Survey 2000 Quality Assurance*. Institute of Terrestrial Ecology, Merlewood.

Norton, L., Scholefield, P., Maskell, L., Smart, S., Murphy, J., Williams, P., Scarlett, P. and Clarke, R. (2008). *Quality assurance report: Mapping quality assurance exercise*. Centre for Ecology and Hydrology.

Prosser, M.V. and Wallace, H.L. (1999). *Countryside Survey 2000 Quality Assurance Exercise*. Report to Institute of Terrestrial Ecology, Merlewood.

Robertson, J.H. and Grieve, Y. (2010) Native Woodland Survey of Scotland. NWSS field survey and QA procedure. *Scottish Forestry* **64:** 10-14.

Rodwell, J.S. (2006) *National Vegetation Classification users' handbook*. JNCC, Peterborough.

Stevens, J., Blackstock, T., Howe, E. and Stevens, D. (2004). Repeatability of Phase 1 habitat survey. *Journal of Environmental Management* **73:** 53-59.

Vittoz, P. and Guisan, A. (2007). How reliable is the monitoring of permanent vegetation plots?

A test with multiple observers. *Journal of Vegetation Science* **18:** 413-422.

The Changing Face of Britain's Landscapes

Marion O'Sullivan
Living With Environmental Change (LWEC) Directorate

Britain's climate seems to be changing but there are many uncertainties as to the causes. Our weather, a favourite topic of peoples' conversation, is having an immediate impact but are there any long-term trends? What impact on biodiversity will the changing climate have and how can we manage or adapt to these changes? Scientists have now produced a comprehensive guide to assist policy-makers and land managers when making decisions about the British Countryside.

Scientific evidence gathered over many decades leaves little doubt that the UK's climate is changing and is already affecting biodiversity. According to the latest evidence produced by the Living With Environmental Change (LWEC) partnership, there will be both winners and losers in nature over the coming decades as the magnitude of climate change increases.

Some of the plants, birds, insects and animals that we are used to seeing in our towns and countryside today are already in decline and could struggle to survive in the future. Others will thrive and new species will arrive as conditions become more favourable for them.

LWEC has produced a Terrestrial Biodiversity Climate Change Impacts Report Card – an assessment of the emerging themes from hundreds of scientific studies, underpinned by a series of specially commissioned reviews. It is the first in a series of web-based, click-through expert reports to advise government policy-makers, land managers and environmental consultants of what the current evidence indicates. It will give them a base on which to make decisions relating to climate change adaptation and mitigation.

The LWEC report card has useful information for anyone who has an interest in their environment. It sets out the key trends in how UK biodiversity is responding to climate change. It acknowledges that not all environmental and ecosystem changes are necessarily due to climate change. In the UK, where the climate is naturally very variable and there are other influences on the climate system, it can be particularly difficult to attribute the causes of change.

But the report card also sets out what we know from decades of monitoring and observational studies, and provides an assessment of confidence levels for what could happen in the future, based on this record of past trends.

So what does the report card show is happening now and what might happen in the future? Dr Mike Morecroft, Head of Profession for Climate Change at Natural England, who led the report card's development, says we could be looking at quite a radical shift, the whole look of the countryside changing – and the species that we find. In particular, places being different to what we're used to. The green and pleasant land that's become so ingrained in the British psyche is not going to be the same in the future.

Despite this year's cold start, the pattern of evidence shows that spring temperatures have generally been a little higher across the UK. The timing of natural events – such as the flowering and leafing of plants, egg laying in birds, and the emergence of insects – has therefore been earlier.

Some species are moving northwards or to higher altitudes as temperatures rise. For some, such as some of the dragonflies and the bee orchid, this means expanding their range. For others, particularly northern and upland species such as the mountain ringlet butterfly, it means a diminishing range. Over a period of 20-25 years, average shifts of 31-60km have been recorded at rates of between 13.7km and 24.8km per decade. Species that are unable to keep pace with climate change, or whose movement is barred by distances between isolated habitats such as mountain tops, could even face local extinction.

Peak District ©Adam Bay

Animals and plants respond on a year-by-year basis to changes in weather patterns and other environmental variations that affect their reproduction, growth and migration. Their survival is also influenced by interactions between species – for example, the food chain, competition, pollination, pests and diseases. Changes to these ecological processes will influence genetic diversity and evolutionary change.

Genetic adaptation is helping some species to expand their range in the UK by increasing their ability to move, or by altering their interaction with other species. A good example is the brown argus butterfly, which has started to use wild geranium as a new food source.

Current climate projections indicate that the UK is likely to experience an increase in the number of extreme weather events such as flooding and drought. Many are localised and will have short-term impacts. But if the intensity and frequency increases, or there is a combination of events – drought followed by a major flood, for example – the cumulative impact could reach a tipping point for some species whose habitants and numbers are irrevocably changed.

Because of uncertainty associated with extreme weather projections, the confidence rating can only be listed as low in the report card, but there is evidence that spring droughts can reduce the survival of young mammals, birds and plants. Badgers and moles, for example, which need a good supply of earthworms for their juvenile development, would have a major problem. And reduced water flow in rivers would adversely affect water voles and otters.

People value their natural environment. This is evident by the number of protected areas and nature reserves in the UK. Programmes such as the Valuing Nature Network the Natural Ecosystem Assessment make us think about what our natural environment has to offer and the values we place on it, and LWEC's biodiversity report card reinforces the importance of maintaining those values.

It highlights the responsibility that Britain has to protect coastal habitats such as vegetated sea cliffs and shingle banks, estuaries, dunes and coastal lagoons. Our coastline provides important environments for wintering populations of wading birds and even small losses of habitat could have major negative impacts on them. The additional threat of rising sea levels in such regions makes them particularly vulnerable to climate change, together with other pressures such as coastal development or changes in land use.

The LWEC report card contains a myriad of interesting and useful scientific facts that can be easily found with a click of a computer mouse. Importantly, the information is set out in bite-sized chunks that are easy to read and understand. The result is an authoritative summary of current and possible future climate impacts that could prove invaluable for transferring science into policy.

Pewsey Down © David Kilbey

References and Further Reading

The click-through Terrestrial Biodiversity Climate Change Impact Report Card can be downloaded from the LWEC website at http://www.lwec.org.uk/resources/report-cards/biodiversity.

The Report Card is a summary of 15 technical papers that were commissioned from leading experts. Each technical paper covered a separate topic and was peer-reviewed. The technical papers include supporting evidence and sections on knowledge gaps and confidence assessments. They can all be accessed by downloading and clicking through the Report Card.

The report card was the subject of a Channel 4 News special feature in May 2013. The programme can be viewed at http://www.lwec.org.uk/stories/climate-impacts-biodiversity-hit-headlines.

For further information

Contact Susan at:
susan.ballard@lwec.org.uk

Letter from a Member: Bats and Breathable Roofing Membranes – An Unsatisfactory Situation

Peter Middleton MCIEEM
Middleton Ecological Consultancy

Like many other consultants I am frustrated with the whole business around European Protected Species (EPS) licensing. Indeed, in the case of bats it would appear that the whole process is fundamentally flawed, in spite of the rigorous and complicated process of acquiring a mitigation licence.

There is no doubt that Natural England, architects and ecological consultants do their best to administer the regulations and the law, but unfortunately it is all done without any 'joined up thinking' whatsoever.

Few architects give any serious consideration to the conservation and protection of bats. Consequently, they are unwilling to deviate from the modern and accepted use of modern breathable roofing membranes (BRMs), and whilst there is no regulation stating that they must be used on refurbishment works such as re-roofing they appear to be universally incorporated into plans that architects produce whatever the situation, whether it be a listed building or otherwise.

Most bat workers are aware of the problems with breathable membranes - particularly entanglement. As a consultant myself, but more importantly as a conservationist, I worry that not enough is being done to prevent bats from getting into contact with BRMs. And can we really prevent them getting into contact when they are used on works involving the retention or re-placement of roosts? The usual way of re-creating a roost under tiles or slates is to use bitumen felt directly under the access point/ slate and to section the area off to 1m with laths to prevent the bats coming into contact with the BRM. Natural England accepts this method, but is this good enough?

When undertaking roof stripping, droppings are often found in places where you can't determine how the bats have entered. Therefore, how can you guarantee that bats will not enter the roof where you don't want them too, for example, under lead flashings or between and under less tightly or poorly fitted slates or tiles? Westmoreland slates are often different thicknesses and less flat resulting in potential access points, especially for pipistrelles. Likewise, hand-made Rosemary tiles are different sizes resulting in the same.

Stacey Waring's research study of what constitutes a safe BRM should eventually result in some progress and hopefully convince the manufactures of BRMs to manufacture a bat-friendly product. However, in the meantime, what should we do? Consultants can obviously take extra precautions to try and prevent bats from coming into contact with the BRMs, for example, by filling any potential gaps between slates with lead seal, but this is very time consuming and can lead to extra costs. Ultimately, it is down to Natural England to devise an acceptable solution to what is a very worrying situation regarding BRMs. The best solution is to ban the use of BRMs in any works where there is an existing bat roost, forcing architects to use the traditional bitumen felt and ventilate or use no membrane at all.

Another scenario is where re-roofing takes place on a listed building that is in a state of dereliction and the works need to be done to protect the building in the long-term. Because of the state of the roof bats no longer inhabit the loft-space and assessment and activity surveys confirm this. However, once the roof is made water-tight by re-roofing and the use of a BRM, the building and indeed the roof-space becomes very attractive to bats because historically they have used it in the past. Obviously such a scenario can potentially result in disastrous consequences for the bats and indeed the roofing membrane.

The roof of this chapel had multiple roosts between slates and boards with access not always obvious. Note the felt flap nailed to lath top side of replacement roost to prevent bats being able to pass over lath and come in contact with the BRM. This was an extra precaution.

The current situation with the use of BRMs makes the whole licensing procedure a complete farce and the work of ecologists is seriously undermined. I take my work seriously and the thought of bats dying after work I have supervised worries me. I take extra precautions to prevent bats coming into contact with BRMs, but there is only so much you can do. Natural England needs to take a grip of this situation and think of a solution that will give us (ecologists) the confidence needed to undertake the work as good professionals.

References

Waring, S.D., Essah, E.A., Gunnell, K., and Bonser, R.H.C. (2013). Double Jeopardy: The Potential for Problems when Bats Interact with Breathable Roofing Membranes in the United Kingdom. *Architecture & Environment* **1:** 1-13. [freely available at http://manuscript.sciknow.org/uploads/ae/pub/ae_1361785788.pdf and www.batsandbrms.co.uk]

About the Author

Peter has been in consultancy for 10 years but in the beginning the work was solely related to conservation. He is the author of papers published in eminent British Journals on a variety of subjects including birds, the ecology of post-industrial land and Bryophytes and lichens. For him, ecology is a way of life not an occupation.

Contact Peter at:
pmiddleton630@btinternet.com

Chartered Institute News

Summer Conference

Landscape Institute
Inspiring great places

The joint conference in partnership with the Landscape Institute on Green Infrastructure was a successful and thought-provoking event. Over 150 delegates, primarily from the two Institutes but also including some planners, heard some challenging presentations in the morning from speakers including Tony Juniper, Gary Grant and Pam Warhurst. This sparked much discussion and debate amongst delegates over lunch and it was interesting to see how the two professions had different perspectives on some of the issues that were raised.

In the afternoon there was an opportunity to hear about two case studies before delegates took part in a facilitated workshop reflecting on the challenges and opportunities of Green Infrastructure approach and how the two professions could work more effectively together to deliver successful project outcomes.

Delegates had been seated in such a way that each table included both landscape architects and ecologists/environmental managers and this helped to ensure lively debate and discussion. Feedback from the debate has been very positive and both Institutes have agreed that there is much to be gained by further joint working in this way.

The conference presentations are now available on the website.

BREEAM

CIEEM has been negotiating with BRE for some considerable time now regarding our concerns at the ecological aspects of the current BREEAM assessment process. BRE have now agreed to establish a BREEAM Ecology Working Group which, in addition to BRE and CIEEM, will include representatives from NGOs. The intention is to work up proposals for improved ecological assessment as part of BREEAM and then consult with a wider stakeholder group including statutory agencies, ALGE and BRE assessors. Revised proposals would then be tested and modified before being submitted to the BRE Trust for approval.

It is hoped that we can use this opportunity to improve the assessment process and deliver better outcomes for biodiversity through BREEAM.

Defra Workshop for Local Planning Authorities

Department for Environment Food & Rural Affairs

Measure 28 of the Review into the Implementation of the European Directives in England was for Defra, supported by CIEEM and the Association of Local Government Ecologists (ALGE), to organise a workshop for local authority planners on strategies for taking proper account of biodiversity in planning decisions involving European designated sites.

The workshop was held at the beginning of July in London. Over 50 attendees heard presentations on the risks for local authorities of not having ecological expertise, or appropriate access to ecological expertise, in place when assessing relevant planning applications. Case studies were used to illustrate different models of ecological support. One of the key issues to come out of the discussion was the difficulty in making local councillors understand the importance of proper ecological assessment of planning applications and thus getting a commitment to spending money on ecological advice, whether that be in-house or external.

A report on the workshop can be downloaded from the CIEEM website.

INTECOL 2013

It was good to see many familiar faces (and some new ones) at the INTECOL 2013 (www.intecol2013.org) conference in August at the ExCel in London. CIEEM had an exhibition stand there where we promoted our new Chartered Ecologist Register and our new degree accreditation scheme. We also ran a workshop at the conference discussing what the practice of ecology might look like in 30 years' time and what skills and competencies ecologists of the future may need to have.

Planning Naturally

CIEEM, RSPB and RTPI recently published a new report aiming to show how nature is integral to every part of the planning process. Launched in July at the RTPI Planning Convention, *Planning Naturally* uses 12 principles of good spatial planning illustrated by examples from across the UK and further afield to set out how we can achieve growth in housing, infrastructure and industry without damaging the habitats which support our threatened species.

The report highlights examples including ambitious plans for the protection of 10,000km^2 of central Scotland, the largest wetland creation project in Europe at Wallasea Island in Essex and a wide variety of plans published in recent years by local authorities around the UK.

Copies of *Planning Naturally* can be downloaded from the CIEEM website.

Natural Resources Wales (NRW) Corporate Plan

CIEEM was pleased to be invited to a stakeholder workshop to input into the development of NRW's first Corporate Plan. This was an early stage in a consultation process which will take place over several months and which CIEEM will continue to be involved with. Key points made at the stakeholder workshop included:

- The importance of supporting the training and professional development of ecologists within NRW.
- The need to make biodiversity considerations more visible in its external communications and website.
- The opportunity to support smaller teams within NRW to share their expertise more widely within the organisation.
- The importance of engaging with stakeholders to help with practical delivery and targeting funding to lever more resources.

Practising Ecologist

Following on from CIEEM's endorsement of the Environment Agency's Training Development Frameworks, CIEEM has now endorsed the internal Agency award of 'Practising Ecologist'. The Award has been developed by the Environment Agency to support, promote and motivate staff to continually develop their knowledge and skills for the better delivery of their roles. It is based on an assessment of performance and competence undertaken by line managers and a national panel of Agency staff.

This innovative tool to support and recognise Agency staff engaged in biodiversity-related activities has been developed alongside CIEEM's Competency Framework so that recipients can see how their training, development and Practising Ecologist status translates into CIEEM membership and chartered status eligibility.

Membership Renewals

Membership renewal notices have now been sent out. Please note that membership subscriptions are due **on or before 1 October 2013** and you can **renew online** by visiting the website. Provided you are not a student you can also opt to pay by monthly direct debit payments to help spread the cost.

If we have still not received your renewal by 1st November 2013 your name will be removed from the Professional Directory and if you have not renewed by 30th December 2013 your membership will be deemed to have lapsed. Please remember that lapsed members are not able to use post-nominals or take advantage of any other benefits.

Every year the membership team spends many hours chasing members who have forgotten to renew and we really would appreciate your help in reducing the size of this task so please act on your renewal notice now.

Staff Changes

In June we welcomed three new members of staff. **Karen Sanderson** joined us as our Registration Officer and is managing the registration process for Chartered Ecologists. **Deborah Alexander** is providing invaluable administrative support in respect of professional standards issues. **Vicky Bowskill** is our new Geographic Sections Coordinator.

At the beginning of September **Mairead Stack** joined us as Irish Section Support Officer whilst **Michael Fray** is our temporary Training and Professional Development Administrator, helping to provide cover for **Helen Boulden** who will be going on maternity leave shortly.

New Fellows

Congratulations to two members who have recently been admitted to Fellowship of CIEEM.

Ian Bainbridge is currently the Head of Science in Scottish Natural Heritage, where he has a wide ranging brief to oversee the strategic direction of science and to ensure the standards of conduct, analysis, reporting and implementation are high. He is extensively connected with the Scottish and UK Government environmental sectors and Biodiversity Committees and is very well known to senior staff in the agencies, research institutes and universities. He has operated at a senior level in an NGO (RSPB), government department, and a conservation agency, as well as having worked at operational, strategic and senior managerial levels.

As the Scottish Government's Chief Ecological Adviser, Ian has had lead responsibility for developing survey and assessment standards in relation to wind farm effects on terrestrial birds. He also represents the UK and the EU as principal adviser on the Convention on Biological Diversity Island Biodiversity Work Programme and he led the development of the Bern Convention Charter for European Island Biodiversity, which was adopted in 2011.

Mike Oxford has over 30 years of experience as an ecologist in local authorities, research and consultancy. A former local authority ecologist himself, Mike Oxford is described by many as the instigator of influential, targeted and timely research for the Association of Local Government Ecologists (ALGE). This research is regarded as having sustained the pressure on local authorities to do more for nature conservation and to meet their biodiversity obligations in meaningful and practical ways. Whilst working as a local authority ecologist Mike secured the first injunction and first prosecution for developer-based wildlife crime on a non-designated site – a landmark event in urban nature conservation.

Mike has generated imaginative, innovative and practical resources and tools, such as the Biodiversity Planning Toolkit, to help planners and ecologists do their job more effectively. More recently he has worked with the British Standards Institute leading the delivery of PAS 2010 and BS 42020.

South East England Section News

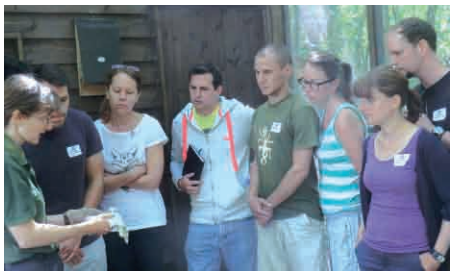
Debbie Bartlett FCIEEM
Vice Convenor, South East England Geographic Section

On 28th July 2013 Hazel Ryan MCIEEM hosted an event focusing on the conservation projects at Wildwood in Kent. Hazel is the conservation officer and has responsibility for the small mammal collection. After a presentation on the ecology and captive breeding programmes for dormice, water voles, water shrews, harvest mice and red squirrels we visited the enclosures to see these animals.

Of particular interest was the 'water vole hotel' where animals are held while development takes place, being returned when mitigation has been undertaken and the habitat is returned to suitable condition with an appropriate management plan in place.

We also had the opportunity to see the flight cage used to train injured and hand reared bats to fly as these can only be returned to the wild when it is certain that they can fly strongly and can catch their own food.

After the formal part of the event everyone went round the park to see the collection of (mainly) British wild animals. Thanks to Hazel for a very interesting event.



CIEEM

Irish Section Conference 2013

Protected Habitats and Species – A Best Practice Approach

18-19 November 2013, Dublin

Overview

This conference will provide practical information on surveying and assessing protected habitats and species in Ireland. A series of focussed presentations, case studies and workshops will be delivered over the two days by a range of speakers from across the isle of Ireland.

Key speakers

Jimmy Deenihan TD, Minister for Arts, Heritage and Gaeltacht

MLA Minister for Environment, Northern Ireland (TBC)

Topics include:

Day 1
Natura 2000
Hydrology and raised bogs
Upland habitat classifications
Hedgerow appraisal
Case studies
Agri-environmental perspectives
Wind energy impacts on birds

Day 2
River restoration
Impacts of aquaculture
Mapping marine habitats
Ecology and other disciplines (Engineering and Landscaping)
Best practice approaches to species surveys (Vertigo moulinsiana, Marsh Fritillary, rare plants, bats and trees)
Bryophytes and Ecological Impact Assessment (EcIA)

Benefits of attending

Delegates will –

- Receive an update on the Conservation Objectives of Natura 2000 sites in Ireland
- Learn about some of the most recent Annex 1 Habitat surveys that have been undertaken and the survey methods used - including the challenges
- Understand, in more detail, Upland Habitat Classifications
- Learn about agri-environmental perspectives of National Parks and Wildlife Service (NPWS)
- Examine case studies of the impacts of projects on protected habitats and species
- Learn about the specific survey methods of protected flora and fauna species
- Take part in workshops to understand the involvement of ecologists with other disciplines in areas of planning and development

www.cieem.net/events/571/irish-section-conference-and-agm-2013

West Midlands Section News

Cody Levine CEnv MCIEEM and Veronica Lawrie CEnv MCIEEM
West Midlands Geographic Section Committee Members

In early May the West Midlands Section held a Reptile Survey and Translocation Discussion Workshop. The event took place in Worcestershire and provided an opportunity to discuss and learn more about reptiles in the region. The event included a site visit to an active reptile receptor site, followed by a discussion workshop. It brought together over 40 ecologists from the region's public and private sectors to discuss examples of best practice in surveying and conserving reptile populations. The ethics and practicalities involved in reptile translocation schemes were considered. Issues relating to site protection, planning conditions and their enforcement, site monitoring and other factors that influence the long-term viability of receptor sites were explored. The diversity of conservation approaches adopted by ecologists was discussed and many attendants voiced the need for local and preferably national guidelines for reptile survey and mitigation. The feedback from the event was very positive and it is likely that a second workshop will be organised later in 2013 before notes are made publicly available. Please contact Cody (clevine@worcestershire.gov.uk) with any further questions.

A date for your diaries is the Annual General Meeting, to be held on 10th September at 6.30pm at the Arup offices in Birmingham (Blythe Valley Park). There will be excellent speakers and it is a chance to meet fellow, local ecologists. We hope you will be able to join us at some of the upcoming events and look forward to seeing you there.

Introducing the new Geographic Sections Coordinator

Vicky Bowskill

CIEEM Geographic Sections Coordinator

Background

With nearly 10 years of experience in Public Rights of Way and four years in Training and Development, Vicky has worked for five different local authorities in England as well as the private sector.

Role

Based at the CIEEM Secretariat in Winchester, Vicky's role is to support the 10 mainland UK Geographic Sections in raising awareness, planning events and promoting activities to meet the needs of local members and potential new members.

By the end of September, Vicky hopes to have connected with all of the Section Committees during her grand tour of the UK. Whilst on her travels she has been finding out how she can best help each Section achieve their aspirations. This includes acting on the wealth of useful feedback provided by members in this year's annual membership survey.

Active and engaged Geographic Sections provide invaluable links to members at the local level and it is Vicky's goal to help them reach their full potential. If you would like to get involved with your local Section, in any capacity, please get in touch and we will be more than happy to make the introduction.

For further information please contact enquiries@cieem.net or visit www.cieem.net/geographic-sections.

Overseas Territories Special Interest Group

Anguilla, the Chagos Archipelago & Plant Conservation in the Overseas Territories

Afternoon Technical Seminar

26th September 2013

Kew Herbarium, London

Overview

This technical seminar will provide an opportunity to hear from practitioners and research teams on current programmes running in both the marine and terrestrial environments of the Overseas Territories. As well as a series of presentations and case studies, there will be time for some lively discussion in a fascinating venue.

Speakers

A number of speakers will be researchers from the Overseas Territories Team at Kew and the Chagos Conservation Trust.

Benefits of attending

Delegates will –

- Receive an update on current programmes running within the Overseas Territories
- Learn about some of the plant conservation work at Kew within the Territories
- Examine case studies of the marine resources of the Caribbean and Indian Ocean
- Take part in discussions to understand the involvement of ecologists within these active programmes

Attendees will have free access to other publically open areas of Kew and also see behind the scenes within the herbarium facilities in these world renowned Gardens!

www.cieem.net/events/565/overseas-territories-special-interest-group-technical-seminar

Partnership News

New Data Management System for Ecological Consultants

The CIEEM Code of Professional Conduct states that members shall "*wherever possible, make scientific data collected during the course of their professional duties available to others such as records centres.*"

However, sharing ecological survey data is not always straightforward – there can be issues around client permission, verification, data formats, and there can be a time and cost implication.

CIEEM is working with the National Biodiversity Network Trust, the Biological Records Centre and the Association of Local Environmental Records Centres to develop a biodiversity data management website for ecological consultants.

Key features include:

- Data entry forms designed for specific survey methodologies.
- Data entry in the field (via smartphone or tablet) or in the office.
- The ability to set a data release date for each project as agreed with the client.
- A range of data download options including GIS formats.
- The ability to tag records as 'sensitive' to restrict their availability to only approved users.

The system will enable consultants to share their records without any extra effort. Data will be available to national recording schemes and local environmental records centres through the iRecord website (www.brc.ac.uk/iRecord) and verified records will be shared via the NBN Gateway.

A steering group has been set up to oversee development to ensure that the system fulfils consultants' requirements and makes their work easier. The steering group members represent large and small consultancies with specialisms in a range of habitats and species. They began by describing the data they collect and the formats in which they present it to clients, and provided initial ideas on features they would like to see in a data management system. A specification was drawn up based on their suggestions and used to develop a prototype.

The steering group met at CEH Wallingford in May to spend a day exploring the prototype and discussing options for further development. Their suggestions are now being incorporated and the prototype will shortly be available for testing by the steering group using real survey data.

The group will meet again in winter to discuss their experiences of using the system, then further refinement will take place prior to full release of the system in spring 2014.

This project is funded by Defra through their contract for the development of the National Biodiversity Network.

For further information, or if you would like to help test the prototype system, contact Paula Lightfoot: p.lightfoot@nbn.org.uk

Society for the Environment

In late 2014 the Society for the Environment will celebrate the 10th anniversary of the grant of its Royal Charter.

Since it was founded the Society has registered over 7,000 people as Chartered Environmentalists. Chartered Environmentalist is the leading cross-sectoral environmental qualification for members of professional bodies.

The Society has launched a bid to achieve 10,000 registrations by its 10th birthday.

Chartered status is the hallmark of professionalism in the UK, and is also widely recognised overseas. There is no profession whose members' activities do not have an environmental impact. Chartered Environmentalists have a knowledge of sustainability principles that enables them to minimise the environmental impacts of their professional activities, and the understanding to develop innovative new approaches. The assessment is rigorous, requiring applicants to demonstrate postgraduate level attributes (although a postgraduate degree is not necessary).

The 7,000 Chartered Environmentalists who have been registered so far represent a growing army. The bid to reach 10,000 by the 10th anniversary will help to raise awareness of the qualification, bringing us closer to the day when it will be specified as a matter of course when recruiting for environmentally sensitive posts.

Chartered Environmentalists can help by urging colleagues to apply for registration. If every current registered Chartered Environmentalist recruited just one colleague the numbers would double. And they would be benefitting themselves as well as their colleagues. The wider the recognition of their qualification the more career opportunities will arise as employers start to specify it as a desirable, or even necessary, criterion. That will happen if the numbers increase to a level that is significant, visible and can't be ignored.

If you are a Chartered Environmentalist you have already demonstrated your commitment to sustainability. Take it one step further and persuade a colleague to apply today.

We are very pleased to announce that the following CIEEM members have been admitted as Chartered Environmentalists: Mr Christopher Barrett, Miss Lynsey Blows, Miss Natalie Boyle, Mr Stephen Clark, Mrs Tawny Clark, Mrs Sally Dalrymple-Smith, Mr Mark Doughty, Mr Nathan Edmonds, Mr Frank Fortune, Mrs Rebecca Hendry, Mr Adrian Hutchings, Dr Sarah Jackson, Miss Caroline Jewell, Mr Cody Levine, Dr Katherine Liney, Miss Hazel Marsh, Miss Julia Massey, Mr Christopher Mitchell, Mr Kieran Sheehan, Miss Samantha Shove, Mrs Lindsay Spink, Ms Susan White

SocEnv
Society for the Environment

www.socenv.org.uk

Applicants and Admissions

If any existing Member has any good reason to object to someone being admitted to the Institute, especially if this relates to compliance with the Code of Professional Conduct, they must inform the Chief Executive Officer by telephone or letter before 7th October 2013. Any communications will be handled discreetly. The decision on admission is usually taken by the Membership Admissions Committee under delegated authority from the Governing Board but may be taken directly by the Board itself. CIEEM is pleased to welcome applications for membership from the following:

APPLICANTS

Applications For Full Membership

Mr Philip Irving, Dr Stephanie May, Miss Claire Parry

Applications For Associate Membership

Miss Aisling Connolly, Mr Peter Haswell, Miss Jane Herbert, Miss Kristy Kelly, Miss Rachel Midgley, Mr Robert Rowe, Miss Fearn Simms, Mr Matthew Thomas

ADMISSIONS

Full Members

Mr Nicholas Aldus, Miss Victoria Alexander, Prof John Altringham, Mr Stewart Angus, Miss Stephanie Attwood, Mr Simon Bates, Mr Jonathan Best, Mr Angus Bloomfield, Mrs Sarah Board, Ms Julie Bowes, Mr Sion Brackenbury, Mr Tim Brooks, Miss Megan Cameron, Ms Sarah Carver, Ms Susan Charlton, Mr Nicholas Collinson, Mr Giles Davis, Ms Andrea Dymond, Mr Jonathan Elmer, Mrs Andrea Gannon, Ms Rachael Greaves, Miss Vivienne Greenough, Mr Alexander Heath, Dr Matthew Heydon, Miss Kathy Hughes, Ms Paula Kearney, Mr Doncha Madden, Dr Stephen McCormack, Mr Chris McGregor, Miss Jenni Morgan, Mr Michael Morris, Miss Kim Norman, Mr Daniel O'Sullivan, Mr Martyn Owen, Mr Guy Parker, Mr Simon Parkes, Miss Katie Partington, Dr Geoffrey Radley, Mr David Rees, Mr Jonathan Richards, Dr Sugoto Roy, Mr Angus Spirit, Ms Ruth Swarbrick, Ms Susan Sweetman, Mrs Polly Tarrant, Mr Michael Thornton, Dr Philippa Tomlinson, Mr Philip Ward, Miss Sian Williams, Mr Arwel Williams

Associate Members

Miss Agni-Louiza Arampoglou, Miss Laura Belfield, Miss Kate Bennett, Mr Christopher Bingham, Miss Claire Browne, Mr Jamie Coleman, Mr Thomas Drinan, Mr David Gash, Dr Malcolm Grant, Mr Ian Heard, Mrs Rachel Hepburn, Miss Andrea Hudspeth, Mr Matt Johnson, Mr Sam Lunn, Mrs Catherine Oakley, Dr Samuel Quin, Ms Ivi Szaboova, Miss Rosie Whicheloe

Upgrades to Full Membership

Mr John Atkinson, Mr Jonathan Bannon, Mr Colin Bonnington, Mr James Campbell, Miss Helen Craig, Miss Susannah Dickinson, Mr Scott Dodd, Mrs Natalie Drury, Mr Gerard Hayes, Mr Del Jones, Miss Sian Jones, Miss Katherine Kennedy, Mr Donald Kernott, Miss Rebecca May, Mr Jonathan Moore, Miss Sarah Muddell, Dr Jenny Owen, Ms Sali Palmer, Mr Richard Pash, Miss Samantha Patrone, Mrs Jana Prapotnikova, Mr Jason Reeves, Mr Will Salmon, Mr Daniel Simmons, Dr Sarah Taylor, Miss Laura Turner, Mrs Jayne Walker, Ms Aisling Walsh, Mr Michael Williams, Mr Daniel Wood, Mr Nicholas Wright

Upgrades to Associate Membership

Mr Liam Atherton, Mr Richard Ayre, Mr Samuel Bacon, Miss Charlotte Bellamy, Mr Jean-Michel Bellas, Mr James Bird, Miss Rebecca Brown, Miss Katherine Bubb, Mr Andrew Burrows, Mr Richard Chilcott, Miss Laura Cobden, Miss Victoria Coulthard, Mr Samuel Durham, Miss Rachel Falkingham, Miss Isla Hoffman Heap, Miss Katie Jackson, Mr Jonathan Jones, Miss Holly Lewis, Mrs Amy McCallum, Mr Brandon Murray, Mr Robert Nussey, Mr Sam Pottier, Miss Heather Ream, Miss Paula Richings, Miss Rebecca Sansom, Miss Alison Sharkey, Mr Christopher Shaw, Miss Hannah Stebbings, Mr Jay Stebbings, Miss Hannah Stephenson, Miss Sarah Thornton, Miss Alexandra Webb, Mr Nicholas Westerman, Mr Derek Whitton

Recent Graduate Members

Dr Isobel Abbott, Ms Lucy Addison, Mrs Rachel Allen, Mr Oliver Amy, Dr Felicity Bates, Mr Jonathan Blair, Miss Amy Blount, Miss Jessica Breedon, Mr Kieran Claiden-Yardley, Mr Conrad Coomber, Miss Catherine Coton, Miss Stacey Dabinett, Mr Pete Deboo, Miss Amy Denness, Mr Gary Dodds, Miss Rhianna Drury, Mr Mike Dyke, Miss Jennifer Gatward, Miss Naomi Green, Miss Sarah Hadman-Back, Mr James Hanlon, Miss Dawn Hynes, Mr Jamie Ingram, Mrs Melina Jack, Mr Ben Jervis, Mr Adam Jones, Mr Samuel Jones, Mr David Kelleghan, Mr Sam Kitching, Miss Elizabeth Langston, Mrs S Louise Mandry, Mr Justin Matthews, Miss Evonne Maxwell, Miss Sara McBride, Mr Sean Meehan, Miss Fiona Montgomery, Miss Sarah Neenan, Miss Lucy Newill, Miss Sarah Pexton, Mr Lindsey Phelps, Miss Kathryn Pittaway, Miss Angela Polak, Miss Sophie Preece, Miss Samantha Pritchard, Mr Matthew Ruiz, Miss Merle Shaw, Miss Leanne Smith, Mrs Jennifer Taft, Mr James Taylor, Miss Victoria Telford, Miss Danielle Thompson, Ms Nicoletta Vianello, Mr Matthew Wall, Dr Nicola Wallbank, Mr Mark Whitfield, Miss Georgina Whittaker

Recent Upgrades to Graduate Members

Mrs Carol Band, Mr Ben Devine, Ms Caitriona Fenton, Ms Fionnuala Lyons, Miss Gemma Nixon, Miss Samantha Rogers, Miss Lucy Rouse

Recent Student Members

Mr James Aldridge, Mr Abraham Ayensu-Ntim, Miss Megan Baker, Mr Stewart Begley, Miss Sara Byles, Mr Benjamin Carver, Ms Mia-Louise Connor, Miss Zoe Costas-Michael, Miss Sophie Coughlan, Mr Marcus Craigie, Mr Joseph Denny, Mr Stephen Doso Jnr, Mr Alexander Gray, Mr Colin Hardacre, Mr Dominic Harrison, Miss Courtenay Holden, Miss Helen Kaye, Mr John Matthews, Mr Julian McAlpine, Miss Ivy Ngo, Mr Sampson Okorie, Ms Kim O'Meara, Ms Joana Pereira da Cruz, Miss Rebecca Price, Miss Caroline Railston-Brown, Miss Joanne Reynolds, Mr George Rockell, Mrs Elizabeth Sullivan, Miss Porscha Thompson, Miss Grace Twiston-Davies, Mr Boakye Twumasi-Ankra, Miss Clare Webster, Miss Alexandra Weeks, Mr Matthew Wicks, Mr Peter Williams

Recent Affiliate Members

Ms Susie Allen, Mrs Marie Barron, Mr Jon Garner, Mr James Kennedy, Mr Steve Miller, Mr Craig Myatt, Mr Richard Parker, Mr Aleczander Smith

Tasker's Meadow Unveiled

Penny Anderson CEnv FCIEEM
Penny Anderson Associates and
CIEEM Past President

On a splendid, warm sunny day in June, Tasker's Meadows were officially opened by Andy Tasker's widow, Linda. Two meadows and some hawthorn scrub surrounded by thick, wide hedges comprise this 4.5ha reserve which forms a link between the Grand Union Canal and Stockton Cutting; an existing Warwickshire Wildlife Trust Reserve between Rugby and Southam. Andy Tasker, President of IEEM from 2006 to 2008, would have approved. His wife described how he loved meadows, he felt at home, rooted in this part of Warwickshire (having researched his family history he found he could trace back Taskers in South Warwickshire to the 1650-1700 period). It is appropriate therefore that CIEEM contributed to the fund that the Trust used to buy these meadows.

The meadows were alive with colourful flowers when we were there, there were butterflies on the wing and birds singing loudly in the adjacent hedges and scrub. The Trust's Chair, Michael Bunney, reminded us of the linkages that the meadows provide between other habitats adding to the Living Landscape strategy for the area. Flower-rich fields are at a premium in Warwickshire with only some 35ha left, more than half of which are managed by the Wildlife Trust. This was the yellow flower season with all three common species of buttercup (black medick, hawksbeards and rough hawkbit) vying with the scatter of greater butterfly orchids. The latter were frustratingly not quite out, but what a sight in store for when they are.

The meadows commemorate for the Trust the 30 years when Andy was the Chief Executive, the contribution to building up the 57 reserves it now manages, in developing Middlemarch, its consultancy arm, and in generally being there; an enthusiastic, energetic, true friend to everyone, including all those he came into contact within what is now CIEEM.

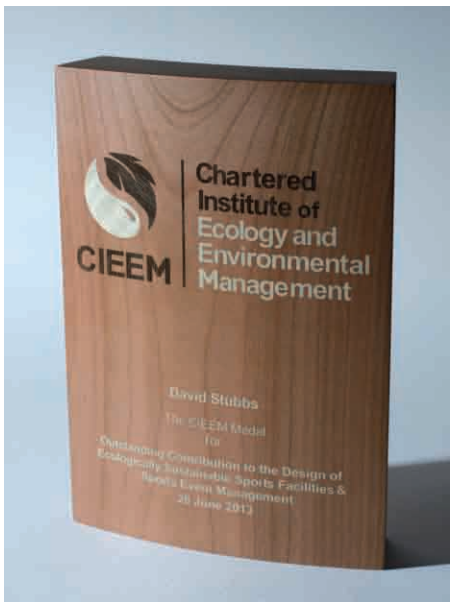
We miss him greatly.

Find out more at http://www.warwickshirewildlifetrust.org.uk/news/2013/05/31/new-nature-reserve-be-unveiled

Andy Tasker, IEEM President 2006-2008, sadly passed away on 16th January 2012.

Michael Bunney, Warwickshire Wildlife Trust Chair, talking about purchasing the meadows. Linda, Andy's widow, is fourth from the left and his elderly father is sitting in the middle.

David Stubbs Awarded CIEEM Medal



The Chartered Institute of Ecology and Environmental Management (CIEEM) has awarded its prestigious Institute Medal to David Stubbs in recognition of his outstanding contribution to the development of ecologically sustainable sports facilities and sports event management.

The Institute Medal is CIEEM's highest accolade and is awarded annually in recognition of a distinguished contribution to the field of ecology and environmental management. This is the first time that the Medal has been awarded to a professional ecologist working outside the traditional boundaries of the discipline and in doing so CIEEM acknowledges the importance of ecologists being able to broaden their scope and apply their experience in new areas.

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

During the 1990s David was Director of the European Golf Association Ecology Unit and he established the first pan-European environmental management programme for golf courses. In 1998 he began advising the British Olympic Association on environmental matters and in 2000 he took a two-month sabbatical to work with the Environment Team at the Sydney Olympics.

David joined the London 2012 Bid team in 2003 with the responsibility to develop the environmental and sustainability elements of the candidature and to create a compelling and distinctive vision in these areas. Following London's election as Host City in 2005, he was immediately appointed as Head of Sustainability within the new Organising Committee. For the ensuing seven years he was responsible for developing and coordinating the sustainability programme for the London 2012 Games and for ensuring that the ambitious vision was fully delivered.

Among his achievements while at the London Organising Committee of the Olympic and Paralympic Games (LOCOG), David was instrumental in the development of ISO 20121, the first certifiable international sustainability management system standard, which is already having a strong impact on the global events sector. He also oversaw the work to develop the first ever full carbon footprint for an Olympic and Paralympic Games project, and was responsible for developing the innovative London 2012 Food Vision; the basis for serving 16 million sustainably sourced meals during the 2012 Games, including strong emphasis on environmental and ethical criteria. This has had massive influence on the hospitality catering sector and is an important legacy from the Games.

Lord Sebastian Coe, former LOCOG Chairman, said: "*The awarding of the CIEEM Medal to David Stubbs for his work on the development of sustainable sporting events, and in particular the London 2012 Games, is fine testament not only to the man but also the ethos and legacy of the London Games. David's leadership of the LOGOC Sustainability Team was nothing short of extraordinary in the face of the size of the challenge, and yet he and his team helped to deliver without doubt the most sustainable Games ever and in so doing raising the bar for all future Games.*"

Tim Smit, co-founder of the Eden Project and a former London 2012 Sustainability Ambassador, adds: "*We owe David personally a huge vote of thanks for setting the sustainable Games vision and tenaciously pursuing its application. Together with his team and their many partners, he has taken the notion of sustainability and provided it with a new horizon and given it a narrative that can be understood and appreciated by professional ecologists and the general public alike. As an interested observer, yes I was impressed by the logistics and the delivery. Yes I was impressed by the muscular pragmatism and focus to get the job done, but the high-spot for me was a moment on my own down by the river – a place where once there was a muddy poisonous watercourse, now beautifully restored and flanked by drifts of wild flowers and trees planted for the long-term – where I experienced as loud a chorus of birdsong as any I have heard, and the birds were the ultimate testament to the success of that original vision. David is an extremely well-deserving recipient of this Medal.*"

David is now serving as an expert member of the International Olympic Committee's Evaluation Commission for the 2020 Olympic and Paralympic Games Candidate Cities.

The full citation for David Stubbs, and further information on the Institute Medal, can be found at www.cieem.net/cieem-medal.

Complaints@CIEEM.net

Changes to Members' Professional Conduct Requirements

Professional Conduct

The manner in which members are expected to carry out their professional practice is set out in the Code of Professional Conduct (the Code). All members are bound by the Code as it forms a part of the contract of membership. Professional conduct is the way in which we expect our members to perform their professional duties; it does not necessarily provide a benchmark for the standard or quality of work undertaken. It is though clear that an appropriate standard or quality of work is more readily achieved when the necessary level of professional conduct is demanded through prescribed behaviours.

Why a New Code?

Codes of professional conduct set out the behaviours that a professional body requires of its members and with which its members have a duty to comply. Therefore, CIEEM periodically undertakes a review of it's Code to ensure that it remains appropriate and pertinent to the standing of CIEEM and best serves the interests of its membership.

The Professional Standards Committee (PSC) has recently completed a review of the Code and advised that some changes would be of benefit, for example, to take account of the breadth of members' roles (from government policy advisers to independent sole traders, working both nationally and internationally). In undertaking the review, PSC investigated contemporary Codes of Professional Conduct/Ethics from comparable professional bodies and from global businesses and the review undertaken by the City in the light of the banking crisis. PSC also received specialist legal advice on how best to develop a Code to achieve the desired interpretation and set of behaviours. Importantly, the Code should set out the behaviours that are expected and not be a list of what members 'shall not do'.

As is standard practice, it is the responsibility of senior members of CIEEM to interpret the Code, establish acceptable standards of practice and provide clarification of the behaviours expected of the membership to deliver these standards.

Importance of Continuing Professional Development

In recognising the importance of practising within a sphere of competence, Continuing Professional Development (CPD) is cited in the Code as an obligation of the member and hence, the supporting guidance on CPD now forms part of the Professional Conduct Series publications.

Review of the Disciplinary Procedures

The Disciplinary Regulations have also been reviewed, along with the Disciplinary Procedures for processing complaints made against a member, to ensure that these remain pertinent to the revised Code. The Procedures comprise nearly 30 stages (excluding an appeal), but has in itself not required change.

Application of the Disciplinary Procedures

Following the Secretariat's verification that a complaint relates to professional conduct, PSC will assess whether there is a case to answer with respect to the alleged breach of the Code. This assessment considers whether the facts provided by the complainant and/or obtained to inform deliberations are sufficient and/or corobrated and/or factually correct, such that they substantiate the allegation. Should it be found that there is sufficient evidence, which 'on the balance of probability' suggests there is a case to answer, a Disciplinary Board will be convened to hold a hearing into whether there has been misconduct, i.e. a breach of the Code.

At the direction of the Chair of the Disciplinary Board, hearings provide the opportunity for the Complainant and the Subject (of the complaint – the member) to present and be questioned on their evidence. The composition of the Disciplinary Board, which is drawn from a Disciplinary Standing Committee comprising senior members of CIEEM and independent non-members, will now comprise two members and one independent member.

Should the Disciplinary Board uphold a complaint, i.e. 'on the balance of probability' there has been a breach of the Code, it has the authority to reprimand, require training or set other conditions, suspend or expel a member from CIEEM.

An appeal against the findings of a Disciplinary Board may be permitted, subject to the grounds for the appeal fulfilling the criteria set out in the Disciplinary Procedures.

Training has been provided by a legal adviser, specialising in professional conduct, to all members of the DSC and PSC to ensure a good understanding of the Code, its interpretation and its application to the assessment of complaints.

Disciplinary Process

The Q&As on the CIEEM website regarding the process will continue to be reviewed and updated in response to queries raised. In time, they will provide an increasingly useful source of information about the outcomes of the complaints process.

Confidentiality

All complaints received by CIEEM are treated as confidential until a Disciplinary Board hearing and/or an Appeal Board concludes, and then, only if a Disciplinary Board upholds a complaint will information regarding the complaint normally be published. Although a complaint may not be upheld by a Disciplinary Board, it may still provide advice to the Subject to help them improve their professional practice.

Where PSC concludes there is no case to answer, then a complaint always remains confidential.

Report on Disciplinary Cases and Membership Objections

Reporting the nature and extent of complaints made against members is an important part of the disciplinary process and is invaluable to help address professional conduct and raise the standards of practice across the industry.

The following tables summarise the nature and number of cases that have been reviewed over the last two years, and the outcome of the process where this has been completed.

Topic	Number of Cases	
	2012-13	2011-12
Fraud	1	0
Fraud/Misrepresentation - non-member claiming membership	4	
Fraud/Misrepresentation - member claiming incorrect level of membership	2	1
Misuse of logo	0	1
Web advertising		1
Survey/reporting standards	10	2
Complaint made - no evidence supplied	1	2
Membership Objection	1	1
TOTAL	19	8

Complaint Assessment Outcomes April 2012 - March 2013

Complaint Assessment Outcomes	Number of Cases	
	2012-13	2011-12
Secretariat Outcomes		
Validation requirements not met	1	2
Referred to Trading Standards, and letter copied to the Police, CEO and Chief Planner relevant planning authority, relevant SNCO*	3	2**
PSC Complaint Outcome		
Case dismissed by PSC	3	2
Discipinary Board Complaint Outcome		
Case not upheld	2	
Case upheld - Reprimand (with conditions)	1	
Case upheld – Reprimand (with training)	1+	
Suspension	0	
Expulsion	0	1
Membership refused		1+
Cases Undergoing Assessment		
Cases undergoing validation	1	
Cases referred to PSC	2	
Cases referred to DB and awaiting hearing	3	
Membership Appeal	1	
TOTAL	19	
Appeals	1	

* Cases of fraud and mis-representation are dealt with by the Secretatiat and reported to PSC.
** Referral procedure only commenced in 2012, previously a warning letter sent.
+ Appealed cases

False Claims of Membership 2012 - 13

The following people have falsely claimed membership of CIEEM:

- Ben Griffiths (Kidderminster)
- Chris Lord (Knaresborough)
- John Meade (Cork)

Autumn Conference 2013

Ecosystem Services 3:
Rivers – A Framework for Action

Grand Harbour Hotel, Southampton
6-7 November 2013

CIEEM's final conference of the year and the third in the series on Ecosystem Services will focus on Rivers - with particular emphasis on the aims and objectives of the Water Framework Directive (WFD). The programme includes specialist presentations whilst showcasing best practice through carefully selected case studies and workshops, and engaging delegates through a lively panel debate.

Speakers to include

Professor Steve Ormerod, Cardiff University
Martin Janes, The River Restoration Centre
Jim Roquette, University of Northampton
Lydia Burgess-Gamble, Environment Agency

Benefits of Attending

Delegate will increase their knowledge of:

1. How to promote better understanding of the legal and policy context around the protection and management of the water environment (in particular, the practical implications for ecological professionals of the WFD).
2. Recognise how river restoration can deliver a wide range of benefits, including meeting objectives under the WFD, such as improvements in water quality, flood risk management, (amenity), biodiversity, fisheries etc.
3. Learn how the latest practice with river restoration is filling gaps in our knowledge and the areas where uncertainty still remains.
4. Explore the latest examples of best practice through a wide range of case studies for river restoration in both the urban and rural environments.
5. Be able to identify key organisations and their roles and responsibilities.

Supported by

Environment Agency

Book your place now at:
www.cieem.net/2013-autumn-conference

An Opportunity for You to Have a Say in CIEEM's Strategic Work

Karen Colebourn MCIEEM
Director, Ecological Planning and Research

CIEEM is blessed with a well-informed and engaged (some might even venture to say opinionated!) membership; but it has not always been clear how to harness those strengths for the benefit of the profession.

The new Advisory Forum may be part of the answer. One of the main functions of the Forum is to ensure that the Governing Board is aware of the views of the membership. This article aims to inform CIEEM members of what the Forum (and therefore the Board) is discussing and also to encourage and assist members who want their opinions or information to be considered in those discussions. It is the first of what I hope will become a regular column, reporting on the outcome of the Forum's discussions and notifying members of up-coming topics.

The first meeting of the new Advisory Forum was held on 5th February 2013. It will meet again on 2nd October 2013 and will continue to meet twice a year. The remit of the Forum is as follows:

a) to advise the Governing Board on the views of the members on matters of strategic or operational effectiveness of the Institute;

b) to advise the Governing Board on matters of interest or concern to the membership;

c) to help provide transparency of governance and good communication between the Governing Board and the members;

d) to act as a sounding board for new ideas and proposals; and

e) to advise on matters of external policy and strategy which the Institute should be seeking to influence or which may influence the Institute's work.

The Members of the Forum

The President (also Chair of the Forum)		John Box
Vice Presidents of:	England	Stephanie Wray
	Wales	Mike Willis
	Scotland	Kathy Dale
	The island of Ireland	Jenny Neff
One representative of each Geographic Section Committee (normally the convenor)		
Chairs of the Standing Committees:		
	Professional Standards	Mick Hall
	Membership Admissions	Keith Ross
	Training, Education and Careers Development	Peter Glaves
Members representing the breadth of the profession.		Sarah-Jane Chimbwandira
		David Tyldesley
		Greg Carson
		Karen Colebourn
		Sue Swales
		Tim Hounsome
		Roger Crofts

Summary of Discussions at the First Meeting

It will be interesting to see how the pattern of the Forum's discussions evolves, but the first meeting was generally a consensual affair, providing a clear steer to the Board on matters including:

- Our strong support for the requirement for evidence of sound ecological knowledge and understanding from prospective Chartered Ecologists.
- That the Geographic Regions of CIEEM should be given more support. The Forum's preferred approach would be to employ a full-time member of the Secretariat for this purpose immediately (not necessarily in Winchester) and then, as soon as financially viable, appoint four out-posted part-time staff, one for each of the Irish, Scottish, Welsh and English Sections; [Subsequently, the Governing Board has decided to focus funding for Geographic Sections on the island of Ireland.]
- That CIEEM's CPD requirements should be set higher, possibly requiring members to produce a (flexible) personal development plan.
- Our support for the Secretariat's ongoing discussions with BRE to try to improve the ecological robustness of BREEAM assessments.

The Agenda of the Next Meeting

Some of these topics will be revisited at the next meeting, including support for Geographic Sections and feedback from the Raising Standards workshops.

We will also be considering further ways in which CIEEM can promote inter-disciplinary working between the professions.

Suggested additional items for the Advisory Forum are:

- Increasing the value of the CIEEM brand
- Engaging members in responding to policy consultations
- Membership recruitment – who, where and how?

If you would like us to raise a topic not listed above, please contact me (details below).

Contacting the Forum

Perhaps you have some information or views we should take into account in our discussions of the above? Or, maybe you think we should be covering some topics not mentioned above – for example, how CIEEM should contribute to the Habitat Regulations Review, or what CIEEM is doing about the trend to ensure that Local Planning Authorities meet their ecological obligations.

If you want to get in touch, one option is to make your views known to the Convenor of your Geographic Section. Their contact details can be found at www.cieem.net/geographic-sections.

Alternatively, please email me at the address shown below. For the meeting on 2nd October, I have undertaken to provide the Forum with your comments and will report on our discussions in the next *In Practice*. Other members of the Forum may be involved in collecting membership feedback in future.

The deadline for receiving your information, opinions and/or suggestions for additional agenda items is Wednesday 18th September 2013.

Want to be More Involved?

If you'd like to make a more regular contribution to the discussions and are a Graduate, Associate, Full Member or Fellow of CIEEM, there remain two vacancies on the Forum. Perhaps regrettably, togas are not obligatory but, despite this, if you still wish to apply to join the Forum please complete and submit a self-nomination form which has been sent out with the AGM notice.

About the Author

Karen Colebourn is a director of Ecological Planning and Research, a consultancy based near Winchester. She co-ordinated the team which produced the Institute's 2006 *Guidelines on Ecological Impact Assessment* and was on the former Council of the Institute for six years. She also runs specialist field-based landscape history courses for visually impaired people.

Contact Karen at:
karen@epr.uk.com

First Accredited Degrees Announced

CIEEM is pleased to announce that six university degree courses have been awarded accredited degree or accredited degree pathway status in recognition of their teaching of the knowledge and skills that are critical to protecting our environment now and in the future. Undergraduate and taught postgraduate programmes at Harper Adams University, Manchester Metropolitan University, Nottingham Trent University and the University of Greenwich represent the first degrees to meet the high standards of course content and delivery approved by CIEEM's Governing Board.

Accredited Degree Courses

Institution	Course	Valid until
University of Greenwich	MSc Environmental Conservation	2018
Harper Adams University	BSc (Hons) Countryside and Environmental Management	2016
Manchester Metropolitan University	BSc (Hons) Ecology and Conservation	2018
Nottingham Trent University	BSc (Hons) Biological Sciences (Ecology and Environmental Management)	2018

Accredited Degree Pathways

Institution	Course	Valid until
Manchester Metropolitan University	BSc (Hons) Environmental Science	2018
Manchester Metropolitan University	BSc (Hons) Environmental Management and Sustainability	2018

CIEEM launched the new degree accreditation scheme in January 2013 following the report in 2011 that revealed skills gaps and shortages in the ecological and environmental management profession. The report, *Ecological Skills: Shaping the profession for the 21st century*, recommended degree accreditation as a means of supporting universities to teach students the knowledge and skills that employers are looking for in the workplace.

CIEEM only accredits those degree courses and degree course pathways that meet our eligibility criteria and identified learning outcomes. These have been developed in consultation with Graduate members and employers of graduates in the ecological and environmental sector. CIEEM is keen to ensure that students leave university equipped with the right knowledge, understanding and skills to have a realistic chance of gaining employment within the sector.

To be accredited a degree course or degree course pathway must meet the relevant eligibility criteria which are based on:

- **course content** – there are 17 areas of core course content. To be accredited an undergraduate course must cover all 17 content areas whilst a postgraduate course must be able to demonstrate how any gaps are addressed and how the knowledge is built on through the taught content of the postgraduate degree);
- **practical skills content** – there is a minimum requirement of 30 days of relevant practical work (including 18 days of taught fieldwork) for undergraduate courses; a minimum requirement of 15 days of taught relevant practical work (of which a minimum 9 days must be taught fieldwork) for postgraduate courses; and
- **academic team** – at least one member of the core academic team must be a member, or must be eligible to be a member, of CIEEM.

CIEEM looks forward to developing effective relationships with the accredited degree programme course leaders so that our members can provide advice, support and networking opportunities for their students.

The deadline for Expressions of Interest in the third round of degree accreditation is 11th October 2013.

Further details can be found at:
www.cieem.net/accreditation

Featured Training Courses and Masterclasses

Ecological Impact Assessment (EcIA)

Trainer: Mike Dean CEnv MCIEEM

Level One – Introduction to EcIA (5 November, Birmingham & 12 November, Reading)
A one-day introductory course for those new to EcIA and for practitioners requiring an overview of the process. You will be taken through some simple case studies to gain a basic understanding of what EcIA is, when it is required, how it fits with other assessment frameworks and the main EcIA steps and stages.

Level Two - Developing practical skills in EcIA (14-15 November, Birmingham & 21-22 November, Reading)
A two-day practical course for practitioners with existing experience of undertaking EcIAs who wish to develop those skills further.You will work through a variety of relatively straightforward case studies, covering all aspects of EcIA. This course includes a short session on how to present the outcomes of EcIAs in a report.

Level Three – Advanced course on EcIA (26 November, Reading & 28 November, Birmingham)
A one-day practical course aimed at those with several years' existing experience of undertaking EcIAs, who wish to develop these skills further or refresh existing skills. You will work through a variety of case studies and will be asked to provide your own examples for discussion. The course will not cover all aspects of the process, but will focus on topics which can be more difficult to get to grips with: identifying important ecological resources, characterising impacts and determining significance.

(In-house courses are also available on request.)

Habitat Regulations Assessment (HRA)

Trainers: David Tyldesley FCIEEM and Caroline Chapman MCIEEM

HRA of Plans for England and Wales and their Territorial Waters
(22 October, Leeds & 19 November, Cardiff)

HRA of Projects for England and Wales and their Territorial Waters
(23 October, Leeds & 20 November, Cardiff)

HRA of Plans and HRA of Projects for Scotland and Scottish Territorial Waters
(3 & 4 December, Edinburgh)

Through these interactive workshops you will come away with a clear understanding of how to apply your role in the HRA process most effectively and with an improved understanding of the roles that others have to play.

Learning outcomes include:

- Appreciation of the source legislation
- Introductory experience in the practical application of key stages such as screening, appropriate assessment and the integrity test
- Knowledge of case law, case studies, examples of good practice and sources of advice and guidance
- How to ensure compliance with the whole of HRA procedures and pitfalls to avoid
- How to keep assessments focused, effective, proportionate and fit for purpose.

Ecological Clerk of Works (8 October, Birmingham & 4 November, Edinburgh)

Trainer: Rob Tyrrell

This course gives an overview of the role of the Ecological Clerk of Works, exploring how these functions should be performed effectively. It includes understanding the role of an ECoW on a construction site - including monitoring, auditing and incident reporting. The identification of construction site constraints and survey methods will be discussed, along with general mitigation measures to protect, enhance and restore ecological receptors. There will also be a session on communication skills including on-site behaviour, site induction, client and stakeholder liaison and record-keeping.

Environmental Advisor for Construction Sites (5 November, Edinburgh)

Trainer: Rob Tyrrell

You will gain a thorough understanding of what it means to be an Environmental Advisor for Construction Sites and how to discharge this role effectively. The course will examine environmental constraints faced during construction such as contaminated land, light, water, noise and dust pollution and explore general mitigation measures for pollution control and emergency response. Risk assessment and method statements will be discussed as well as the appropriate use of impacts registers.

Understanding Wildlife Law (18 October, Oxford)

Trainer: Penny Simpson, Environmental Lawyer (English & Welsh Qualified)

This course will provide an introduction to both the criminal and administrative parts of English and Welsh law in relation to wildlife, focusing on Protected Species and Protected Sites.

By the end of the day you will:

- Understand the EU and UK legal framework to wildlife law
- Know the key criminal offences which developers / operators / land managers must consider in their work and understand how to comply with those offences
- Understand the duties of public bodies as regards wildlife law
- Know how those duties can play out in the context of planning applications and other consenting procedures

Water Environment: The Legal Framework (25 October, Oxford)

Trainer: Penny Simpson - Environmental Lawyer, English & Welsh Qualified

Covering key aspects of European and national Water Law, the seminar will provide professional knowledge of the Water White Paper and the implications of the Water Framework Directive. Topics will include Abstraction and Impoundment; Pollution of Controlled Waters; Structures and Obstructions in Watercourses; Permits and consents. The course is intended for professional ecologists working with the water environment as well as land managers and developers, operators and consultants working on land-based activities.

European Protected Species Masterclass for Consultants (5 December, Oxford)

Trainer: Penny Simpson - Environmental Lawyer, English & Welsh Qualified

This day will provide a detailed explanation of up-to-date law on European Protected Species (EPS) and the implications that this legislation has on providing robust EPS consultancy services to clients. Practical examples will be provided and there will be ample opportunity to discuss any specific case studies, issues or problems that attendees wish to bring with them.

European Protected Species Masterclass for Local Planning Authorities (12 December, Oxford)

Trainer: Penny Simpson - Environmental Lawyer, English & Welsh Qualified

Focusing on the legal duties relating to wildlife and protected species that local authorities in England and Wales are required to discharge, and what this means in practice. Practical examples will be provided and there will be ample opportunity to discuss specific case studies, issues or problems that attendees wish to bring with them.

BOOK NOW for all the above courses! www.cieem.net/training-events

Membership Survey 2013

Thank you to everyone who responded to the recent members' survey. We had a good response across all employment sectors and membership grades that was consistent with our current membership profile.

What You Like

You told us that there is a lot that you like about the current direction of travel of CIEEM. Over 50% of respondents feel more positive about the organisation than they did three years ago, which is fantastic! A further 45% feel as positive as they did 3 years ago. You feel that our service to you as members is improving with over 56% rating it as very good and 41% as quite good. Over 80% of respondents feel that their membership subscription is good value or very good value and almost 60% are very likely to recommend CIEEM membership to a friend or colleague.

The most valued activities that CIEEM has undertaken in the last three years are the achievement of the Chartered Institute status, expanding the scope and geographic distribution of our training, producing the Competency Framework, increasing our policy engagement and publishing research into the ecological skills gap and skills shortages.

Member services that are highly regarded include the professional development training programme, the production of technical/professional guidance and advice, information provision and conferences.

One area of concern was the number of members that said that their workload and/or lack of support from their employer precluded attendance at conferences and training events even though they thought that they would be helpful. Continuing professional development is a cornerstone of professional competence, and of course a requirement for continued membership, so we do need to make sure that individuals and employers can see the benefit of spending time in this way.

Where We Need to Improve

There were a number of areas where respondents consistently suggested improvements could be made and these are summarised in the table opposite. In some of these there has been significant recent activity which should help to address the concerns raised by some of the respondents. For the remainder we are looking at possible interventions that would be of benefit to our members.

Please note that if you gave feedback and asked to be contacted to discuss your thoughts further we are unable to do so because the feedback is anonymised. However please do feel free to contact us directly to discuss your views in more detail.

What Happens Next?

CIEEM's Governing Board will consider the findings of the survey in more detail at its October meeting. Meanwhile the Secretariat has already spent some time analysing the findings and identifying changes that could be made to some of our services and activities. Over the next few months we will be coming back to you with further questionnaires and online discussions to drill down in more detail as to the changes you would like to see.

Thank you again to all those who completed the survey. CIEEM is **your** professional membership body and your feedback is extremely important to us.

The five respondents who came out of the draw to receive £50 worth of NHBS vouchers were:

Lizzy Peat MCIEEM

Lesley Mason GradCIEEM

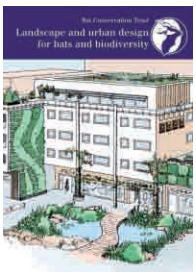
Phillip Morgan CEnv MCIEEM

Simon Cahill MCIEEM

Debbie Alston MCIEEM

Area for improvement	What we are already doing and what we are looking into
Better geographical spread of training	Since 2012 we have significantly expanded the number of training courses that we have offered in most of the Geographic Section areas, however we have had to cancel many of these through lack of bookings. We will continue to plan courses with geographical spread in mind but we do need more specific feedback from members on both priority topics and local trainers.
More support for activities by Geographic Sections	We have just appointed a Geographic Section Coordinator and a part-time Irish Section Support Officer. Hopefully both of these two new posts will help the Geographic Sections to continue to provide valuable networking events and activities for members. However, Sections are run by busy volunteers and many Sections are currently looking for new volunteers to join the Committee or to organise an event in their area. Please contact us if you would like to get involved with your Section.
There is too much focus on consultants in CIEEM (e.g. conferences, training and *In Practice* articles). Too much focus on ecology rather than environmental management.	The content of the conference and training programme is driven by suggestions from members as to what they need and how popular they are when we run them. We are trying to diversify but would welcome more suggestions from members as to suitable subjects. Similarly *In Practice* content is driven by the articles that are submitted – and we get very few from members who are not working in consultancy or who are environmental managers. We need you to take action!
There is very little awareness of the European Network of Environmental Professionals and CIEEM's involvement in it.	A short report on ENEP activities is included in almost every issue of *In Practice* under Partnership News but clearly we need to do more to profile the organisation and the benefits to CIEEM members. We will therefore produce some longer articles on ENEP activities for future issues.
We could make better use of the website.	We will be working on improving the website this autumn/winter. Useful suggestions included improving the search function, having online discussion forums/networking opportunities and online focus groups to 'bounce' ideas around.
In Practice has improved a lot – but could be even better.	The font size does need to increase and we are working with our designers on how best to do this without just creating a bigger publication. Many respondents would like to see more opinion pieces with 'right to reply' and a letters page. Other suggestions include a regular feature on a member in an unusual or high profile role, commissioned articles on broader environmental issues and shorter, more concise articles. The Editorial Board will consider all of these suggestions later this year.
Making more use of social media. Our LinkedIn and Twitter accounts are becoming increasingly subscribed to but we can see that the plethora of online discussions, particularly with the number of LinkedIn groups, is encouraging duplication and is in danger of causing information overload.	We need to make sure that we have a coherent strategy around the use of these tools and the kinds of information that they are most useful for. We have noted the comment by several members that although they are happy with CIEEM's use of social media they do not want this to be at the expense of more traditional forms of communication.
Improving careers guidance and support to students and early career members.	One of the benefits of the degree accreditation scheme will be the opportunity to engage with students through their programme leaders and to provide CIEEM members as speakers and to contribute to careers events. We are also currently exploring the potential for rolling out a new mentoring scheme.
Raising standards of practice and poor conduct.	We have recently revised the Code of Professional Conduct and disciplinary process and we have recognised the need to improve our communication about complaints cases we have dealt with (without divulging confidential information). The recent series of Raising Standards workshops, which many members attended, will enable the Professional Standards Committee to prioritise further actions.
Support members to achieve better working practices.	Following on from last autumn's survey we are currently working on producing some guidance on fair working practices.

New Publications



Landscape and Urban Design for Bats and Biodiversity

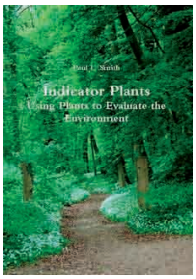
Authors: Kelly Gunnell, Gary Grant and Carol Williams

ISBN-13: 9781872745978

Price: Free non-printable download, or £12.99 hardcopy from www.nhbs.com

Available from: www.bats.org.uk

Aimed at landscape architects and ecological consultants on how typical landscape design measures can be emphasised for bats, this publication presents simple but effective measures that designers, consultants, developers and planners can use to enhance biodiversity on sites of all sizes with a focus on bats. The content covers landscape design features such as urban woodlands, trees, urban wetlands, green roofs, walls, linear features, eco-passages and lighting from a bat ecology perspective. It also includes a useful plant species list categorised by features such as rain gardens, green roofs, living walls and bed and borders.



Indicator Plants: Using Plants to Evaluate the Environment

Author: Paul L. Smith CEnv MCIEEM

ISBN-13: 9781904098362

Price: £15.00

Available from: www.lulu.com

The guide looks at how plants may be used to 'read the environment', essentially treating them as indicators of the state of the habitat where they are found. It was written with three sets of people in mind: 1. Junior ecological consultants who want to improve their Phase 1 Habitat Surveys with botanical target notes useful in ecological assessment. 2. Students of ecology who need to use plants to interpret the landscape around them and understand habitats in greater detail. 3. Amateur naturalists who seek to enrich their experience of the countryside.

A-Z of Tree Terms: A Companion to British Arboriculture

Author: Philip Wilson

ISBN-13: 9780957178403

Price: £44.99

Available from: www.nhbs.com

The A-Z of Tree Terms contains over 3,000 entries, many on the staples of arboriculture: tree physiology and management, tree mechanics and hazard, trees and development, soil properties and building subsidence, and planning and legal matters. Some are in the closely related fields of forestry, fruit tree culture, plant propagation, garden design, historic landscape and building design. And others are on the natural environment and on climate change. *A-Z of Tree Terms* is a primer for arboricultural consultants and allied professionals, and will be interesting and useful for anyone who owns trees, is affected by them or just likes them.

Designing for Biodiversity: a technical guide for new and existing buildings (2nd Edition)

Authors: Carol Williams, Kelly Gunnell, Brian Murphy

ISBN-13: 9781859464915

Price: £29.99

Available from: www.nhbs.com

Through written guidance and architectural drawings, *Designing for Biodiversity* advises on how to incorporate provision for biodiversity within developments. With sections on different building-reliant species, general principles for design, ready-made products that be incorporated into designs, and legislation, policy and regulations, *Designing for Biodiversity* is an invaluable resource for all architects, ecologists and anyone involved in designing or briefing for biodiversity in buildings.

Plants and Habitats: An introduction to common plants and their habitats in Britain and Ireland

Author: Ben Averis

ISBN-13: 9780957608108

Price: £24.99

Available from: www.nhbs.com

Plants and Habitats combines the species and habitat approaches to plants and vegetation. Most of it is an identification guide to 700 plant species selected as those which are common, conspicuous or useful ecological indicators; species which collectively make up most of the vegetation in Britain and Ireland. There is also a separate Habitats section describing the flora, ecology and management of habitats. *Plants and Habitats* is illustrated throughout with colour photos and some line drawings. For those working with habitat classifications, National Vegetation Classification (NVC) codes are incorporated throughout and there are summary tables cross-referencing various classifications.

Meadows (British Wildlife Collection No.2)

Author: George Peterken

ISBN-13: 9780956490247

Price: £26.95

Available from: www.britishwildlife.com

Meadows are the quintessential British habitat, and yet flower-rich hay meadows have almost disappeared from our countryside. In this exceptional work George Peterken brings together years of research and discovery from his travels across Britain and Europe, as well as an understanding borne out of caring for his own meadows, to produce a book that will put this often misunderstood habitat back in the public's eye.

Ladybirds (Naturalists' Handbook 10)

Authors: H.E. Roy, P.M.J. Brown, R.F. Comont, R.L. Poland and J.J. Sloggett

ISBN-13: 9781907807077

Price: £19.99

Available from: www.nhbs.com

This revised and updated edition of *Ladybirds* provides a succinct but comprehensive and accessible overview of the biology of ladybirds and their parasites, focusing on ecology in an evolutionary context. It provides the latest information, coverage of recent additions to the British list including the harlequin ladybird, and makes suggestions for further research, highlighting gaps in knowledge and showing readers how to get involved with recording and studying ladybirds. It includes updated keys for the identification of ladybirds at late-instar larval and adult stages, and techniques for studying ladybirds and their parasites in both laboratory and field.

Amphibians and Reptiles (Naturalists' Handbook 31)

Author: Trevor Beebee

ISBN-13: 9781907807459

Price: £19.99

Available from: www.nhbs.com

Amphibians and Reptiles is a comprehensive guide to the native and non-native species found in the British Isles. It covers the biology, ecology, conservation and identification of the British herpetofauna, and provides keys for the identification of adult and immature newts and newt eggs, larvae and metamorphs; frog and toad adults and metamorphs, spawn and larvae; adult and hatchling limbed lizards; and adult snakes. Distribution maps are included for all species. The author summarises the current state of knowledge, including behaviour, breeding, habitat selection, migration and development, and offers ideas for research projects that could be undertaken to further what is known. A chapter is devoted to the practicalities of professional work, including licensing requirements. Research techniques, including survey methods, are discussed in detail, and consideration is given to methods of data analysis.

The 'dirty dozen': socio-economic factors amplify the invasion potential of 12 high-risk aquatic invasive species in Great Britain and Ireland.

Gallardo, B. and Aldridge, D.C.

Journal of Applied Ecology 2013, 50: 757–766.

This study evaluates the ability of environmental and socio-economic factors to predict the risk of invasion of 12 potential aquatic invaders covering all major aquatic groups. Species distribution models (SDM) were calibrated with a set of environmental factors and integrated with socio-economic predictors. The inclusion of socio-economic factors in SDM did not affect accuracy scores, but their effects were more pronounced in spatial predictions, resulting in up to a six-fold amplification of the area predicted suitable for each species. Despite the inclusion of potential surrogates of water chemistry and propagule pressure, temperature-related variables were most important predictors of aquatic species' distributions. According to SDM, the environmental suitability for a suite of invaders belonging to different taxonomic groups and regions of origin is greatest in east and south-east England. Major management regions to be prioritised in monitoring programmes include the Humber, Thames and Anglian River Basin Districts. Species of special concern include a mysid *Hemimysis anomala*, a gammarid *Dikerogammarus villosus*, a plant *Ludwigia grandiflora* and two crayfishes *Procambarus clarkii* and *P. fallax*. The inclusion of socio-economic factors in species distribution models has the potential to improve predictions of areas under a highest risk of multiple invasions and to help disentangle the complex interplay between biological invasions and global environmental and socio-economic processes. Such understanding is pivotal to prioritise limited resources for the optimum prevention and control of biological invasions.

Correspondence: galla82@hotmail.com

A partnership approach to addressing applied ecological research needs of an oil and gas business.

Pedroni, P.M., Jaramillo, H., Torres, C.M.d.L., Navarrete, Z.H., Bernal-Ramirez, J. and Reed, T.

Journal of Applied Ecology 2013, 50: 539–543.

Oil and gas companies are continually searching for new resources in ever more remote terrestrial and challenging marine areas. These also tend to be areas with higher biodiversity and ecosystem service (BES) resources. Demonstrably good BES performance helps ensure business continuity under increasingly stringent regulations, access to new resources, reputational benefits and meeting the requirements of the finance sector. These require that oil and gas companies are able to identify, assess and mitigate their potential impacts on BES by accessing good quality applied ecological science. In 2000, the Energy and Biodiversity Initiative (EBI) brought together oil and gas companies and international conservation NGOs to work together to understand each other's perspectives, and to establish a common ground as a basis for improving sectoral BES performance. The result was a series of guidance documents, taken up and further developed by the global oil and gas association for environmental and social issues (IPIECA) and the international Oil and Gas Producers Association (OGP). Since 2003, the oil and gas sector has developed an increasingly stringent set of best practices and tools which sectoral leaders follow and apply when considering future operations and have begun to apply to their existing activities. The EBI found that few oil and gas companies had suitable internal capacity to fully address BES issues, and that peer-review-level research into BES baselines and impact assessments was also at a premium. In addition, most of the basic and applied research that was being undertaken by energy companies was not published, but kept as internal 'grey literature', only partially filtering out into sectoral guidelines.

Correspondence: timreed@ecotext.co.uk

Potential consequences of discard reform for seabird communities.

Bicknell, A.W.J., Oro, D., Camphuysen, K. and Votier, S.C.

Journal of Applied Ecology 2013, 50: 649–658.

Upcoming reform of the EU Common Fisheries Policy will be the biggest change in European fisheries management for a generation. A central plank of this reform is a proposed ban on discards, to aid the creation of economically and environmentally sustainable fisheries. This, together with a global trend for declining discards, may have unforeseen knock-on consequences for the large number of scavenging seabirds that consume this plentiful subsidy. Discards have shaped many aspects of seabird foraging, distribution and population dynamics. The authors review these effects and consider the potential for both negative and positive impacts of discard reforms for seabirds and propose recommendations for ongoing research and conservation. EU seabird scavengers are dominated by a relatively small number of large generalist taxa. Many of these occur at globally significant numbers within the EU, but may be able to buffer a decline in discards by switching to feed on alternative foods. A discard ban may have negative consequences by creating a food shortage for scavenging birds. Some species may offset this by feeding more on other birds, with potentially negative population-level impacts, or by moving into novel environments. Benefits of a discard ban may be a reduction in seabird bycatch in fishing gears, as well as a reduction in populations of large generalist species that currently dominate some seabird communities. The nature of these impacts is still poorly understood, highlighting the need for detailed long-term seabird monitoring, as well as building resilience into populations through policy measures that incorporate remedial action on major seabird conservation priorities. Research should focus on understanding how seabird foraging, in terms of functional responses and searching behaviour, is influenced by both changing discards and natural fish prey availability, and how they impact upon fitness. It is also essential to link individual-level responses with population-, community- and ecosystem-level change.

Correspondence: stephen.votier@plymouth.ac.uk

Matrix modelling of prescribed burning in *Calluna vulgaris*-dominated moorland: short burning rotations minimize carbon loss at increased wildfire frequencies.

Allen, K.A., Harris, M.P.K. and Marrs, R.H.

Journal of Applied Ecology 2013, 50: 614–624.

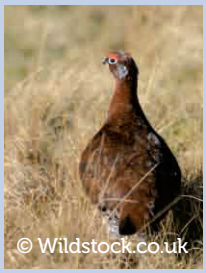
As a first approximation of the relative impacts of prescribed burning and wildfire, the authors have modelled above-ground fuel-load accumulation and carbon release under varying wildfire return intervals at a study site in the Peak District. The stable age structure of vegetation under varying prescribed-burning rotations was then predicted using an age-structured matrix model and moorland above-ground fuel load calculated using a boot-strapping approach. Finally, long-term carbon losses were predicted under varying wildfire return intervals. There was a clear interaction between prescribed-burning rotation interval and wildfire return interval. At 50- and 100-year wildfire return intervals, carbon losses were minimised by short prescribed-burning rotations. However, under a 200-year wildfire return interval, carbon loss was minimised by long rotation intervals where delayed regeneration was modelled. Under a 50-year wildfire return interval, 8-year prescribed-burning rotation intervals could reduce carbon loss by 22% or 34% compared with 25- and 50-year rotations, respectively. The modelling approach outlined here provides a first approximation to the above-ground carbon balance between prescribed burning and wildfire frequency at a single site. This may be useful in other dwarf-shrub-dominated ecosystems if prescribed burning is to be used to mitigate the effects of wildfire. At this study site, long prescribed-burning rotations may minimise carbon loss at low wildfire return intervals. However, if wildfire incidence increases, more frequent prescribed burning is likely to minimise overall carbon loss. Well-informed prescribed burning on a short rotation may produce smaller carbon losses than longer rotations under future climate conditions.

Correspondence: kaallen@liv.ac.uk

Rotational vegetation burning effects on peatland stream ecosystems.

Ramchunder, S.J., Brown, L.E. and Holden, J.

Journal of Applied Ecology 2013, 50: 636–648.



Rotational vegetation burning in peatlands is undertaken predominantly to increase habitat suitability and food availability for red grouse *Lagopus lagopus*. Red grouse shooting contributes to the upland economy and is seen as a traditional leisure activity. However, there is concern that burning can have detrimental effects on peatland terrestrial and freshwater ecosystems. This study examined spatial and seasonal dynamics of stream physicochemistry and benthic macroinvertebrates from peatland sites that are managed via rotational vegetation burning and compared these with intact sites with no recent history of burning. Streams draining burned catchments were characterised by higher fine benthic particulate organic matter (FPOM), suspended sediment concentration (SSC), aluminium, iron and dissolved organic carbon than unburnt intact catchments. Anion concentrations were higher in intact catchments. There were significant differences in benthic macroinvertebrate richness, diversity and dominance, and community composition and functional feeding groups between burned and intact catchments, suggesting that land management had an effect on aquatic ecosystems. Higher SSC and FPOM in burned catchments were associated with lower abundance of some mayflies, stoneflies and caddisflies and elevated abundance of some Diptera larvae. This study suggests that some aspects of peatland stream ecosystems are altered in catchments with rotational vegetation burning. Agencies with a remit covering upland freshwater ecosystem management might need to consider ways of reducing the extent of rotational vegetation burning to prevent effects on lotic ecosystems, and monitor whether macroinvertebrate assemblages subsequently shift back to a status similar to those in intact peatland streams.

Correspondence: geosjr@leeds.ac.uk

Exploring the ecological constraints to multiple ecosystem service delivery and biodiversity.

Maskell, L.C., Crowe, A., Dunbar, M.J., Emmett, B., Henrys, P., Keith, A.M., Norton, L.R., Scholefield, P., Clark, D.B., Simpson, I.C. and Smart, S.M.

Journal of Applied Ecology 2013, 50: 561–571.

A particular current challenge is reconciling demand for increased food production with provision of other ecosystem services and biodiversity. Using a spatially extensive data base (covering Great Britain) of co-located biophysical measurements (collected in the Countryside Survey), the authors explore the relationships between ecosystem service indicators and biodiversity across a temperate ecosystem productivity gradient. Each service indicator has an individual response curve demonstrating that simultaneous analysis of multiple ecosystem services is essential for optimal service management. The shape of the response curve can be used to indicate whether 'land sharing' or 'land sparing' is the most appropriate option. Soil carbon storage and above-ground net primary production indicators were found to define opposing ends of a primary gradient in service provision. Biodiversity and water quality indicators were highest at intermediate levels of both factors, consistent with a unimodal relationship along a productivity gradient. Positive relationships occurred between multiple components of biodiversity indicating potential for management measures directed at one aspect of biodiversity to deliver wider ecosystem biodiversity. The authors demonstrate that in temperate, human-dominated landscapes, ecosystem services are highly constrained by a fundamental productivity gradient. There are immediate trade-offs between productivity and soil carbon storage but potential synergies with services with different shaped relationships to production. Using response curves to analyse multiple service interactions can inform the development of Spatial Decision Support tools and landscape-scale ecosystem service management options. At intermediate productivity, 'land-sharing' would optimise multiple services, however, to deliver significant soil carbon storage 'land-sparing' is required.

Correspondence: lcma@ceh.ac.uk

Long-term effects of rotational prescribed burning and low-intensity sheep grazing on blanket-bog plant communities.

Lee, H., Alday, J.G., Rose, R.J., O'Reilly, J. and Marrs, R.H.

Journal of Applied Ecology 2013, 50: 625–635.

The authors investigated the impact of prescribed burning on vegetation composition and diversity in a long-term experiment at Moor House NNR in northern England. The study comprised a comparison between no-burn reference plots last burned in ca. 1924 and an experiment where all plots were burned in 1954/5. Within the experiment, the effects of very light sheep grazing vs. no grazing and three burning rotations (no-burn since 1954/5, repeat-burning at 10- and 20-year intervals) were tested. *Calluna vulgaris* and *Hypnum jutlandicum* cover and bryophyte species richness increased in the least-disturbed, no-burn reference plots, but bryophyte cover did not. Lichen diversity declined. Within the formal experiment, low-intensity sheep grazing had little impact but there were substantive changes produced by the different burning rotations. There was divergence between the burning rotation treatments with the least-disturbed, no-burn treatment changing towards a *C. vulgaris-H. jutlandicum* community, whereas the most-disturbed 10-year rotation had a much greater abundance of both *Eriophorum* and *Sphagnum* spp. The findings suggest that blanket-bog vegetation on peat responds to prescribed burning in a complex manner. Where burn return interval is long (>20 years), *C. vulgaris* becomes dominant and there was no evidence that preferred peat-forming species *(Eriophorum/Sphagnum)* increased. Where burn return interval is short (10 years), *E. vaginatum/Sphagnum* abundance increased. The authors found no evidence to suggest that prescribed burning was deleterious to the abundance of peat-forming species; indeed, it was found to favour them.

Correspondence: calluna@liv.ac.uk

Fat provisioning in winter impairs egg production during the following spring: a landscape-scale study of blue tits.

Plummer, K.E., Bearhop, S., Leech, D.I., Chamberlain, D.E. and Blount, J.D.

Journal of Animal Ecology 2013, 82: 673–682.

Provisioning of garden birds is a growing phenomenon, particularly during winter, but there is little empirical evidence of its true ecological impacts. One possibility is that winter provisioning could enhance subsequent breeding performance, but this seems likely to depend on the types of nutrients provided. For example, whereas effects of macronutrients such as fat are unlikely to be carried over to influence breeding in small passerines, micronutrients such as dietary vitamin E (an antioxidant) may be stored or have lasting health benefits. Here the authors examine the carry-over effects of winter food supplements on egg production in wild populations of blue tits *Cyanistes caeruleus*. Over three consecutive years, birds were provisioned with fat, fat plus vitamin E or remained unfed (controls). The provision of fat in winter resulted in smaller relative yolk mass in larger eggs and reduced yolk carotenoid concentrations in early breeders. However, these effects were not seen in birds provisioned with fat plus vitamin E. Lay date, clutch size, egg mass and yolk vitamin E concentrations were not significantly affected by winter provisioning treatment. The results indicate that winter provisioning can have important downstream consequences, in particular affecting investment in egg production several weeks or months later. Provisioning is widely applied to support garden bird populations and for the conservation management of endangered species. However, the results challenge the assumption that such practices are always beneficial at the population level and emphasise how the ecological impacts can depend on the specific nutritional profile of provisioned foods.

Correspondence: j.d.blount@exeter.ac.uk

Biodiversity offsets in theory and practice.

Bull, J.W., Suttle, K.B., Gordon, A., Singh, N.J. and Milner-Gulland. E.J.

Oryx 2013, 47: 369–380.

This review of biodiversity offsetting evaluates implementation to date and synthesises outstanding theoretical and practical problems. The authors outline the criteria that make biodiversity offsets unique and then explore the suite of conceptual challenges arising from these criteria and indicate potential design solutions. They find that biodiversity offset schemes have been inconsistent in meeting conservation objectives because of the challenge of ensuring full compliance and effective monitoring and because of conceptual flaws in the approach itself. The authors clarify the meaning of the term biodiversity offset and propose a framework that integrates the consideration of theoretical and practical challenges in the offset process. They also propose a research agenda for specific topics around metrics, baselines and uncertainty.

Correspondence: j.bull10@imperial.ac.uk

How many seabirds do we need to track to define home-range area?

Soanes, L.M., Arnould, J.P.Y., Dodd, S.G., Sumner, M.D. and Green, J.A.

Journal of Applied Ecology 2013, 50: 671–679.

Marine predator and seabird tracking studies are often conducted without first considering how many individuals should be tracked and for how long they should be tracked in order to make reliable predictions of a population's home-range area. Home-range area analysis of two seabird-tracking data sets was used to define the area of active use (where birds spent 100% of their time) and the core foraging area (where birds spent 50% of their time). Analysis was conducted on the first foraging trip undertaken by the birds and then the first two, three and four foraging trips combined. Appropriate asymptotic models were applied to the data, and the calculated home-range areas were plotted as a function of an increasing number of individuals and trips included in the sample. Data were extrapolated from these models to predict the area of active use and the core foraging area of the colonies sampled. Significant variability was found in the home-range area predictions made by analysis of the first foraging trip and the first four foraging trips combined. For shags, the first foraging trip predicted a 56% smaller area of active use when compared to the predictions made by combining the first four foraging trips. For kittiwakes, a 43% smaller area was predicted when comparing the first foraging trip with the four combined trips. This analysis predicted that 39 shags and 83 kittiwakes would be required to predict 95% of the area of active use when the first four foraging trips are included in the sample compared with 135 shags and 248 kittiwakes when only the first trip is included in the analysis. Tracking studies are increasingly being used to aid the designation of marine conservation zones and to predict important foraging areas. The authors suggest that many studies may be underestimating the size of these foraging areas and that better estimates could be made by considering both the duration and number of data logger deployments.

Correspondence: louise.soanes@liv.ac.uk

Lapwing © Wildstock.co.uk

Managing uplands for biodiversity: Do agri-environment schemes deliver benefits for breeding lapwing *Vanellus vanellus*?

Smart, J., Bolton, M., Hunter, F., Quayle, H., Thomas, G. and Gregory, R.D.

Journal of Applied Ecology 2013, 50: 794–804.

The authors assessed whether land management options within agri-environment schemes designed to benefit waders improve the suitability of breeding habitat and population dynamics for a declining wader, the lapwing. The suitability of nesting and chick-rearing habitat was better on land with agri-environment scheme management, and breeding densities and productivity increased with habitat suitability. The lapwing populations declined during this study, and trends did not differ between agri-environment and non-agri-environment scheme land. Productivity was below that required for population stability, although there was evidence of higher productivity on agri-environment scheme land in later years. Agri-environment management consisted of multiple land management options that varied in delivery of suitable habitat, breeding densities and success. The best management options were all in England on land benefiting from specific management advice or with rough grazing and grazed pasture agri-environment scheme options.

Despite considerable investment and positive effects of agri-environment schemes on habitat quality, populations of lapwing in the UK uplands have declined because of inadequate productivity. For species with complex requirements, populations are only likely to increase when all of these requirements are provided. Appropriately targeted habitat management, delivered through agri-environment schemes, can play an important role in improving habitat quality and increasing landscape diversity. However, when populations are limited by something other than habitat quality, for example, predation, then habitat management alone is unlikely to recover populations. Increasing evidence suggests that predation impacts are also likely to be important for ground-nesting species such as lapwing. Predator management may therefore need to be integrated with habitat measures where predation is limiting breeding success and population recovery.

Correspondence: jennifer.smart@rspb.org.uk

Forthcoming Events

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

Conferences		
Date	Title	Location
26 September 2013	Overseas Territories Special Interest Group Technical Seminar – Anguilla, the Chagos Archipelago and Plant Conservation in the Overseas Territories	Kew Herbarium, London
6-7 November 2013	CIEEM Autumn Conference 2013: Rivers - A Framework for Action	Southampton
18 - 19 November 2013	Irish Section Conference: Protected Habitats and Species – A Best Practice Approach	Dublin

Training Courses		
01 October 2013	Badger survey, impacts and mitigation	Falkirk
02 October 2013	Hazel dormouse – Introduction to survey techniques	Lydney
02 October 2013	Freshwater fish monitoring	Salisbury
03 October 2013	Hazel Dormouse – handling and mitigation	Lydney
08 October 2013	Best practice in veteran tree management	Burnham Beeches
08 October 2013	Ecological Clerk of Works	Edinburgh
18 October 2013	Understanding Wildlife Law	Oxford
22 October 2013	Plan HRA for England and Wales and their Territorial Waters	Leeds
23 October 2013	Project HRA for England and Wales and their Territorial Waters	Leeds
24 October 2013	Protected Mammals – impacts and mitigation (not including bats)	Dunblane
25 October 2013	Water Environment: The Legal Framework	Oxford
28 October 2013	Otters – Ecology and Surveying	Jedburgh
04 November 2013	ECOW and EA for Construction Sites	Edinburgh
05 November 2013	Introduction to EcIA	Birmingham
05 November 2013	ECOW and EA for Construction Sites	Edinburgh
07-08 November 2013	Camera trapping for ecologists	Heiton by Kelso, Scottish Borders
12 November 2013	Introduction to EcIA	Reading
12 November 2013	Ecosystem services valuation	Redhill
14 November 2013	Surveying for Bats and Development – The Consultant's Approach	London
14 - 15 November 2013	Developing practical skills in EcIA	Birmingham
19 November 2013	Plan HRA in England and Wales and their Territorial Waters	Cardiff
20 November 2013	Project HRA in England and Wales and their Territorial Waters	Cardiff
21 - 22 November 2013	Developing practical skills in EcIA	Reading
21 November 2013	Survey and Assessment of Hedgerows in Winter months	Salisbury
26 November 2013	Advanced course on EcIA	Reading
28 November 2013	Advanced course on EcIA	Birmingham
3 December 2013	Plan HRA for Scotland and Scottish Territorial Waters	Edinburgh
4 December 2013	Project HRA for Scotland and Scottish Territorial Waters	Edinburgh
4 December 2013	Accessing and Using Biodiversity Data	Birmingham
5 December 2013	EPS Masterclass for Consultants	Oxford
12 December 2013	EPS Masterclass for Local Planning Authorities	Oxford
8 January 2014	Salmonid Habitat and Spawning Assessment	Salisbury

Geographic Section Events		
8 September 2013	Yorkshire and Humber Section event – Marine and Coastal Wildlife at Flamborough	Flamborough