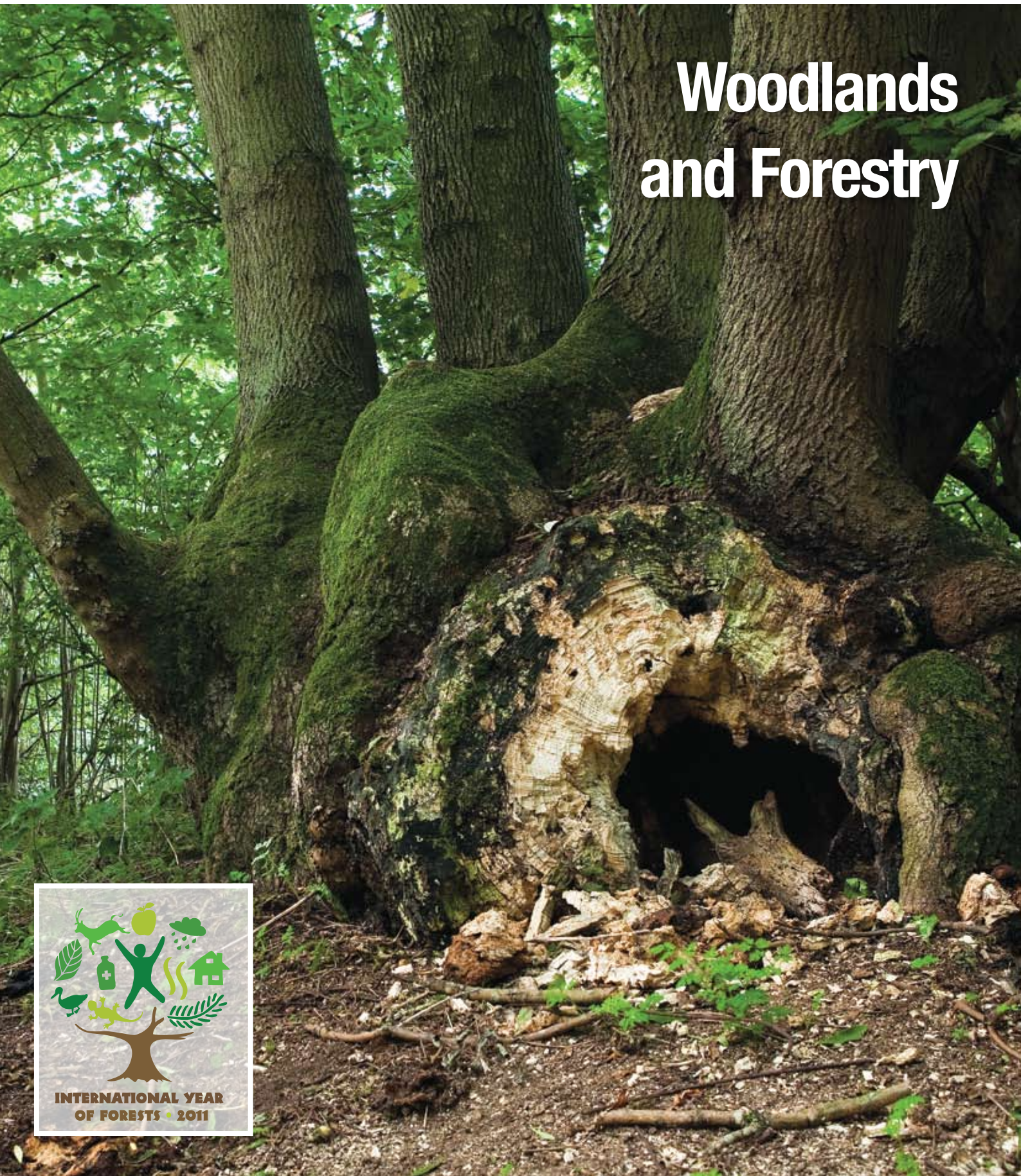
Number 73 • September 2011

In Practice

Bulletin of the Institute of Ecology and Environmental Management



Woodlands and Forestry

INTERNATIONAL YEAR OF FORESTS • 2011

In Practice No. 73, Sep 2011. ISSN 1754-4882

Editor: Jason Reeves (jasonreeves@ieem.net)

Editorial Board

Mr Jonathan Barnes
Dr Andrew Cherrill
Dr William Latimer
Mr Paul Rooney
Miss Katrena Stanhope
Mr Darren Towers
Mr Matthew Chatfield
Ms Sally Hayns
Mrs Allison Potts
Mr Paul Scott
Miss Emma Toovey

In Practice is published quarterly by the Institute of Ecology and Environmental Management. It is supplied to all members of IEEM and is also available by subscription (£30 per year in the UK, and £40 overseas).

In Practice will publish news, comments, technical papers, letters, Institute news, reports of conferences and meetings, events and courses. *In Practice* invites contributions on any aspect of ecology and environmental management but not scientific papers presenting the results of original research. Contributions should be sent to the Editor at the IEEM office (address below).

Opinions expressed by contributors to *In Practice* are not necessarily supported by the Institute. Readers should seek appropriate professional guidance relevant to their individual circumstances before following any advice provided herein.

Should you wish to reference or quote from an article in *In Practice*, please ensure that it is fully referenced and that you inform the author(s) of your intention to do so.

Advertising

Full page: £500, half-page: £250, quarter-page: £125, eighth-page: £65, inserts: £400. The Institute does not accept responsibility for advertising content or policy of advertisers, nor does the placement of advertisements in *In Practice* imply support for companies, individuals or their products or services advertised herein.

Membership

Full £130 (outside UK: £80)
Associate £95 (outside UK: £55)
Retired £50
Affiliate £50
Graduate £50
Student £20

Full membership is open to those with four years experience, and Associate membership to those with two years experience. Appropriate qualifications are usually required. Details are given in the Membership eligibility criteria on the IEEM website.

Naturally Professional

Institute of Ecology and Environmental Management

IEEM aims to raise the profile of the profession of ecology and environmental management, to establish, maintain and enhance professional standards, and to promote an ethic of environmental care within the profession and to clients and employers of its members.

Patrons

Prof Charles Gimingham
Mr Chris Packham
Baroness Barbara Young
Prof David Goode
The Earl of Selborne

Office Bearers

President
Vice-President
Secretary
Treasurer
Prof Penny Anderson
Dr Robin Buxton
Mr Mike Barker
Mr Richard Graves

Secretariat

Chief Executive Officer
Miss Sally Hayns

Deputy Chief Executive Officer
Mrs Linda Yost

Senior Membership Officer
Mrs Gwen Heywood-Waddington

Marketing and Communication Systems Officer
Mr Nick Jackson

Training and Professional Development Officer
Miss Becky May

Policy and Information Officer
Mr Jason Reeves

Finance and Office Administrator
Ms Carol Best

Assistant Membership and Administrative Officer
Mrs Zacyntha Dunhill-Rice

Administrative Assistant
Mr Richard Watts

Operations Assistant - Professional Affairs
Miss Jessica Batchelor

IEEM Office

43 Southgate Street, Winchester, Hampshire, SO23 9EH, UK
T: 01962 868626 | E: enquiries@ieem.net | W: www.ieem.net

IEEM is a Company limited by guarantee, no. 2639067.

In Practice is printed on Revive Silk, a 100% recycled paper (100% post consumer waste).

© Institute of Ecology and Environmental Management

IEEM is a member of the following organisations and networks:

SocEnv Society for the Environment
IUCN Member
ENEP European Network of Environmental Professionals
PARN Professional Associations Research Network
United Nations Decade on Biodiversity

The Institute is immensely grateful to those organisations below which have made financial contributions or provided substantial 'help in kind' to support its activities during 2011.

Atkins
ARUP
McParland Finn
RPS

Editorial

Whither Woodland and Forestry in Britain?

Forestry should be on a roll. After a decade or so in the doldrums, timber and wood prices are starting to rise; interest in agro-forestry is up. The sector was exploring concepts of multiple benefits and valuing non-market products and services long before the concept of ecosystem services became fashionable. Forest expansion is seen as a potentially cost-effective way of increasing carbon sequestration. New woods and trees can improve the diversity of the countryside and the permeability of landscapes to species movement to help meet the aspirations set out in the Lawton Report and the Natural Environment White Paper. By and large the public 'get' trees and woods, as is clear from the interest the Big Tree Plant. Big Society initiatives may revive interest in community woodland.

Yet there are considerable challenges ahead for the forestry sector. The Forestry Commission is having to bear its share of spending cuts. Forestry policy is being reviewed in England by an independent panel; in Wales there is a study around merging Forestry Commission Wales, Environment Agency Wales and the Countryside Council for Wales.

Woodland management is hampered by inadequate deer management in many places. There is the impact of emerging pests and diseases, particularly *Phytophthora* spp., acute oak decline and red band needle blight; other threats await just across the Channel.

There is concern in some conservation circles that forest expansion could be at the expense of valued open habitats, if not the peatlands targeted in the 1980s, then dry heathland soils or other unproductive agricultural land. We cannot afford a re-run of the antagonism that existed between the forestry and conservation sectors. Both groups need to work together to identify where different types of woods and other non-woodland tree cover provide the greatest overall benefits. We then must get the funds or other incentives in place to deliver these.

Trees and woods starting to grow now will mature at the end of the century when the impact of climate change is expected to have become significant. The countryside and society's needs could be quite different to what they are now. Both native species and current commercial species could come under pressure. We must find a balance between what trees will be wanted in, say, 60 years time, and what will survive and thrive in the meantime.

At the same time we must not neglect the legacy of the past. Ancient semi-natural woods, wood-pastures and parkland may change but they are still likely to remain rich in tree and woodland species. Throughout the country there are good examples of replanted ancient woods being restored to native broadleaves, of veteran trees being 'rescued' from over-shading by younger growth. Such processes must continue. These woods and trees are the sources from which woodland plants and animals will spread out to the new trees and woodland that (I hope) are going to be created. Open habitats that were planted up with conifers in the post-War period should also continue to be restored, but to expand this programme without decreasing the total area of woodland, the rate of afforestation must also increase.

Foresters need to embrace non-woodland trees. In cities the concept of the 'urban forest' as including all types of tree cover is promoted, but in the countryside there can be a divide between 'proper forestry' that deals with woods and the management of the rest of the tree-scape. Yet many of our most important veteran trees are outside woods; many of the benefits that woods bring can also be provided by dispersed tree populations.

Discussions on the next round of rural development programmes under Common Agricultural Policy (CAP) reform are underway. These could provide an opportunity to integrate and, if possible, simplify, incentives and regulation across land-use generally. So in the International Year of Forests let us plan for the *century* of trees and woods.

Keith Kirby FIEEM
Forestry and Woodland Officer (Evidence Team), Natural England

CONTENTS

Cover image: Gamlingay Wood, Cambridgeshire

Photography: Pete Johnstone CEnv MIEEM (pete@johnstone34.plus.com)

Artwork on the cover will normally illustrate an article in, or the theme of, the current issue. The Editor would be pleased to consider any such material from authors.

A Deeper Shade of Green:

The Case for Trees and Woods in Green Infrastructure

Sian Atkinson
Conservation Adviser, The Woodland Trust

There is nothing new in the idea that green spaces are important and should be incorporated in our spatial planning. More than a century ago, Ebenezer Howard[1] dreamed up garden cities – small, planned communities that would combine the amenities of urban life with the ready access to nature typical of rural environments.

But the modern concept of 'green infrastructure', which has increasingly pervaded policy since the 1990s, takes things a step further, referring to the 'life support' functions that a network of connected green spaces and natural habitats perform, from providing clean air, water and healthy soils, to shade and shelter, and space for recreation.

Now Natural England recommends that this green infrastructure should be incorporated into all new development alongside more traditional 'grey' infrastructure such as transport networks and utilities, and Planning Policy Statement 12 requires that Core Strategies are supported by evidence of green infrastructure[2].

If green infrastructure is vital for our well-being, then trees and woods form a vital part of green infrastructure. With their complex structure, rich ecology, and their ability to deliver multiple ecosystem services, woods are an asset in both urban and rural settings. It may be impractical to plant large swathes of woodland in urban areas, but the beauty of trees is that they also deliver strongly as individual features, or as small groups, within a whole range of other elements of green infrastructure networks such as allotments, parks and canal and river corridors.

The quality and integrity of green infrastructure influences a wide range of outcomes, including climate change adaptation and mitigation, safeguarding and encouraging biodiversity, economic productivity, food and energy security, public health and well-being, social cohesion, reconnecting people with the natural environment, sustainable use of a finite land resource, and the importance of place-making[3]. There are a number of ways in which trees can be seen to offer a particular and cost effective contribution to these outcomes.

If You Can't Stand the Heat…

Climate change projections[4] show that by 2080 London will be between 2°C and 6°C hotter than today. Already the temperature differential between the city centre and surrounding suburbs may be as much as 10°C on summer days. This in turn impacts on air quality, since increased temperature combined with pollution from traffic emissions and other sources leads to increases in ground level ozone. This has serious implications if you have a chronic lung condition, are one of the increasing numbers of children with asthma or, ironically, are a child or adult with an active outdoor lifestyle[5].

The combination of direct shade and the reduction in ambient temperature as a result of absorption of latent heat during evapo-transpiration makes trees a powerful way to reduce the urban heat island effect. Further improvement in air quality through the adsorption of particulates from vehicle emissions and other sources creates a strong case for maintaining and increasing tree cover near to where people live.

Image 1. Tranquil woods are a natural antidote to the stresses and strains of modern life
Photo: WTPL/Nick Spurling

It has been estimated that doubling the tree cover in the West Midlands alone would reduce mortality as a result of poor air quality from particulates by 140 people per year[6]. On top of this there would be a significant reduction in morbidity resulting in fewer people in doctors' waiting rooms and lower costs in terms of hospital treatment.

Nature's Health Service

"The countryside can be seen as a great outpatient department whose therapeutic value is yet to be fully realised."
Dr William Bird, in his 2004 report for the RSPB, *Natural Fit*

"When we are stricken and cannot bear our lives any longer, then a tree has something to say to us: Be still! Be still!"
Herman Hesse, *Wandering*

Access to green space can have a positive effect on health and well-being, a fact recognised in The Public Health White Paper *Healthy Lives, Healthy People*[7]. Trees and woods offer particular benefits, as endorsed by the charity Campaign for Greener Healthcare, which has developed a five-year project to improve the health of staff and patients through access to green spaces, aiming to plant one tree per employee – over a million trees – on NHS land.

Lack of exercise is estimated to cost the economy in England £8.2 billion a year[8]. There is a drive to get people more active, and contact with nature can help, with people more likely to maintain exercise levels long-term if they have attractive natural spaces in which to do it[9,10]. If just 1% of the 2.5 million people on incapacity benefit in Britain could be helped back into the workplace through active lifestyles encouraged by a better environment, it would save the country £67 million a year[11]. Mental ill health affects one in six people and costs the NHS £12.5 billion and the economy £23.1 billion a year[12]. Studies show that exposure to nature aids recovery from daily stresses[13].

Early experience of nature is important in children's development, especially before the age of 12, with the freedom of unstructured outdoor play helping to develop independence and inner strength that can be drawn upon during stressful situations throughout life[14]. Contact with nature has been shown to aid concentration and self discipline, and may even be helpful in dealing with Attention Deficit Hyperactivity Disorder (ADHD)[15] which affects at least one in 20 schoolchildren in England and Wales. A study of the original Forest

Schools programme in Sweden showed reduced aggression, better concentration, reduced stress and 25% fewer days absent from school amongst those children who took part in the programme[16].

All green space has potential to nurture body, mind and spirit, and can offer opportunities to play and to learn, but woods and trees have special qualities. They can screen out noise and absorb large numbers of people. They are rich in wildlife and their complex structure means that they offer opportunities for imaginative play that more open spaces do not. They often hold special meaning for people, and can bring communities together. Research has shown communities to be more harmonious and closely knit where the urban setting includes trees[17,18], with an increased sense of place and pride in surroundings. This is likely to be increased where communities are actively engaged in some way in the stewardship of woods and trees, and the current emphasis on localism may offer increasing opportunities for this.

Slowing the Flow

In the UK, we are predicted wetter winters and drier summers together with an increase in the frequency of very heavy rainfall. The insurance cost of flooding in 2007 was thought to have been around £3 billion[19], but the Environment Agency expects the regular annual cost of damage to property alone to be in excess of £1 billion. When the cost of further disruption, damage to infrastructure and loss of business is added this increases to £2.5 billion and could rise to £4 billion by 2035[20].

One of the outcomes of the Pitt Review following the 2007 floods was the increased importance placed on surface water flooding[21]. One in six homes in England are at risk of flooding, with 2.4 million homes at risk from coastal or river flooding, but with around 3.8 million homes susceptible to surface water flooding[22].

The Government is committed to managing surface water more sustainably, including improving the capacity for slow absorption through the ground and use of green space for storage of extreme downpours. Trees make a major contribution to regulating the rate at which rainfall reaches the ground and contributes to run off, and have a key role to play when combined with other measures as part of sustainable urban drainage schemes.

In Atlanta, Georgia, USA, which has a reputation as a 'city in the forest' for its abundance of trees, a 2001 study found that when the tree cover declined from 48% in 1974 to 38% in 1996, this resulted in a 33% increase in storm water runoff and a loss of 11 million pounds of pollutants removed annually, a value of approximately $28 million per year[23]. Research by the University of Manchester has shown that increasing tree cover in urban areas could reduce surface water run-off by as much as 80% compared to asphalt surfaces[24]. Slowing the flow increases the possibility of infiltration and the ability of engineered drains to take away any excess water.

Shady Characters

Trees can mitigate climate change in two ways: by reducing energy costs and by providing a source of renewable energy themselves. The UK Low Carbon Transition plan[25] announced in 2009 highlighted the role of green space and trees in providing shade and shelter for buildings, thus reducing energy costs of both heating and cooling. Deciduous trees in particular provide shading during hot summer months, reducing the need for air conditioning, whilst allowing solar gain to buildings during the winter, reducing the need for heating. The current Government's Carbon Plan[26] reaffirms support for woodland creation, stating the role of forests in climate change mitigation.

Research in the USA suggests a per tree saving in carbon emissions for shade and shelter trees as a result of reduced building energy use of around 10-11 kg per year[27]. That is more than many trees sequester and, importantly, represents a saving in resource consumption rather than a capture of carbon once emitted. In reality

Image 2. Trees in residential areas can increase property prices
Photo: WTPL/Nick Spurling

the figures are undoubtedly more variable than this simple figure suggests, but the point is that the saving appears significant; at least of the same order as sequestration figures.

There is also increasing interest in woodfuel as a source of heat and power, and arisings from management of trees and woods in both urban and rural situations can contribute. Since the greatest benefits come from woodfuel supplies close to the point of conversion to energy, woodfuel strategies should be part of wider green infrastructure strategies. Although urban-based woodfuel energy is not without potential problems relating to air quality and 'leakage' of heat adding to urban heat island effect, schemes operating in Sweden in particular show that it can form part of viable urban heating systems[28].

Money Does Grow on Trees…

As well as fuel, trees within parks and other areas of green infrastructure can provide a range of by-products, from chippings for mulch to fruit from allotment and street trees. In addition, green space with good levels of tree cover is proven to be much less costly to maintain than grassed areas[29].

Broadleaved trees have also been shown to have a positive impact on property values ranging from 5-18%[30], with larger trees having a greater proportional value. Yet there is evidence that we are losing many of our larger urban trees and they are not being replaced[31]. Industrial areas and employment sites with access to natural green space can have more productive employees[32], with greater job satisfaction too[33]. As a consequence of all of these contributions, commercial and urban areas with good tree cover tend to attract higher levels of inward investment[34].

Creation of new woodland has been shown to be an effective way of reclaiming industrial and derelict land, as well as regeneration of urban communities where social and environmental conditions are poor. Trees and woods generally form part of larger schemes, so it can be difficult to evaluate their individual contribution, though one study in community forests[35] indicated that despite high start-up costs, new community woodland of this type would eventually deliver more than £4,000 per hectare annual public benefit.

Habitats and Wildlife Havens

It may seem odd to leave biodiversity until last, but this is not because it is an afterthought. Rather, the value of woods and trees for biodiversity underlies all their other benefits. It is utterly fundamental and should not even need stating.

Trees, the older the better, are valuable organisms in their own right, as well as habitat for many others. A mature oak can host up to 5,000 different species of invertebrate and these in turn provide food for species higher up the food chain. The complex structure of woodland provides a multitude of niches for different species, and even new woodland provides a range of interesting transitional and temporary habitats as it develops. Broadleaved woodland is particularly valuable, containing twice as many species

of conservation concern as any other habitat[36]. Individual scattered trees, such as those found in parkland and wood pasture, have been shown to be key features for wildlife[37].

Creating new native woodland and treescapes in the right places will help widlife adapt to climate change, by buffering our most valuable natural habitats, and developing a landscape that is more resilient and connected.

Conclusions

Increasingly we hear of the value of natural habitats as providers of 'ecosystem services'. Of course it is important that we have a variety of green space to fulfil all our needs, but it would be difficult to overstate the value of woods and trees as a component. They are places of beauty, rich in wildlife, where our children can play, develop, and explore a measure of wilderness and where all of us can refresh our bodies, minds and souls. They help clean our air and water, ameliorate the effects of climate change, and provide us with vital resources.

Yet the UK has less woodland than most countries in Europe, with only 12% cover compared with an average of 44%, and planting rates have steadily declined over recent years. Political will is swinging the right way, with the Government's national tree planting project, and recognition of the carbon benefits of increasing forest cover, but many are still to be persuaded in the face of increasing and competing demands on our land, and in the meantime trees continue to be lost, particularly in urban areas.

It takes a long time for trees to grow, and their full range of benefits to accrue, so we need to act now. Like Ebenezer Howard, with his garden cities, we all need to have a vision of a better world and plan accordingly, before it is too late.

References

1. Sir Ebenezer Howard (1850 - 1928) was an urban planner who wrote *Garden Cities of To-morrow* (1898), which gave rise to the garden city movement.
2. Department for Communities and Local Government (2008) *Planning Policy Statement 12: Local Spatial Planning*, para 4.8.
3. Landscape Institute (2009) *Green Infrastructure: connected and multifunctional landscapes*. Landscape Institute Position Statement.
4. UKCP09. UK Climate Projections. Downloaded at: http://ukcp09.defra.gov.uk/
5. Airnow. *Ozone and your health*. Downloaded at: http://airnow.gov/index.cfm?action=static.ozone2
6. Stewart H, Owen S, Donovan R, MacKenzie R and Hewitt N (2002) *Trees and Sustainable Urban Air Quality*. Centre for Ecology and Hydrology, Lancaster University.
7. Department of Health (2010) *Healthy lives, healthy people: Our strategy for public health in England*.
8. Bird W (2004) *Natural Fit: Can green space and biodiversity increase levels of physical activity?* RSPB.
9. Tabbush P and O'Brien L (2003) *Health and well-being: trees, woodlands and natural spaces*. Forestry Commission, Edinburgh.
10. Bird W (2004) *Natural Fit: Can green space and biodiversity increase levels of physical activity?* RSPB.
11. Speech by Andy Burnham MP, Secretary of State for Health, 13 August 2009. *Fit for the future - can we build a more active Britain?* Department of Health. Downloaded at: http://www.dh.gov.uk/en/News/Speeches/DH_104324
12. Sainsbury Centre for Mental Health (2003) *The economic and social costs of mental illness*. Policy paper 3.
13. Ulrich RS, Simons RT, Losito BD, Fiorito E, Miles MA and Zelson M (1991) Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology* **11:** 201–230.
14. Wells NM and Lekies KS (2006) Nature and the life course: Pathways from adulthood nature experiences to adult environmentalism. *Children, Youth and Environments* **16:** 1-24.
15. Faber Taylor A, Kuo F and Sullivan W (2001) Coping with ADD. The surprising connection to green play setting. *Environment and Behaviour* **33:** 54-77.
16. Forest Schools website. Download at: http://www.forestschools.com/history-of-forest-schools.php
17. Burgess J, Harrison CM and Limb M (1988) People, parks and the urban green: a study of popular meanings and values for open spaces in the city. *Urban Studies* **25:** 455-473.
18. Prow T (1999) *The power of trees*. The Illinois Steward, Volume 7 Issue 4. University of Illinois, Human Environmental Research Library.
19. Newratings (2007) *UK floods likely to cost £3bn in insurance*. Downloaded at: http://www.newratings.com/en/main/company_headline.m?&id=1577047
20. Environment Agency. *New reports highlight GBP20Bn investment over 25 years is needed to protect England from flooding*. Downloaded 29 July 2009 at: http://www.environment-agency.gov.uk/news/108705.aspx
21. Cabinet Office (2007) *The Pitt Review: lessons learned from the 2007 floods*.
22. Environment Agency (2009) *Flooding in England – a national assessment of flood risk*.
23. http://www.treenextdoor.org/index.php?option=com_content&view=article&id=148&Itemid=179
24. Armson D, Stringer P and Ennos AR (2011) The effect of trees and grass upon temperatures and surface water runoff in urban areas.
25. UK Government (2009) *The UK low carbon transition plan – national strategy for climate and energy*. The Stationery Office, London
26. Department of Energy and Climate Change (2011) *Carbon Plan*.
27. Akbari H (2002) Shade trees reduce building energy use and CO2 emissions from power plants. *Environmental Pollution* **116:** 119-126.
28. CABE Sustainable Cities. *Collecting woodfuel*. Downloaded at: http://www.sustainablecities.org.uk/energy/portfolio/wood/
29. Land Use Consultants (2011) *Trees or Turf. Best Value in managing urban green space*. Woodland Trust.
30. CABE Space (2005) *Does money grow on trees?*
31. Department for Communities and Local Government (2008) *Trees in Towns II. A new survey of urban trees in England and their condition and management*.
32. Wolf K (1998) *Urban Nature Benefits: Psycho-social dimensions of people and plants*. University of Washington College of Forest Resources, Factsheet 1, 1998.
33. Kaplan R (1993) The role of Nature in the workplace. *Landscape and Urban Planning* **26:** 193-201.
34. Department of Environment (1997) *Managing Urban Spaces in Town Centres – Good Practice Guide*.
35. Selman *et al.* (2003) *Capital Modernisation Fund: Measuring Delivery of Economic, Social and Environmental Outputs*. University of Gloucestershire. Final report to the Forestry Commission.
36. HMSO (1995) Biodiversity: the UK steering group report. Volume 1: Meeting the Rio Challenge.
37. Manning AD, Fischer J and Lindenmayer DB (2006) Scattered trees are keystone structures. *Biological Conservation* **132:** 311-321.

Correspondence: SianAtkinson@woodlandtrust.org.uk

Irish Forest Biodiversity Research:

New Knowledge from the Canopy

Sandra Irwin
PLANFORBIO Programme Manager, University College Cork

Forests are home to more plant and animal species than any other terrestrial ecosystem on earth. The biodiversity supported by our forests is important for many reasons, providing food, jobs, energy and medicine as well as recreational and cultural values. Worldwide pressures on forest biodiversity such as deforestation, commercial forestry and climate change have increased in recent times and global attention has now turned to the sustainable management of our forests. When managed effectively it is possible that forests can achieve multiple objectives including timber production and ecosystem services. Management measures taken in this regard must be evidence-based, and research examining the extent of plant and animal diversity in common forest types is essential to the scientific understanding of biodiversity conservation. These issues were addressed by research scientists in Ireland during the FORESTBIO project, which investigated species diversity with a view to informing effective forest biodiversity conservation. This four-year project concluded in December 2010, during the International Year of Biodiversity.

Introduction

Forests are home to a wealth of biodiversity and provide us with vital ecosystem services, Unfortunately, global pressures threatening these habitats are increasing, and these include deforestation, climate change, invasive species and the commercial use of forests. Ecosystem services provided by forests include carbon sequestration (which moderates climate change), biodiversity conservation, and opportunities for recreation and tourism. Effective management of forests is necessary to promote the conservation and enhancement of biodiversity, which in turn helps maintain a full set of ecosystem processes and increase ecosystem stability. Also referred to as Sustainable Forest Management, this is an essential part of implementation of the Convention on Biological Diversity, to which all European countries are signatories. Current strategies to enhance forest biodiversity include the designation of special areas within forests for biodiversity conservation, increased natural regeneration, deadwood accumulation and promotion of mixed tree species forests. Targeted research is required to provide the foundations on which future forest biodiversity conservation policies are built to allow us to meet out commitments under EU and UN environmental policies.

Extensive historical deforestation in Ireland has meant that much of our native forest estate has been depleted. Over the last century there has once again been an increase in our forest estate through public and private afforestation schemes which establish forest stands in areas that were previously not forested. Just over 10% of Ireland's land area is now forested, primarily with non-native commercial conifer plantations. Much of this forest is now entering its second rotation (where the first forest crop has been harvested and new planting is now taking place, also known as restock or reforestation). Furthermore, the planting of mixed forest stands is increasing, in line with recognition of the environmental benefits of this forest type, particularly where broadleaved (deciduous) trees are included in the mix. Broadleaved forests support a greater diversity of plants and animals than coniferous forest. This is believed to be related to the greater structural complexity of broadleaved forests, which provides increased habitat for a range of species. These forest types will make up the forests of Europe over the next century, and thus present an ideal selection of sites on which to base a study of forest biodiversity.

Plantation forests compare favourably with many other intensive land uses in the biodiversity that they support. Effective management of our forests will allow us to promote forest biodiversity, and can even play a part in protecting threatened species. FORESTBIO (Management of biodiversity in a range of Irish forest types) was a collaboration between University College Cork, Trinity College Dublin and Coillte that ran from 2007 to 2010. The project was funded by the Irish Government through COFORD (The National Council for Forest Research and Development). The aim of the project was to assess the biodiversity of a comprehensive range of species in some common forest types and determine the causes of high and low biodiversity to inform management and policy decision-making. The diversity of familiar species, such as ground vegetation and birds, as well as less visible species, such as epiphytes and invertebrates, was surveyed in a targeted network of 60 sites throughout the island of Ireland. Survey sites included commercial coniferous plantations, mixed tree species plantations, and native woodlands.

Methods Employed

Biodiversity surveys were conducted at Sitka spruce reforestation plantations of four age classes from newly planted to commercial maturity, mixed species plantations of Norway spruce with oak and Norway spruce with Scots pine, as well as in both oak and ash native woodlands. Data on second rotations plantations were compared with data on first rotation (or afforestation) plantations collected during the earlier BIOFOREST project (http://bioforest.ucc.ie/), conducted by the same team of researchers.

Standard biodiversity assessment methods such as point counts for birds, and visual surveys of percent coverage for plants, were employed where possible, together with some novel techniques not previously used in Ireland. Among the novel techniques used were thermal canopy fogging for invertebrate sampling and terrestrial LiDAR (Light Detection and Ranging) for assessment of forest structure. The biodiversity of ground vegetation, epiphytes (ground and canopy), invertebrates (ground- and canopy-dwelling spiders and beetles, and moths) and birds was assessed at all sites. A complementary survey of deadwood in native woodlands and plantation forests was also conducted at a sub-set of project sites due to the recognised importance of both fallen and standing deadwood for biodiversity in forests.

Image 1. The fogging technique being used by Rebecca Martin at a Sitka spruce plantation in Ireland

Despite advances in our knowledge of forest biodiversity, still little is known about the canopy invertebrate fauna of our forests. Canopy fogging is a relatively new technique used for the collection of large volumes of insects from forest canopies. It was developed during the 1980s for use in tropical forests, where access to the forest canopy is particularly problematic, and there it revealed exceptionally high canopy insect species richness. We now know that forest canopies contain a major proportion of the diversity of the Earth's organisms and make up the bulk of the biomass in forest ecosystems. Sampling of invertebrates from the canopy using more traditional techniques (such as sweep netting and beating trays) is a very difficult and labour intensive undertaking. The canopy fogging technique allowed us to sample insects in the forest canopy without needing to access the canopy directly.

Canopy fogging disperses an aerosol knockdown insecticide into the tree canopy from a machine operated from the ground beneath the tree. The fog is clearly visible and rises through the canopy in still conditions, allowing researchers to observe its progress. It rapidly paralyses and knocks down the canopy insects, which are collected using an arrangement of plastic sheets suspended just above the ground beneath the trees. The fogging method is, however, highly susceptible to mechanical failure and heavily constrained by weather conditions, and can only be used on sunny days with very low winds. The canopy must also be dry, and so sampling cannot be carried out after recent rainfall as the insects may stick to the damp trees rather than fall to the ground. When successful it does, however, sample a large vertical portion of the forest canopy and produce very large sample numbers.

Image 2. Point count surveying for bird biodiversity being conducted by Oisin Sweeney in a Sitka spruce plantation in Ireland

Forest Biodiversity in Ireland

This four-year project revealed a wealth of biodiversity in Ireland's forests, not only in our native woodlands, but also in our plantation forests. A total of 346 species of ground vegetation were recorded across the 60 study sites, 136 ground-dwelling spiders, 64 ground-dwelling beetles, 122 moths, 42 canopy-dwelling spiders, 87 canopy-dwelling beetles and 39 species of bird. The species richness of plants, spiders, insects, birds and other groups was typically highest at the beginning and end of the plantation forest cycle. For some groups, particularly those adapted to living or feeding on native broadleaved trees, the inclusion of broadleaved trees in plantations had a positive effect on biodiversity.

In addition to the many species recorded for each group studied, one new Irish plant record and one new county plant record of a near-threatened species were found in plantation forests during this research. Three rare woodland flowering plant species and two near threatened moss species were recorded in our plantation forests. Four moth species, the barred red, the cloaked pug, the satin beauty and the tawny-barred angle, were found exclusively in plantation forests, demonstrating the value of our commercial forests for biodiversity. The rare garden warbler, which favours broadleaved forests, was also recorded in Irish forests during the survey. Two new species records were recorded for Ireland during the canopy fogging of native oak woodlands. The spider *Entelecara acuminata* was sampled in County Kilkenny, and the beetle *Anobium inexspectatum* was sampled in Counties Galway and Kerry. *Entelecara acuminata* is patchily distributed in southern England, is rarer in northern England and has been recorded in Scotland. *Anobium inexspectatum* is also on the UK conservation Red List. This species is generally found in association with old broadleaved trees, and in particular with stems of ivy *Hedera helix* growing on these broadleaves. It feeds on deciduous wood only, and is rarely found in conifers. These species may have previously gone undetected in Ireland due to limitations of traditional sampling methods which did not allow for detailed exploration of forest canopy biodiversity.

Biodiversity of Native Woodlands

Oak and ash native woodlands in Ireland supported broadly similar numbers of bird and invertebrate species, though ash woodland supported more ground vegetation and epiphyte species. Although similar numbers of species were found, these species differed between the two woodland types, particularly for plants and insects. The conservation of both oak and ash woodlands in the landscape can therefore act to increase biodiversity.

Native woodlands were generally more species rich and supported different communities to plantations. Where similar or greater numbers of species were supported in plantations, the communities differed from those in native woodlands, and where communities were similar, more species were supported in native woodlands. Ground-dwelling beetles were an exception, possibly because this group is composed of generalists in Ireland, where few forest specialists are found. Since forest plantations are the predominant forest type in Ireland, attention should focus on the preservation or extension of native woodlands, and on the management of plantations to encourage native woodland characteristics. This will ultimately enhance the biodiversity within existing forests, and maximise biodiversity in the landscape throughout the island as a whole.

Image 3.* Anobium inexspectatum*: This small, wood boring beetle is typically found in the canopies of broadleaved trees. It was reported for the first time in Ireland in 2007 on oak trees.
Photo: Frank Köhler (koleopterologie.de)

Biodiversity of Pure and Mixed Commercial Stands

This study found that the different groups of plants and animals displayed similar patterns in species richness and community composition over the forest cycle in both first and second rotations of Sitka spruce. Biodiversity was typically high at the beginning and end of the cycle and low during the closed-canopy middle stages where little thinning has been carried out and light penetration is low. The different plant and animal groups also displayed similar patterns of community composition across

Image 4.* Entelecara acuminata*: This small spider spins small sheet webs in forest canopies. It has recently been found for the first time in Irish forest canopies where it may have previously gone undetected due to its arboreal lifestyle and small size.
Photo: Lynette Schimming

***Image 5. Large Emerald* Geometra papilionaria**
Photo: Veronica French

stages in the forest cycle; composition was generally most distinctive in the early stages of both first and second rotation plantations.

The inclusion of a broadleaved species (oak) or a light-canopied conifer (Scots pine) in an intimate mixture with Norway spruce had little effect on the diversity or community composition of most of the groups studied. The exceptions were those groups specifically adapted to living or feeding on native broadleaved trees, and epiphytes also showed a positive response to the addition of a light-canopied conifer. The proportion of Scots pine and oak in the majority of the mixtures studied was less than 40%, and most of the planted oak trees had been outcompeted by surrounding Norway spruce, such that they formed an understorey layer rather than part of the main canopy. It is likely that mixed tree species planting would have a more positive effect on forest biodiversity through the planting of more compatible tree species mixtures, or targeted management strategies that allow the secondary species to reach the canopy. This is an important finding in terms of its potential impact on future forest plantings in Ireland and elsewhere.

Deadwood

Both fallen and standing deadwood in forests provides habitat for a wide range of organisms, particularly insects and birds, that would otherwise be absent from a forest. The history of extensive deforestation and exploitation of forests for wood resources in Ireland was evident in the paucity of large-diameter logs and snags (two common deadwood categories) found in both native woodlands and plantation forests in this study. Deadwood levels in Irish forests are low even compared to those in Great Britain which has also experienced extensive forest clearance. Deadwood is one of the most important components of forest ecosystems, is an indicator of the conservation value of a forest, and one of the factors that most clearly distinguish woodlands with natural characteristics from more intensively managed forests. Despite the low levels of deadwood recorded in Irish forests, deadwood was positively related to diversity of a range of species in the forests investigated.

Indicators of Forest Biodiversity

The development of indicators of biodiversity in forest habitats is a long-term goal of forest biodiversity research in Europe. The Convention on Biological Diversity requires all countries to identify and monitor components of biodiversity that are important for conservation and sustainability. It recognises that monitoring can exploit the use of indicators to avoid the need for extensive species surveys. In cases where not all groups of

Image 6. Great spotted woodpecker returning to the nest with food. Absent from Ireland for hundreds of years, the great spotted woodpecker has recently re-colonised County Wicklow. They are found predominantly in oak woodlands, where they feed on insects from deadwood. Photo: Dick Coombes

interest can be included in a survey, an evaluation of biodiversity can be conducted using measurable parameters that act as correlates or surrogates of true biodiversity. Information about unsurveyed groups can be inferred from known relationships with structural and environmental variables (indicators) or other taxonomic groups (surrogate taxa). Indicators are not substitutes for surveys of plants and animals in terms of providing detailed information about a site's biodiversity. However, they can serve as a means of assessing the effectiveness of management for biodiversity, or enable identification of sites with potential biodiversity interest without having to conduct labour- and time-intensive surveys.

The results of the FORESTBIO project suggest that certain environmental/structural variables can serve as indicators of biodiversity in the forest types studied. There is broad overlap between groups for several of these indicators, increasing our confidence that they might enable managers and operators to get an impression of a site's biodiversity value. This confidence is further increased by substantial overlaps between some of the indicators identified during the previous BIOFOREST project and those arising from the FORESTBIO project. A new project (BIOPLAN) is now underway in Ireland to test this theory, and is being conducted in collaboration with Forest Research UK in order to test indicators across both countries.

For further information see www.ucc.ie/en/planforbio

Correspondence: s.irwin@ucc.ie

Image 7. Grey oyster mushroom: A bracket fungus that favours broadleaved deadwood
Photo: Rebecca Martin

Image 8. Primrose* Primula vulgaris*: Primroses are a common feature of Irish woodlands during spring and, like the bluebell, flower in high light conditions before the leaves come on the trees. They are found throughout Ireland, where there are a number of hybrids. Their flowers are heterostylous, i.e. individual plants bear either pin flowers (with a long style and short stamens) or thrum flowers (with a short style and long stamens). Fertilisation can only take place between pin and thrum flowers. Pin-to-pin and thrum-to-thrum pollination rarely takes place and is ineffective.

Deadwood: Importance and Management

Chris Cathrine MIEEM[a] and Andy Amphlett[b]
[a] Director, Caledonian Conservation Ltd, and, Conservation Assistant (Scotland), Buglife – the Invertebrate Conservation Trust
[b] Reserve Ecologist, Royal Society for the Protection of Birds (RSPB)

Deadwood provides important habitat within woodland ecosystems, supporting a diversity of organisms including invertebrates, fungi and bryophytes, as well as mammals, birds and herptiles. However, the provision of a sustainable resource of the full variety of deadwood habitats requires a woodland with varied species and age structure. As much of the woodland in the UK is heavily managed for human use and lacks a dynamic species and/or age structure, this resource is not available naturally, and may even be actively removed ('tidied up') to ensure that the woodland conforms to public expectations. Therefore, areas of semi-natural, commercial or amenity woodland require particular management targeted at creating a sustainable supply of deadwood habitat resources.

While 'deadwood' is increasingly recognised as an important habitat component in natural and commercial woodland management, it is important to understand the different deadwood micro-habitats, and ensure that a sustainable supply of these is provided throughout its dynamic life. It is essential that, rather than focusing on meeting average deadwood density targets, management must consider regular input of new deadwood material over time.

This article provides an overview of different deadwood micro-habitats found within woodlands and their biodiversity conservation importance (with a focus on invertebrates). The article then outlines habitat management techniques that may be employed to create and maintain this resource, using the Royal Society for the Protection of Birds (RSPB) management of Abernethy Forest National Nature Reserve as a case study demonstrating these techniques in practice.

***Image 1. Male lesser stag beetle* Dorcus parallelipipeds**
Photo: Chris Cathrine

Image 2.* Callicera rufa *(a hoverfly)
Photo: Ellen Rotheray

Introduction

Deadwood plays a key role in ecosystem functioning and productivity in terrestrial and riparian habitats. It provides habitat for many species of bryophytes, lichens, fungi, invertebrates, fish, amphibians, reptiles, birds and mammals. It also provides nursery sites for germination of plants, protection from grazing, shelter and mobility for herptiles, birds and mammals, a store of carbon and a nutrient resource that can be cycled through the ecosystem. Despite this essential role, deadwood has been removed from woodland ecosystems by humans for thousands of years. Initially the deadwood was used by people as raw material for constructing tools and shelter as well as for fuel. Now it is sometimes removed in the belief that it will prevent the spread of fungal or insect-borne disease in commercial woodlands, in response to a perceived threat to public safety or to meet public expectations of 'tidiness'. However, the removal of this important habitat component is having a serious effect on biodiversity and sustainability of our woodlands.

The woodlands in the UK have been managed to meet human needs for thousands of years, and so it is difficult to estimate what the appropriate level of deadwood should be within our woodland habitats. Woodlands in Scandinavia, Poland and western Russia can provide an indication of the levels we should expect within our semi-natural woodlands at any given time, suggesting average densities of c.60-100 m^3ha^{-1} may be considered appropriate for boreal forests, while broadleaf forests may support densities in excess of 200 m^3ha^{-1} and as high as 500 m^3ha^{-1} (Dudley and Vallauri 2004, Humphrey *et al.* 2002). Although some woodlands meet or exceed this value in the UK, these are rare, with most falling far short. For example, areas of semi-natural boreal forest in Scotland considered to be amongst the least disturbed in the country are estimated to have an average deadwood density of 30-50 m^3ha^{-1}, while more managed woodlands may have almost no deadwood at all (Humphrey *et al.* 2002). The importance of deadwood to woodland ecosystems and biodiversity has been increasingly acknowledged in recent years, and a number of papers, articles and guidance

Image 3. Female timberman beetle* Acanthocinus aedilis *Photo: Chris Cathrine

documents have been published on the topic of deadwood management, measured in terms of average density.

However, measuring deadwood in terms of average density provides only a spatial snapshot of what is a dynamic habitat, and management that is designed merely to meet these targets may fall short of achieving meaningful and sustainable conservation goals. It is equally important to measure average volume input of new deadwood into the woodland ecosystem on a temporal scale. This is because deadwood provides temporary micro-habitats, and the taxa that rely on deadwood habitats require a continual supply of new material to ensure that their requirements are met in the future – *i.e.* to ensure a sustainable woodland ecosystem.

The Importance of Deadwood Habitats

Deadwood is often viewed simplistically as standing snags or fallen dead tree material and logs. In fact, there is a huge range of deadwood habitats that may be found within these categories, as well as on living trees – in particular, veteran trees provide many important deadwood habitats. Table 1 provides some examples of deadwood micro-habitats and of species that rely on them. In addition to these terrestrial habitats, deadwood that is fully or partially submerged in water provides essential micro-habitats for a variety of fish and freshwater invertebrates (Mott 2010).

Deadwood habitats directly support a great many specialist species – known as 'saproxylic' organisms. The majority of saproxylic invertebrates are micro-habitat specific, and not tree species specific, although many of these are threatened through loss of habitat. Those species specialising both in micro-habitat and tree species are at particular risk, such as the aspen hoverfly *Hammerschmidtia ferruginea* and the pine hoverfly *Blera fallax*, both of which are included in the Scottish Natural Heritage Species Action Framework. Overall, it has been estimated that 13% of all species of plants and animals known in the UK are directly dependent on deadwood habitats, while many more are dependent upon the saproxylic organisms themselves, making deadwood an important focus for conservation management (Antrobus *et al.* 2005).

The list of deadwood micro-habitats provided in Table 1 is by no means exhaustive, but is intended to demonstrate the variety of these provided during the 'life' of deadwood. Depending on its nature, deadwood may last *in situ* for 80 years, or sometimes considerably more, depending on size and location. However, it offers different micro-habitats at different stages of its decay.

For example, decaying sap under bark is an extremely important deadwood habitat for saproxylic Diptera (true flies). A study which sampled saproxylic Diptera from 300 woodlands in Scotland found that 65.1% of the 258 species recorded relied on decaying sap under bark during their larval stage (Rotheray *et al.* 2001). Yet, this micro-habitat is extremely short-lived, lasting no more than four years after the creation of the deadwood. Furthermore, many of the invertebrate species which occupy deadwood micro-habitats have limited dispersal ranges, and so are not easily able to colonise new deadwood unless it is nearby.

Table 1. Terrestrial deadwood micro-habitat examples

Deadwood Micro-Habitat	Dead or Living Tree	Associated Species Example
Wet rotting heartwood (above ground)	Dead or Living	Lesser stag beetle larvae *Dorcus parallelipipeds*.
Wet, detritus filled rot holes and crevices in standing trees	Dead or Living	*Callicera rufa* larvae (a hoverfly). RDB 3.
Wet, detritus filled rot holes in tree stumps	Dead	Pine hoverfly larvae *Blera fallax*. RDB 1. UK BAP Priority Species.
Rotting wood below ground	Dead	Stag beetle larvae *Lacunus cervus*. Annex II Habitats Directive.
Dry rot holes	Dead or Living	A great variety of invertebrates, birds, bats and mammals depend on these rot holes for roosting and nesting. Examples include goldeneye *Bucephala clangula*, barn owl *Tyto alba*, noctule bat *Nyctalus noctula*, *etc.*
Under bark	Dead	Timberman beetle larvae *Acanthocinus aedilis*. Nationally Notable B.
Decaying sap under bark or sap exudations	Dead or Living	Aspen hoverfly larvae *Hammerschmidtia ferruginea* – Aspen specific. RDB 1. UK BAP Priority Species.
Deadwood piles	Dead	Adder *Vipera berus* hibernacula. UK BAP Priority Species.

It is therefore essential that there is a continual supply of new deadwood material within a woodland so as to ensure that different stages of decay, and so a great variety of these niche-habitats, are present throughout at all times.

Deadwood habitats created from different tree species do support different numbers of invertebrate species. While oak is undoubtedly an important tree species, in Scotland Scots pine and downy birch all support a great variety of invertebrate species, while aspen is also critical when considering invertebrates of conservation concern (using Diptera as an indicator group) (Rotheray *et al.* 2001).

Image 4. Mating timberman beetles* Acanthocinus aedilis *Photo: Chris Cathrine

Image 5. Long-horn beetle larvae
Photo: Chris Cathrine

As well as providing direct ecosystem services through nutrient cycling, soil creation and food for other animals (*e.g.* birds, mammals, centipedes, spiders, mites, pseudoscorpions, *etc.*), saproxylic species create new habitats within deadwood. For example, old woodpecker holes support wrynecks, while the bores left by stag beetle larvae are used as hibernacula by great crested newts *Tritutus cristatus*, smooth newts *Lissotriton vulgaris* and common lizards *Zootoca vivipara* (J Cranfield pers. comm.). The bodies of saproxylic invertebrates themselves also provide habitats for other invertebrates, such as parasitoid wasps, including the sabre wasp *Rhyssa persuasoria* which lays its eggs within the larvae of wood wasps and longhorn beetles that live within fallen deadwood.

Creation and Management of Deadwood Habitats

Focusing on conservation, all other factors ignored, the ultimate aim of a woodland management project would be to restore the habitat to a natural self-sustaining state. In reality, this is rarely likely to be realistic as other factors (commercial timber production, amenity use, other human landuse pressures, the small size of most of our woodlands, *etc.*) will place constraints on conservation.

In almost all cases, active management will be required to provide a deadwood resource. The appropriate level of deadwood resource for a woodland will need to be decided considering all other factors, and addressed in a management plan. The management plan itself should provide a framework to meet the following key areas:

1. As close to a semi-natural volume of deadwood for the woodland – *e.g.* 60-100 m^3ha^{-1} would be ideal for boreal forests, while levels in excess of 200 m^3ha^{-1} should be aimed for in broadleaf forest (although any deadwood is better than none).
2. A regular input of new deadwood material each year, at as close to a natural rate of input as possible. For example, one study of near natural boreal forests, dominated by Scots pine, estimated the annual input rate of new dead wood as 1.4 $m^3ha^{-1}yr^{1}$ (Rouvinen *et al.* 2002).
3. A range of deadwood types (*e.g.* standing dead at different heights and girths, fallen dead of different girths, stumps with and without rot holes, living veteran trees, *etc.*).
4. A regular supply of deadwood created from a range of tree species, as some of the most threatened saproxylic species rely on particular species of tree.

In order to develop an appropriate management plan it will be necessary to estimate the baseline deadwood density in the target woodland. The recommended method of estimating deadwood density is detailed in Kirby *et al.* (1998). A system that provides an estimate of the proportion of deadwood in a woodland, as provided by Forestry Commission England (2008), may be adequate for some sites, such as community woodlands, where comparable and robust data are not required.

There are a number of techniques that can be used to create and maintain a supply of fresh deadwood, and some of these are illustrated in Images 9-11 and outlined in Table 2, although this is by no means exhaustive. These will not all be appropriate for every woodland management project, and health and safety, practicality, economics and logistics must be considered before selecting the methods best suited to your project.

Table 2. Deadwood management and creation examples

Deadwood Habitat Feature	Creation and Maintenance Methods
Veteran tree	Identify and retain existing veteran trees, if present in a woodland.
	Encourage establishment of veteran trees. Soil surrounding selected trees should be protected from compaction and erosion (*e.g.* through livestock trampling or car parking) and ground water level changes. Fertilisers, pesticides and ploughing must be avoided. A range of veteran tree species is important. Birch can provide veteran trees faster than other species, and can therefore provide a 'quick fix' for the interim, while other species slowly mature.
	Pollarding may increase the life of a tree, and also encourage the creation of deadwood habitats within the living tree.
	Tree Protection Orders can be a useful tool for protecting veteran trees.
Standing dead	Cut branches and top tree (*e.g.* using pole saw or harvester)
	Use explosives to top tree (important to use specialist trained contractors and to fully consider public affairs, and the serious health and safety implications).
Fallen dead	Cut trees (near ground level or leaving higher stumps to provide standing dead).
	Pull trees over (*e.g.* using tirfor winch or vehicle mounted winch).
Rot holes and crevices.	Intentionally damage living trees to encourage formation of rot holes and crevices.
	Pollarding may encourage the creation of rot holes and crevices within living trees.
Log piles	Stack brash or thinned material to create log piles.

The methods described in the table above create general deadwood habitat features, and a range of shaded and unshaded aspects should be encouraged for each. Within each of these, different micro-habitats will develop (examples provided in Table 1). A range of different deadwood habitat should be created to allow opportunities for a variety of deadwood micro-habitats to develop, while annual input of new material will allow sustainable populations of saproxylic

Image 6. Female sabre wasp* Rhyssa persuasoria *laying eggs
Photo: Daisy Shepperd

Image 7. Leisler's bat* Nyctalus leisleri *a species that relies on deadwood for roost habitat
Photo: John Haddow

species to establish. Of course, by encouraging a natural mix of species and age structure within a woodland, it is possible that a naturally sustaining deadwood resource may be established.

While management intervention to increase deadwood volumes and input rates may often be required, natural processes (*e.g.* snow and wind-break, and wind-throw) are of vital importance too.

In addition to the practical management of deadwood habitats, survey and monitoring of biodiversity present should also be encouraged. Saproxylic invertebrates are generally most easily sampled during their larval stages, which are restricted to the deadwood habitats and may be long-lived (for example, stag beetle larvae may take up to five years to mature). While we are more familiar with the adult stages, these may be highly mobile (in some cases occupying the canopy, and providing pollinator services), seasonal, short-lived and more difficult to sample. A number of techniques can be employed, including active searching, bark traps, bark window traps, pitfall traps and flight interception traps, depending on the target species group and life stages. Lichens, fungi and bryophytes may also be surveyed. Indices have also been developed to provide a measure of deadwood quality, such as the Saproxylic Quality Index (Fowles *et al.* 1999). These surveys all require specialist skills and lab analysis, and should therefore be undertaken by ecologists with the relevant experience. There is a great opportunity to make exciting discoveries through such monitoring – for example, of 258 species recorded during a saproxylic Diptera study, 53 were Red Listed, nine were new to the UK and 10 were new to science.

The following case study demonstrates different approaches to deadwood management where the aim is to create a semi-natural self-sustaining boreal forest at a site that consisted of a mix of semi-natural woodland and commercial plantation at the time of acquisition by the RSPB.

Case Study: Abernethy Forest National Nature Reserve

The RSPB owns and manages Abernethy Nature Reserve. Situated in northeast Scotland (57°15'N, 3°40'W), within the Cairngorms National Park, it extends to 13,715 ha. The reserve covers a wide altitudinal range, from 200-1309 m AOD. Mature woodland (with greater than 10 trees ha^{-1}) currently covers c.4,100 ha, with an additional c.1,400 ha of other trees, scrub and established natural regeneration. Caledonian forest and bog woodland are the major woodland types present, and are both listed under Annex I of the Habitats Directive.

The reserve is protected under international and national nature conservation legislation. It includes all, or parts of: three Special Protection Areas (SPA), two Special Areas of Conservation (SAC), a Ramsar site, two Sites of Special Scientific Interest (SSSI) and is a National Nature Reserve (NNR). In addition, it lies within the Cairngorms National Park, a National Scenic Area and a proposed World Heritage Site.

At the time of acquisition by RSPB, there were within Abernethy Forest: 1,882 ha of Scots pine plantations, a similar area of semi-natural woodland, and 304 ha of planted non-native conifers. Timber had been extracted, over the lifespan of the present trees, from c.97% of the semi-natural woodland.

RSPB began active management of the plantations in 1981. Here the aim was to develop the forest structures seen in the mature semi-natural woodland elsewhere in Abernethy. Within Scots pine plantations a programme of phased thinning began, aiming to create variable tree densities (300-1,000 ha^{-1}), over the course of three rounds of thinning. This management sought to diversify woodland and field layer structure, increase blaeberry *Vaccinium myrtillus* and maintain minority tree and shrub species.

Plantation management drew on standard sylvicultural methods operating at the time; phased thinning, avoidance of wind-throw, and extraction of timber. Existing deadwood was highly valued as a wildlife habitat (*e.g.* as nesting sites for crested tits *Lophophanes cristatus*) and was retained in areas of management. In addition, only limited amounts of standing deadwood were created, as the deadwood volume was anticipated to rise as the forest matured.

Over the period 1981-2003, RSPB re-structured 611 ha of Scots pine plantations and clear-felled 238 ha of non-native conifers. Approximately 40,000 tonnes of timber was extracted and sold, covering costs of management (in most years) and providing an income to RSPB (in some years), depending on the fluctuating timber prices.

In the late 1990s managers began to consider a wider range of approaches to restoration of the Caledonian pinewood ecosystem. Investigations also began to explore what features and attributes woodland of natural character might have. As part of this process a major review of the importance of dead and decaying wood was undertaken, which also looked at how amounts in Abernethy compared to more natural pine forests.

At Abernethy, in some taxonomic groups a very high proportion of rare and scarce species are associated with deadwood. For example, of 69 Nationally Rare and Nationally Scarce lichens in woodland at Abernethy, >90% are restricted to deadwood (exposed lignum), and of 122 Red Listed or Nationally Scarce beetles recorded from woodland at Abernethy Forest, 48% are saproxylic species.

Geographically, the closest examples of near natural Scots pine dominated boreal forests are in parts of Scandinavia and western Russia. Here, the remaining areas of pristine forest, with little or no history of sylvicultural management, provide models for deadwood abundance and dynamics to be aimed for in Abernethy Forest.

When management began, deadwood density was estimated to be 6-10 m^3ha^{-1}, which is about 10% of that found in analogous near

Image 8. Male Leisler's bat* Nyctalus leisleri *tree roost in rot hole
Photo: Stuart Spray

Image 9. High topped trees Photo: Ross Watson (RSPB)

Image 10. Harvester creating standing deadwood Photo: Ross Watson (RSPB)

natural boreal Scots pine dominated forests in Scandinavia and western Russia, and the mean annual input rate of fresh deadwood was less than 1% of the rate in these other forests. RSPB therefore began a management programme of deadwood creation within plantations, starting in winter 2006/07.

The primary aim of deadwood management was to create an additional minimum of 1 m^3ha^{-1} of standing and fallen deadwood over a 5-10 year cycle over all plantation areas. Continuity of supply of fresh deadwood, both standing and downed, was seen as a key prerequisite for conservation of deadwood dependent species. A range of techniques were adopted (see Images 9-11) to create a variety of types of deadwood. Standing deadwood was created by cutting branches and the tops off trees using a pole saw, and latterly by a timber harvester. Downed deadwood was created by felling trees, sometimes cutting near ground level and sometimes leaving a high stump, and by pulling trees over. This was done by hand, using a tirfor winch, and using a tractor mounted winch. Smaller numbers of live trees were 'damaged' to encourage formation of rot holes. In this way, it is hoped that a continuity of supply of deadwood in space and time can be provided. In the long-term, aspirations are to reach near natural deadwood volumes, with less active management as natural processes of disturbance begin to create the majority of the deadwood input.

Over the five year period 2006/07 to 2010/11, deadwood was created in over 997 ha of plantations, at a mean rate of 17.3 trees killed per ha. This represents an increase in mean deadwood volume of approximately 2-3 m^3ha^{-1}, exceeding the original minimum target. One third of the trees have been killed standing and two thirds left as downed deadwood. RSPB staff and volunteers have devoted about 400 man days to this project over the last five years, with considerable additional work by contractors. This management is currently supported through the Scotland Rural Development Programme (SRDP).

Through exploring different deadwood creation and management techniques, the Abernethey Forest may be used as a case study example to inform similar management at other woodland sites.

Conclusions

Deadwood provides important micro-habitats for a huge diversity of saproxylic species directly. These organisms provide important ecosystem services and support other species through provision of food and creation of new habitats.

It is important that those involved in designing and implementing woodland management realise that although a fallen tree or large branch may last for decades, the micro-habitats themselves are transient and so continual input of fresh deadwood material is essential throughout the spatial extent and lifetime of the woodland.

As this article demonstrates, there are many management techniques that may be employed to create different deadwood habitats that will then go on to provide myriad micro-habitats throughout the decay process. While these will not all be practical or affordable for every project or site, those that are most appropriate may be employed to the benefit of biodiversity, and will help contribute towards ultimately creating a more sustainable woodland.

Image 11. Pulled over trees Photo: Ross Watson (RSPB)

Further Reading

The various habitat management methods described in this article are further outlined in the Deadwood Habitat Management Guidance Document published by Buglife – the Invertebrate Conservation Trust (available from www.scottishinvertebrates.org.uk). Other deadwood habitat management advice documents are also available from other organisations. As this is an evolving management field, new documents are likely to provide more up-to-date advice.

Acknowledgements

The authors wish to thank Ellen Rotheray, Daisy Shepperd, Stuart Spray, Ross Watson and Rory Whytock for their invaluable contributions.

References

Anon (2008) *Forestry Commission Operations Note 15: Deadwood.* Forestry Commission England.

Antrobus D, Bird T, Bloxham M, Browne E, Hinton S, Millett P, Sadler J, Smart MJ, Williams N, Wilde N and Moode W (2005) *Biodiversity Action Plan for Birmingham and the Black Country: Deadwood Habitat Action Plan Technical Appendix*. Birmingham and the Black Country Biodiversity Action Plan Steering Group.

Dudley N and Vallauri D (2004) *Deadwood – Living Forests: The Importance of Veteran Trees and Deadwood to Biodiversity.* WWF.

Fowles AP, Alexander KNA and Key RS (1999) The Saproxylic Quality Index: evaluating wooded habitats for the conservation of dead-wood Coleoptera. *The Coleopterist* **8:** 121-141.

Humphrey J, Stevenson A, Whitfield P and Swailes J (2002) *Life in the Deadwood: A Guide to Managing Deadwood in Forestry Commission Forests.* Forest Enterprise – Environment and Communications, Edinburgh.

Kirby KJ, Reid CM, Thomas RC and Goldsmith FB (1998) Preliminary estimates of fallen deadwood and standing trees in managed and unmanaged forests in Britain. *Journal of Applied Ecology* **35:** 148-155.

Mott N (2010) *Fish live in trees too! River rehabilitation and large woody debris.* Staffordshire Wildlife Trust.

Rotheray GE, Hancock G, Hewitt S, Horsfield D, MacGowan I, Robertson D and Watt K (2001) The biodiversity and conservation of saproxylic Diptera in Scotland. *Journal of Insect Conservation* **5:** 77-85.

Rouvinen S, Kuuluvainen T and Siitonen J (2002) Tree mortality in a *Pinus sylvestris* dominated boreal forest landscape in Vienansalo wilderness, eastern Fennoscandia. *Silva Fennica* **36:** 127-145.

Correspondence: chris.cathrine@caledonianconservation.co.uk / chris.cathrine@buglife.org.uk

How Forest Product Markets Deliver Woodland Biodiversity

Mariska van der Linden
Policy and Programme Manager, Business and Markets, Forestry Commission England

Introduction

Forests and woodlands deliver a multitude of so-called 'ecosystem services and products', from timber to carbon sequestration, to fuel, biodiversity and beyond. Woodlands that are actively and sustainably managed[1] deliver more of these services and products. Importantly, even where woodlands are not managed explicitly for biodiversity, biodiversity is likely to improve as a result of management.

This article sets out that where there is market pull for forest products, sustainable forest management naturally follows. Therefore forest product markets provide a sustainable solution to increasing biodiversity levels. Moreover, with timber prices on the up and carbon, woodfuel and other relevant markets making forestry increasingly economically viable, now is the time to raise awareness of both the biodiversity and economic benefits of woodland management.

Sustainable Woodland Management Increases Biodiversity But Many Woodlands are Not Managed

Wildlife in the UK has been shaped by economic activities. Woodlands in England have been managed for timber and wood fibre for well over 4,000 years, with timber and wood providing building materials, tools, crafts and fuel. Virtually all woodland in England today is the result of management at some point in its lifetime.

Despite this strong history of woodland management, today 47% of England's woodlands are currently un- or under-managed[2], the lack of suitable markets being a contributing factor. An additional four million tonnes of timber could be harvested sustainably each year if these woodlands were managed[3].

Image 1. Old small-leaved lime coppice

Image 2. Coppice harvesting - stacking produce from newly restored coppice

The lack of woodland management has resulted in important biodiversity loss. The most common reasons for unfavourable woodland condition and biodiversity loss are[4]:

- Excessively high deer populations
- Inappropriate livestock grazing
- Non-native species, especially densely shading conifers
- Invasive non-natives such as *Rhododendron*
- Monocultural species composition
- Lack of natural regeneration, coppice and understorey
- Inappropriate management or over intensive usage

Detailed figures on how biodiversity has responded to woodland management in practice are awaited but in the meantime evidence is mounting. For instance, woodland butterflies are used as an indicator species for woodland biodiversity and the long-term decline in woodland butterfly populations is a concrete example of the negative impact of lack of woodland management on wildlife. Butterfly Conservation suggests that the major cause of decline in woodland butterflies is a change in the structure of our woods, as a result of changes in active broadleaved woodland management, especially the decline of coppicing[5].

To tackle this issue, Butterfly Conservation developed the South East Woodlands project[6] in collaboration with Forestry Commission England, which ran over three years and ended in spring 2011. The project used public grants to support coppicing and the restoration of the sunny rides and glades that woodland butterflies need - in targeted areas the project increased woodland management rates by 30%, and rare butterflies such as the pearl-bordered fritillary and Duke of Burgundy are already starting to colonise new areas.

Looking at pearl-bordered fritillary populations in particular, these have undergone a steep decline in recent years and in the South East became restricted to just 10 sites, with just a handful of butterflies left at most of them. Through a conservation programme involving carefully targeted grants, commercial forestry and reintroductions to former sites, the butterfly is once more thriving

Image 3. Pearl-bordered fritillary basking on the woodland floor in late Spring

at several sites. In Abbots Wood in Sussex for instance, a record count of more than 600 pearl-bordered fritillaries were spotted in 2011 flying in woodland corridors, along pathways and across open spaces. This and similar conservation efforts across the country are using sustainable woodland management to restore butterflies and other wildlife to our woods.

Changes to wild bird populations are another example of how woodland management affects biodiversity. Wild birds are a good indicator of the general state of health of our wildlife. Changes in woodland structure from long-term non- and under-management have contributed to a 24% decline of the breeding woodland bird population over the past 40 years[7].

A Woodland Birds Project[8] set up by RSPB, Forestry Commission England, Natural England and others in the East Midlands is reversing the decline by creating more and improved habitats for woodland birds. Through grant aiding landowners and managers, an additional 2,500 ha of woodland will be in management and 464 ha of either bare land or non-native plantations will have been converted to native woodland by the end of the project. Woodland bird populations are being monitored and results are awaited.

Forest Product Markets Provide a Sustainable Solution to Tackling Lack of Woodland Management

While both the butterfly and woodland bird projects are clearly making an impact, continued woodland management is needed to ensure the right habitat remains in place for these species. In fact, Butterfly Conservation states that 'continuity of management is essential'[9] to sustain pearl-bordered fritillary butterflies.

While these projects support(ed) the forestry economy where possible (*e.g.* by putting local woodland workers and businesses in touch with landowners with saleable crops) they are also grant funded. The risk with any grant-dependent project is that funding is cut, particularly in the current economic climate. If woodland management rates drop again, biodiversity gains will be lost.

However, where markets for wood products are buoyant, woodland management has an economic imperative and can pay for itself, even turn a profit. Rather than using grant funding, a more sustainable solution could be to create and improve markets for woodland products, increasing the profitability of management, leading to increased management and therefore improved biodiversity.

Happily, bringing woodlands back into management not only benefits biodiversity, it also improves the quality and quantity of timber that can be harvested, thus increasing the return on forestry operations. Management can improve the economic value of the woodland in several ways:

- Reduced vulnerability to epidemics of pests and disease
- Better stem quality, especially of hardwoods
- Reduced damage from deer, grey squirrels and rabbits
- More stocking with productive or timber quality species
- More stable stems/stands and larger crowns as a result of thinning
- Improved natural regeneration and/or regrowth.

Markets Linked to Woodland Management are Growing, Opening Up Opportunities to Increase Biodiversity

Despite the long-term negative effects of non- and under-management on wood products and low timber prices over the past two decades, things are looking up. There are significant market opportunities around for forestry businesses and the mood within the sector is optimistic, meaning that soon we could be seeing an increase in woodland management. If directed appropriately, this will increase biodiversity benefits.

While timber prices have been steadily increasing over the past few years, recent developments are likely to further increase the financial viability of woodland management. It is expected that in particular the woodfuel and carbon markets will create a strong market pull for woodland management. The strong government interest in creating markets for other ecosystem services also has the potential to increase the return on woodland management.

With the carbon footprint of fossil fuels is now well known, and energy security being of concern, countries such as the UK are looking to drive renewable energy. Woodfuel, as a form of bioenergy, plays an important role here. Provided woodlands are managed sustainably, woodfuel is carbon lean as for every tree burned, another is planted.

The UK's National Renewable Energy Action Plan[10] includes a commitment to develop plans for bringing an additional two million tonnes of wood to energy markets in England each year by 2020. This fuel could provide sufficient heat to supply 800 hospitals, or 3,000 schools or 250,000 homes. Using this quantity of wood instead of fossil fuel could save 1.5 million tonnes of CO_2 each year. Forestry Commission England has recently published its strategy[11] to achieve these two million tonnes of additional supply, which includes a £10 million Woodland Improvement Grant[12].

The Government has also recently announced a Renewable Heat Incentive (RHI)[13], a long-term feed-in tariff for renewable heat for both non-domestic users and households. This effectively means that producing renewable heat becomes financially attractive as a fixed income is given for every kilowatt hour produced.

Image 4. Management of a woodland ride to create a habitat for birds and butterflies

Image 5. Wood chips for woodfuel

The RHI and buoyant energy markets more generally are stimulating the woodfuel market, which is already leading to more sustainable forest management. This is expected to lead to significant biodiversity benefits, as demonstrated by the large number of conservation bodies supporting action to drive this market[14].

Carbon markets are another opportunity to make woodland management pay. Forestry Commission has set up a Woodland Carbon Task Force[15], which is all about enabling a step-change in the level of woodland creation to help deliver carbon abatement in the land management sector. As well as working with the financial sector to develop new opportunities for investment in UK-based woodland creation, the Task Force is helping to ensure that the contribution of woodland creation to carbon budgets is recognised.

One of the outcomes of the Task Force is the new Woodland Carbon Code[16]. This sets out the standards for voluntary carbon sequestration projects that incorporate core principles of good carbon management as part of sustainable woodland management. The Code is already leading to more woodlands being planted.

At the same time, there is increased interest from the UN and governments around the globe, including the UK Government, in ensuring the social value of ecosystem services is reflected by their financial value, even if that means creating markets for ecosystem services and products that are currently not marketable. Woodlands are particularly pertinent to this trend: A recently published assessment of the UK's ecosystem services[17] by the Government states that 'Woodlands [compared to other ecosystems] provide the highest identified number of ecosystems services including regulating climate, air quality and water flows, providing timber and other wood products as well as a range of cultural benefits'.

Biodiversity underpins many ecosystem services and therefore has a high social value but this is not reflected by its financial value – biodiversity provides clear benefits to society but there is no obvious market in which to 'sell' biodiversity to make the work required to achieve high rates of biodiversity pay for itself. If interest and theory can be turned into practice and effective markets for biodiversity-related ecosystem services can be created, this will also make woodlands and their management increasingly economically attractive.

These new markets do not necessarily need to be underpinned by legislation nor created by government. Voluntary visitor pay back schemes are a good example of a market with potential for growth. Nurture Lakeland[18], a charity in Cumbria running a visitor pay back scheme, is a good example of how successful such a scheme can be. Businesses including hotels and restaurants ask visitors to voluntarily support conservation by donating a very small amount of money via their bill or fees. Set up in 1993, the charity now has 275 business members representing more than 1,200 tourism businesses and holiday cottage owners across Cumbria, generating £130,000 per year. This effectively means that tourists visiting the area for its natural assets, thereby benefitting from the conservation work, also make a direct financial contribution to maintaining these.

New Markets Indicate Future Woodland Management for Timber is Likely to Focus Increasingly on Hardwood

The significant underpinning factor behind the woodfuel, carbon and other potential ecosystem services markets is climate change. Governments are aiming to reduce our carbon footprint and make our ecosystems more resilient to changes in climate.

Interestingly, climate change is not only influencing the demand for forest products, but also the supply. For instance, to ensure woodlands are resilient to climate change, Forestry Commission England is recommending a move away from monoculture conifer plantations towards increased planting of broadleaves and more diverse woodlands. This work has already started on the Public Forest Estate.

So there are two trends towards increased growth of hardwood. Firstly, with sustainable forest management likely to increase, and bearing in mind that most unmanaged woodlands are broadleaf, more hardwood will be harvested. Management of these woodlands will improve timber quality in the long-term, opening up other market opportunities besides woodfuel.

Secondly, with more broadleaves being planted, again the volume of hardwood timber is likely to increase. These two trends could create further opportunities for niche markets such as furniture and wooden flooring, which are likely to face less international competition and price pressure than current UK-produced softwood products such as fencing and pallets.

Can You Help to Drive Woodland Management and Increase Biodiversity?

The Government's recently published Natural Environment White Paper[19] includes ambitions for 'a major increase in the area of woodland in England, better management of existing woodlands and a renewed commitment to conserving and restoring ancient woodlands' with 'woodlands [playing] a full part in achieving a resilient and coherent ecological network across England'.

Government wants a 'much larger proportion of existing woodlands brought into active management [and to] increase the use of sustainably grown and harvested wood products'. The detailed level of ambitions and interventions by Government to achieve these are subject to any Ministerial response to the Independent Panel on Forestry, which will report in 2012.

In the meantime, without pre-judging Ministers' decisions on the exact scale or approach that might arise from the Panel process, there are a number of actions that we could all take to help drive woodland management and increase biodiversity.

Image 6. Rural craftsman making a traditional split hazel hurdle

Image 7. Bundles of cut three-year old sweet chestnut coppice for walking sticks

Despite the growing number of opportunities, there seems little awareness among woodland owners of both (1) the importance of sustainable forest management for biodiversity and wildlife, and (2) how this can pay for itself or even turn a profit, among woodland owners. You can help to drive woodland management by raising awareness of the benefits of woodland management. For those interested, the following sources of information will be useful:

1. For information and advice on sustainable woodland management, including grants and forestry business contacts, please contact your regional Forestry Commission England office www.forestry.gov.uk/forestry/HCOU-4U4J23#eastengland.
2. The Institute of Chartered Surveyors also provide information on woodland management www.rics.org.
3. For information specifically on managing ancient and native woodlands please see the relevant Forestry Commission England practice guide at www.forestry.gov.uk/pdf/FCPG201.pdf/$FILE/FCPG201.pdf.
4. For information on, and contacts of, forestry businesses, please contact www.confor.org.uk.
5. Information for owners of smaller woodlands seeking to manage their woodland can be found at www.smallwoods.org.uk. The Small Woods Association can also help to provide contacts of coppicing businesses in particular.
6. For information and advice on how to benefit from the RHI, including information on managing woodlands for fuel and information on woodfuel boilers and their installation, please see www.biomassenergycentre.org.uk. For information and advice on how to benefit from the RHI by selling energy, please see the Energy Saving Trust http://www.energysavingtrust.org.uk/Generate-your-own-energy/Sell-your-own-energy/Renewable-Heat-Premium-Payment.
7. For further information on the Woodland Carbon Code and how to get involved, please see www.forestry.gov.uk/carboncode.
8. For further information on the products made from different tree species, as well as the carbon benefits of non-fuel timber products, please see www.woodforgood.com.

Notes

1. Sustainable management as defined by the UK Forestry Standard, for example, http://www.forestry.gov.uk/website/publications.nsf/WebpubsbyISBN/0855386266.
2. Forestry Commission England (2009) *Woodland Management Indicator.*
3. Forestry Commission England (2007) *A woodfuel strategy for England.* http://www.forestry.gov.uk/pdf/fce-woodfuel-strategy.pdf/$FILE/fce-woodfuel-strategy.pdf.
4. Forestry Commission (2010) *Managing ancient and native woodland in England, Forestry Commission England Practice Guide.* http://www.forestry.gov.uk/pdf/FCPG201.pdf/$FILE/FCPG201.pdf.
   Natural England (2008) *State of the Natural Environment 2008*, woodland chapter. http://www.naturalengland.org.uk/publications/sone/default.aspx.
5. Clarke SA, Green DG, Bourn NA and Hoare DJ (2011) *Woodland management for butterflies and moths: a best practice guide.* Butterfly Conservation, Wareham.
6. For further information, please see http://www.butterfly-conservation.org/downloads/244/south_east_woodlands.html.
7. Defra (2011) *Biodiversity Indicators in your pocket 2011*. This document, with additional supporting data and text, is available on the Joint Nature Conservation Committee website: www.jncc.defra.gov.uk/biyp.
8. For further information, please see www.forestry.gov.uk/eastmidswoodlandbirds.
9. Clarke SA, Green DG, Bourn NA and Hoare DJ (2011) *Woodland management for butterflies and moths: a best practice guide.* Butterfly Conservation, Wareham.
10. *UK National Renewable Energy Action Plan*. http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/renewable/ored/uk_action_plan/uk_action_plan.aspx.
11. Forestry Commission England (2011) *Woodfuel Implementation Plan*. http://www.forestry.gov.uk/england-woodfuel.
12. For further information on the Woodland Improvement Grant please see http://www.forestry.gov.uk/ewgs-wigwoodfuel.
13. For information and advice on how to benefit from the RHI by selling energy, please see the Energy Saving Trust website http://www.energysavingtrust.org.uk/Generate-your-own-energy/Sell-your-own-energy/Renewable-Heat-Premium-Payment. For information on how to benefit from the RHI by managing woodlands for fuel, please see the Biomass Energy Centre website www.biomassenergycentre.org.uk or get in touch with your regional Forestry Commission office www.forestry.gov.uk/forestry/HCOU-4U4J23#eastengland.
14. In July 2009, a Wildlife Link Statement of support for the Forestry Commission England Woodfuel Strategy was endorsed by 13 conservation NGOs including RSPB, Wildlife Trusts, Friends of the Earth and Campaign to Protect Rural England as a crucial method of improving woodland biodiversity. For more information see www.wcl.org.uk/docs/2009/Link_position_statement_Woodfuel_Strategy_03Jul09.pdf.
15. For further information on the Woodland Carbon Task Force, please see www.forestry.gov.uk/england-wctf.
16. For further information on the Woodland Carbon Code, please see http://www.forestry.gov.uk/carboncode.
17. UK National Ecosystem Assessment 2011. http://uknea.unep-wcmc.org/Resources/tabid/82/Default.aspx.
18. For further information, please see www.nurturelakeland.org.
19. *The Natural Choice: securing the value of nature* - The Natural Environment White Paper 2011. http://www.official-documents.gov.uk/document/cm80/8082/8082.pdf.

Correspondence: Mariska.vanderlinden@forestry.gsi.gov.uk

In Pursuit of the Truth About Coppice Woodland Management in the South East

Debbie Bartlett CEnv FIEEM
Landscape Architect, Ecologist and Rural Development Consultant

I was first involved in the coppice issue over 15 years ago, when I was the Kent County Woodland Officer. There was widespread concern about the decline in the area of woodland managed by coppicing and the effect on wildlife resulting in both BAP targets and initiatives to 'drive' woodland management by creating new markets for small diameter roundwood. At the same time I was getting frequent requests for chestnut fencing from bulk buyers, both here and abroad. This just didn't add up and triggered research to find out exactly what was going on.

The South East has remained the centre of the coppice industry with the majority of the sweet chestnut *Castenea sativa*, the most commercially viable species, in Kent. Hazel *Corylus avellana*, the other main coppice species has a more westerly distribution. While the Forestry Commission inventories give an excellent national picture of the woodland resource these are less helpful when considering local management, in part because of a lack of consistency in definitions and methodology. The first step in the investigation was to try to establish how much coppicing was going on and the trend; evaluating progress towards the BAP targets required a baseline. But when is woodland in active coppice management? Chestnut is harvested commercially at a rotation of anywhere between three (for walking sticks and trellis) and 50+ (for post and rail fencing) years growth, although hazel remains economically viable for hurdle making for only a couple of years. A voluntary survey was begun in the late 1990s, asking where coppice was cut between 1 September and 31 August, and the area and the species harvested. This ran for four years, with the first being a pilot, and was then repeated after an interval of five years, with records beginning to come from outside Kent. Random checking showed good accuracy, possibly since many

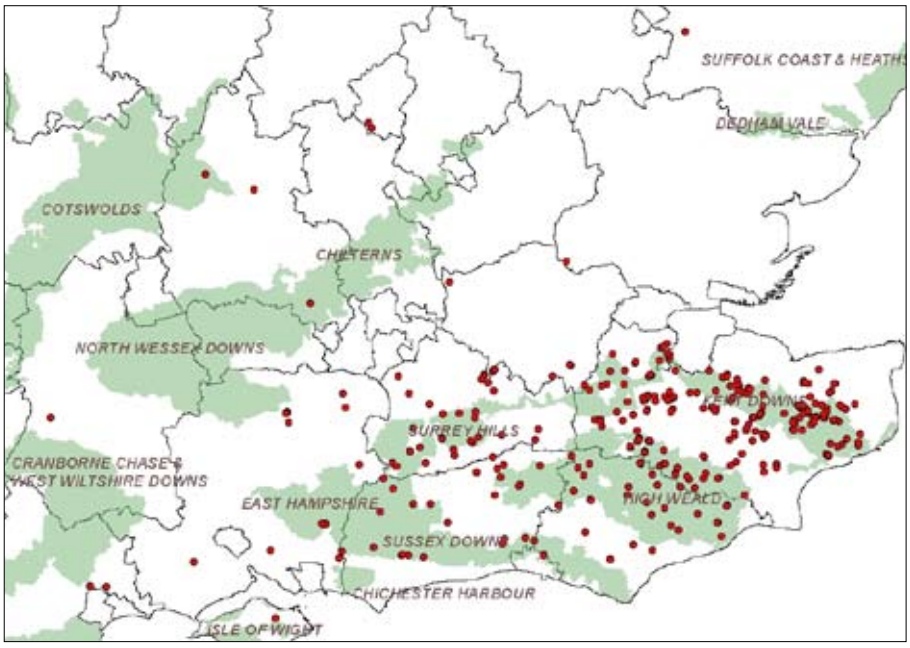


Figure 1. Distribution of active coppice activity on the basis of survey returns 2007-2010

records were from woodland workers, agents and landowners. This showed that coppice activity is widespread, as shown in Figure 1.

The relationship between the survey return figures and the area managed as rotational coppice is complex. The density of records in Kent may reflect greater awareness of the survey and of the author there. The variability in commercial rotations has been alluded to, with chestnut a particularly complex example. The area of chestnut is subject to debate with Braden and Russell (2001) giving a UK total of 18,788 ha, of which 96% is in England and 60% in Kent and East and West Sussex. However Lockhart Garratt (2009) claim this is an under estimate. It has been suggested that there may be around 12,500 ha of chestnut in Kent (*e.g.* Dannett 1991), so with the survey recording an annual average of 112 ha cut annually then, on the basis of a 15-year paling rotation, about a seventh of Kent's chestnut seems to be in active management. Rotations for post and rail are much longer and, if a conservative 25-year rotation is assumed, then almost a quarter is managed. While the proportion of different chestnut fencing products is unknown there is currently a very healthy demand for both paling and post and rail with significant quantities being exported to mainland Europe. The two sets of surveys reveal no decline over the last decade and areas cut, in Kent at least, seem to be stable.

I am sure that the problem of research in this area is becoming clear; although chestnut has been used as an example the situation for mixed species woodland is no easier. There are no clear figures to work on and change in woodland is relatively slow. There is no doubt that woodland management, as well as area, has declined since the Second World War but the extent, and the importance, of this is debatable. Research into the emergence of 'the coppice problem' in the 1980s, the evidence it was based on and the attempts to address it has been fascinating with two aspects standing out.

First is the assumption that market failure was the principle cause. In Kent the closure of the Kemsley paper mill in

the late 1980s bears most of the blame despite the fact that the mill was unable to source enough pulpwood locally and was having to import it by sea. A number of the speakers at the Forestry Authority conference *New Markets for Old Woods* (Betts and Claridge 1994) refuted the idea that new markets were needed, and several subsequent marketing initiatives have failed because they stimulated a demand that could not be supplied.

The second point is that there has been little, if any, real attention paid to the woodland workforce. The apparent demand for chestnut fencing in excess of supply was part of the initial trigger for investigation and the logical step was to look at production and see how this could be increased. There was a general view that the workforce was in decline with many approaching retirement. Extensive interviews, questionnaires and focus groups were carried out, attracting funding for training to increase coppice harvesting efficiency and other capacity building activities but no evidence for either market-based solutions or that the workforce is aging has been found (Bartlett and Rossney 2007). Quite the contrary – there are several hundred (at least) coppice workers, many are young, and they can sell all they can produce, whether this is firewood, fencing or hazel hurdles. There are complaints about the market price but that is a rather different issue.

The socio-economic well-being of the woodland workforce is fundamental, whether the aim of woodland management is biodiversity, biomass fuel or landscape and amenity. The South East retains a significant traditional coppice workforce and, particularly in the chestnut industry, there are many family groups. Knowledge and skills have been passed down through the generations and these are often working the same woodlands as their ancestors. In a developing country these would be considered as forest dependant people, their livelihood issues would be a material consideration in any plan relating to the woodlands and we would be referring (reverently) to their Traditional Ecological Knowledge. It seems strange that there is so little interest in the workforce and their issues here.

At present the focus is on the potential productivity of the South East's woodland resource with many reports generated by the promotion of large-scale woodfuel production (*e.g.* Forestry Commission 2006). There is plenty of woodland but perhaps things are not quite as simple as it might first seem. Producing 'chip wood', as pulp is now being called, at a commercially viable price requires large scale forestry machinery, wide tracks and large cutting areas. The post-war drive to increase agricultural efficiency

Image 1. Young woodland workers

led to larger fields, loss of hedges and fewer jobs. The same trend in the ancient woodlands of the South East could be devastating. A foretaste was the recent equipment grants that benefited forestry contractors but were not accessible to, nor appropriate for, the majority of the coppice workforce.

This research has demonstrated that there is still a significant coppice industry in South East England, which has maintained wildlife by cutting small areas on regular rotations which provides the mixed aged structure and edge habitat. The drive to increase woodfuel production runs the risk of disrupting – if not destroying – the traditional industry that has persisted, despite all the changes of the last century. Forestry techniques are appropriate in secondary woodland and plantations but maintaining the cultural and natural heritage of the more sensitive ancient woodlands of the South East is surely better served by encouraging more small scale management rather than focusing on bulk woodfuel that needs to be produced cheaply. Many coppice workers produce domestic firewood, sometimes as their sole product, but often as an outlet for low grade wood. Demand is high, particularly over the last two winters, with adverts in virtually every parish magazine, village and farm shop. This is far more profitable than producing for bulk markets, although it has received little attention since the early 'tree station' feasibility studies (*e.g.* Levy *et al.* 1996).

New initiatives to increase woodland management have many benefits, from reducing emissions to landowner incomes but all need an efficient, stable workforce. New entrants should be encouraged but the traditional workers, who already have established markets, should not be forgotten and, as has been the case to date, left out of most funding initiatives.

References

Bartlett DMF (2011) Identifying Issues for the Coppice Industry. *Quarterly Journal of Forestry* **105:** 131-134.

Bartlett DMF and Rossney D (2007) Socio-economic Analysis of the Coppice Industry in South East England. *Quarterly Journal of Forestry* **101:** 285-290.

Betts A and Claridge J (1994) *New Markets for Old Woods* Conference Report. The Forestry Authority HMSO.

Braden N and Russell K (2001) Chestnut in the United Kingdom Forest Area, Management and Utilisation as Timber. *Forest, Snow and Landscape Research* **76:** 505-510.

Dannatt N (1991) *Marketing of Coppice and Other Small Roundwood in the South East*. Report Commissioned by the Forestry Commission.

Forestry Commission (2006) *A Woodfuel Strategy for England*. Available at http://www.forestry.gov.uk/pdf/fce-woodfuel-strategy.pdf/$FILE/fce-woodfuel-strategy.pdf.

Levy S, Evans M, Desai P and Fisher M (1996) *Firewood: a study into the background and potential markets in the Weald*. Report produced for Weald Woodnet.

Lockhart Garratt (2009) British and Irish Hardwoods Trust: Chestnut Project 2009 code 523392. Report prepared for the Department of Energy and Climate Change.

Correspondence:
debbiemfbartlett@gmail.com

The New LISS/CSCS Skills Card – One Card Does It All

Denise Ewbank
Ubiquita Interim Solutions Limited

The recently launched Land-based Industry Skills Scheme (LISS) is a major new initiative that promotes skills training, records professional competence and qualifications, and demands industry-specific health and safety awareness training for anyone wanting to work in the land-based sector. The scheme is administered by BALI – the British Association of Landscape Industries (www.bali.org.uk).

Thanks to an important partnership with CSCS (Construction Skills Certification Scheme), the new LISS/CSCS skills card provides professional ecologists and others working in the land-based sector with a single card that gives them access to any construction or development site, or area of estate owned and managed by the Highways Agency.

The LISS/CSCS card is a pre-requisite of the National Highways Sector Scheme 18 for the Natural Environment and Landscape including Ecology (NHSS 18) and anyone working for an accredited contractor must hold one before they can work on the road network. It provides evidence that the holder has all the required skills and training required to undertake the work as stipulated on the card and it identifies the varied skill levels for different workers (*e.g.* operative, site manager, consultant, *etc*). A process is currently in development to allow the recognition of in-house training, allowing companies to deliver this provided they can demonstrate it meets the requirements of the National Occupational Standards (NOS).

The new LISS/CSCS 'smart' card with 'app' carries details of the holder's specific industry qualifications and/or competencies under the occupational areas of NHSS 18, namely:

- landscape construction and maintenance;
- arboriculture;
- pesticide application;
- amenity;
- environmental management; and
- ecology.

In addition to holding relevant qualifications and/or competencies, to obtain a card applicants must first attend and pass the BALI ROLO (Register of Land-based Operatives) Health and Safety Awareness Course and pass the CSCS 'touch screen' Health and Safety Test.

ROLO Health and Safety Awareness Course

This one-day course has been in place for some years but has now undergone a major review to ensure all information is not only up-to-date but reflects changing working practices and legislation. It provides attendees with sound basic industry-focused health and safety information that helps establish a strong awareness of the importance of working safely and the implications of failing to do so. It is delivered by BALI-approved training providers who are required to comply with strict criteria regarding their training and subject qualifications. They may be colleges, commercial trainers or in-house company trainers, provided they meet the required criteria.

The course is mandatory for anyone applying for a LISS/CSCS card and, it is anticipated, will be adopted by many colleges as the health and safety course delivered to students undergoing land-based training.

For full information on NHSS18, the ROLO Health and Safety Awareness Course and the new LISS/CSCS card, visit the BALI website at www.bali.org.uk and select the LISS or ROLO buttons. Alternatively contact Nikki Feltham at BALI on 02476 690333 or e-mail nikki.feltham@bali.org.uk.

Note:

IEEM has been asked on several occasions if it would become registered with a construction card scheme; investigations revealed high costs and low benefit and was not recommended by the Professional Affairs Committee. Our investigations have been confirmed through a report prepared by Pye Tait Consulting for the Health and Safety Executive and Construction Skills 2011. *A commentary on routes to competence in the construction sector* states:

'This research has shown that there are in existence 300 cards from over 40 certification schemes, a number of which have inconsistent and incompatible requirements and meanings.' It has also shown that 'There are currently around 2.6 million cards of all types and levels in circulation (for an operative workforce of perhaps around 1.5 million)… around 77% of these cards have multiple routes and that 73% of them do not necessarily require a formal, nationally recognised qualification. Only 4% of the identified cards can be obtained only by acquisition of a formal, nationally-recognised qualification (12 of 300).'

Individual contractors can be carrying up to seven different cards to gain access onto one construction site. It is expected that the LISS/CSCS card will become *the* card as it is industry-based and competency driven. The card will demonstrate to clients that the individual takes competence and health and safety seriously. It provides a structured and visible career path.

IEEM is now represented on the BALI (NHSS 18) Full and Training Committees. She will be working with others sector representatives and CSCS to develop the standards required for the cards for ecology and environmental management professionals.

Card Costs as at June 2011

Health and Safety Training

ROLO H&S course (pre-requisite) – 1-day industry specific training through a BALI approved provider: £60-90

LISS/CSCS (valid 5 years)

Touch Screen H&S Test: £17.50

LISS/CSCS Card: £38

What is an Ecologist/Environmental Manager?

How Do Students and Other Professions See Us?

Peter Glaves MIEEM
Enterprise Fellow, Northumbria University

Introduction

As part of professional training sessions, workshops, careers events, *etc.*, a series of practical exercises have been undertaken to explore how ecologists, environmental managers and geographers are perceived. Over a thousand individuals have taken part in these sessions ranging from 11-year old school children to recently graduated architects and others from the construction professions.

This article presents some initial findings which are of particular relevance to IEEM – *i.e.* how the following three key groups perceive and understand ecology and environmental management and their perceptions of who work in these fields:

1. school pupils studying geography and/or biology;
2. undergraduate students studying environmental management and/or ecology[1]; and
3. final year undergraduate students and recent graduates in construction related professions[2].

The majority of individuals involved were from the North East of England, with smaller numbers from Yorkshire, the South East, the East Midlands and Scotland.

The findings show some interesting similarities and differences to those of the IEEM student and member surveys. They complement the emerging findings from the recent Ecological Skills Project and throw light on some of the gaps identified in that study.

Perceptions of School Pupils

At the start of careers events run in a range of schools, pupils were asked to draw and describe the characteristics of people who work as ecologists or environmental managers. This exercise was run with pupils from the age of 11 (Key Stage 2) to age 17 (A/AS Level). The language used was appropriate to the age of the pupil and the extent to which they had studied relevant subjects. The analysis presented here focuses on GCSE, AS and A Level students who were studying geography and/or biology and therefore had been taught about some aspects of ecology and/or environmental management.

A common theme with all groups of pupils was that over 75%, and in some cases up to 90%, of pupils saw environmental managers as being men and in most cases as being middle aged. Typical examples are shown in Figure 1. This is particularly interesting as the majority of teachers of these subjects in the schools concerned were female.

The most frequently mentioned characteristics of environmental managers/ecologists were:

- Intelligent
- Concerned
- Eco-friendly
- Practical
- Scientific
- Passionate
- Happy

Over 50% of drawings of ecologists/ environmental managers showed a hat and glass-wearing man with map, in the field, collecting samples (see Figure 1).

Not all perceptions were positive, however, and the most frequent characteristics also included:

- Not that well paid
- Scruffy
- Nerdy
- Bit dull
- Hippies

Things could be worse. One group of 14-year olds boys thought that a typical geographer was: a boring, middle aged, balding, depressed and divorced bloke!

There was a division amongst pupils between those who saw ecologists/ environmental managers as field-based scientists and a smaller group who saw them as environmental activists. The latter included a depressing number of young pupils who used the phrase 'tree hugger' (for example see Figure 2) and who looked at ecologists/environmental managers as being anti-development.

A small proportion of pupils, including some as young as 13, recognised that there was a stereotypical view of ecologists/environmental managers and went on to look at wider characteristics and skills of these professions.

Awareness of the career options open to graduates in ecology/environmental management was limited amongst school pupils (more worryingly such limitations were also found amongst undergraduates – see below). When asked to list the range of jobs/careers someone with qualifications in these subjects could go into the answers were fairly predictable and most frequently included:

- Teacher/lecturer
- Working with nature/wildlife/plants and animals
- Environmentalist/ 'hug trees'

[1] The sample includes students studying degrees in environmental management, environmental conservation, environmental science and ecology.

[2] The sample includes students studying construction management, estate management, planning, architecture and surveying and recent graduates in these fields.

Figure 1. Typical examples of drawings of ecologists/ environmental managers (both are from GCSE students)

Figure 2. Alternative perceptions of ecologists and environmental managers

Figure 3. Final year environmental management degree students' views of what drives their choice of career

Figure 4. Final year environmental manager/ecologist's view of the career they do want (good) and don't want (bad)

- Researcher/collect data
- Study environment/biomes / ecological systems
- Work in a museum
- Work for an NGO

A small number (less than 20%) recognised that there were a wider range of careers open to ecologists/ environmental managers (named examples included green technology, risk management, pollution, *etc.*), and that the skills gained from studying these subjects were transferable. One student stated that ecologists/environmental managers could go on to 'do anything'.

Perceptions of Undergraduate Students

As part of preparation for work placements, a series of sessions have been run for final year and second year undergraduates exploring the world of work and potential careers as ecologists/ environmental managers. The following analysis is based on environmental management students who had selected an ecological/conservation route through their degree. Reponses from students taking straight ecology or conservation degrees may differ, but the following findings appear to be consistent with informal feedback from undergraduate and postgraduate conservation and ecology careers sessions run by the authors.

The findings support the IEEM April 2010 student survey in terms of students' motivation with over 80% of students having taken their degree because they wanted to go on to work in ecology/ environmental management. Over 50% of the students thought it would be difficult/ very difficult to get an ecological job, with a general perception that it was harder to get an ecological job than a post in more technological aspects of environmental management such as waste, renewable energy, environmental auditing, *etc.*

The motivation and desire for a relevant career is higher amongst ecology/ environmental management students than many subject areas that the authors have worked with. There appear to be two common drivers in terms of students' choices of study and career: firstly, ecology/environmental management students want to 'make a difference', and to 'do something worthwhile' (see Figure 3), and secondly, students do not want a nine to five office job and see a career as an environmental manager/ecologist as offering something different (see Figure 4).

There are however some clear barriers between students studying ecology/ environmental management and a future career in these fields. Some of these barriers are well recognised by the students, other less so. The recent Ecological Skills Project report identifies a number of specific skills gaps; this research highlights some issues which underlie these gaps.

Firstly, there is a **lack of awareness of the range of career options** and in some cases an idealised view of their future career amongst ecology/ environmental management students. Figure 4, which was drawn by a final year environmental management student, shows that the classic idealised view of a ecologist job (*i.e.* working in a National Park, with Ranger Rover, dog, *etc.*) can still be found amongst students. Students were most aware of, and felt most prepared for, a career as an environmental consultant, conservationist, ecologist, and teacher as well as work in sustainable development, agriculture, forestry and research. But they were much less aware of, and less prepared for, work involving economics, auditing, lab analysis, legislation and, interestingly, environmental management.

Secondly, there is a perception amongst students that **an undergraduate degree does not prepare them for a career as an ecologist/ environmental manager**. As part of a recent programme review, a range of undergraduate and postgraduate ecology/environmental management programmes have been cross-compared and mapped to relevant professional body job descriptions (including the IEEM ecologist profile and draft environmental manager profile). This mapping has identified several areas of weakness, which have also been identified in the Ecological Skills Project report; for example there are particular weaknesses in coverage in undergraduate programmes when mapped against the IEEM ecologist profile in relation to:

- conservation legislation and regulation;
- standard ecological survey methods;
- general management issues including people management and finance; and
- consultation and communication.

It is interesting however to note that when students were directly asked why they felt unprepared for a particular career, they mentioned a range of barriers some of which related directly to their education, but others related to wider factors/issues including:

- lack of experience/suitable experience;
- not having the right skills;
- lack of motivation or willingness to learn;
- lack of knowledge of what the career involves;
- a perceived lack of ability in that subject;
- lack of confidence;
- perception that the career is to technical; and
- thinking that the career would be too dull.

Thirdly, there is often a **lack of student recognition of the skills that they have**, and their ability to sell these, including the transferable skills that they have gained from other work such as time management, presentation skills, financial management skills, analytical skills and people skills.

Fourthly, there is a **lack of understanding of what employers are looking for** in an ecologist/ environmental manager post. When asked what their ideal job would involve, most students often found it difficult to list the tasks and skills which someone in that job would use during a typical working week. There was also a lack of awareness of where they could obtain such information.

Finally, many students are **not proactive**. For example, normally a minority of ecology/environmental management students undertake regular voluntary work. Whilst students fees and the requirements for students to undertake paid part-time work may have affected volunteering rates it is interesting to note that some student cohorts contain more students who have done voluntary work abroad on exotic species conservation projects than have volunteered for local ecological/ environmental management projects. Optional or compulsory work placements form part of a number of undergraduate and postgraduate programmes and such experience can be invaluable for future careers. In addition, many students have not registered with their university careers services nor with online careers support sites and indeed many careers advisors have little knowledge about ecological/environmental management careers. Many students have also not looked online at career descriptions or job vacancies to see what skills and experience they need for their chosen career.

There are clear opportunities for IEEM to build on its support for students, careers advisors, *etc.* and help mould the future professionals in the field of ecology/ environmental management.

Perceptions of

Construction Students and Recent Graduates

The author is frequently involved in running training sessions with final year and recent graduates from a range of land management and construction professions. These sessions have provided the opportunity to explore the opinions and attitudes of these professions to ecologists/environmental managers.

At the start of a series of training workshops on ecology for land and construction professionals and students, attendees were given red and green cards and asked to indicate their opinion of ecologists, positive (green) or negative (red). In all cases the majority of trainees indicated they currently had an overall negative opinion of ecologists. Often negative opinions accounted for over 80% of trainees on a course.

As a follow up exercise, and prior to any training on ecological issues, students were asked to write down their negative and positive opinions and attitudes on the cards which were then collected in and discussed. In all sessions the number of negative comments outweighed the positive comments by a factor of two to one. The most common negative and positive phrases used have been summarised in Figures 5 and 6. The size of the words in these figures indicates how frequently the phrase was used. The two negative words used most frequently were 'expensive' and 'tree huggers', followed by 'costly', 'jobsworths' and 'hippies'. Positive words and phrases were more varied and frequently included 'caring', 'passionate', 'understanding' and 'extrovert'. It is interesting that many positive phrases described the character of ecologists and negative phrases were about their perceived impact on construction works.

There was an interesting dichotomy of views amongst construction students and professionals, between seeing ecologists as being: 'required for the future' or 'useless tree huggers' and as being 'often a problem not a solution' or 'good for the future'.

It is interesting to note that a small group of respondents thought that ecologists were 'often forgotten' or 'overlooked'.

Whilst a proportion of construction students and professionals recognised that ecological issues were relevant, some had concerns about the importance/priority given to ecology stating, for example, that ecologists were 'people who are too obsessed with an issue which everyone should be interested in'.

Finally, there was a difference in perception between ecologists and environmental managers, the latter being seen as being more relevant to construction, one respondent stated:

'Ecologists = an obstacle' but 'Environmentalists = the solution'

Conclusion

In the 2010 IEEM Member survey, student members were asked to rank how ecologists and environmental managers were perceived by other professions with 67% indicating that they thought that the perception was good or excellent. The above work indicates that there are negative opinions and issues that still need to be tackled; both in relation to how professions view ecologists and environmental managers but also in relation to those who may go on to work as ecologists and environmental managers. Some of these attitudes appear to be ingrained and may be developed at a fairly early age

These issues and perceptions may have important implications for the future development of our profession.

Correspondence:
peter.glaves@northumbria.ac.uk

Figure 5. Land and construction students' and graduates' negative attitudes towards ecologists and environmental managers

Figure 6. Land and construction students' and graduates' positive attitudes towards ecologists and environmental managers

Closing the Gap

Making the Case for Investment in Ecological Skills

Max Wade CEnv FIEEM
RPS

Introduction

In July the Institute published a report, *Ecological Skills: Shaping the Profession for the 21st Century*[1], the conclusion of three years of stakeholder engagement, member and employer surveys, literature review and interviews with representatives across the profession. The objectives of the Ecological Skills Project were to:

- **evaluate the evidence for a skills gap;**
- **if present, analyse its nature, scale, significance and causes;**
- **engage with stakeholders in identifying a strategy for closing any skills gap; and**
- **build partnerships amongst stakeholders in order to implement an agreed strategy.**

Concerns about an ecological skills gap were, until recently at least, mostly anecdotal and opinion-led rather than evidence-based. In 2010 the Environment Research Funders' Forum (ERFF[2]), backed by Defra and a host of UK statutory sector organisations, published *Most Wanted*, a report on the postgraduate skills requirements for the environment sector[3] that identified 15 critical environmental skills that it considered to be in short supply in the UK. Now, IEEM's own commissioned report has provided further detailed evidence that ecological skills in the UK are in such short supply that, if they are neglected further, they could seriously undermine our capacity to deliver the environmental mandate that has become critical to us all.

Current Context

The need to determine whether or not there really is an ecological skills gap becomes more and more pressing. Public interest in the environment has never been greater. Government science has established how our health, well-being and prosperity depend on our natural capital.

In 2010 the United Nations published the final report of *The Economics of Ecosystems and Biodiversity* Study (TEEB)[4]. The presentation of the study's findings to the UNEP Convention on Biodiversity COP10 meeting in Nagoya in October 2010 renewed the determination of many governments to take greater account of environmental protection. Policy development is highly dynamic, evidenced by two important environmental White Papers[5] from Defra and similar policy statements from the devolved administrations[6]. The UK National Ecosystem Assessment[7] has exposed the need to better understand and protect ecosystem functioning.

These and other environmental issues now combine to create an unprecedented urgency in the language of governments and businesses across the globe about the need to manage the world's natural environments from a perspective of understanding, evidence and confidence in our actions. However, behind this new sense there are those persistent and growing concerns that, at a time when arguably the demand for ecological skills and knowledge has never been greater, such skills are in decline. If real, such a skills deficit could undermine the implementation of key policy and our capacity to protect our environment and our future.

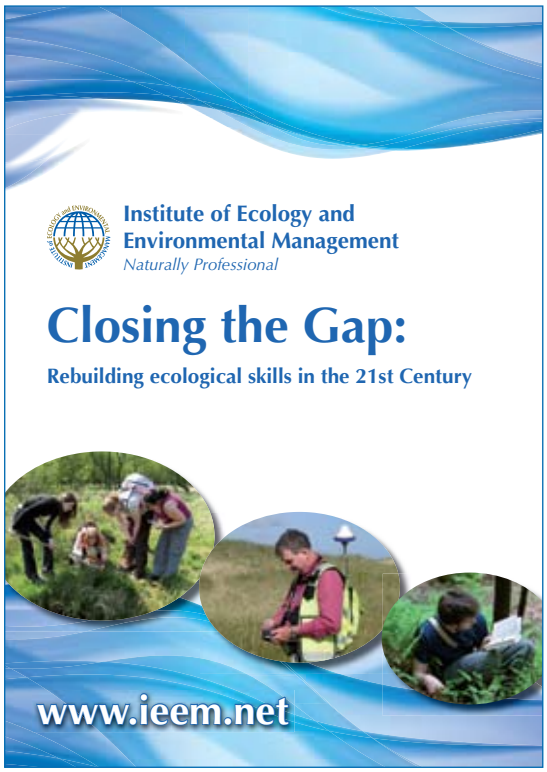
Methodology

The latter stages of the project were undertaken by The Management Standards Consultancy (working with Radnorshire Wildlife Services) in order to bring some wider skills framework experience to the research. A Project Board chaired by Professor Max Wade, and comprising Dr Eirene Williams, Ms Pam Nolan, Dr Robin Buxton and Ms Sally Hayns oversaw delivery of the project supported by valuable contributions from the Ecological Skills Gap Steering Committee[8]. IEEM's Deputy Chief Executive, Mrs Linda Yost, was the project manager and drove the project forward. Many of IEEM's members contributed to the research.

The research methods included:

- a literature review;
- analysis of survey responses from member ecologists and environmental managers, employers, graduates and associates (early career stage practitioners);
- a review of continuing professional development records;
- semi-structured face-to-face and telephone interviews with key stakeholders; and
- a key stakeholders' workshop to review the initial findings and identify options to address the issues.

The design of the research ensured that the effects of the length of experience of the ecologist or environmental manager concerned,



the ecosystems in which the profession operates (*e.g.* marine, freshwater, coastal and terrestrial), and employment context (*i.e.* land/marine management, research, public sector, consultancy, industry and teaching) were all accounted for in the analysis of the results.

To facilitate the gathering and classification of data, a high-level Knowledge, Skills and Applications Framework (KSA Framework) for Ecology and Environmental Management was developed, listing the key requirements for ecologists and environmental managers under four sections:

- knowledge;
- specialist skills;
- transferable skills; and
- applications.

This KSA Framework was refined through consultation with stakeholders and consensus was reached that it covered all the requirements at a high level. It is envisaged that the development of additional levels of detail will enable its use as a tool for the strategic development of professional competence.

Key Findings

The research identified unequivocal evidence for a skills gap in some key areas.

Specialist Skills Gaps

- Taxonomy and systematics
- Species identification skills, particularly in respect of: invertebrates, fish, lower plants, lichens, algae and fungi
- Ecological survey, sampling, analysis, assessment, evaluation and monitoring skills in respect of: invertebrates, fish and bird communities
- Undertaking Environmental Impact Assessments (EIA) and Strategic Environmental Assessments (SEA)
- Habitat creation, restoration and management in marine, coastal and upland environments
- New technologies, particularly IT, mobile technology and genetics
- Tackling invasive species and the spread of diseases
- Landscape-scale Approach, recognising the importance of ecological networks and connectivity

Knowledge Gaps

- Environmental economics, including understanding of ecosystem goods and services
- Freshwater, coastal and, especially, marine systems and processes
- Environmental legislation and policy
- Microbiology, including microbes in marine biotopes[a], micro aquatics, micro invertebrates, plant pathology and biosecurity
- Understanding of application of spatial planning systems
- Construction techniques to mitigate threats to habitats

[a] an area that is uniform in environmental conditions and in its distribution of animal and plant life

Transferable Skills Gaps

- Written communication, particularly writing reports that address the key questions and show the evidence that support the findings
- Project management and contract management
- Management and accessibility of data
- Influencing and stakeholder engagement
- Financial management
- Risk analysis and management

The full research report (available on the website at www.ieem.net) outlines further trends relating to length of experience and employment sector. For example, and perhaps surprisingly, those with less than two years experience appear to be more confident in their species identification and ecological assessment skills than those with more than two years but less than four years experience. This may be due to the proximity of their survey experience to being taught species identification, a trend towards less time in the field and more desk work with experience, the confidence of youth, or none of these. We are not alone, as apparently there are other professions where new graduates are more confident in their knowledge and skills than those with a little experience who have realised how much there is still to learn!

Implications

The evidence for an ecological skills gap is compelling and alarming at a time when the demand for knowledge and skills in ecology and environmental management has never been greater. The findings support previous studies that have, for example, identified a worrying reduction in freshwater ecology research capacity[9] in the UK and yet action has still not been taken to address the decline. Of further concern are the continuing significant cuts to staffing in many of the UK's statutory agencies responsible for ecological research, knowledge exchange, innovation, guidance and legislative compliance.

The Causes of Decline

It is easy to speculate and to point the finger at universities and higher education institutions – surely they are responsible for giving potential entrants into the profession the tools that they need to do their jobs? But, of course, it is not as simple as that. University course programmes are largely driven by demand and there are a number of factors that have combined to undermine higher education provision.

The first is an image problem. The perception of ecologists and environmental managers as male, bearded, open-sandaled hippies still persists (see Peter Glaves' article on page 23) along with concerns about low salaries and poor job prospects. Add to this the confusing array of roles and job titles, and it is little wonder that the public, potential students and undergraduates are unclear as to what an ecologist or environmental manager actually does or whether there are any real career prospects over and above the sense that you will be doing something 'good for the environment'.

Next is a lack of peer professional recognition and regulation. Ecologists and environmental managers increasingly work as part of multi-disciplinary teams whose members may well be part of a regulated profession with all of the associated recognised accreditation of competencies. In the UK and Ireland the ecological profession is unregulated other than via membership of IEEM, voluntary assessment and accreditation of skills and experience together with compliance with a Code of Professional Conduct. This means that almost anyone can provide ecological advice to a business, landowner or planning authority without necessarily having the knowledge and skills to do so competently. That is somewhat alarming when breaches of, for example, European Regulations can lead to substantial fines. This does not inspire pride and confidence in our profession.

Then there is the lack of investment in the sector's skills needs through integrated strategic planning of higher education programming and ongoing provision and support for training. A structured career path, with the opportunity to acquire specialist skills along the way, would enable us to develop and implement innovative approaches to effective biodiversity and habitat management.

Finally there is our profession itself. Perhaps we have been guilty of a degree of inertia in promoting the contribution our profession makes

to economic success. Perhaps we have not made clear the degree of knowledge and expertise required to make sound judgements on activities that impact on biodiversity and ecosystem services. Possibly we have yet to make a convincing case for an investment in ecological skills as a critical component of a plan to achieve environmental sustainability. If we are indeed guilty as charged, then the time has come for us to address the issue.

IEEM's Response to the Findings

The Institute believes that the UK and Ireland need a comprehensive strategy to deliver the full range of required ecological and environmental knowledge and skills across the environmental professions. This must involve schools, colleges and higher education institutions, Sector Skills Agencies, training and continuing professional development providers, employers across all sectors, professional membership bodies and learned societies. It requires leadership at government level and through the appropriate agencies and bodies such as NERC, the Quality Assurance Agency, the Committee Heads of Environmental Sciences, the Higher Education Funding Councils, FÁS and the UK Commission for Employment and Skills. It also requires leadership from the profession itself, and IEEM must play a leading role in engaging with partners to drive new initiatives and seek robust solutions.

The strategy should include:

- creation of a government-supported multi-partner task force to oversee delivery of the strategy, and to monitor progress against current and future needs;
- renewed commitment to the promotion of ecology and environmental understanding at primary and secondary school stages both to improve perception of the industry and to raise awareness of the range of career opportunities;
- development of a detailed competency framework as an ongoing career planning tool to guide practitioners in the knowledge, skills and applications requirements for a range of ecologists and environmental manager roles[10];
- engagement with higher education institutions and accreditation of their under- and postgraduate programmes and postgraduate research strands that deliver the required knowledge and skills;
- improvements in careers advice and guidance to market the knowledge and skills needs and promote links to employment opportunities;
- mechanisms to promote and support the acquisition of specialist technical knowledge and skills;
- investment in high quality and accessible training programmes that target identified skills gaps and shortages;
- assessment and certification of knowledge and skills as part of continuing professional development;
- engagement from employers in the support and delivery of career structure, on-the-job training and training programmes; and
- recognition and accreditation of the specialist knowledge and skill requirements of the profession in order to raise standards and drive self-improvement.

Work has already begun. Since the report was published IEEM has:

- called on the UK Government and devolved administrations to commit policy and funding support to develop and take the strategy forward;
- responded to the consultation on the Higher Education White Paper, pressing for more financial support for courses involving fieldwork and promoting the need to address the identified skills gap;
- successfully launched a Knowledge Transfer Partnership project with the University of Portsmouth to develop a more detailed knowledge, skills and competency framework for the profession and to develop a methodology, based on this framework, for accreditation of higher education undergraduate and postgraduate degrees that provide the skills we need; and
- commenced work on a new Professional Development Strategy for the Institute.

We know that there is a lot more to do. Addressing the skills gap, inspiring high calibre entrants into the profession and communicating a better understanding of the work that we do and how it contributes to a sustainable future are three of the most important challenges we face. Failure is not an option.

Acknowledgements

Thanks to Sally Hayns, Professor Steve Ormerod, Dr Eirene Williams and Ms Pam Nolan for their contributions to the Skills Project summary document which formed the basis for this article. Thanks are also due to all members of the Steering Committee (see note 8 below) and to RPS who provided substantial 'in kind' support to the Skills Project.

Notes

1. IEEM (2011) *Ecological Skills: Shaping the profession for the 21st Century.*
2. The Environmental Research Funders' Forum has now merged with the Living With Environmental Change Partnership.
3. ERFF (2010) *Most Wanted: Postgraduate Skills needs in the Environment Sector.* NERC.
4. TEEB (2010) *The Economics of Ecosystems and Biodiversity: Mainstreaming the Economics of Nature: A synthesis of the approach, conclusions and recommendations of TEEB.*
5. Defra (2011) *The Natural Choice: Securing the value of nature.* HM Government White Paper. HMSO and the forthcoming Water White Paper due to be published in 2011.
6. The Welsh Assembly published *A living Wales – a new framework for our environment, our countryside and our seas* in 2011. The Scottish Government's Wildlife and Natural Environment Bill completed Stage 3 in March 2011. The Northern Ireland Executive has recently consulted on a new Environment Strategy.
7. UK National Ecosystem Assessment (2011) *The UK National Ecosystem Assessment: Synthesis of the key findings.* UNEP-WCMC, Cambridge.
8. Max Wade (Chair), Jill Sutcliffe (Project Officer, May 2008 - March 2010), Debbie Bartlett, Derek Finnie, Katharine Pilcher, Steve Pullan, Eirene Williams, Linda Yost, Rebecca Collings, Karen Devine, Paul Lunt, Steve Muddiman, Clare O'Reilly, Mark Woods
9. Batterbee R *et al.* (2005) *A review of Freshwater Ecology in the UK.* Freshwater Biological Association. 24pp.
10. IEEM has already begun to develop the higher level Knowledge, Skills and Applications Framework produced as part of this research that identified the core competencies for ecologists and environmental managers

Correspondence: wadem@rpsgroup.com

IEEM Summer Conference 2011: Biodiversity and the Big Society

Becky May AIEEM
Training and Professional Development Officer, IEEM

IEEM's summer conference took place on 15 June 2011 in London and attracted 100 delegates. The aim of the conference was to provide delegates with a better understanding of the principles behind the Government's Big Society vision and its implications for the ecology and environmental management sector. The conference was auspiciously timed to coincide with the publication of the Government's Natural Environment White Paper, entitled *The Natural Choice: securing the value of nature*.

IEEM was very pleased to welcome **Richard Benyon MP**, Minister for Natural Environment and Fisheries, to start off the conference. The Minister delivered a presentation on using the principle of the Big Society to deliver on biodiversity challenges. He pointed out that the Big Society is not a completely new idea, as volunteer action and local support have been at the heart of nature conservation for many years. He explained how, following the outcomes of COP10 in Nagoya, the Government has ambitious plans for the natural environmental in England, including the aim to move from net biodiversity loss to net gain over the next 50 years. The Minister highlighted the main actions set out within the White Paper, which will guide nature conservation priorities in order to achieve these aims. He also explained the ways in which the Government will facilitate these actions, including the forthcoming reform of the National Planning Policy Framework.

The next speaker was **Adam Wallace**, the Natural England Area Manager for London, Surrey and Buckinghamshire, who provided an overview of Natural England's response to the challenges of developing the Big Society concept. Adam highlighted the need to encourage public participation in protection of the natural environment and to improve our 'bedside manner' whilst talking to different audiences. He stated the benefits of tapping into the passions that drew us to the sector in the first place and using these passions to provide inspiring leadership to encourage community involvement. Adam explained that Natural England is endeavouring to listen to what people want, rather than telling them what to do, in the spirit of the Big Society, and he encouraged delegates to read Natural England's recent report, *ThinkBIG: How and why landscape-scale conservation benefits wildlife, people and the wider economy*, available at http://naturalengland.etraderstores.com/NaturalEnglandShop/NE309.

Mike Oxford MIEEM, Project Officer for the Associate of Local Government Ecologists (ALGE), then spoke about how best to tackle the seemingly impossible challenge of delivering a Big Society approach to protecting and enhancing local biodiversity in an 'age of austerity'. Or, as he summarised, 'How can we do more with less?!' Mike highlighted the need to overcome our frustrations with spending cuts and planning reform, and instead to assume a positive attitude if we are to successfully deliver biodiversity gains under the Big Society approach. For example, we need to seek new opportunities present within the White Paper, identify pointers from successful current projects to roll out as good practice and to embrace any improved ways of working that are made possible by reforms within the planning system and the White Paper. Mike focused on the structure and operation of the Torbay Coast and Countryside Service as an encouraging example of how the Big Society approach can work well in practice.

Richard Benyon MP addresses the conference
Photo: Nick Jackson

Next to speak was **Marcus Kohler MIEEM**, Managing Director of MKA Ecology Ltd. The focus of Marcus's presentation was to share with delegates his experiences of stakeholder engagement, using the Beddington Farmlands quarry restoration project in South London as a case study. Marcus stressed the crucial role of stakeholder participation to the delivery of the quarry restoration project, especially in a fluctuating economy, and the need for regular liaison with stakeholders through various forums. Marcus also discussed the criteria and perspective by which the success of stakeholder participation is judged, including an outline of the limitations of stakeholder participation, learnt through his own experience at Beddington Farmlands.

The next presentation was provided by **Penny Anderson CEnv FIEEM**, Managing Director of Penny Anderson Associates Ltd and President of IEEM. Penny highlighted that, as a profession, we struggle with inaccurate stereotypes of amateurism. She stated that it is essential that we market ourselves effectively as professionals in order to prove that our competencies and expertise are necessary for delivering on biodiversity in the Big Society. In order to achieve this, Penny described how we need to provide clarity on what we do and what our 'product' is and why exactly we are needed. Finally Penny outlined the ways in which IEEM works towards this aim, for example, through raising the profile of the sector, publishing the *Code of Professional Conduct* and working towards establishing a Royal Charter for the profession.

Sarah Carey, Sustainable Developments Executive at British Land Company Plc, ended the morning session by giving an interesting industry perspective on biodiversity issues, focusing on the benefits to businesses of including biodiversity in their bottom line. She looked in particular at the example of the property development and management company, British Land, explaining how the company manages

biodiversity on its developments and existing property assets, including installing over 60,000 square feet of green roofs in central London. Sarah finished with her thoughts on the opportunities for business, and some lessons that British Land has learned on the relationship between biodiversity, estate management, and designing for the built environment.

After lunch, **Nick Perks** from the Environmental Funders Network gave a presentation on the current, fairly bleak, context for financing environmental work, given the backdrop of government spending cuts. He explained that private sector and voluntary funding will be looked upon to come to the rescue, but will not be able to replace the lost government funding. He highlighted that environmental projects will increasingly have to be seen to be able to generate income or mobilise voluntary effort. Finally, Nick drew on his experience of coordinating the Environment Funders Network (www.greenfunders.org) in order to advise on what philanthropists may be looking for from grant-seeking projects.

Matt Davies from Greenspace Information for Greater London (GiGL) then provided a Local Record Centre-based example of successfully putting the principles of Big Society into action, via the BioBlitz project. A BioBlitz is a light-hearted, accessible biological survey that provides the chance for naturalists and members of the public to explore and learn together. Participants come together at a set location and join a collaborative race to discover as many types of wildlife as possible within that location. As well as raising awareness of biodiversity and the importance of biological recording, the events also generate genuinely useful biodiversity information. Matt went on to describe other public wildlife surveys that GiGL help to run and demonstrated that GiGL, like most Local Record Centres, have been following the Big Society approach of community engagement long before the phrase was coined!

A further local perspective was then gained from **Catherine Chatters**, who runs the New Forest Non-Native Project for Hampshire and Isle of Wight Wildlife Trust. Catherine explained how the project aims to stop the spread of non-native invasive plants in the New Forest area, particularly along rivers and in wetland habitats. This partnership project helps to implement *The Invasive Non-Native Species Framework Strategy for Great Britain* at the local level. Catherine went on to describe how the project's success depends on strong links with volunteers, landowners and the general public and is an effective example of the Big Society in action. The Project encourages landowners to take responsibility for tackling non-native invasive plants on their own land, whilst recognising that, as individuals, they all play a role in solving the problem at the catchment level.

Claire Wansbury (right) was presented with her Fellowship certificate at the conference
Photo: Nick Jackson

Paul Johnson, a Director from Arup, then used the case study of Beam Parklands in East London to demonstrate an example of where collaborative effort between multiple organisations and local communities has led to the successful development of a socially valuable resource. The views of local communities were sought throughout the planning phase and communities provided voluntary support during the development phase. The new park now links deprived communities to the natural environment and is home to numerous protected species and a diverse range of habitats. Paul finished by explaining how the project has been funded by numerous sources, including an endowment to secure the long-term future of the site.

The final talk of the conference was given by **Merrick Denton-Thompson**, who provided an intriguing and incisive portrayal of what biodiversity and Big Society may look like in 2050. Merrick explained that, taken to its logical conclusion, Big Society and localism should drive cultural change to transform us into responsible stewards of the land. Merrick gave many examples of how, if we can meet the challenges to become such stewards, our landscapes will look very different in 2050 as we inevitably turn to a symbiotic relationship with natural systems.

The presentations from this conference are now available on the IEEM website. I would like to thank ARUP for their generous sponsorship of the conference. I would also like to thank all the speakers for their time and presentations and hope that the delegates found it a useful and interesting day.

Correspondence: beckymay@ieem.net

ARUP

Autumn Conference 2011

IEEM's next conference is taking place on 2-3 November 2011 in Liverpool, and is entitled ***Rebuilding Biodiversity***.

Further details, booking information and the conference programme are now available on the IEEM website. There are also more details on the next page.

To book your place, please visit:
www.ieem.net/ieemautumnconference2011.asp

Rebuilding Biodiversity

IEEM Autumn Conference, 2-3 November 2011, Liverpool












Key conference topics:

- **Planning reform**
- **Biodiversity offsetting**
- **Habitat translocation**
- **CAP reform**
- **Biodiversity audit**
- **Climate change**
- **Case study examples:**
  - London 2012 Olympics
  - Peatlands for the Future
  - Great Fen Project
  - SCaMP Project

Photos (clockwise from top left): Andy Karran, Nick Jackson, Scottish Natural Heritage, Claire Hopkins, Nick Jackson, TEP, Cris Barron, Mott MacDonald, Pete Johnstone, Alan Bell, Martha Tressler, Southern Water

www.ieem.net/ieemautumnconference2011.asp

Lead sponsor:

ATKINS

Supporting sponsor:

crex
environmental & economic sustainability

IEEM Medal Awarded to Pavan Sukhdev at the House of Lords

Jason Reeves AIEEM
Policy and Information Officer, IEEM

The Institute of Ecology and Environmental Management (IEEM) awarded Mr Pavan Sukhdev the 2011 Institute Medal for his outstanding contribution to the economic valuation of the natural environment. The award was presented by IEEM Patron, Baroness Barbara Young, at an event in the House of Lords in London on 29 June 2011. Previous recipients of the award include Professor Tony Bradshaw and Sir David Attenborough.

Lord David Chidgey opened the evening by welcoming the 100 or so invited guests to "his little café", the splendid Cholmondeley Room and Terrace overlooking the River Thames. He gave a brief explanation of the workings of the House of Lords and what constitutes a usual day for himself.

Image 1. Guests enjoy the terrace overlooking the Thames

Our President, **Professor Penny Anderson CEnv FIEEM**, briefly described the role of IEEM for those non-members present and presented our guest speaker.

IEEM Patron and guest speaker, *Baroness Barbara Young*, introduced herself briefly, including to say that she is currently raising funds for an RSPB project to carpet-bomb Thatcher Peninsula on South Georgia with rat poison! She went on to talk about her own involvement with a number of conservation organisations but that conservation and ecology are not her forte, rather she has a skills set for leading, managing and influencing. This brought us neatly onto skills and the new IEEM Ecological Skills Project report (see page 27), which looks at the changes and challenges in the environment along with the needs of employers. She highlighted in particular the need for identification skills and gave her own light-hearted summary of a recent ant identification course that she had attended: "You only need to know three things, there are black ones, red ones, and little yellow ones, and there are some that if you squash them go 'crunch' and others if you squash them go 'squidge'. And if you can sort that out you can probably get it down to about three species." More seriously, she raised the issue of there being very few people in the UK who are competent to identify, for example, lichens, algae and fungi, and this needs to be addressed. Continuing, she highlighted more modern skills that also need attention, for example, EIA, SEA, marine habitat restoration and environmental economics. Regarding environmental economics, Baroness Young commented on how this is becoming ever more important, as highlighted in the Natural Environment White Paper and the UK National Ecosystem Assessment, and how putting an economic value on the natural environment is incredibly important because the natural world has a huge value, from national economies right down to individual livelihoods. She said that we need to move away from the mindset that we need to choose between economic recovery and protecting biodiversity and ecosystems and realise that that we cannot have one without the other. She concluded by saying that we have some huge challenges ahead – human population growth, climate change, landscape-scale conservation, ecological networks and connectivity, agriculture, planning reform, invasive species – and that we need to make sure that we have the right people with the right skills to tackle these and IEEM has a role in ensuring this.

Fellowship Presentations

Sally Hayns, IEEM's Chief Executive Officer, presented brief biographies for the two Fellowship recipients: Stephanie Wray and Philip James.

Dr Stephanie Wray CEnv FIEEM has contributed significantly to the promotion of ecological professionalism. She has been a member of IEEM since its early days and was involved with the early development of the Institute's Professional Practice Standards. She has contributed to teaching and training programmes in higher education as well as contributing to industry guidance on, for example, bat survey and mitigation. Stephanie is a recognised expert witness, especially in relation to highways schemes, and has influenced biodiversity protection and enhancement on a number of major highway schemes which will no doubt be familiar to those of us benefiting from the improved

Image 2. Dr Stephanie Wray with IEEM Patron and guest speaker, Baroness Barbara Young

transport links. Stephanie jointly set up a new consultancy, Cresswell Associates, which grew into one employing over 60 people in just 10 years and quickly became recognised for ecological innovation, technical excellence and integrity. Within the company Stephanie promoted professional standards as a cornerstone of the values on which the company was based. She developed an in-house graduate development programme to support staff to progress within the membership grades of IEEM and to achieve Chartered status. Stephanie also served on IEEM's External Affairs Committee for a number of years and contributed significantly to the Institute's policy and consultation work.

Professor Philip James FIEEM is recognised as having made an outstanding contribution to developing a multidisciplinary approach to sustainable urban development. His portfolio of published work combines ecology, sociology and economics and has provided new insights into how effective environmental management can play a vital role in social and economic regeneration. He has been described as innovative in his establishment of new partnerships for ecological professionalism, not only integrating disciplines within higher education but also building links with external bodies. As a senior academic at the University of Salford, Professor James has promoted professionalism in the science and practice of ecology to both undergraduate and postgraduate students. He is internationally recognised for his research and the quality of his work has attracted funding from prestigious national research bodies as well as involvement in numerous multinational research networks. Here in the UK he has previously established and led the Urban Nature Research Group as well as co-establishing the Research Centre for Urban Quality. He has published more than 50 papers in journals and has contributed to the work of both the Institute of Biology (now part of the Society for Biology) and the International Association of Landscape Ecologists.

The Medal Citation and Presentation

Jim Thompson CEnv FIEEM, former IEEM Executive Director, then read out the citation for **Mr Pavan Sukhdev**, a short extract of which is included below.

The IEEM Medal is awarded annually in recognition of a distinguished contribution to the development, profile and/or influence of ecology and environmental management.

Presenting the 2011 Medal to Pavan Sukhdev reflects worldwide respect for his work and especially in recognition of his distinguished contribution as Study Leader of the TEEB project – *The Economics of Ecosystems and Biodiversity*. Pavan's career in banking has been a glittering one. After joining Deutsche Bank in 1994, he held capital markets, trading and sales management positions in Singapore, London and India. He played a major role in the development of India's currency and interest rate derivatives markets eventually becoming, in 2006, Managing Director and head of Deutsche Bank's Global Markets business in India.

A defining moment for Pavan was the publication of the *Blueprint for a Green Economy* by Professor David Pearce. He then realised that nature's contribution to the economy was huge, but that the conventional accounting of the world ignored it, and that GDP growth did not translate into better health, wealth, education, or poverty reduction.

Pavan was appointed as Study Leader for the TEEB project in 2008. It was heralded as doing for nature conservation what the IPCC (Intergovernmental Panel on Climate Change) reports have achieved in raising economic awareness of climate change. The TEEB project sought views from a very wide spectrum of expertise and was published as a series of reports culminating in the presentation to the Tenth Meeting of the Conference of the Parties to the Convention on Biological Diversity, COP 10, in Nagoya, Japan in October 2010. The results were incorporated into many of the 47 decisions made. The work was also presented to the World Economic Forum Meeting in Davos in 2010 – that the words 'biodiversity' and 'ecosystems' should be heard at such a meeting was truly a major step forward.

The recently produced report of the UK National Ecosystem Assessment is further vindication of the use of this approach with a monetary value being placed on the UK's green spaces in terms of health and welfare and many other benefits.

Pavan is a rare individual, able to span the diverse and complex worlds of economics, biological conservation and social equity. The world of ecology and conservation can truly be grateful to

Image 3. Professor Philip James (left) with another IEEM Patron, Professor David Goode CEnv FIEEM

Image 4. TEEB project guests from left to right: Patrick ten Brink, Lara Barbier, Pavan Sukhdev and James Vause

him for having at last made the multi-trillion dollar global value of forests, freshwater, soils and coral reefs as well as the social and economic costs of their loss feature in the harsh world of global economics.

The full citation can be found on the IEEM website at www.ieem.net/awards.asp.

The citation scroll and Medal were presented to Mr Pavan Sukhdev by Baroness Barbara Young.

Pavan responded to the citation and Medal by saying a few thank yous.

Firstly to his father, who was an Indian Police Service Officer and later a member of the Indian Intelligence Service. He recalled that his father used to say to him that "good work is its own reward" and so inspired him to achieve what he has.

Pavan also thanked IEEM for giving him the Medal and his wife and daughters for their support.

Lastly, Pavan wished to thank the TEEB team. He went on to say that it was really more than a team though, rather that is was a 'community' of over 550 people around the world who all contributed to the project. He praised the way that the community had worked together and that perhaps this is a new way forward, where the community matters more than anything else. The community were from a very broad set of backgrounds but were bound together by a shared vision that the economic invisibility of nature must end. The vision was borne out of a common belief and understanding that there was a problem in that some of the most important assets for a nation, ecosystems and biodiversity (*i.e.* natural capital), were simply not there in so much as they did not figure in national accounts, business accounts nor anywhere else – and what you don't measure, you don't manage, and what you don't manage, you lose!

Pavan questioned why it is so difficult to understand the value of clean air and fresh water and other services that nature provides for us. He suggested that it is due partly to our education systems, which are excellent in some ways, but do not provide a good understanding of our natural assets – for example, children are taught about the water cycle, some are now also taught about the carbon cycle, but very few are taught about the nitrogen cycle.

Pavan praised IEEM's Ecological Skills Project Report which is a step in the right direction and explained that his latest role is at Yale University in the United States, where he is helping to set up a course to teach TEEB so that young economists will learn to value natural capital along with all of the other types of capital. The course will also be online and will hopefully be emulated by other institutions around the world.

Penny Anderson closed the evening by thanking the speakers, award recipients and guests for attending.

Correspondence: jasonreeves@ieem.net

IEEM Medal 2012

The IEEM Medal is awarded annually in recognition of a distinguished contribution to the development, profile and/or influence of ecology and environmental management.

This is your opportunity to nominate that individual who you feel is rightly deserving of the Institute's highest accolade and should be acknowledged at our annual awards event.

For a nomination form please visit:
www.ieem.net/awards.asp

The deadline for nominations is
Friday 16 September 2011.

Image 5. Left to right: IEEM Patron Baroness Barbara Young, IEEM President Professor Penny Anderson, Fellowship recipient Dr Stephanie Wray, IEEM Medal recipient Mr Pavan Sukhdev, Fellowship recipient Professor Philip James, event host Lord David Chidgey, and IEEM CEO Ms Sally Hayns

Competencies for Species Survey

Jessica Batchelor GradIEEM
Operations Assistant – Professional Affairs, IEEM

IEEM has published its *Competencies for Species Survey* Guidance as part of the Technical Guidance Series. The Competencies set out what IEEM would consider the minimum knowledge, skills and experience required to survey, disturb, handle or carry out research work for particular protected species, in a professional capacity.

Background and Purpose

IEEM initiated the *Competencies for Species Survey* project after identifying the demand for specific guidance on the knowledge, skills and experience required for survey work. IEEM has worked with the Statutory Nature Conservation Organisations (SNCOs) and the Mammal Society, Bat Conservation Trust and Amphibian and Reptile Conservation to produce the guidance

The Guidance aims to:

- set a standard for the survey skills required by those practising ecology as a profession;
- assist in the provision of training by relevant bodies;
- enable individuals to demonstrate the appropriate knowledge, skills and experience to survey for particular species *e.g.* when applying for survey licences;
- provide background when dealing with enquiries for surveyors through the IEEM Commercial Directory; and
- provide information for clients to help them understand the role and responsibilities of a surveyor and what can be expected of them.

The document does not provide guidance on the techniques to be employed in carrying out survey activities; this can be found in various publications that are referenced in the *Sources of Survey Methods* (www.ieem.net/surveymethods.asp). The documents also do not cover the competencies required for mitigation works or activities.

The *Competencies for Species Survey* will be available to the public via the IEEM website. It is intended to assist ecologists undertaking surveys or research, developers commissioning surveys from professional ecologists, training providers and planners and ecologists working within local authorities and SNCOs.

Barn owl ***Photo: Colin Shawyer***

Smooth Snake ***Photo: Liam Russell***

Publications in the Series

Currently the Guidance covers competencies for survey of the following species:

- Badger *Meles meles*;
- Barn owl *Tyto alba*;
- Bats (Chiroptera);
- Brown hare *Lepus europaeus* and mountain hare *Lepus timidus*;
- Eurasian otter *Lutra lutra*;
- Great crested newt *Triturus cristatus*;
- Hazel dormouse *Muscardinus avellanarius*;
- Hedgehog *Erinaceus europaeus*;
- Natterjack toad *Epidalea calamita*;
- Pine marten *Martes martes*;
- Polecat *Mustela putorius*;
- Red squirrel *Sciurus vulgaris*;
- Reptiles (Reptilia);
- Shrews (Soricidae);
- Water vole *Arvicola amphibious*; and
- White clawed crayfish *Austropotamobius pallipes*.

Hazel dormice ***Photo: Michael Woods***

The Guidance outlines the status and legislative protection for each species, and details the types of survey that require licences. In addition to this, it sets out the:

1. subject areas in which an individual should have knowledge;
2. specific survey skills that an individual should possess, to carry out surveys for particular protected species independently and competently; and
3. amount of supervised practical experience that individuals are recommended to have accrued before they attempt to carry out surveys without supervision.

It should be noted that it is the role of the appropriate licensing authority to define the criteria for issuing licences that permit activities which would otherwise be an offence under nature conservation legislation. Therefore attainment of the skills set out in the *Competencies for Species Survey* is no guarantee that a survey licence will be obtained.

This project is a good example of IEEM working towards our aim to 'establish, uphold and advance the standards of competence of those who practise ecology as a profession'. The Guidance should raise standards within the ecological field for the benefit of the public as well as the profession.

Acknowledgements

IEEM would like to thank Paul Bradley, Johnny Birks, Paul Chanin, Tom Clarkson, David Clements, Mike Dean, Melanie Findlay, Tony Gent, Chris Gleed-Owen, Mick Green, Peter Hancocks, Dorian Latham, Stephanie Peay, Nigel Reeve, Liam Russell, Richard Sands, Rob Strachan, Colin Shawyer, David Wells, Phil Wheeler, Kate Williamson, Jonathan Woods, Dorothy Wright, Derek Yalden, Richard Yarnell, the Statutory Nature Conservation and Environment Protection Agencies, Amphibian and Reptile Conservation, the Bat Conservation Trust, the Mammal Society and the Professional Affairs Committee for their help developing the Guidance.

Correspondence: jessicabatchelor@ieem.net

Professional Guidance Series

Jessica Batchelor GradIEEM
Operations Assistant – Professional Affairs, IEEM

The IEEM Professional Guidance Series, previously entitled the Professional Issues Series, has been reviewed, revised and redesigned. The latest versions are now available on the members' area of the IEEM website.

In 2010, the Professional Affairs Committee identified a review and update of the Professional Guidance Series as a high priority. Some documents needed expanding to cover Scotland and Ireland and some needed updating in light of changes to legislation or Codes of Practice.

What is the Professional Guidance Series (PGS)?

The PGS is comprised of individual, sector specific guidance documents unavailable elsewhere. They are produced as a result of issues being identified by the membership. The Guidance is a benefit of membership, exclusively available to members, and IEEM copyright, and cover a wide range of topics relating to ecological and/or environmental management. Their purpose is also to raise the standards of professionals in ecology and environmental management.

How Have the Documents Changed?

The professional documents at the heart of the Institute now stand separately from the Professional Guidance Series and are comprised of the governance documents and the professional conduct documents. They have been revised to take account of the new Objects of the Institute, which were updated and approved by Council in March 2011.

The following PGS documents that have received revisions include: Costing of Project Work (renamed as Estimation of Fee Rates), Advertising Practice, Access to Land, Tendering, Model Service Agreements, and Risk Assessments for Lone Working.

The PGS now comprises of 11 documents, which will be added to as and when required and are available from the members section of the website. Please note that the documents have been renumbered.

Governance

- Constitution: Memorandum and Articles of Association

Professional Conduct

- Code of Professional Conduct
- Complaints Procedure
- Disciplinary Regulations

Professional Guidance Series

1. Estimation of Fee Rates
2. Continuing Professional Development
3. Organising Training Workshops
4. Advertising Practice
5. Access to Land
6. Tendering
7. Model Service Agreements
8. Risk Assessment for Lone Workers
9. Ecological Report Writing
10. Metadata
11. Contract Advice Notes (Part 1)

Acknowledgements

The review was co-ordinated by Linda Yost on behalf of the Professional Affairs Committee and undertaken by Simon Kain and completed by Jessica Batchelor, both Professional Affairs Interns at IEEM. The content of the documents was reviewed and revised by members.

IEEM would like to thank Andrew Cherrill, Kathy Dale, Bridget Finton, Paul Goriup, David Hill, Lisa Kerslake, Hilary Ludlow, Niall McAleenan, Jill Meyer, Anne Murray, Stewart Pritchard, Neil Redgate, and members of the Professional Affairs Committee for their significant contributions.

Correspondence:
jessicabatchelor@ieem.net

NEW FOR 2011/12!

NEW FOR 2011/12!

IEEM MASTERCLASS SERIES

Protected Species: How Local Planning Authorities Should Discharge Their Legal Duties

Trainer:
Penny Simpson, Environmental Lawyer with DLA Piper UK LLP

Dates and Venues:
Friday 28 October 2011, London
Thursday 17 November 2011, Manchester
Thursday 19 January 2012, Birmingham

Level: Intermediate - Advanced

Costs:
IEEM Members: £125
Non-members: £175

These half-day masterclasses will focus on the legal duties relating to wildlife that local authorities are required to discharge, and what this means in practice. Many 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.

For further information and to book your place, please visit
www.ieem.net/masterclasses.asp

European Protected Species: Legal Training Seminar for Commercial Ecological Consultants

Trainer:
Penny Simpson, Environmental Lawyer with DLA Piper UK LLP

Dates and Venues:
Friday 11 November 2011, Birmingham
Friday 25 November 2011, London
Thursday 26 January 2012, Edinburgh
Thursday 9 February 2012, Manchester

Level: Intermediate - Advanced

Costs:
IEEM Members: £125
Non-members: £175

These half-day masterclasses will provide a detailed explanation of up-to-date environmental law and the implications that this legislation has on providing a robust ecological consultancy service to clients. Many 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.

For further information and to book your place, please visit
www.ieem.net/masterclasses.asp

Photo credits: Derek Crawley, David Clements, Chris Gleed-Owen, Nick Jackson, Nick Mott, Liam Russell, Michael Woods, www.wildstock.co.uk

NERC BESS Funding

Jason Reeves AIEEM
Policy and Information Officer, IEEM

Biodiversity and Ecosystem Services Sustainability (BESS) is a major new NERC programme (£13 million over six years, February 2011 - January 2017) aimed at untangling the linkages between biodiversity and ecosystem services, how these linkages may change in the future, and how best to measure the changes in natural capital stocks and the ecosystem servcies from those stocks. There are clear linkages with the Valuing Nature Network (www.valuing-nature.net) aims and objectives.

The first tranche of funding (£9 million) is for consortium type projects to do intensive research on focal landscapes in farmland (multi-functional agricultural, which could include woodlands), upland (though must not just build on existing work), wetland (freshwater and coastal) and urban (including the urban interface with other landscapes, *e.g.* coast, rural margins) ecosystems. The current programme has excluded the marine environment as NERC is hoping that a programme for looking at deepsea and offshore marine biodiversity and ecosystems will be launched in 2012.

The programme is designed to look specifically at three questions at the landscape scale:

1. What are the relationships between biodiversity stocks and flows of ecosystem services?
2. What are the important drivers and how will these affect stocks and flows?
3. What novel tools and metrics can be developed to measure trends in stocks and flows?

Ideally, NERC would like one consortium to look at each of the above four ecosystem types, with each receiving around £2.5-3 million. Consortia have been encouraged to be multi-disciplinary, include early career researchers, look specifically at landscapes that deliver multiple important functions and services and are currently subject to rapid change, look at future drivers of change that are likely to have the biggest impact on stocks and flows, and fill any pressing gaps in our current knowledge.

Commercial consultancies are not eligible to apply for the funding directly, nor to be the lead partner of a consortium, but they are encouraged to get involved, for example, as subcontractors.

Unfortunately, the deadline for initial expressions of interest was in July 2011. However, there will be a second tranche of funding in summer 2012, which will be used to fill any gaps left by the initial research and also to fund three Fellowships for four years each.

For more information contact Fiona Lawson (fiona.lawson@york.ac.uk) or visit www.nerc.ac.uk/research/programmes/bess.

Correspondence: jasonreeves@ieem.net

All Party Parliamentary Group

Jason Reeves AIEEM
Policy and Information Officer, IEEM

On 19 July 2011, amidst the frenzy of the Murdoch inquiry, Barry Gardiner MP launched the All Party Parliamentary Group on Biodiversity (APPGB) in Portcullis House.

Over 70 people, including a handful of MPs, gathered to hear Barry Gardiner and Martin Brasher, Deputy Director of Defra's Biodiversity Team, speak.

Barry Gardiner announced that the purpose of the APPGB will be to provide a forum for cross-party parliamentarians, senior policy-makers, academics, leading industry figures and other interested parties to have an informed discussion on all aspects of protecting biodiversity in the UK and abroad. He continued by says that because of the many recent publications (UK National Ecosystem Assessment, Nagoya targets, Lawton Review, National Environment White Paper, European Biodiversity Strategy, *etc.*) there will be challenging times ahead that we need to get right. He also emphasised that it will be important to get the Treasury engaged. The group will consider biodiversity both in the UK and globally, especially the Crown Dependencies and Overseas Territories.

Richard Benyon MP, Minister for the Natural Environment, was originally intended to be the guest speaker but was called away to Brussels to discuss the reform of the Common Fisheries Policy. Lord Henley was then drafted in to replace Richard Benyon but he too was called away, this time by the Lords' whips. So Martin Brasher had the task of giving the first talk to the APPGB. He began by highlighting the same policies as Barry Gardiner and spoke about the imminent England Biodiversity Strategy. He went to say that 2010 was a turning point and that the future will no doubt be challenging but that there is definitely cause for optimism.

Danny Stevens, the APPGB Secretary, has drafted a programme of meetings and events for the next 12 months and will act as the initial point of contact for group members. There is also a website currently under construction and two reports per annum will be published by the group.

IEEM has joined the group in order to ensure that the voice of the ecology and environmental management profession is heard in Parliament and also to disseminate information from Parliament out to the membership.

For more information please see: http://www.publications.parliament.uk/pa/cm/cmallparty/register/biodiversity.htm

Correspondence: jasonreeves@ieem.net

CIRIA Working With Wildlife

Jason Reeves AIEEM
Policy and Information Officer, IEEM

On 19 July 2011, CIRIA (Construction Industry Research and Information Association) and The Ecology Consultancy launched *Working with Wildlife* at the Islington Ecology Centre in London.

Working with Wildlife is a new guidance document that is intended to help the construction industry better understand and fulfil good practice with regards to wildlife.

The event was opened by Philip Charles, CIRIA Network Manager, who gave an overview of the CIRIA Network and explained three reasons for the construction industry needing to take wildlife into account:

1. protecting reputations and brands from public disapproval;
2. legal compliance to avoid fines; and
3. adding benefits by enhancing biodiversity.

Edel McGurk from Natural England's Regulatory Services gave a brief explanation of how they are trying to move to a "lighter touch" with regards to development and impacts on wildlife, but naturally within the legal framework.

John Newton CEnv MIEEM, Managing Director of The Ecology Consultancy, gave an overview of how the first edition of *Working with Wildlife* came about in 2004, and updates that are included in the new 2011 edition. The publication gives an overview of all the important legislation and explains the mitigation hierarchy. It also promotes how the construction industry can enhance biodiversity (*e.g.* green infrastructure). The publication is not intended to turn construction professionals into ecologists, but rather to increase their awareness and understanding.

Stewart Smith, Environment Manager at Kier London, presented two case studies where the construction industry had brought about benefits for biodiversity including for swifts and bats.

Lastly, Julia Baker MIEEM of Chris Britten Consultancy introduced BITE. BITE (Business Improvement Through Ecology) is intended to be a web-based toolkit that identifies the economic benefits of enhancing biodiversity for the construction industry through an innovative combination of business improvement tools, ecological best practice, and newly emerging ecological valuation techniques. BITE will also have a database of best practice case studies. BITE's intended target audience will be both non-ecology professionals (*e.g.* designers, contractors, clients) as well as ecologists (*e.g.* consultants, central government, statutory agencies).

Correspondence: jasonreeves@ieem.net

RTPI Planning Convention

Jason Reeves AIEEM
Policy and Information Officer, IEEM

On 14-15 June 2011 IEEM attended the Royal Town Planning Institute (RTPI) Planning Convention in central London. IEEM was represented by Linda Yost, Nick Jackson, Jessica Batchelor and Jason Reeves.

Along with attending a number of the plenary and parallel sessions, the Institute representatives were also able to make a number of useful contacts through our exhibition stand.

Our Deputy Chief Executive, Linda Yost, had an opportunity to talk to Greg Clark MP, Minister for Decentralisation and Planning, about better integrating ecology and environmental management into planning, and our Chief Executive, Sally Hayns, attended the Convention's main evening reception, where she was able to talk to the RTPI Chief Executive, Trudi Elliot, about future collaboration between our two professional bodies.

IEEM will of course also be responding to the draft National Planning Policy Framework, which is currently out for consultation.

Correspondence: jasonreeves@ieem.net

Jason Reeves with RTPI President, Richard Summers, at the IEEM exhibition stand at the 2011 RTPI Planning Convention
Photo: RTPI

Institute News

Major Projects Underway

In line with the new Strategic Plan, IEEM has recently launched a number of new projects. Most of these projects are drawing on the expertise of Council and Committee members. A number of the projects will, at some point, require input from members through consultation so please be ready to respond. The projects include:

- development of a new Professional Development Strategy encompassing internal and external training provision, accreditation, CPD and career planning;
- a review of the criteria for Fellowship and the Fellowship nomination process;
- a review of membership grades and assessment methods for competence at each level of membership;
- a review of the Disciplinary Process;
- development of a new customer relationship managements system and a new website, which, when combined, will give an enhanced service to members; and
- a review of IEEM's governance.

Look out for project updates in future issues of *In Practice*.

Ecological Skills Project

The publication of the Ecological Skills Project Report (see page 27) is a major landmark for the Institute after a long and detailed research project to test the validity of a skills gap in our profession. The evidence for a skills gap and skills shortages in certain key areas is unequivocal. The Institute now needs to show leadership in addressing the issues that have been raised and securing investment in the education, training and development of ecologists and environmental managers. In short we intend to broadcast the message about the skills gap and skills shortages to those who need to hear it, including the UK and Irish Governments and devolved administrations, employers, higher education institutions and training providers. We will engage with a range of partners to deliver projects designed to put in place a comprehensive strategy covering careers guidance, higher education, continuing professional development and career planning. We must seize this opportunity to raise the profile of what we do and how we contribute to sustainable environmental management. Initial signs have been positive with some good media coverage of the report. For more information about the skills report and what IEEM is doing about it, visit the website at www.ieem.net.

Knowledge Transfer Partnership Project

In May this year we were successful in our application to the South East England Development Agency for a Shorter Knowledge Transfer Partnership Project in association with the University of Portsmouth Business School. Knowledge Transfer Partnerships bring organisations and universities together to enable project and product development that utilises the skills of an appropriately qualified Associate recruited to deliver the project, supported by the University and the organisation or company concerned. Our bid was for an Associate to help us develop a more detailed Knowledge and Skills Competency Framework as highlighted in the Ecological Skills Project Report and, based on the Framework, an appropriate methodology for the accreditation of higher education courses and programmes that deliver the required knowledge and skills. We are delighted that the Associate, **Michael Ramsell**, was appointed in August and will be working with us on this project. Under the supervision of TECDC, an Accreditation Project Steering Group has been set up to help the project reach its goals and is being chaired by Dr Peter Glaves MIEEM.

Guidelines for Ecological Impact Assessment

The consultation on the revised Guidelines for Ecological Impact Assessment: Terrestrial, Freshwater and Coastal closed in July 2011. We would like to extend a big thank you to members for sending in feedback and organising and attending section workshops on the revised Guidelines. IEEM also had a fantastic response from organisations across Britain and Ireland including all five Statutory Nature Conservation Organisations, the Welsh Government, Environment Agency, Environmental Protection Agency Ireland, SEPA, Defra, Transport Scotland and the Highways Agency. Other organisations that sent in valuable feedback include the RSPB, FBA, RTPI and IEMA. The EcIA Technical Review Group, made up of IEEM members, has addressed the comments received and is currently finalising the document. IEEM aim to publish the revised Guidelines in the autumn of 2011.

Membership Renewals

Membership renewal notices have now been sent out. Please note that membership subscriptions are due on or before 1 October 2011. If we have still not received your renewal by 1 November 2011 your name will be removed from the Commercial Directory and if you have not renewed by 30 November 2011 your membership will be deemed to have lapsed such that you will not be able to use your post-nominals or take advantage of any other benefits. Every year the membership team spends many hours chasing members for a response and we really would appreciate your help in reducing the size of this task so please act on your renewal notice now. IEEM has ambitious plans for the future but these are dependent on having a growing and active membership. If you have colleagues who are eligible for membership of the Institute but have not yet joined please do give them a firm nudge as we are keen to reach our 5,000 membership target as soon as possible. We currently have 4,351 members.

New Member Benefits

New for 2011/12 we are pleased to announce the introduction of some great new benefits for members:

- All IEEM members are now able to receive a 15% discount at both Blacks and Cotswold Outdoor clothing and outdoor equipment suppliers. More information will be available on the Members' Section of our website shortly.
- All Graduate members can now use the suffix GradIEEM to acknowledge their qualifications and commitment to professionalism at the start of their careers.
- Unemployed and low income members can receive additional discounts on workshop and conference fees (see below).

Financial Support for Low Income Members

Just a reminder that IEEM's Council has approved a package of financial support, on a trial basis, for IEEM members who are unemployed or earning below the minimum wage. The support is intended to enable such members to continue to develop their professional competence and knowledge-base and to have the opportunity to network with other professionals. The support involves discounted attendance at conferences and workshops and further details are available on our website.

Consultations and Inquiries

There are a number of forthcoming (at the time of writing) consultations that IEEM will be responding to, these include:

- Red Tape Challenge - Environment (Cabinet Office)
- Natural Environment White Paper Inquiry (EFRA Select Committee)
- EIA Public Guidance Review (Natural England)
- Draft National Planning Policy Framework (CLG)
- Higher Education White Paper (BIS)

For more information please contact jasonreeves@ieem.net or visit www.ieem.net/consultations.asp.

Sources of Survey Methodologies (SoSM)

IEEM will be adding a new publication to the SoSM. *Barn Owl Tyto alba Survey Methodology and Techniques*, by Colin Shawyer FIEEM, will be published as an e-publication and available on the IEEM website shortly.

2012 Professional Development Programme

We are currently putting together the 2012 programme of workshops and training courses. It is important that the programme meets the needs of more experienced ecologists and environmental managers seeking to develop their knowledge and skills as well as those who are newly qualified. What courses/subject areas would you like to see IEEM add to its course programme? Are there courses you can offer to teach? Please do get in touch with beckymay@ieem.net with your ideas and suggestions.

Conference Sponsorship

We are very grateful to Arup for sponsoring our Summer Conference, *Biodiversity and Big Society*, and also to Aecom for supporting the forthcoming Autumn Conference in Liverpool, *Rebuilding Biodiversity*. If your company or organisation would be interested in sponsoring one of our 2012 conferences then please contact beckymay@ieem.net.

IEEM Wallplanner 2012

IEEM will again be producing a wall calendar for 2012. If you are interested in advertising on the wallplanner please visit www.ieem.net/advertising.asp or contact nickjackson@ieem.net. The deadline for artwork will be Friday 4 November 2011, but please do get in touch as soon as possible as every year we have more interest than spaces available.

IEEM Representation on British Standards Institutes (BSI) Water Quality Committee

The BSI Water Quality Committee and its sub-committees are responsible for standardisation in the field of water quality, including input into ISO TC 147 water quality and CEN TC 230 water analysis committees. To find out more about BSI water quality committees, sub-committees and key standards, have a look here: http://standardsdevelopment.bsigroup.com/Home/Committee/50001293. BSI committee members are expected to comment on national, European and international standards at their various stages of progress. Members generally meet twice a year and there is a committee members' website to which all standards are uploaded, and which also includes e-mail links to other committee members, meeting minutes and more. If any member is interested in representing IEEM on this Committee please contact lindayost@ieem.net providing a brief outline of your specialist knowledge and skills in this topic (max. 500 words).

Biodiversity Data Management

In recent months IEEM has facilitated multi-stakeholder discussions of issues related to biodiversity data management in the UK, including the sharing of data collected as part of development projects. The issues involved are complex, and are inevitably influenced by available funding, but IEEM is pleased to be able to help with this issue which is fundamental to the work that we do. Others involved include representatives of the NBN Gateway, ALERC, NFBR, BTO (as a representative of specialist schemes and societies) and ecological consultants. Aggregate Industries has supported the initiative by hosting a stakeholder meeting.

Members are reminded that it is a condition of use of the NBN Gateway that any data sourced from the Gateway is **not** used for commercial purposes, which includes use in consultancy reports. Members should refer to the Gateway's terms and conditions of use for further information.

Obituary – Monica Hale MIEEM

Kindly compiled by Sue Everett MIEEM:

I got to know Monica well during the founding period of IEEM in the early 1990s. She was a key 'mover and shaker', dripping with enthusiasm and dogged determination to get the Institute off the ground and professionalise ecologists. In her role as Chair of the Training, Education and Career Development Committee, and with others on the Committee, we worked together, developing a number of initiatives, including the IEEM training programme, Continuing Professional Development requirements, creation and production of the first 'careers' handbook, a project on professionalising ecologists in Europe and a skill-mapping exercise for ecologists. Monica was also IEEM Vice President between 1997 and 1998.

In 1998, she left the UK to work as a Senior Environment Specialist at the World Bank Institute (WBI), Washington. Prior to that she founded and became Executive Director of the London Environment Centre (LEC) and Reader (Research Professor) in Business and Environmental Management at London Guildhall University, UK (1992-98). Other positions she held included Sustainability Director at Science Applications International Corporation (SAIC) in McLean, Virginia and Environment Specialist in the Capital Markets Environment Services Unit of the International Finance Corporation (IFC) where she was the Training Coordinator for internal and client training in environmental and social policy applications.

Monica was appointed an RSA Fellow in 1996 and she was a committed Trustee on the Board of RSA-United States. The RSA-US website gives tribute to her tireless commitment in promoting the development of sustainable design, green jobs, and applications of environmental sustainability in economic sectors such as energy utilities, finance, and insurance.

Monica lost a year-long battle with cancer on Boxing Day 2010.

Steve Ormerod Wins Marsh Award

Immediate Past President of IEEM, Professor Steve Ormerod FIEEM, Cardiff School of Biosciences, has been awarded the 2010 Marsh Award for Marine and Freshwater Conservation by the Zoological Society of London (ZSL). Sponsored by the Marsh Christian Trust, the award recognises those who dedicate their lives to ensuring a future for the world's species and their habitats; those who deserve but don't expect recognition. Described by the ZSL as 'one of the foremost applied freshwater ecologists and conservationists of his generation', Professor Ormerod was recognised for his contributions to the application of fundamental science to conservation in freshwater ecosystems. Steve is the first freshwater specialist to win the award, with all previous recipients having been marine biologists.

Staff News

The Secretariat will sadly soon be saying goodbye to our most recent intern, **Jessica Batchelor**, who has been with us for six months. In addition to completing previous work on the review of IEEM's Professional Guidance Series and the production of the Competencies for Species Survey, Jessica has been coordinating a major review of IEEM's Guidelines for Ecological Impact Assessment. This has been a challenging piece of work but Jessica has done an excellent job and we wish her well as she looks to begin a career within ecological consultancy in the Midlands.

Future Themes for *In Practice*

If you are interested in contributing to a future edition of *In Practice*, please note the themes and deadlines below. For more information please contact jasonreeves@ieem.net.

Edition	Theme	Submission Deadline
Dec 2011	Rebuilding Biodiversity	26 Sep 2011
Mar 2012	Planning Reform and Biodiversity	6 Jan 2012
Jun 2012	21st Anniversary Edition	TBC
Sep 2012	Soils and Biodiversity	TBC
Dec 2012	Renewable Energy and Biodiversity	TBC
Mar 2013	Green Infrastructure	TBC

East of England Section News

The East of England Section, formed in 2009, has been going from strength to strength, organising a series of winter indoor events and outdoor summer events attracting members from across the region. Since January we have held seven events which have been well attended and enjoyed by all.

At the start of the year Cambridgeshire was the focus of our attention with two indoor events, first in January a talk on *Floodplain Meadows: Diversity Water and Nutrients* which was held in partnership with the Cambridge Geographical Society in the beautiful setting of Girton College, and then in February a talk on the management of Wicken Fen. In March things took on a more international flavour when the Mott MacDonald office in Cambridge hosted a talk by Mihai Coroi on *Biodiversity and Conservation in Romania*. Mihai gave us an introduction to the variety of habitats and notable plants and animals in the country as well as an insiders view of how European legislation is implemented, and the public perception of wildlife and conservation.

Once the evenings had begun to draw out we kicked off with our outdoor events. We started in May with a an evening walk around Thetford Forest with Tim Pankhurst, the Regional Conservation Manager for Plantlife, and all-round Breckland expert. Meeting at Santon Downham in the heart of the forest, members enjoyed a beautiful evening identifying and learning about the specialist plants that survive in the nutrient poor conditions in the Brecks, and how rabbit grazing plays a chief role in the maintenance of this rare habitat. Some of the plants Tim showed us are solely confined to the Brecks such as perennial knawel *Scleranthus perennis*. One of the highlights was seeing the spectacular tower mustard *Arabis glabra* which can grow to 4 ft in height and seemed to be thriving at the site of a burnt out car! Classified as Vulnerable in the Red Data Book, the Brecks are one of its main strongholds. After the botanists had retired for the evening a few members ventured out onto the clear-fell areas of Santon Downham to try and hear, or hopefully catch a glimpse of, the elusive nightjar *Caprimulgus europaeus*. We weren't disappointed and at one point heard three of them churring in the fading dusk, a magical end to the evening.

Figure 1. Tim Pankhurst from Plantlife leads a guided walk around Thetford Forest

In June another popular event to RSPB reserve Sutton Fen in Stalham attracted a long waiting list, and was a special treat as the reserve is not normally open to the public. Site manager Richard Mason showed members around the reserve, which is said to represent one of the most pristine and untouched areas of Broadland habitat and fen in the country. The visit proved to be particularly useful for birdsong identification as at one point reed, sedge and grasshopper warbler were all singing at the same time! Richard spoke about the management being undertaken on the reserve for the fen mason-wasp *Odynerus simillimus* which is confined to just a handful of sites in the region, and was thought to be extinct until it was rediscovered in 1986.

Figure 2. Richard Mason talking about the ecology of the fen mason-wasp

Events have continued in June with an indoor workshop to review the consultation document for the new IEEM EcIA guidelines, and with a visit to Blackmoor Farm in Suffolk to look at elements of the Higher Level Stewardship Scheme.

The Committee are busy planning future events so if you would like to organise an event and would like some help, or have any ideas for events you would like to see in your region then please contact one of the Committee members via the Geographic Sections area on the IEEM website (www.ieem.net/eastengland.asp). We are particularly keen to hear from people in the Essex and Bedfordshire/Hertfordshire areas as we are lacking coverage of events in these areas.

Poppy McDonald CEnv MIEEM
Section Committee member

North East England Section News

Bat detectors and bush crickets

Early March saw Andrew Cherrill (Sunderland University) giving a talk on Orthoptera at the Durham Bat Group (DBG). This was arranged after Noel Jackson of DBG recorded what was almost certainly dark bush cricket near Harehope in County Durham – the first record for the county - whilst out surveying for bats in June last year. Bat workers in warmer parts of the UK frequently encounter bush crickets when using their bat detectors but in northern England this is a rare experience. A number of species of bush cricket have been expanding their range significantly over the last 30 years, perhaps a result of climate warming, and so records of Orthoptera in new locations are a real possibility. In southern England the most striking examples of range expansion are Roesel's bush cricket and the long-winged conehead. Evidence is limited but it is likely that with their shared requirements for warmer climes, and particularly sunshine to raise their body temperatures, a number of other species present in northern counties may also be expanding. Species of bush cricket known from the relatively northerly latitudes of (variously) Dumfriesshire, Cumbria, North Yorkshire and Humberside, but not currently recorded from the north east, include short winged conehead, speckled bush cricket, oak bush cricket, bog bush cricket and Roesel's bush cricket (a recent arrival in North Yorkshire). The songs of those most likely to be picked up in bat surveys are available as bat detector recordings on the Orthoptera Recording Scheme website (www.orthoptera.org.uk). A useful introduction to surveying for Orthoptera using bat detectors has been produced by the Environmental Records Centre for Cornwall and the Isles of Scilly (ERCCIS). Bat detector recordings of bush crickets are also available from the ERCCIS website (go to www.erccis.co.uk, select Wildlife Recording and then select Identification Guides). For real enthusiasts the definitive guide to Orthopteran calls is D Ragge and W Reynolds (1998) *The songs of the grasshoppers and crickets of Western Europe*. This is out of print but copies are still available with a 2 CD set from specialist dealers.

Bumblebees in agricultural landscapes

Bumblebees provide valuable services in the pollination of agricultural crops but numbers of some species are in decline (www.bumblebeeconservation.org). Several species have gone extinct in the last 70 years and six species are UK BAP priority species. In the second half of March Dr Roy Sanderson, with postgraduate researchers Louis Goffe and Sophie Derveau, from Newcastle University, gave a timely seminar on the subject of *Bumblebee behaviour in Agricultural Landscapes*. Roy described the major changes that have taken place in the broader agricultural landscape in Britain over the last 30 years, with an intensification of agricultural practice, and cultivation of mass-flowering crops (MFC), especially oilseed rape (OSR) and field beans. OSR provides a 'glut' of forage for pollinating insects; it is primarily wind- or self-pollinated, although nevertheless improved cropping is obtained with pollination. At the same time as these changes have taken place in the agricultural landscape, there has been a decline in the distribution and abundance of many species of wild pollinators, especially amongst bumblebees. Roy described some of the research done at Newcastle into bumblebee ecology that he had been involved in over the last few years, with Juliet Osborne's team at Rothamsted Research and Dave Goulson's at Stirling University. Newcastle's primary role has been ecological modelling, using satellite data of vegetation cover, together with the field experiments at Rothamsted, and genetic analyses of bee populations done at Stirling.

Several specific experiments were described into particular aspects of bumblebee ecology. First, a study into the flight distances of bumblebees, using their attraction to a field of borage planted at Rothamsted Research as a forage source. This used captive bumblebee colonies placed along a transect extending 1.5 km into the countryside, with a colony at every 500 m intervals along the transect. Each captive colony was equipped with a specially designed dye-dispenser, that marked each worker bee with a distinct colour (children's non-toxic paint) as it left the colony (Martin *et al.* 2006, available for download from the open access journal *Apidologie* volume 37 pages 341-350 at www.apidologie.org). The colour applied at each colony differed. By carefully assessing marks on foraging bees in the 'target' field of borage, the distance from which they had flown could be determined. As might be expected, most bees came from the nearest colonies, but nevertheless, it indicated that *Bombus terrestris* workers would fly up to 1.5 km to forage. This research was coupled with parallel studies into the genetics of wild bee populations along the transect, which indicated that there were considerable differences amongst species in typical distances travelled, although all foraged up to 1 km from their nest. Studies to estimate nest density indicated, perhaps unexpectedly, the very beneficial impact of suburban areas as a source of forage and possible nesting habitats for some species of bee, in comparison with the more intensively managed agricultural landscape. A more recent study done with Rothamsted used seedset of two common wild flowers, ground ivy and birdsfoot trefoil, to measure pollinator activity in different agricultural landscapes. The seedset was highest near suburban gardens, and there was evidence of temporary effects of OSR on wild flower seedset during the OSR flowering period – negative on the (blue) ground ivy, but positive on the (yellow) birdsfoot trefoil. This study, by Cussans *et al.* (2010), can be accessed via the open access journal *PLoSONE* at www.plosone.org, and searching by author).

Roy finished his talk by describing the research currently being done into bumblebee behaviour at Nafferton Farm in Northumberland – this University farm is split north-south into a conventional and organically managed farm, and the behaviour and performance of bumblebee colonies is being assessed and compared in the two agricultural practices. This is using infra-red detectors at each nest, to monitor daily patterns of exit and entry activity, and comparing this with meteorological data, plus satellite maps of the whole landscape to interpret temporal and spatial variation in behaviour. The talk was well attended, and there was a wide-ranging discussion amongst the participants at the end of the meeting.

Consultation on the IEEM Guidelines for Ecological Impact Assessment

In June a small group of IEEM members met at the University of Sunderland to review the consultation draft of the Institute's Guidelines for Ecological Impact Assessment. Attendees included representatives from local government

(Ian Bond, Hartlepool Borough Council; David Feige, Sam Talbot and Colin Marlee, Northumberland County Council), an NGO (Martin Kerby, RSPB), higher education (Andrew Cherrill, Sunderland University) and consultancy companies (Robin Cox, Entec; Duncan Watson, SKM Enviros; and Nicola Faulks, WYG). Comments were forwarded to the Technical Review Group for consideration in the drafting of the final version. Thanks to all who contributed to this process.

North East England Section AGM

The Section AGM will be held on 6 October 2011 at Northumbria University in Newcastle upon Tyne. Peter Glaves of the University will speak on Ecosystem Services – along the theme of 'this year's buzz word or a useful tool for practitioners?' Peter has run a series of feasibility studies and demonstration pilots funded by statutory agencies (including Natural England and the Environment Agency) looking at how the ecosystem services approach can link into, and add value to, existing approaches such as EIA, SEA, sustainability appraisals, major project development, and flood risk assessment. Please check the Section webpage (www.ieem.net/nesection.asp) for further details of times and venue.

Members may have noticed that Derek Hilton-Brown will be stepping down as Section Convenor at the AGM due to increased work commitments. Derek has provided a steadying hand and renewed focus of activity within the Section during the last year. His input will be missed by the Committee. We are hoping that Derek will remain as a Committee member.

As in previous years the Committee invites suggestions for meetings, field events, conferences and alternative venues for Section events. Please contact any member of your Committee with your ideas.

Andrew Cherrill CEnv MIEEM
Section Committee member

Scottish Section News

The Scottish Section Committee members have been keen supporters of student events for many years and have helped organise a range of speakers for events in Edinburgh, Glasgow, Stirling, Aberdeen, Dundee and Perth.

This year we have already supported and helped organise the *Breaking into the Environment* (BITE) event with the University of Edinburgh Careers Service. Special thanks must go to the four speakers (Neville Makan of Scottish Natural Heritage, Andrew Robertson of Jacobs/Scottish Water Solutions, Karen Thorburn of Wind Prospect, and Kevin Houston of Carbon Masters) for their informative and interesting presentations that provided useful details of their varied and sometimes unconventional career paths.

The speakers' advice for getting ahead in the challenging environmental sector was welcomed by the students who gave encouraging and positive feedback. 75% of students rated the event as valuable or very valuable, 83% said they were satisfied or very satisfied with the organisation and delivery of the event and almost 100% said they would recommend the BITE event to other students.

The Scottish Section Committee will continue to attend and support student events and we would be interested to hear from any students or university faculties that would benefit from our support in organising and delivering similar events. We would also be keen to hear from any IEEM members that wish to contribute by presenting at student events over the coming year. For more information please contact nicola.m.tyrrell@gmail.com.

Nicola Tyrrell (Marsland) MIEEM
Vice Convener

Welsh Section News

The Wales Section hopes to emerge from the shadows and hold its first AGM as a full-fledged Section in early February 2012. We are combining the AGM with a seminar on *Transport Links and Environmental Impact*. The venue will be The Media Centre, Llandrindod Wells, and the exact date is still to be confirmed. All IEEM members in Wales are welcome!

The current Shadow Committee meets quarterly, with venues linked by video/conference phone in North and South Wales.

On 17 November we are holding a workshop, jointly with Natur on developing the work of the IEEM Ecological Skills Project, at the Welsh Government Building, Aberystwyth. Further details to be announced.

We recently held a joint field visit with the North West England Section at Alun Evans's farm at Fron, near Mold, on 3 June, to discuss grassland management and restoration. The weather was incredibly warm and after a good walk around several sites, the desiccated company was restored with welcomed cold drinks provided by Alun and his wife.

Mike Willis MIEEM
Convenor

Yorkshire and Humber Section News

The Shadow Section continues to be active with an increase in Committee members over the past year. Meetings continue to be well attended with members regularly contacting Committee members with ideas and offers of meetings and venues.

Of particular note recently was a meeting led by Hugh Firman (Planning Ecologist at Calderdale Council) and Robert Masheder of West Yorkshire Ecology (WYE – the Biological Records Centre for West Yorkshire). The workshop was titled *Exploring Knotty Issues in Bat Reports and Mitigation*. Through a process of consultation with planning departments and ecology professionals, and using bat records held for West Yorkshire, WYE have produced detailed guidance notes for bat ecologists working in West Yorkshire recommending where, when and to what extent bat survey and assessment should be carried out. The guidance is intended as a tool to enable planning officers with little ecological background to assess whether sufficient bat survey and assessment has been undertaken for a planning application received. The guidelines are also aimed at providing a 'level playing field' for bat ecologists in the County, ensuring minimum standards are achieved (or exceeded). As you can imagine this workshop was very popular with members, however, we were offered excellent accommodation for 45 participants courtesy of Arup in Leeds. Presentations were thorough and well received leading to lively debate and very useful feedback. The session was significantly over-subscribed, however, we are looking at repeating similar events in other parts of the region – please contact the Committee if you would like to host/facilitate such an event elsewhere in the region.

Image 1. Someone spotted a merlin

Other recent events have been led by members facilitated by the Committee focussing on a range of topics.

Dave Martin co-ordinated an informative visit to Ingleborough National Nature Reserve led by the Natural England Reserve Manager allowing participants an insight into management for this diverse reserve.

Subsequently, Bill Lever led a follow up session to the *Exploring Knotty Issues in Bat Reports and Mitigation* event looking at guidelines for bat work associated with windfarm development – once again this was well attended indicating an appetite for sharing good practice in this area of our work.

Caroline McParland chaired a regional event as part of the national review of the Guidelines for Ecological Impact Assessment which allowed members to input to this process; there was lots of informed discussion around Zones of Influence, mechanisms to ensure monitoring of mitigation and clarification of relevant case law. The proceeds of this meeting have been forwarded to Jessica Batchelor to inform the wider review currently ongoing. Also in July, Alex Ramsay ran an informative and well-attended invertebrate survey event at Sun Lane Local Nature Reserve in Wharfedale.

The active season continued with a 'weeds and aliens' session at Rodley Nature Reserve and bird ringing demonstration by East Dales Ringing Group in late July. There will then be a short 'summer recess' before the autumn/winter season – watch this space!

Any members who are interested in being involved with the Committee, or able to offer events, activities or venues in our region please contact Gordon Haycock at gordon.haycock@haycockandjay.co.uk or on 01943 850276. Thank you.

Gordon Haycock CEnv MIEEM
Convenor

Image 2. Finding a bush cricket

North West England Section News

The North West England Section has been active over spring/summer 2011 with a range of field visits to various locations and different projects.

First up was a visit to Mersey Bio Bank in May where Rich Burkmar demonstrated free software that he has developed that enables data loggers to be used for collecting biological records. This event explored the utility of these devices for field ecologists who want a quick, accurate and flexible method of recording these records and other location-based information in the field.

In early May Alun Evans ran a well attended joint visit with the Shadow Welsh Section that required morning and afternoon sessions, no doubt aided by the good weather. The visit looked at meadows around his farm under different Tir Gofal scheme options, noting positive signs of restoration on former improved grassland, and discussions regarding the use of yellow rattle to reduce grass dominance. Groups also visited part of Bryn Alyn SSSI to see the use of ponies for grazing and visited a small community meadow creation project on former conifer plantation land managed by Forestry Commission/ Denbighshire Countryside Service

In a busy early July, three events were held.

The first was a well attended visit to the Widnes Warth grazing conservation project. English longhorn cattle were introduced in mid-April of this year and the effect of the grazing on the vegetation is already clear from the exclosures being used as a control,

Image 1. Cattle on saltmarsh

and the adjoining ungrazed saltmarsh area. Discussions ensued regarding the proximity of the saltmarsh to an urban area and how this socio-ecological aspect has created an excellent opportunity to examine the cultural ecosystem services delivered by the project. A habitat creation area was also visited that already attracts up to 15 common urban butterfly species, bumblebees and hoverflies after only three years.

The second comprised a visit to three areas of limestone grassland/ woodland in the Morecambe Bay areas including a National Trust owned and managed SSSI, a SSSI under mixed management and a brand new Butterfly Conservation reserve. The visit reviewed a range of issues surrounding conservation management including: practical habitat management techniques; monitoring species and habitats; public access and engagement issues; and sustainable grazing and coppicing regimes. Given the current interest in landscape-scale conservation, practical issues relating to the need for appropriate management to maintain and restore butterfly metapopulations, the creation of habitats to allow for recolonisation by more sedentary species and the potential need for species re-introductions were all discussed.

Image 2. At Arnside Knott, on the edge of Morecambe Bay

The third early July event provided information on the Lancashire Wildlife Trust's project *Forever Meadows*, working with landowners to conserve and enhance meadows in Lancashire and Merseyside. The visit reviewed traditional grassland management and gave the opportunity to visit a meadow site. The project provides surveys and management advice as well as practical support and a capital works budget.

All of the events have been very well attended with some oversubscribed. Apologies to those who have not been able to get on their desired event. Many thanks to those giving their time for arranging events and if you wish to organise an event or have any ideas for the future, please let us know.

Andy Whitfield CEnv MIEEM
Convenor

Partnership News

Society for the Environment

The Society's Annual Reception and Awards Presentation, held towards the end of June at The Institute of Materials, Minerals and Mining, was a very successful event with over 100 people attending. The Guest of Honour was Caroline Lucas MP, Britain's first-ever Green Party Member of Parliament.

In her keynote speech Caroline focused on the positive contribution that the 'Chartered Environmentalist' (CEnv) qualification is bringing to the environmental profession across the wide array of sectors represented by SocEnv's members. She described how Chartered Environmentalists are helping to move environmentalism away from the 'doom and gloom' scenario by demonstrating the benefits to society, industry and the wider economy that can be achieved through environmental best practice. Caroline also highlighted how the expertise and knowledge within the CEnv community, could provide an important source of knowledge and expertise for policy-makers.

On a more practical note the Registration Authority of SocEnv has been particularly busy, revising the practice directions for Licensed Body approval, the use of the grandparenting route for new Licensed Bodies and the eligibility criteria for CEnv. The Board has also been considering a report on the strategic governance of the Society. Meanwhile the search for a new Chief Executive goes on.

Recently approved Chartered Environmentalists (since the last list was advertised in *In Practice* 71, March 2011):

Mrs Gail Boyle, Mr Iain Bray, Ms Jessica Durkota, Dr Celia Figueira, Dr Anne Glasspool, Mr Thomas Hall, Miss Heather Hickman, Mr James Hildreth, Mrs Alison Johnson, Miss Melanie Knight, Dr Mark Linsley, Mr Kris Long, Dr Paul Lynas, Mr Robert Masters, Miss Poppy McDonald, Mr Ian Morrissey, Miss Samantha Munslow, Mrs Joanna Neville, Mr Edward Partridge, Mrs Hayley Scoffham, Mrs Angela Simmons, Mr John Simmons, Miss Elizabeth Wickens

www.socenv.org.uk

Europarc Federation

The Europarc Federation and Eurosite have jointly recommended that both organisations should seek to form one network, the aim being to create a single representative organisation to serve common and shared priorities of both memberships. The organisations have reported that a paper will be co-developed to present to the 2011 General Assemblies (both in September), which will set out joint recommendations as well as the rationale for, and purpose of, the proposal to form one network.

www.europarc.org

UN Decade on Biodiversity

UNDB is currently promoting *Conservation Biology for All*, a textbook written by some of the world's most prominent ecologists and biodiversity experts and available in conventional print versions and as a **free download** (www.mongabay.com/conservation-biology-for-all.html). A principal aim of the authors and publishers was to provide cutting-edge, but clear and accessible, evidence-based resource in response to the issues of ecosystem degradation and biodiversity loss. The book covers many important topics ranging from balancing conservation and human needs; climate change; the planning, design and analysis of conservation research; understanding ecosystem services; addressing principal threats to habitat loss; and more.

Another UNDB partner, KPMG, has launched a report called *Sustainable Insight – The Nature of Ecosystem Service Risks for Business* (www.kpmg.com/NL/nl/IssuesAndInsights/ArticlesPublications/Documents/PDF/Sustainability/Sustainable_Insight_May_2011.pdf) which has been developed in collaboration with Fauna and Flora International and the UNEP Finance Initiative. The report looks at how business can seek to turn addressing the risks into competitive advantage and concludes that, despite tough financial conditions, progressive companies will increasingly see the long-term advantage of supporting biodiversity and ecosystem services. The paper recommends focusing on water and climate services in the first instance and argues that asset owners and mutual funds will increasingly focus their attention on these issues.

www.decadeonbiodiversity.net

IUCN

The 2012 UN Conference on Sustainable Development (Rio +20) will aim to set a global vision on Greening the Economy, or 'to decouple natural resource use and environmental impacts from economic growth'. IUCN recommends that a Green Economy transition focuses on three fundamental challenges: building resilience; mainstreaming ecosystem values; and designing an appropriate governance model for a Green Economy. IUCN reiterates the importance of the EU in taking leadership in the discussions leading up to Rio and encourages recommitment and appropriate implementation to the obligations and targets adopted from 1992 to date, particularly those that relate to good governance and a Green Economy.

www.iucn.org

European Network of Environmental Professionals

ENEP had an exhibition stand at Green Week at the end of May 2011. The European Commissioner for the Environment, Janez Potocnik, visited the stand on 26 May and spent about three minutes discussing Green Infrastructure, the cross recognition of environmental qualifications and how ENEP could interface with the Commission in other areas. This was a great coup for ENEP, as the Commissioner normally only spends about 30 seconds at each stand, and reflects the Commissions continuing benevolent interest in ENEP.

Mike Barker CEnv MIEEM, Chair of the ENEP Biodiversity Working Group, also had a useful conversation with Angelo Salsi, Head of Unit for DG Environment 3 (LIFE+), about progress on the Green Infrastructure Strategy. He reported that it has slowed due to it becoming overly complex but that the initiative is still ongoing. There was also an opportunity to promote IEEM on a number of occasions.

www.environmentalprofessionals.org

Left to right: Commissioner Janez Potocnik with Mike Barker, Jason Reeves and Simon Pascoe

Recent Publications

The Changing Nature of Scotland

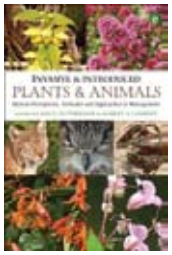
Editors: Susan J Marrs, Simon Foster, Catriona Hendrie, Edward C Mackey MIEEM, Des BA Thompson FIEEM
ISBN-13: 9780114973599
Price: £27.50
Available from: www.tsoshop.co.uk

This publication provides a stock take of environmental change across the land, water and seas of Scotland. Drawing on more than 40 papers and posters presented at a conference organised by Scottish Natural Heritage and other agencies of the Scottish Government, the book provides a fresh overview of research, policies and grass root activities.

Scottish Invertebrate Habitat Management Advice Documents

Author: Buglife
Price: Free downloads
Available from: www.buglife.org.uk

Few important Scottish habitats are suitably managed for invertebrates. Often landowners and managers are willing to act, but there is a lack of available invertebrate habitat management advice. These Scottish Invertebrate Habitat Management Advice Documents provide this advice, and also include details of agricultural grants and subsidies that may be available to help support management, such as the Scottish Rural Development Programme (SRDP). The series covers cereal field margins, coastal vegetated shingle, blanket bog, lowland raised bog, deadwood, school grounds, and ponds.



Invasive and Introduced Plants and Animals: Human Perceptions, Attitudes and Approaches to Management

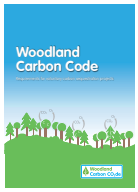
Editors: Ian D Rotherham CEnv MIEEM and Robert A Lambert
ISBN-13: 9781849710718
Price: £65.00
Available from: www.earthscan.co.uk

This book addresses the broader context of invasive and exotic species in terms of the perceived threats and environmental concerns. In order to redress major ecological losses, the science of reintroducing native species has also come to the fore and is widely accepted by many in nature conservation. However, with questions of where and when, and with what species or even species analogues, reintroductions are acceptable, the topic is hotly debated. It is shown that many decisions are based on values and perceptions rather than objective science. Including a wide range of case studies from around the world, his book raises critical issues to stimulate wider debate.

Enhancing Arable Biodiversity Through the Management of Uncropped Land

Editor: Emily Boys
Price: Free download
Available from: www.hgca.com

This guide describes simple techniques to enhance on-farm biodiversity through the efficient use of land without impacting greatly on farm management and profitability. The guide is mainly formulated from the LINK project Farm4bio, which set out to determine whether acceptable levels of biodiversity could be achieved on conventional arable farms through the management of uncropped land.



Woodland Carbon Code

Authors: Forestry Commission
ISBN-13: 978-0-85538-843-0
Price: Free download
Available from: www.forestry.gov.uk/carboncode

The potential of woodlands to soak up CO_2 from the atmosphere while providing a host of other benefits for society and biodiversity is becoming increasingly recognised, and many individuals and businesses wish to contribute to tree planting to help society soak up the carbon it emits. However, before investing in such projects people want to know that schemes will actually deliver the carbon savings that they claim. The *Woodland Carbon Code* aims to provide that reassurance. The voluntary code will encourage a consistent approach to woodland carbon projects and offer clarity and transparency to customers about the carbon savings that their contributions may realistically achieve.

Lowland Heaths: Ecology, History, Restoration and Management

Editors: Ian D Rotherham CEnv MIEEM and Janice Bradley CEnv MIEEM
ISBN-13: 978-1-904098-10-2
Price: £17.50
Available from: www.lulu.com

This book is based on the proceedings of the UK National Lowland Heaths conference which took place in Nottingham in 2002. Containing many expanded and additional contributions, the publication has been edited into an integrated whole that will be of interest and value to all heathland managers.

Bumblebees

Authors: Oliver E Prys-Jones and Sarah A Corbet
ISBN-13: 978-1-907807-06-0
Price: £19.99
Available from: www.pelagicpublishing.com

This new edition embraces the wealth of information published on bumblebee life history, ecology, foraging, parasites and conservation in recent years. It includes a new chapter on the very real threats to bumblebees; their crucial role as pollinators of our native flora and crops; ways to promote their survival; advantages and problems posed by their commercial use; as well as updated colour plates, keys and distribution maps of all British species (including *Bombus hypnorum*). The book introduces techniques and approaches to original work so that anyone with an interest can usefully contribute to furthering our understanding and appreciation of these wonderful and important insects.

Blogging for Nature

Author: Mark Avery
Price: £9.92
Available from: www.lulu.com

A 'How to blog' guide and a selection of blogs from the former Conservation Director of the RSPB. With a foreword by Hilary Benn MP, the book covers wildlife conservation issues from 2009-2011 in the UK including farming, climate change, illegal persecution, public spending cuts, non-native species, reintroductions and a lot more.

In the Journals

MJ Whittingham

The future of agri-environment schemes: biodiversity gains and ecosystem service delivery?

Journal of Applied Ecology 2011, 48: 509–513

Recent work has demonstrated that under a range of circumstances European agri-environment schemes (AESs) can return substantial benefit both to biodiversity and ecosystem service delivery. This Special Profile brings together 13 papers that point the way to greater effectiveness. One study in this Special Profile suggests that AES options modified by experience of working on the ground (*i.e.* guided by adaptive management) and applied to small fragmented pieces of land can have population level effects on a farmland bird species. Such adaptive management has been shown to correlate with increased levels of biodiversity for a range of taxa in a variety of situations, and thus demonstrates the potential of AESs to achieve significant biodiversity benefits. Examples from this Special Profile also provide evidence that AESs can improve ecosystem service provision, such as pollination services, biological control and carbon storage. However, AESs located in heterogeneous landscapes and in areas supporting high levels of biodiversity are likely to yield greater benefits than those in more homogeneous landscapes. In addition, there is a paper that describes a range of caveats that need to be borne in mind if and when management strategies and policies are formulated based upon economics. The authors conclude that agri-environment schemes are more likely to deliver substantial benefit if: (i) they are implemented with clear guidance to land managers, and (ii) they are located in landscapes with high levels of biodiversity. Greater biodiversity on farmland is likely to increase the provision of a range of ecosystem services, which, in turn, should buffer agricultural land against likely future environmental changes.

Correspondence: m.j.whittingham@ncl.ac.uk

AJ Perkins *et al.*

Adaptive management and targeting of agri-environment schemes does benefit biodiversity: a case study of the corn bunting *Emberiza calandra*

Journal of Applied Ecology 2011, 48: 514–522

Maximising the effectiveness of agri-environment schemes (AES) is a key policy challenge. Monitoring is essential to inform adaptation and improvement of schemes over time, and to understand how measures may need to vary across a species' range. The authors measured changes in breeding abundance of a severely declining bird, the corn bunting *Emberiza calandra*, in response to AES in Scotland over seven years and 71 farms. Two AESs were monitored, one with general management for farmland birds, and one with targeted, adaptive management for corn buntings. They used these data to estimate the proportion of the population that AES must influence to halt the overall decline. Corn buntings increased by 5.6% per annum on farms in the targeted AES, showed no significant change on farms in the general AES, and declined by 14.5% per annum on farms outside AES. In arable-dominated areas, AES management that increased food availability reversed population declines. However, where a high proportion of corn buntings nested in grasslands, an additional AES option that delayed mowing was essential to achieving population increase. The results suggest that approximately 72% of the corn bunting population in mainland Scotland must receive targeted AES management to halt the current decline. In 2009, only 24% was targeted in this way. The authors conclude that AES measures are capable of reversing corn bunting declines in Scotland, and the same measures are likely to benefit a wide range of other taxa too, but require geographical targeting and flexibility to adapt and improve management options, backed by expert advice. Targeted AES provision to the required level for corn buntings will cost approximately £120 000 per annum, with 500–600 ha under appropriate management. This is 0.02% of annual subsidies paid to Scottish farmers, and 0.5% of land in the remaining mainland range of the corn bunting.

Correspondence: allan.perkins@rspb.org.uk

E Fuentes-Montemayor, D Goulson and KJ Park

The effectiveness of agri-environment schemes for the conservation of farmland moths: assessing the importance of a landscape-scale management approach

Journal of Applied Ecology 2011, 48: 532–542

The authors surveyed 18 pairs of agri-environment schemes (AES) and conventionally-managed farms in central Scotland to evaluate the effects of specific AES management prescriptions (field margins, hedgerows, species-rich grasslands and water margins) on farmland moths. They also measured the influence of the surrounding landscape on moth populations at three spatial scales (250 m, 500 m and 1 km radii from each trapping site) to assess at which scale management was most important for the conservation of farmland moths. In general, percentage cover of rough grassland and scrub within 250 m of the trapping site was the most important landscape predictor for both micro- and macromoth abundance and macromoth species richness, although negative effects of urbanisation were found at wider scales (within 1 km), particularly for macromoth species richness. The abundance and species richness of micromoths was significantly higher within field margins and species-rich grasslands under AES management in comparison to their conventional counterparts, whereas AES water margins increased micromoth abundance, but not species richness. AES species-rich grasslands and water margins were associated with an increased macromoth abundance and species richness, and macromoths considered 'widespread but rapidly declining' also gained some benefits from these two AES prescriptions. In contrast, hedgerows under AES management enhanced neither micromoth nor macromoth populations. The findings indicate that increasing the percentage cover of semi-natural environment at a local scale (*e.g.* within 250 m) benefits both micro- and macromoth populations, and that the implementation of simple AES management prescriptions applied to relatively small areas can increase the species richness and abundance of moth populations in agricultural environments.

Correspondence: ef12@stir.ac.uk

EF Power and JC Stout

Organic dairy farming: impacts on insect–flower interaction networks and pollination

Journal of Applied Ecology 2011, 48: 561–569

Although less intensive agricultural approaches, including organic farming, could improve farmland biodiversity, it is not clear whether or not these approaches enhance wild plant pollination and the stability of insect–flower interaction networks. The authors investigated the effects of organic vs. conventional farming on insect–flower interaction network size and structure, bee and hoverfly diversity, and pollination in 10 pairs of organic and conventional dairy farms in

the Republic of Ireland. They found that insect–flower interaction networks on organic farms were larger and more asymmetrically structured than networks on conventional farms. Overall, however, networks contained fewer taxa and niche overlap and plant/animal ratios were relatively low compared with previously documented insect–flower interaction networks. Organic farms did attract higher numbers of bees, partly because of higher floral abundances (mainly *Trifolium* spp.). Hoverfly evenness was greater in organic farms but neither abundance, richness nor evenness was related to floral abundance, suggesting organic farms provide additional resources for hoverflies. Pollination of *Crataegus monogyna* hawthorn was higher on organic farms, although pollen deposition was limited. Organic dairy farming can increase the size and alter the structure of insect–flower interaction networks. However, network stability was not improved and all networks (organic and conventional) were vulnerable because of their small size, low niche overlap and low plant/animal ratios. Nonetheless, organic farming provided more flowers that attracted more flower visitors and improved pollination of *C. monogyna*. The authors suggest that strategic management of important flowers for pollinators in hedgerows and pastures should be endorsed in agri-environmental schemes. Sowing *Trifolium* spp., and allowing these plants to flower, could benefit bees, but more research into hoverfly ecology is necessary before realistic conservation recommendations can be made for this group. They conclude that organic farming, although not the solution in its present form, can benefit insect biodiversity, insect–flower interaction networks and insect-mediated pollination.

Correspondence: eipower@tcd.ie

GB De Deyn *et al.*

Additional carbon sequestration benefits of grassland diversity restoration

Journal of Applied Ecology 2011, 48: 600–608

A major aim of European agri-environment policy is the management of grassland for botanical diversity conservation and restoration, together with the delivery of ecosystem services including soil carbon (C) sequestration. To test whether management for biodiversity restoration has additional benefits for soil C sequestration, the authors investigated C and nitrogen (N) accumulation rates in soil and C and N pools in vegetation in a long-term field experiment (16 years) in which fertiliser application and plant seeding were manipulated. In addition, the abundance of the legume *Trifolium pratense* was manipulated for the last two years. To unravel the mechanisms underlying changes in soil C and N pools, they also tested for effects of diversity restoration management on soil structure, ecosystem respiration and soil enzyme activities. The authors show that the long-term biodiversity restoration practices increased soil C and N storage especially when these treatments were combined with the recent promotion of the legume *T. pratense*, sequestering 317 g C and 35 g N $m^{-2}year^{-1}$ in the most successful management treatment. These high rates of C and N accumulation were associated with reduced ecosystem respiration, increased soil organic matter content and improved soil structure. Cessation of fertiliser use, however, reduced the amount of C and N contained in vegetation. The findings show that long-term diversity restoration practices can yield significant benefits for soil C storage when they are combined with increased abundance of a single, sub-ordinate legume species. Moreover, the authors show that these management practices deliver additional ecosystem benefits such as N storage in soil and improved soil structure.

Correspondence: g.dedeyn@nioo.knaw.nl / gerlindede@gmail.com

R Seppelt *et al.*

A quantitative review of ecosystem service studies: approaches, shortcomings and the road ahead

Journal of Applied Ecology 2011, 48: 630–636

The prolific use of the term 'ecosystem services' in scientific studies has given rise to concerns about its arbitrary application. A quantitative review of recent literature shows the diversity of approaches and uncovers a lack of consistent methodology. From this analysis, the authors have derived four facets that characterise the holistic ideal of ecosystem services research: (i) biophysical realism of ecosystem data and models; (ii) consideration of local trade-offs; (iii) recognition of off-site effects; and (iv) comprehensive but critical involvement of stakeholders within assessment studies. These four facets should be taken as a methodological blueprint for further development and discussion. They should critically reveal and elucidate what may often appear to be *ad hoc* approaches to ecosystem service assessments. Based on this quantitative review, the authors provide guidelines for further development and discussions supporting consistency in applications of the ecosystem service concept as well as the credibility of results, which in turn can make it easier to generalise from the numerous individual studies.

Correspondence: ralf.seppelt@ufz.de

JM Reid *et al.*

Diagnosing the timing of demographic bottlenecks: sub-adult survival in red-billed choughs

Journal of Applied Ecology 2011, 48: 797–805

Determining the precise timing and location of major demographic bottlenecks, such as periods of low survival, is key to identifying ecological causes of variation in population growth rate and essential for designing efficient and effective mitigation. In a protected population of red-billed chough *Pyrrhocorax pyrrhocorax* on Islay, Scotland, variation in population growth rate largely reflects among-year variation in first-year survival. First-year survival was unprecedentedly low during 2007–2010, threatening population viability. The authors used colour-ring resightings to estimate monthly survival probabilities throughout the first year from fledging for eight chough cohorts (totalling 519 individuals) representing the full observed range of variation in first-year survival. They thereby identify the time and location of recent low survival. On average across all cohorts, monthly survival probability varied among months, being low during the first month after ringing (May–June, accounting for c. 24% of all first-year mortality) and high during the last four months of the first year (January–May, accounting for c. 6% of all first-year mortality). Most mortality (c. 70%) occurred after fledglings dispersed from natal territories. The 2007–2009 cohorts experienced low monthly survival probabilities during July–December. This represents an additional low survival period compared to previous cohorts rather than decreased monthly survival probabilities across all months or further decreases through periods when monthly survival probability was low across all cohorts. These data have general relevance in showing that dramatically low annual survival, which needs to spark rapid management action, can reflect different and unanticipated periods of low survival rather than exaggeration of typical variation. With specific regard to conserving Islay's chough population, the data show that sub-adult survival has recently been low during July–December, probably reflecting conditions on key grassland foraging areas. Managers aiming to increase population viability should increase invertebrate diversity, abundance and availability at these times and locations, thereby increasing foraging options available to choughs.

Correspondence: jane.reid@abdn.ac.uk

ADM Dobson, TJR Finnie and SE Randolph

A modified matrix model to describe the seasonal population ecology of the European tick *Ixodes ricinus*

Journal of Applied Ecology 2011, 48: 1017–1028

The sheep tick *Ixodes ricinus* is the most multicompetent vector in Europe, which is responsible for significant diseases of humans and livestock throughout the northern hemisphere. Modelling the tick's complex seasonal dynamics, upon which pathogen transmission potential depends, underpins the analysis of tick-borne disease risk and potential tick control. The authors use laboratory- and field-derived empirical data to construct a population model for *I. ricinus*. The model was fitted to field data from three UK sites and successfully simulated seasonal patterns at a fourth site. After modification of a single parameter, the model also replicated divergent seasonal patterns in central Spain, but any biological factors underlying this geographical heterogeneity have not yet been identified. The model's applicability to wide geographical areas is thus constrained, but in ways that highlight gaps in our knowledge of tick biology. Vector population models allow investigation into the effects of individual environmental factors on population dynamics in ways not easily possible by experimental manipulation of *in situ* populations. The model could be used to evaluate public health risk, tick management strategies and potential effects of future environmental change.

Correspondence: sarah.randolph@zoo.ox.ac.uk

ADM Dobson and SE Randolph

Modelling the effects of recent changes in climate, host density and acaricide treatments on population dynamics of *Ixodes ricinus* in the UK

Journal of Applied Ecology 2011, 48: 1029–1037

A population model for the tick *Ixodes ricinus*, the most significant vector of pathogens in Europe, is used to explore the relative impact of changes in climate, host density and acaricide-treated hosts on tick abundance and seasonality. A rise in temperature of the sort witnessed since 1989 speeds up the inter-stadial development of ticks, thereby reducing the cumulative effect of constant daily mortality rates and potentially raising population levels. The predicted earlier onset of tick questing activity in the spring, due to stage-specific temperature thresholds, could increase contact between ticks and humans during recreational visits to the countryside in spring holidays. These tick population effects vary geographically with background climate. The significant increase in deer abundance across Europe, including the UK, in recent decades is predicted to drive tick population increases, the effect varying with the initial density of hosts. In areas only recently colonised by deer, tick numbers are predicted to rise dramatically (given suitable climatic conditions). Where host densities are already high, however, further increases may reduce numbers of questing ticks; unfed ticks leave the questing population more rapidly, even though the overall tick population (and therefore pathogen transmission potential) increases. Culling high-density deer populations as a control measure could, therefore, initially cause an apparent increase in questing ticks, with the predicted long-term population trajectory depending on the severity of the cull. Conversely, the further addition of large hosts (*e.g.* sheep) would effectively reduce the number of questing ticks and therefore the risk to humans. If such sheep were treated with acaricide, tick populations are predicted to decrease rapidly, to an extent that depends on the relative abundance of wild (untreated) and treated hosts. Tick control in designated areas may be achieved by using sheep in this way as 'lethal mops', as used to occur in the past when sheep were regularly dipped.

Correspondence: sarah.randolph@zoo.ox.ac.uk

U Bradter *et al.*

Prediction of National Vegetation Classification communities in the British uplands using environmental data at multiple spatial scales, aerial images and the classifier random forest

Journal of Applied Ecology 2011, 48: 1057–1065

National Vegetation Classification (NVC) maps are typically produced from ground surveys which are prohibitively expensive for large areas. An approach to produce NVC maps more cost-effectively for large areas would be valuable. Creation of vegetation community maps from aerial or satellite images has often had limited success as the clusters separable by spectral reflectance frequently do not correspond well to vegetation community classes. Such maps have also been produced by exploring correlations between community occurrence and environmental variables. The latter approach can have limitations where anthropogenic activities have altered the distribution of vegetation communities. The authors combined these two approaches and classified 24 common NVC classes of the Yorkshire Dales and an additional class 'wood' consisting of trees and bushes at a resolution of 5 m from mostly remotely sensed variables with the algorithm random forest. Classification accuracy was highest when environmental variables at low and high resolution (50 and 5–10 m, respectively) were added to aerial image information aggregated to a resolution of 5 m. Low-resolution environmental variables are likely to be correlated with the dominant vegetation surrounding a location and thus could represent critical area requirements or local species pool effects, while high-resolution environmental variables represent the environmental conditions at the location. Overall classification accuracy was 87–92%. The median producer's and user's class accuracies were 95% (58–100%) and 92% (67–100%), respectively. The classification accuracies achieved in this study, the number of classes differentiated, their level of detail and the resolution were high compared with those of other studies. This approach could allow the production of good quality NVC maps for large areas. In contrast to existing maps of broad land cover types, such maps would provide more detailed vegetation community data for applications like the monitoring of vegetation in a changing climate, the study of animal–habitat relationships, conservation management or land use planning.

Correspondence: bsub@leeds.ac.uk

ES Jeffers *et al.*

Abrupt environmental changes drive shifts in tree–grass interaction outcomes

Journal of Ecology 2011, 99: 1063–1070

Plant–plant interactions are known to vary with changing environmental conditions; however, we have little empirical knowledge of the impact of abrupt environmental changes on millennial scale plant–plant interaction outcomes for long-lived plant species. The authors used palaeoecological data (13,000–7,600 years before present) and a novel statistical modelling approach to determine the impact of multiple environmental drivers on predicted tree–grass population interaction outcomes from our study site in eastern England. Changes from high to low herbivore density shortly preceded changes to low fire levels and a shift to warmer summers. These transitions occurred during a period of increasing nitrogen (N) availability. Shortly thereafter, there was a shift in landscape dominance from grasses to oaks and then a change to decreasing N availability. Model predictions of tree–grass interaction outcomes varied over time with respect to all environmental changes. During the time of high disturbances and cool summers, grasses were predicted

to out-compete oaks. After climate warming and the loss of regular disturbances, the predicted outcome was stable coexistence. However, changes in the N cycle corresponded with different predicted outcomes: unstable competition under increasing N availability and facilitation of oaks by grasses when N availability was declining. Akaike Information Criterion weights indicate that climate warming and fewer fires were consistent with the best-fitting model of oak–grass interactions for the entire time series (*i.e.* competitive exclusion to stable coexistence). However, reconciling the conflicting model predictions with the observed population dynamics suggests that a temporary period of unstable competition preceded the predicted shift to stable coexistence. This dynamic behaviour is consistent with known patterns of shifts between alternative stable states. The authors show that abrupt changes in environmental conditions over time lead to similarly abrupt changes in tree–grass interaction outcomes, which were shown to vary in contrasting directions with respect to resource versus non-resource variables. The approach described here allows plant ecologists to test hypotheses of plant–plant interactions over successional time scales for long-lived species and thus can lead to new knowledge about the structural role of these interactions in community dynamics.

Correspondence: elizabeth.jeffers@zoo.ox.ac.uk

K Taylor and P Rowland

Biological Flora of the British Isles: *Stachys palustris* L.

Journal of Ecology 2011, 99: 1081–1090

This account presents information on all aspects of the biology of *Stachys palustris* (marsh woundwort) that are relevant to understanding its ecological characteristics and behaviour. The main topics are presented within the standard framework of the *Biological Flora of the British Isles* - distribution, habitat, communities, responses to biotic factors, responses to environment, structure and physiology, phenology, floral and seed characters, herbivores and disease, history, and conservation. *Stachys palustris* is a monoecious perennial herb, with long creeping, strong, subsurface rhizomes. It is a common native herb growing by streams, rivers, ditches, ponds, in fens, marshes and swamps, and less frequently a weed of cultivated land. Although widespread throughout most of the British Isles, *S. palustris* is typically a plant of land–water transitional situations that are not seral and, as such, appears to be under-represented in descriptions of plant communities. *Stachys palustris* is typically found on intermittently flooded and poorly drained soils, which are weakly acid or weakly basic and highly fertile. The production of numerous subsurface rhizomes by *S. palustris* helps to maintain shoot population density with little recourse to seedling recruitment. *Stachys* × *ambigua*, the hybrid between *Stachys palustris* and *S. sylvatica*, is most frequent in northern and western Britain. *Stachys palustris* is particularly valuable as a nectar source for insects, especially bumblebees. It has antispasmodic, antiseptic and astringent properties; the name 'woundwort' derives from its traditional use in staunching bleeding and healing wounds.

Correspondence: ktaylor@ceh.ac.uk

C Breau, RA Cunjak and SJ Peake

Behaviour during elevated water temperatures: can physiology explain movement of juvenile Atlantic salmon to cool water?

Journal of Animal Ecology 2011, 80: 844–853

Fish actively avoid potentially lethal temperatures by moving to cool-water sites created by inflowing tributaries and groundwater seeps. Juvenile Atlantic salmon *Salmo salar* of different age classes exhibit different behavioural responses to elevated temperatures (>23°C). Yearling (1+) and 2-year-old (2+) Atlantic salmon often cease feeding, abandon territorial behaviour and swim continuously in aggregations in cool-water sites; whereas young-of-the-year (0+) fish continue defending territories and foraging. This study determined whether the behavioural shift in older individuals (2+) occurred when basal metabolic rate, driven by increasing water temperature, reached the maximum metabolic rate such that anaerobic pathways were recruited to provide energy to support vital processes. Behaviour (feeding and stress responses), oxygen consumption, muscle lactate and glycogen, and circulating blood lactate and glucose concentrations were measured in wild 0+ and 2+ Atlantic salmon acclimated to water temperatures between 16 and 28°C. The results indicate that oxygen consumption of the 2+ fish increased with temperature and reached a plateau at 24°C, a temperature that corresponded to cessation of feeding and a significant increase in muscle and blood lactate levels. By contrast, oxygen consumption in 0+ fish did not reach a plateau, feeding continued and muscle lactate did not increase, even at the highest temperatures tested (28°C). The experiment demonstrated that the 0+ and 2+ fish had different physiological responses to the elevated water temperatures. The results suggest that wild 2+ Atlantic salmon employ behavioural responses (*e.g.* movement to cool-water sites) at elevated temperatures in an effort to mitigate physiological imbalances associated with an inability to support basal metabolism through aerobic metabolic processes.

Correspondence: cunjak@unb.ca

LE Brown *et al.*

Food web complexity and allometric scaling relationships in stream mesocosms: implications for experimentation

Journal of Animal Ecology 2011, 80: 884–895

Mesocosms are used extensively by ecologists to gain a mechanistic understanding of ecosystems based on the often untested assumption that these systems can replicate the key attributes of natural assemblages. Previous investigations of stream mesocosm utility have explored community composition, but here the authors extend the approach to consider the replicability and realism of food webs in four outdoor channels (4 m^2). The four food webs were similarly complex, consisting of diverse assemblages (61–71 taxa) with dense feeding interactions. Mesocosm food web structural attributes were within the range reported for 82 well-characterised food webs from natural streams and rivers. When compared with 112 additional food webs from standing freshwater, marine, estuarine and terrestrial environments, stream food webs (including mesocosms) had similar characteristic path lengths, but typically lower mean food chain length and exponents for the species–link relationship. Body size abundance allometric scaling coefficients for trivariate taxonomic mesocosm food webs and individual size distributions were consistent and similar to those from natural systems, suggesting that patterns of energy flux between mesocosm consumers and resources were realistic approximations. The results suggest that stream mesocosms of this scale can support replicate food webs with a degree of biocomplexity that is comparable to 'natural' streams. The findings highlight the potential value of mesocosms as model systems for performing experimental manipulations to test ecological theories, at spatiotemporal scales of relevance to natural ecosystems.

Correspondence: m.e.ledger@bham.ac.uk

News in Brief

Successful Prosecution

A recent press release from Natural England announced that a London woman has been given a formal conditional caution by the Metropolitan Police after admitting fraudulently producing protected species licences in order to illegally undertake paid consultancy work as a self-employed ecologist. The fraudulent licences, one for great crested newts and two for dormice, were seized by police who searched her home when arresting her. The conditions of the caution place a number of constraints on the individual with regard to certain protected species work that she may undertake in the future. As a consequence of this successful prosecution, IEEM is now carrying out its own investigation as the woman concerned is believed to be an Affiliate member of the Institute and therefore subject to the Code of Professional Conduct.

Natural England Licence Handy Hints

Natural England have produced some new 'Handy Hints' documents, one on hints for receiving a dormouse licence on first submission of an application (www.naturalengland.org.uk/Images/wmlg35_tcm6-26811.pdf), and another for bats that includes hints for obtaining a mitigation licence at first submission and common reasons for a 'further information request' response to a license application (www.naturalengland.org.uk/Images/bat-handy-hints_tcm6-15663.pdf).

International Network of Next-Generation Ecologists

For the past year a group of graduate students, post-docs and early career researchers have been working to set up a global network with the goal of bringing the new generation of ecologists around the world into contact. The newly born initiative goes under the name 'International Network of Next-Generation Ecologists' or simply INNGE [in-jee]. INNGE has close connections to the International Association for Ecology (INTECOL). The launch of the network was announced in a recent newsletter of INTECOL (http://psjorgensen.files.wordpress.com/2011/07/pages-from-intecol_e-bulletin-jun_2011.pdf). The website of INNGE is currently under construction. They have also set up Facebook, LinkedIn and Twitter accounts.

Working With Soil

The British Society of Soil Science (BSSS) and its professional body, the Institute of Professional Soil Scientists, have launched a new professional competency scheme for scientists and engineers working with soil. *Working With Soil*, which was officially unveiled at an event at the Royal Geographical Society in London in July, promotes high standards in soil science as an essential component of the successful and sustainable use of the world's land resources. The framework identifies eight areas of soils knowledge and skills competency. Within each category the minimum competencies of knowledge and skills are identified, together with any relevant qualifications. The framework is presented in easy to use individual documents that provide a useful checklist to aid continuing professional development and career planning. *Working With Soil* can be downloaded at www.soilscientist.org/workingwithsoil.

IPBES

The UK Government has pledged £2 million (from Defra and DfID) over the next four years to help establish the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES). JNCC will support Defra in achieving a pragmatic evidence-based approach to IPBES building on existing initiatives, and by facilitating efficient engagement with the UK biodiversity science and policy communities. The 65th United Nations General Assembly on 21 December 2010 agreed that IPBES should be fully operationalised. IPBES will be an interface between the scientific community and policy makers that aims to build capacity for, and strengthen the use of, science in policy-making. This new UN scientific body on biodiversity is a major step forward in the global battle to stop the loss of animal and plant species and restore ecosystems for long-term human well-being and sustainable development. A plenary meeting to agree on the modalities of IPBES will be held in October 2011. Internationally it has been agreed that the four main functions of IPBES will be to: identify and prioritise key scientific information needed for policy-makers and to catalyse efforts to generate new knowledge; perform regular and timely assessments of knowledge on biodiversity and ecosystem services and their interlinkages; support policy formulation and implementation by identifying policy-relevant tools and methodologies; and prioritise key capacity-building needs to improve the science-policy interface, as well as to provide and call for financial and other support for the highest-priority needs related directly to its activities. For further information on IPBES please visit http://ipbes.net.

Police Launch Nationwide Badger Crime Operation

The Badger Trust will launch a nationwide campaign in September with police backing to expose crimes against badgers. The Trust is setting up meetings to take place at the same time on the same day in Glasgow for Scotland, Sheffield for England, and Belfast for Northern Ireland. The Trust has the support of the police-endorsed *Operation Meles* campaign. Richard Crompton, Chief Constable of Lincolnshire who leads on wildlife for the Association of Chief Police Officers will chair the England meeting on 20 September 2011 and deliver the keynote address.

BBC Wildlife Fund Closes

In light of the decision by the BBC to no longer support the BBC Wildlife Fund (BBCWF), the Board of Trustees has implemented a wind down plan for the charity. The Trustees will continue to show commitment to the existing projects supported by the charity, ensuring monitoring and evaluation of the work and all governance obligations are delivered before the closure of the charity in the future.

Cairngorms National Park Authority Adopts Guidance on Wildness

The Cairngorms National Park Authority (CNPA) has become the first planning authority to produce and adopt guidance on Wildness. Supplementary Planning Guidance on Wildness has been adopted by the CNPA's Planning Committee (meeting on Friday 22 July 2011) and expands on the detail of some of the policies in the recently adopted Cairngorms National Park Local Plan which is used when assessing planning applications. The Wildness Supplementary Planning Guidance and Cairngorms National Park Local Plan can be viewed at www.cairngorms.co.uk/planning/localplan/.

Larch Tree Disease Found in New Areas of Britain

Ramorum disease of larch trees has been found in two new areas of Great Britain. Outbreaks have been confirmed in larch woodlands in Lancashire, England, and on the island of Mull in western Scotland. The Lancashire outbreak, in woodland managed by Lancashire County Council at Churn Clough Reservoir between Burnley and Clitheroe, is the second confirmed finding on larch in England outside the South West. Although the site is about 60 miles from the next nearest confirmed outbreak on larch, in the Peak District, there have been findings on other plants, such as *Rhododendron*, nearby. Investigations are continuing into other suspected sites in North West England, and the Forestry Commission believes there is a high probability that more outbreaks will be confirmed in the region. The Mull outbreak is only the second larch site in Scotland confirmed with the disease, following an outbreak in a small woodland on the Craignish peninsula in Argyll found in 2010. Suspected host plants near the Mull outbreak, such as *Rhododendron*, are being investigated

Prevention Cheaper than Cure

According to new research published in *Biodiversity Conservation*[1], a proactive approach to biodiversity loss – where conservation of a species starts *before* it becomes endangered – could save millions of Euros compared to the cost of recovering a population already in serious decline. Proactive steps to preserve habitat, such as setting up conservation areas or banning property development, can prevent a vulnerable species from ever reaching critical status. The study urges policy-makers to consider proactive, rather than reactive, conservation as a cost-effective way to meet biodiversity targets under the EU Habitats Directive. The paper authors developed a hypothetical model to compare the costs of proactive and reactive conservation of a species. They applied the model to a real life example, the Common Hamster in the Mannheim region of Germany. The study found that an estimated €17.2 million could have been saved if the proactive approach had been used instead of the reactive response that was actually taken. However, this is likely to be an under-estimate and the real figure may be as high as €36.4 million.

[1] Drechsler, Eppink and Wätzold (2011) Does proactive biodiversity conservation save costs? *Biodiversity Conservation* **20:** 1045-1055.

Defra Response to *Making Space for Nature*

The Government has published its response to *Making Space for Nature*, an independent review of England's wildlife sites and ecological network, which looked at whether they represented a coherent and robust ecological network capable of responding to the challenges of climate change and other pressures. The Government's recent Natural Environment White Paper provided a broad response to the review and set out how the recommendations would acted upon, however this report provides a response to each recommendation. One of the recommendations of the review was that local authorities should ensure that ecological networks, including areas for restoration, are identified and protected through local planning. The review also called on the Government to support local authorities in this role by clarifying that their biodiversity duty includes planning coherent and resilient ecological networks. In response the Government highlighted that the forthcoming National Planning Policy Framework will set out the Government's environmental, social and economic objectives for the planning system. Furthermore, the Government stated that it will develop additional supporting and enabling tools to assist public bodies with their implementation of the biodiversity duty under section 40 of the Natural Environment and Rural Communities Act 2006. It also states that it is considering the extent to which the forthcoming National Planning Policy Framework can support, through the planning system, the protection of significant biodiversity interest when sites are transferred out of public ownership. For more information, visit http://www.defra.gov.uk/publications/files/pb13537-lawton-response-110607.pdf.

Report on Special Areas of Conservation in Wales

The Countryside Council for Wales has published the report entitled *Special Areas of Conservation (SAC) in Wales*. The report provides an overview of SACs in Wales and sets out details of their identification, designation, and legal protection; public access to SACs; the national and international importance of SACs and the features of SACs. There are currently 92 SACs, protecting over 600,000 ha of land and sea in Wales; 27% of designated habitats and species within SACs are considered to be in favourable condition, and 11% are in a process of recovery. For more information, visit http://www.ccw.gov.uk/publications--research.aspx.

Wildlife Law Review Confirmed

Elements of wildlife law in England and Wales will be updated and consolidated in a review by the Law Commission. After an initial internal scoping process, the Commission will produce a consultation paper in the second half of 2012. After analysing the results and coming to conclusions on the way forward, they will share the results with Defra with a view to reviewing the future development of the project in March or April 2013. If both Commission and Government agree at that point that the project should continue they will aim to produce a final report, with draft bill, by mid-2014. If, at the review, either party decides that the project should not continue, they will produce a narrative report of their conclusions in about May 2013. For more information, visit http://www.justice.gov.uk/lawcommission/docs/lc330_eleventh_programme.pdf.

Government Response to EFRA Committee CAP Report

The Government has published its response to the Environment, Food and Rural Affairs Committee's recent report on the Common Agricultural Policy after 2013. The Committee's original report recommended that one of the objectives of the CAP should be to ensure the sustainable management of the EU's natural resources, biodiversity and landscapes. In response, the Government says that 'sustainable land management is best delivered through multi-annual, contractual, agri-environment schemes, which are currently enabled under Pillar 2 of the CAP'. For more information, visit http://www.publications.parliament.uk/pa/cm201012/cmselect/cmenvfru/1356/1356.pdf.

JNCC Report on Nitrogen Impacts

The Joint Nature Conservation Committee has published a Collation of Evidence of Nitrogen Impacts on Vegetation in Relation to UK Biodiversity Objectives. This report presents an analysis of national vegetation data sets in relation to nitrogen deposition carried out to date. The study statistically analysed eight independent national vegetation surveillance datasets using a consistent approach, to identify evidence of nitrogen deposition impacts in four habitat types; acidic and calcareous grassland, heathland and bogs. For more information, visit http://jncc.defra.gov.uk/page-5894.

House of Lords Debate on Biological Diversity

On 20 June 2011, IEEM Patron, Lord Selborne tabled a question for debate on the Government's proposals for implementing the agreement reached at the meeting of the Conference of the Parties to the Convention on Biological Diversity in October 2010. Introducing the debate, Lord Selborne highlighted that he thought previous targets on biodiversity had been missed because of a basic lack of understanding among Governments about the value of nature and the long-term benefits to be derived from its protection. Furthermore, he said that there was a lack of public awareness of how ecosystem functions contribute to human welfare and of their benefits, including goods and services, some of which can be valued economically and others that have a non-economic value. He later referred to the importance of ensuring that governments, the business community and society at large understand and value biodiversity. Baroness Hilton contributed to the debate and highlighted the importance of protecting freshwater. Baroness Parminter raised concerns about overfishing and the financing of biodiversity protection. She went on to welcome the Government's decision to pilot biodiversity offsetting so as to test and refine the operation, but questioned whether a voluntary scheme will generate enough interest to establish a viable biodiversity market. For more information, visit http://www.publications.parliament.uk/pa/ld201011/ldhansrd/text/110620-0002.htm#11062017000125.

25% Increase in Natural England EPS Applications

Natural England's 2010-11 European Protected Species (EPS) performance statistics show that the number of EPS applications processed from April 2010 to March 2011 had risen by 25% in the last 12 months. It shows that 82% of licensing decisions were reached within the Citizen Charter target of 30 working days. In 2010-11 licensing decisions for re-submissions took an average of 14 working days to turn around and 16 working days for modification requests.

Tauro-Scatology and Hollywood

You should expect an environmental professional to have a small carbon footprint, but *In Practice*'s special correspondent is heading out to Hollywood this month where he hopes to track down Basil O'Saurus, the well-known Professor of Tauro-Scatology, who is pitching yet another of his ideas to a room of film industry moguls.

What's your theme this time, Prof?

I'm cashing in on Hollywood's predilection for safe bets: once they have a hit film, they milk it for sequels and prequels until everyone is sick of the idea. So I have a great idea, based on a film that was both a box office hit and is totally cutting-edge... *The Day After Tomorrow*.

Hang on... *The Day After Tomorrow* was released in 2004: what is cutting edge about that?

In the O'Saurus household, 'cutting edge' means 'available for £3 from HMV'.

Fair enough. So you've come up with a sequel?

A prequel actually, called *Three Days Before The Day After Tomorrow*. And it has a very serious underlying message, which is to convey the reality of climate change science.

Go on.

Well, in films such as *The Day After Tomorrow*, all the action has to be condensed into a couple of hours, leading to the ludicrous scenario of a team of scientists suddenly realising that there is going to be a drastic change in climate only moments before it happens...

...whereas, in reality, climate change science is based on a consensus built up from interweaving strands of evidence accumulated over many years?

Exactly. And, what is more, the protagonists in films such as *The Day After Tomorrow* produce data that are so utterly convincing that they and their colleagues have no doubts at all...

...whereas, the truth is that most climate change science is hedged about by wide margins of error, with scope for multiple interpretations?

Absolutely. So I decided that the time had come for a film which laid out the reality of slow, painstaking evidence accumulation and hypothesis testing and, more particularly, the validation of atmospheric circulation models using evidence from past environments.

You are, in other words, trying to persuade a room full of hard-nosed, market-savvy media professionals to invest millions in a film about... palaeoecology?

Put as bluntly as that, it doesn't sound very enticing. I prefer to think of it as a film about palaeoecology but with a lead role tailor-made for Keira Knightly. Remember that palaeoecology involves many hours hunched over a microscope, painstakingly identifying and counting pollen grains? This gives plenty of scope for long, lingering tracking shots taking in every angle of the heroine. It also takes several months to analyse a core in detail, thus giving us the chance for several costume changes...

Surely she'll be wearing a lab coat?

And cut down on the revenue from product placement? Get serious.

Okay. What about the male lead?

Good question. I discussed this with the Hollywood moguls. I insisted on an actor who could give an honest depiction of a mid-career academic juggling teaching and research commitments, never quite finding the time to keep himself in shape and gradually watching youthful ambition and idealism fade away in the economic realities of the contemporary higher education set up...

Timothy Spall perhaps, or Dan Ackroyd if you are casting in North America?

They said "George Clooney". And, being a screenwriter of the utmost personal integrity, I tore up my draft of the screenplay and rewrote the male lead to be what George Clooney thinks a mid-career, slightly down-at-heel and out-of-condition academic ought to be like.

His standard role, in other words? Of course, you've also created a scenario for some on-screen chemistry and the type of thoroughly unprofessional behaviour that never happens in a real palaeoecology laboratory, mostly because the benches are far too cluttered.

You are, regrettably, right. Try as I might, there are limits to the amount of drama you can make out of analysis of a sediment core, and the ensuing multivariate statistics.

And did the Hollywood moguls decide to fund your project?

On one condition.

And that was?

That I found someone really famous to write the theme song.

So you have to go out and find someone to write a song called 'Three Days Before The Day After Tomorrow'?

Not exactly. Paul McCartney has already done it.

thomson habitats




vegetation management

clearance

clearing with hand tools in sensitive areas
large scale mechanised clearance of trees and scrub
clearance in and around water bodies
general site clearance

translocating and new planting

translocation of scarce plants and hedgerows
seeding of grass and wildflower meadows and planting of native species

ongoing management

management of cleared and established sites
coppicing, thinning and hedgelaying
management of newly planted and translocated stock
treatment of invasive species

enquiries@thomsonhabitats.com www.thomsonhabitats.com

London & the South 01483 466066
Leeds 0113 2473787
Cardiff 02920 020680

greenfutures

Subscribe for £24 a year
www.greenfutures.org.uk/subscriptions

“It’s about the sweeping changes to the Chinese scene, but also about the ‘hidden beauty’ of waste...

‘Reimagining rubbish’, Issue 79, January 2011

Subscribe to *Green Futures*, the leading international magazine on environmental solutions and sustainable futures.

Read it for the brightest and best innovations in:
- clean energy
- food and finance
- smart lifestyles
- transformative design
- leapfrog technology.

greenfutures

Subscriptions address: AASM, Unit 8 Earlstrees Court, Earlstrees Road, Corby, NN17 4AX
greenfutures@aasm.co.uk, +44 (0)1536 273543, Twitter @GreenFutures

Building with Nature



- River & wetlands specialist
- Native wetland plant supplier
- Largest UK supplier of coir rolls
- Bioengineering design and installation
- Habitat creation and restoration
- Specialist contracting services
- Sensitive dredging

Salix, Croxton Park, Croxton, Thetford, Norfolk, IP24 1LS
Telephone 0870 350 1851 **Fax** 0870 350 1852 **Email** info@salixrw.com **www.salixrw.com**

Salix bioengineering

Ecology is taking off

Principal Ecologist

• Based UK (flexible)

Share expertise with a recognised industry leader, shape the future of a growing ecology team and build an outstanding global career at SKM.

Sinclair Knight Merz (SKM) is an independent, employee owned, values driven firm, employing over 6,000 skilled professionals. As a fast growing, global technical consultancy whose success has been driven by a reputation for excellence amongst our client base and by the talent of our people, SKM continues to win challenging and fascinating projects and has an outstanding reputation for consulting expertise.

SKM Enviros is our market leading consultancy providing water, environmental, sustainability and health and safety solutions. We combine local expertise with global experience to lead debate, influence policy, shape development and achieve outstanding client success in a low carbon economy.

The EIA and planning team works with a varied portfolio of clients including a number of major energy and mining companies, undertaking projects across the world. In the UK, SKM has a particular strength in the power sector with an industry leading track record in renewables (wind and biomass), thermal generation and electrical grid connections. The team has worked on over 100 wind farm projects since 2000 and biomass projects totalling a combined electrical capacity of over 1.8 GW. Feeling inspired?

The role offers a unique opportunity to work closely with our existing Technical Lead for Ecology and play a key role in managing client relationships and shaping our ecology team for the future. You will deliver high-level ecological inputs to a varied project portfolio, technical review, provide support through public inquiries, manage large proposals and projects and mentor less experienced staff.

It is a broad role requiring experience within a consulting environment and competence in a range of ecological disciplines including Ecological Impact Assessment. Ideally, you'll have experience in the energy sector, particularly onshore wind farms, EIA project management, public inquiry and working internationally.

This is an exciting chance to expand your technical expertise on high profile projects with the support of a truly passionate multidisciplinary team. We will provide you with a competitive salary package, support for your career development and all the opportunities, rewards and benefits of working within a dynamic, expanding global leader.

For more information, contact Sneeta Madhara on 01952 503134, or to apply online visit our website quoting reference SIN00J3K.

SKM also welcome expressions of interest from experienced Ecologists who may not be necessarily suitable for this post but who would be interested in hearing about future opportunities both in the UK and in Australia.

EOWA Employer of Choice for Women

SKM values the diversity of its workforce and actively supports, encourages and promotes a working environment where all employees can achieve their potential.

www.globalskm.com/careers

achieve.

SINCLAIR KNIGHT MERZ SKM

Conference: Scrub and woodland on coastal dunes 12th & 13th September 2012

European Dune Network
Sharing experience across borders

We are pleased to announce our plans to hold a two-day international conference and excursion on scrub and woodland on coastal dunes at Liverpool Hope University in September 2012. As this would be a contribution to marking the 20th anniversary of the Habitats Directive, the conference will primarily be set within the context of the habitats of the Atlantic Biogeographical Region but will seek to draw on research from a wider geographical area.

The conference would follow our aim of linking science and management and we are publishing this early announcement to invite papers and contributions to the programme. The topics we wish to address include: research on the development of woodland and scrub habitats in north-west Europe, an evaluation of Atlantic Dune Woodland in the Atlantic Biogeographical Region including the potential of developing this habitat in the British Isles, research into the relationship between wet woods and coastal dune slacks and the biodiversity value of native dune scrub.

The meeting will also be an opportunity to review dune forestry practices (in the UK and northwest Europe), evaluate the research on alien species and, for the UK, development of a new national strategy for Sea Buckthorn. We have interest and support from the UK statutory agencies and the Mersey Forest and would welcome proposals for presentations, sponsorship and links to other initiatives. We would particularly welcome offers of research papers or discussion papers which could be circulated before the meeting. The proceedings will be published.

Please contact dunes@hope.ac.uk to register your early interest in this meeting.

「Innovative protection for bats」

Wienerberger
Building Value

Introducing the Terca/EcoSurv Bat Box from Wienerberger

Our new bat box is designed to encourage and protect the most popular bats found in the UK, such as the Pipistrelle, Natterer's, Whiskered and Brandt's species.

With a new innovative internal structure, it helps to maintain the bat's body temperature to ensure conditions in which they should flourish.

We can manufacture the boxes in any colour found within our current product range to match or complement existing or new brickwork. They will also help you gain additional ecological points to meet the requirements of the Code for Sustainable Homes.

Wienerberger. Providing Sustainable Solutions

For further detailed information including drawings visit: www.brick.co.uk/batbox or e-mail sustainability@wienerberger.co.uk

TERCA

Countryside Jobs Service

For highly targeted recruitment, professional training and all the industry news.
Make **CJS** your first port of call.

Recruitment - CJS carries ecology and biodiversity vacancies for employers across the spectrum from Government agencies to small specialist private companies. 12% of our readers are actively seeking work within a research or consultancy field and such vacancies are of interest to 90%.
Advertisers say: "*Very quick and easy to advertise. Your professional service means no hassle for me and excellent value too.*"

Professional Training – our Training Directory lists around 1000 courses across the sector of which around one quarter are for surveying and identification skills.

Industry news – a daily round up of the headlines and latest information. Watch out for **CJS Focus on...** a periodic publication featuring one area of the sector.

For a ***free monthly newsletter*** of the latest news, jobs and full calendar of short courses, email your name and organisation to CJSMonthly@countryside-jobs.com

COUNTRYSIDE CJS JOBS SERVICE

CJS *is the Countryside Specialist*

www.countryside-jobs.com

If Ecology is your thing...
you should visit us.

www.StopDodo.com

Don't let our Environment go the Way of the Dodo!

THE IMPROVED RANGE OF BAT BOXES
from the Nestbox Company

- British Made
- FSC® Certified
- Easy to Erect
- Boxes last Years
- Landing Ladders
- Ceramic Heat Sinks
- Improved Thermal Performance
- Range Designed for British Species
- Boxes for Cavity and Crevice Dwellers

FSC® C007915 The mark of responsible forestry FSC www.fsc.org

The Improved Treble Crevice Bat Box

The Nestbox Company Ltd
Eastcote House
Barston Lane
Eastcote
Solihull B92 0HS UK

Tel: +44 (0) 1675 442299
Web: www.nestbox.co.uk
Email: mail@nestbox.co.uk

SocEnv
Society for the Environment

Apply to become a

Chartered Environmentalist

For full details please visit:

www.ieem.net/cenvapplication.asp

New and Prospective Members

APPLICANTS

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 **7 October 2011**. Any communications will be handled discreetly. The decision on admission is usually taken by the Membership Admissions Committee under delegated authority from Council but may be taken directly by Council itself. IEEM is pleased to welcome applications for membership from the following:

APPLICATIONS FOR FULL MEMBERSHIP

Associates applying to upgrade to Full membership were listed previously for their Associate application and are not listed again.

Mrs Emma-Jane Ahart, Miss Mandy Apps, Mr Jonathan Cocking, Mr St.John Hughes, Mr Chris Kaighin, Mr Richard Knight, Mr Andrew Nyul, Dr David Parish, Mr Matthew Roberts, Charlotte Rose

APPLICATIONS FOR ASSOCIATE MEMBERSHIP

Mr Steven Mills, Mr Gregor Neeve, Mr Nicholas Pond

APPLICANTS WISHING TO UPGRADE TO ASSOCIATE MEMBERSHIP

Mr Adam Bratt, Miss Barbara Goncalves, Miss Elizabeth Webster

ADMISSIONS

IEEM is very pleased to welcome the following new members:

FULL MEMBERS

Mr Tim Barfield, Miss Natalie Boyle, Dr Elizabeth Bradshaw, Dr Ann Cantrell, Dr Roger Catchpole, Mr Paul Corner, Mr Robert Dixon, Mr Duncan Glen, Mr Timothy Hextell, Mr Colin Hicks, Mr Craig Hodgson, Miss Jennifer Hunt, Mr Matthew Liston, Ms Deborah MacKenzie, Ms Una Maginn, Mr Roger Martin, Ms Rachel McDonald, Mr David Pape, Mr Jez Perkins, Mr James Phillips, Mr Phil Preston, Ms Heather Scott, Mr Stephen Searle, Dr Paul Sharman, Ms Erica Sommer, Mrs Emily Whittingham, Miss Tina Wiffen

ASSOCIATE MEMBERS

Miss Joanne Eaton, Miss Toni Harrington, Mr Austin Hopkirk, Mr Mark Jermy, Miss Catherine Lake, Miss Sophie Mairesse, Mrs Anne Proud, Mr John Lewis, Miss Monique Speksnyder, Ms Gilian Taylor

GRADUATE MEMBERS

Mr Kenneth L Armstrong, Miss Louise Barker, Miss Charlotte J Bellamy, Miss Eleanor A Body, Mr Andrew Bray, Miss Kirsten Campbell, Miss Laura Cobden, Miss Stephanie V Cooling, Mr Thomas J Deaney, Miss Emily Dickins, Mr Joe L Doyle, Miss Kathryn Driscoll, Miss Sarah L Dutton, Mr David Elliott, Miss Louise A Fairless, Mr Simon Fry, Miss Rebecca Gale, Mr Roger P Gravestock, Mr Martin Green, Miss Marian Griffiths, Miss Ann M Hendry, Miss Charlotte R Holliday, Ms Rebecca Holmes, Mr Les Hughes, Mr Joseph Jenkins, Miss Kiran Jones, Miss Emma M Kerr, Ms Josiane M Kirk, Miss Tajinder Lachhar, Mr Gareth Lang, Mr Samuel Leigh, Mr David McNicholas, Miss Katherine Milburn, Mr Andrew Morris, Miss Claire G Porteous, Mr Sam Pottier, Miss Rebecca Ratcliffe, Mr Ciaran J Roe, Miss Hannah Rose, Miss Natasha E Rowlands, Mr Barnaby Scott, Mr Jay P Stebbings, Miss Carrie L White, Miss Lucy Williams, Mr Edward J Winfield

AFFILIATE MEMBERS

Mr Kevin Anderson, Mr Simon Carroll, Mr Scott G Dodd, Mrs Patricia J Eaton, Mr Gareth Jones, Mr Jamie Luck, Mr Alex Mays

STUDENT MEMBERS

Mr Philip J Aldwinckle, Mr Ross HA Booth, Mr Edward DB Boyle, Miss Georgia Brill, Miss Charlotte Carter, Mr Mark E Coles, Mr Steven Duerden, Mrs Patricia Eyden-Wood, Mr Stephen T Gibbins, Mr Shantanu Goel, Miss Laura Gosset, Mr John F Grainger, Miss Stephanie Griggs-Trevarthen, Miss ADC Nayomi Gunarathna, Mr Elliott J Flynn, Mr Gareth J Harrison, Miss Emily Heath, Miss Samantha J Ireton, Ms Georgina Kelly, Ms Anna Lewis, Mr Hugh A E Loy, Mr Ben Notcutt, Ms Gail Rainford, Miss Ellie Rickman, Miss Amanda Roberts, Miss Rachel A Smith, Miss Chelsea Uribe, Miss Catherine J Wiseman

UPGRADES

The following have successfully upgraded their membership:

UPGRADES TO FULL MEMBERSHIP

Mr Christopher Barrett, Miss Amanda Bassett, Miss Sarah Bignell, Miss Jane Brinkley, Mr Mike Coleman, Mr Andrew Cross, Miss Sarah Dale, Miss Faye Durkin, Miss Judith Eley, Mr James Godbeer, Miss Cheryl Gogin, Dr Timothy Graham, Miss Kay Hinchsliffe, Miss Claire Hodge, Miss Joanne Jameson, Mr Sam Phillips, Mr John Polley, Mr Robert Randall, Mrs Jenny Roebuck, Mrs Katharine Taylor, Mr Martin Townsend

UPGRADES TO ASSOCIATE MEMBERSHIP

Mr Timothy Buckland, Miss Rebecca Close, Miss Katie Glover, Miss Tamsin Ismail, Mr Thomas Shelley

UPGRADES TO GRADUATE MEMBERSHIP

Miss Hannah Stephenson

Forthcoming Events

IEEM Conferences

DATE	EVENT	LOCATION
2 - 3 November 2011	Autumn 2011 Conference and AGM - Rebuilding Biodiversity	Liverpool
March 2012	Spring 2012 Conference - Planning and Biodiversity	London TBC
June 2012	Summer 2012 Conference - Soils and Biodiversity	London TBC
November 2012	Autumn 2012 Conference - Renewable Energy and Biodiversity	Bristol/Cardiff TBC

For more information on conferences please visit: www.ieem.net/conferences.asp

IEEM Training Workshops

13 September 2011	Dormouse Ecology and Conservation	Bideford, Devon
14 September 2011	Introduction to Bats	Bury St Edmunds, Suffolk
19 September 2011	Freshwater Invertebrates: Identification and Survey	Shrewsbury, Shropshire
3 October 2011	Stonewort Identification and Ecology	Oaksey, Wiltshire
3 October 2011	Water Vole Ecology	Lifton, Devon
4 - 5 October 2011	Water Vole Conservation and Development	Lifton, Devon
5 October 2011	Field Signs for Water Voles	Lenzie, East Dunbartonshire
6 - 7 October 2011	Water Vole Conservation and Development	Lifton, Devon
7 October 2011	Introduction to NVC Survey	Guildford, Surrey
12 October 2011	Introduction to Peatland Restoration	Bishopbriggs, East Dunbartonshire
18 - 19 October 2011	Otters: Survey and Mitigation	Alresford, Hampshire
27 October 2011	Surveying for Bats and Development	Croydon, Greater London
9 November 2011	Badgers: Survey, Exclusions and Mitigation	Motherwell, North Lanarkshire
16 November 2011	Introduction to Ecological Consultancy	Near Polegate, East Sussex
23 November 2011	Winning Approaches	Basingstoke, Hampshire
25 November 2011	Winter Tree Identification	Dorking, Surrey

For the full list of workshops and more information please visit: www.ieem.net/workshops.asp

IEEM Masterclass Series

28 October 2011	European Protected Species: Legal Training Seminar for Ecological Consultants	London
11 November 2011	Protected Species: How Local Planning Authorities Should Discharge Their Legal Duties	Birmingham
17 November 2011	European Protected Species: Legal Training Seminar for Ecological Consultants	Manchester
25 November 2011	Protected Species: How Local Planning Authorities Should Discharge Their Legal Duties	London
19 January 2012	European Protected Species: Legal Training Seminar for Ecological Consultants	Birmingham
26 January 2012	Protected Species: How Local Planning Authorities Should Discharge Their Legal Duties	Edinburgh
9 February 2012	Protected Species: How Local Planning Authorities Should Discharge Their Legal Duties	Manchester

NEW !!!

For more information please visit: www.ieem.net/masterclasses.asp (More information also on page 38)

IEEM Geographic Section Events

14 September 2011	West Midlands Section AGM (followed by two guest speakers) ***FREE EVENT***	Stoke-on-Trent
5 October 2011	Scottish Section AGM and Conference - Technological Advances in Ecological Monitoring	Battleby, Perth
6 October 2011	North East England Section AGM and guest speaker Dr Peter Glaves MIEEM - Ecosystem Services: This Year's Buzz Word or a Useful Tool for Practitioners? ***FREE EVENT***	Newcastle-upon-Tyne

For more information on IEEM Sections please visit: www.ieem.net/geographicsections.asp