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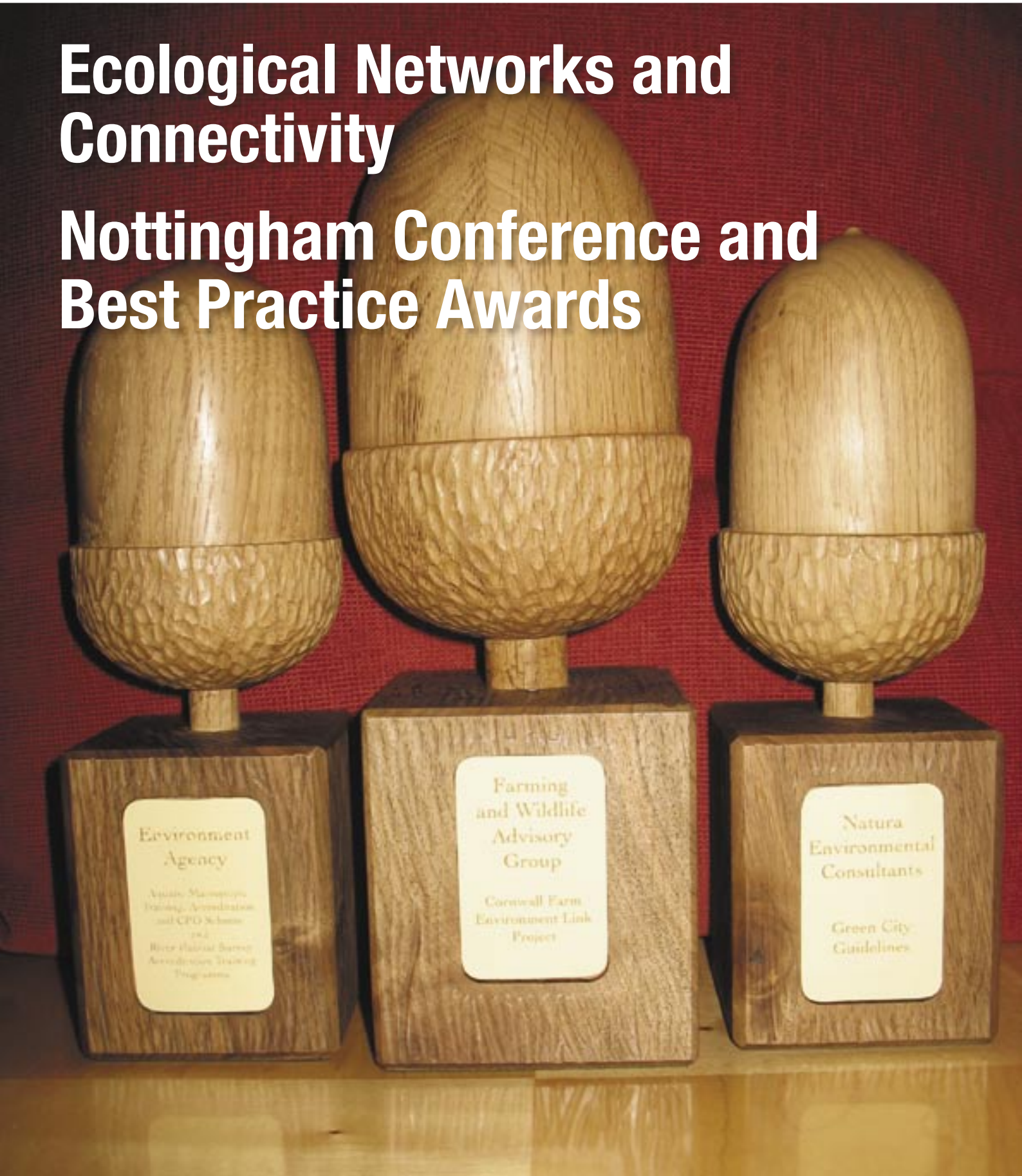
Ecological Networks and Connectivity

Nottingham Conference and Best Practice Awards



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British Ecological Society
Countryside Council for Wales

Editorial

Set-aside has been in the news this summer following the announcement in July by the European Commission of its proposal to reduce the rate of set aside to 0% for 2008.

This has been driven by market forces resulting from low cereal stocks after a poor harvest in 2006 and the prospect of a mediocre outlook for the 2007 harvest.

Many IEEM members will remember that set-aside was first introduced in 1988 as a voluntary supply-control measure. It effectively became compulsory in 1992 when it was made a condition of receiving the, then new, EU Arable Area Payments. The quantity and type of set-aside has changed over the years and was set at 8% of eligible arable area in the 2006/07 season.

There is sufficient evidence to support the contention that set-aside has had major environmental benefits. In particular, it has boosted populations of threatened farmland birds such as skylark, yellowhammer, corn bunting, cirl bunting and grey partridge. Scarce arable plant populations have also benefited from set-aside. Set-aside has also contributed to meeting targets for resource protection, for example, by reducing the potentially negative impacts of pesticides and fertilisers on the farmed environment, especially watercourses.

Most commentators predict that there will be large losses of set-aside to arable production following the setting of a 0% rate. Thus, at least some of the environmental gains made over the last 15 years or so could be lost over the next year. In particular, loss of set-aside could threaten the ability to meet the Public Service Agreement (PSA) and UK BAP targets for farmland birds. The loss of set-aside could also reduce landscape connectivity, which may constrain the ability of species to move between habitat patches. Ecological networks is the theme of the IEEM autumn conference entitled 'Making the connections: A Role for Ecological Networks in Nature Conservation'. See the conference report on page 28.

The most straight forward solution would be to introduce a new cross compliance condition under which a percentage of arable land is managed for environmental benefits. Alternatively, extra resources could be made available for agri-environment schemes to mitigate the impact of the loss of set-aside on key environmental features.

However, it is unlikely that these measures will be adopted as DEFRA favour a voluntary approach whereby it will be left to farmers to continue to deliver at least some set-aside. Continued monitoring of key farmland biodiversity indicators will be essential to see if this approach is successful.

Richard Jefferson CEnv FIEEM
Senior Specialist (Grasslands), Natural England

Merry Christmas and Happy New Year!

Everyone here at IEEM would like to wish you a wonderful Christmas and a prosperous New Year!

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Cover image: The three acorn trophies, created using sustainable methods by Deryck Gilham, ready to be presented to the winners of the IEEM Best Practice Awards 2007.

Photography: Jason Reeves AIEEM

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.

Environmental Stewardship: From Disfunction to Connectivity

Professor Roger Crofts CBE
IUCN World Commission on Protected Areas

Introduction

Those working in the field of ecology and environmental management wish to see gradual improvement in environmental quality. In our highly managed environments in the UK, the reality is that maintaining environmental quality and natural environmental processes is not getting any easier. The situation is complex. There is a wide variety of owners and managers of land having different objectives, and managing their land for different outcomes. There is a plethora of strategies and plans. And the number of bodies, governmental, private and charitable, makes the position confusing to say the least. Fragmentation of habitats is continuing as a result of agricultural intensification, under-management of land, urbanisation, renewable energy infrastructure and improved transportation networks. One might conclude that, despite the great efforts on biodiversity and landscape diversity conservation in the last decade and a half, the battle is not being won.

Many talk of connectivity as the answer. I consider this is the case but not just in the traditional sense of ecological connectivity between habitats and using corridors to build networks of protected areas. To achieve connectivity is a rather more complex business as I shall argue in this paper. It requires connections beyond the purely ecological if it is to succeed.

Disfunctions

Much of the problem is a result of the lack of connections between different polices, of old style thinking and action, and of the failure to get the message through to those who make the key decisions.

There are many disfunctions around us and many are still occurring. I shall state just a few to emphasise the challenge that we have to face and overcome if improved environmental stewardship is to be achieved.

On many soft coasts and along the lower and middle reaches of rivers hard engineering solutions are still favoured despite the unbelievable mistakes of the past that have undermined the natural working of these systems. The political and economic imperatives to safeguard land and building appears to ignore environmental common sense.

The Mid-term Review reforms of the Common Agricultural Policy (CAP) are bringing greater intensification in the prime agricultural, especially arable, areas, and under-management and near abandonment in the hill areas where sheep numbers are declining rapidly. Is this what we really intended through the formulation of new agri-environmental programmes in the 1990s and the breaking of the link between financial support and production? I do not think so. There are unintended environmental consequences which must be addressed in the next review.

Protected areas are not working because habitat fragmentation is a major problem and there is insufficient public and political support. The 'benefits beyond boundaries' arguments, so well set out at the 5th World Parks Congress in Durban in 2003, have not been well articulated and there is an uneasy truce between local communities and protected areas authorities. More significantly, the long-standing ideas of buffering protected areas from the surrounding non-protected territory have rarely been implemented, despite the long-standing thinking and action under the UNESCO Biosphere Reserves approach as revised through the Seville Agreement of 1996. And the decade old Pan European Ecological Network (PEEN), as part of the Council of Europe's Pan European Biological and Landscape Diversity Strategy (PEBLDS), has been virtually ignored until literally months ago in the UK. Perhaps a classic case of the 'not invented here' syndrome. We are so far behind in our thinking and especially in our action in the UK compared with many other parts of the world that it is little wonder that habitat fragmentation continues and the ecological durability of protected areas is not secured.

A vast effort has been invested in implementing Natura 2000. But little thought has been given to the fact that it is an old fashioned, site based mechanism, a top down classification approach, and can only succeed because the legal basis is very strong. The identification of sites has become a political bargaining mechanism between the NGOs, Member State governments and DG Environment. Is it worth the effort? To call it a network is a great fallacy: it is a series of unconnected sites, maybe better termed a suite. But certainly not a network in any ecological sense of the term. It ignores the delivery agents, ignores modern consultation processes with legitimate stakeholders, and ignores the dynamics of nature. In addition, Article 10, the door to connectivity, is something that DG Environment officials have avoided considering until a few months ago.

There are many worthy efforts on landscape. Rebuilding the stone walls and bringing back the hedgerows are important, but are hardly going to solve the problems of fragmentation and loss of key cultural features. The European Landscape Convention is a step forward and certainly better than the original ideas favoured by some of our British colleagues for a directive-style approach. It is only now that the statutory agencies have been given the support from government to develop implementation plans for the component countries of Great Britain. The International Council on Monuments and Sites (ICOMOS) UK/IUCN UK Landscape Working Group is helping to stimulate action on implementation. In this work, we must be careful not to isolate natural and cultural components of landscape, as they are part and parcel of the whole.

Then there is the challenge of new uses of land. There remain polarised views on the benefits of the production of vegetable oil from oil seed rape despite its visual intrusion and its negative effects on the human nostrils and respiratory system. There

Professor Roger Crofts (on the right) is thanked by IEEM Vice-President, Dr Eirene Williams

are certainly also divided views on the development of energy crops: are they environmentally neutral, are they preferable to energy from any forms of fossil fuel sources? Surely, we should be reducing energy consumption dramatically: that is what the Royal Society of Edinburgh report on energy concluded and that is what the international energy experts advised.

The Convention on Biodiversity (CBD) has arguably been a great advancement in concerting action for biodiversity conservation through the Biodiversity Action Plan (BAP) process. As a result there are hundreds of Species Action Plans (SAPs), some Habitat Action Plans (HAPs), but no EAPs (Ecosystem Action Plans). Where is the ecosystem functionality in all of this to ensure that species and habitats survive and remain ecologically healthy in the longer term?

So far, the potential effects of climate change have not been factored in to managing our important and representative plants and animals, ecosystems and landscapes. There is an urgent need to do this as change is occurring and the predictions of the types of changes in the future are becoming more scientifically robust.

From this rather negative assessment, can we conclude that the UK is: failing to use its knowledge base; ignoring how the environment works; not listening to environmental systems common sense; and not thinking in the longer term? Have we lost the art and science of connectivity? Is our leadership inadequate? Have we any sense of a longer term vision?

Are we already too late? Is it all gloom and doom? Or am I exaggerating to make a point?

Certainly, the approaches in use at present are not the solutions. But I am by philosophy and design an optimist.

I do not think the answer to these questions is entirely negative. We have environmental experts and environmental managers who have long known many of the answers. The issues are keeping our knowledge up to date on the present and foreseeable environmental circumstances, to factor in the social, economic and political contexts to make environmental action relevant, and making sure that those who make decisions and take action are as well informed as possible.

There is a real and ever increasing need for ecosystematic solutions (if I can be excused the use of such a term). We need a new Ecosystem Approach. I am becoming less convinced about the approach under CBD Conference of the Parties (COP) Decision V/6. Although its basic philosophy is sound, its 12 Principles and five Operational Guidelines mean all things to all people and has not been taken on board in the UK despite presentations many years ago on the approach to senior departmental and agency officials.

The basis of the new approach is 'connectivity' in a variety of ways. The remainder of the paper sets out my suggestions in the form of 'The Three-Point Plan: integration and connectivity'.

The Three Point Plan

1. Connecting Nature

In any approach to connectivity, restoring and improving connections in nature and in natural systems is essential. Three aspects of connectivity are highlighted.

(1) Connecting Protected Areas

There is a need to develop effective networks and corridors to link the core of protected areas and to achieve adequate buffering from activities beyond the boundaries. Protected areas need to be designed and managed within appropriate bioregions as part of whole ecosystems and whole landscape approaches. The science of networks and corridors is not perfect but the knowledge base is improving all of the time and new work has recently been published that provides an improved scientific basis. In the true spirit of the Precautionary Approach, connecting protected areas through corridors and networks is essential for biodiversity and landscape diversity reasons. The Papallacta Declaration of the IUCN World Commission on Protected Areas (WCPA) mountain connectivity conference in November 2006 supports this approach and stated that:

'maintenance and restoration of ecosystem integrity requires landscape-scale conservation. This can be achieved through systems of core protected areas that are functionally linked and buffered in ways that maintain ecosystem processes and allow species to survive and move, thus ensuring that populations are viable and that ecosystems and people are able to adapt to land transformation and climate change. We call this proactive, holistic, and long-term approach connectivity conservation'.

There are many excellent examples of connectivity approaches, most notably the Meso-America Biological Corridor, and others are being developed, such as the Yellowstone to Yukon Corridor in North America, Alps to Atherton in Australia; these are predominantly in mountain regions but some are in river basins. In Europe, the PEEN system has been developed in a number of central and eastern European countries and the Netherlands to cover the whole of the national territory. In addition, specific corridor initiatives are being developed in the Alps, the Apennines, and the Cantabrians to Pyrenees. There is a great deal of activity in the UK identifying the basis for corridors and habitat networks and these will be described in the conference proceedings. We need a whole range of scales from the local to the national, and covering whole landscapes rather than just the relatively easy parts along the river valleys and in the uplands. One interesting approach is being developed in Wales by Plantlife International as part of the identification of Important Plant Areas. Zones of opportunity are being identified to provide adequate buffering for core areas, create connections between core areas, and providing the basis for environmentally sensitive development.

(2) Connections in Catchments

River basin management is currently torn between meeting the needs for flood alleviation and for developing plans to achieve

favourable ecological status to meet the obligations of the EC Water Framework Directive. The focus on alleviation is inevitable as a result of the increasing number of severe flood events and the predictions that these will become more frequent as a result of global climate change. However, all too often the focus of action is at the point of flooding not on the source of the problems. The issue seems to be 'what is the government going to do about it?' The answer is quite clear; it is not just for the government and its agencies, but also for the land owner and the property owner, and the insurance companies helped by those who have scientific and practical knowledge of the characteristics of river systems. A more natural solution is required rather than building ever higher and ever more extensive flood barriers at the current points of flooding. This requires real river basin planning through implementation of the Water Framework Directive.

The approach needed is simple: get back to the basics of river basin management. A number of measures should be carried out: reducing grazing levels in the headwaters through culling wild herbivores and managing down the sheep flock, stopping upland drainage schemes, improving timber extraction and re-planting methods, removing levees and other flood barriers to farmland, creating new flood plain woodlands and other natural ecological features that retain water, creating holding ponds and stocking them with native fish species, and not allowing housing on flood plains by doing a deal with the insurance industry. None of this is rocket science, so why have we been so incompetent? And why have English Environment Ministers recently said that we cannot avoid some new housing on flood plains?

(3) Connections Through the Soil

Have we forgotten about the ecological and wider environmental role of the soil, not to mention geodiversity as a whole? Admittedly, it is not as bad as 15 years ago when soil productivity was seen as endlessly increasing and soil erosion thought to be non-existent by those working in government agriculture departments. The Good Agriculture and Environmental Code (GAEC) is a great step forward, but let us make sure that it works effectively in practice. And, what about soil biodiversity? A great deal of scientific investment has been made but has it improved practice on the ground?

A new approach is needed centred on 'don't forget the soil'. It is essential that the three main Conventions, CBD, Framework Convention on Climate Change (FCCC) and Convention to Combat Desertification (CCD), have linked and integrated strategies for the soil system. In turn, these should be linked to the achievement of the Millennium Development Goals and taking into account the outcomes of the Millennium Ecosystem Assessment. Adopting these connections might help to achieve some of the Millennium Development Goals. This is what the International Forum on Soils, Society and Global Change held in Selfoss, Iceland, in September 2007 sought to do and is following up with a programme of influencing at international and national levels.

2. Connecting Policy

There is a need to ensure that the key policy instruments are connected to each other and that there is connectedness in their delivery.

(1) Connecting the Delivery of the Convention on Biological Diversity

The UK and its component parts have been rightly praised for their approach, commitment and energy to the implementation of the CBD. NGOs have been the driving force for well over a decade from the original Biodiversity Challenge. It is all the more curious, therefore, that DEFRA appears to be wishing to omit the NGOs from the next stages of the implementation process. This needs to be averted as time has shown that without the commitment and activity of the NGOs, implementation would have been much less effective.

There should be no complacency about implementation in the UK and its component parts. Key elements are still missing. The action plans are over-focussed on species and the underlying thinking seems to forget the basic ecological fact that they will only survive within habitats and wider ecosystems. So there is a vital and urgent need to refocus the action planning effort so that the SAPs are linked into wider HAPs and that Ecosystem Action Plans are developed.

There is also need to recognise the Ecosystem Approach as a classic common sensical integrated approach despite its complexity and to factor in the Approach in revised action plans. And there is also the need to determine how the UK is going to deliver its responsibilities under the Programme of Work on Protected Areas approved by the UK government in 2005. Basically, an integrated action plan on the various aspects of the CBD is urgently needed and that this should go up the scale from the unconnected to the connected.

(2) Connecting Natura 2000 Sites as a Network

Natura 2000 is unique globally by seeking to achieve a consistent approach over 27 countries to the protection of species and habitats. But it has a long way to go to become a functioning network, which is what the Directive calls for. Most policy makers clearly have not a clue what a functioning network is and the Directive's Article 10 is not a great deal of help. The recent guidance developed jointly by IUCN Europe and the Institute for European Environmental Policy (IEEP) should help, along with the work of Graham Bennett. Let us show the way in the UK with the development of Natura networks in practice, not just on paper. This is very challenging and will need careful work with planning and other authorities and with owners and managers of land. It is not an exercise just for experts in the statutory agencies.

Also, there needs to be a formal funding delivery instrument. The review of funding of Natura in 2002-03 gave the answer but it was avoided and ignored by EC officials. We have a mechanism that really cannot be implemented effectively without a formal funding mechanism. The Eurocrats thought they had got out of the muddle by saying that existing funding instruments, such as the CAP, the European Regional Development Fund (ERDF) and Cohesion Funds, should be used. Who were they kidding? Only themselves it seems, as the funding for securing Europe's diversity of species and habitats in the longer term is far from resolved. This leads me to reform of CAP.

(3) Connections Through Reform of the Common Agricultural Policy

The Good Agricultural and Environmental Condition (GAEC) is excellent in theory but in practice the driving force is the global level playing field on world trade and the removal of subsidies. It will prove extremely difficult to achieve the right balance between food production and environmental requirements. For example, ending of set-aside means that habitat and carbon sequestration gains are lost immediately. Why have the arguments for long-term set-aside been ignored when they make such good sense? We should have a new regime which stimulates the highest levels of environmental stewardship: soil management, landscape and biodiversity management, carbon and other greenhouse gas sequestration, water management etc. In other words, a reformed CAP should be the critical instrument for maintaining food production but also

achieving key environmental deliverables. So we really need a Common Environmental Policy instrument which stimulates farmers and other managers of land to produce the wide range of environmental goods and services which society requires alongside continuing to provide food of the highest quality.

We should not forget food production for our own domestic consumption and also for export into European and global markets; and also the ability to increase production as our national part in satisfying the increasing global food demand. Strategic approaches to safeguarding the most productive agricultural land, Classes 1 and 2, were phased out quietly many years ago. We need an approach that allows UK plc to supply food for the world market and allow for the possibility of expanding agricultural production to meet world demand and, at the same time, maintain the highest environmental standards at the system scale. Allowing permanent development over the best agricultural land does not seem to me to be a very wise use of a non-renewable resource: the soil. We need to develop a more integrated, strategic and long term land use policy, rather than just grabbing at short-term solutions for specific problems like the provision of housing land.

3. Connecting Organisations

The third connection has to be about ensuring that people, in the form of organisations and stakeholders, are connected into environmental decision-making and environmental action. They are just as vital as nature and natural processes in our developed world.

(1) Connections Within Organisations

Too many organisations fail to be effective because they do not have a single culture: staff operate as separate groups; they fail to exchange knowledge and information; keep information as private material; and have strategies that are not accepted by all members. Phrases like 'herding cats' and 'the silo mentality' are resonant with, and are a constant source of frustration to, the organisational leaders.

The ingredients of the solution are simple but not always easy to implement, as I know from practical experience both in the public sector and more recently in the NGO sector. Leadership from the top, collective agreement on the direction, inclusive approaches through a process of developing new ideas and practical solutions, ensuring closure of debate and the move to implementation, and the development of measurable deliverables are all key elements. To achieve this transformation is not without pain and frustration, but failing to act as one organisation with a clear sense of purpose and key measurable deliverables is an abrogation of responsibility on the part of the leadership and top management, and represents a state of anarchy on the part of staff. Sadly, this has been the case in the past in the conservation world and is still the case is some organisations. Frankly, for those who cannot contemplate accepting the necessary organisational structure and cultural changes, the only route is the exit one to somewhere else.

There is another very important element in making sure that organisations are functional and that they are delivering: connecting strategy and policy with both scientific and practical knowledge. This should be a continuing iterative process and not just from science to policy and practice, as all elements can inform and improve practice with others. My recent experience as a non-executive director of a knowledge transfer organisation (the Scottish Agriculture College) proves to me the essence of transferring learning from the field and the farm to the laboratory and the experiment, and to the need for a policy development unit to harness collective wisdom and develop new ideas.

(2) Connections Between Organisations

The need for connections between organisations has been accepted for a long time. Indeed, in the conservation world it was one of the drivers behind the merger between the Scottish arm of the Nature Conservancy Council and the Countryside Commission for Scotland, and the formation of the Countryside Council for Wales in a similar manner way back in 1989. As someone deeply involved as a central government policy maker and then a public sector implementer of the changes in Scotland, I remain convinced of the benefits of mergers. I am naturally delighted, therefore, with the establishment of Natural England. At long last this puts behind us the nonsensical separation of landscape and nature enshrined in the 1949 Act and the two different strands of thinking from the ecological and landscape schools developed from the mid 1930s onwards. And, I am pleased, in retrospect, that the Joint Nature Conservation Committee has a new statutory basis. But it does need to operate more effectively at the strategic UK and European levels in a way that the original body was never allowed to by its controllers in the agencies (and that included me personally as a CEO). But these are not the only connections.

There are critical ones between all parts of government, both national and local and with the statutory agencies on land use, planning, development control, regional economic strategies. And with the development of a more federal approach in the UK, there is the need to ensure that devolution of authority to Scotland, to Northern Ireland, and to a lesser extent to Wales, does not mean parochial approaches and a failure to recognise that connecting the pieces means transcending political and administrative boundaries, and also continuing to show leadership in the wider world of Europe and beyond. Here the role of the NGOs, individually and especially collectively, is so important. I welcome the success of the various national and regional LINKS and their sectoral offshoots, such as the Plant LINKS. The weight of collective knowledge and experience being brought to bear on government policy and action is vital if we are to develop more connected approaches than in the past. I also welcome the deep connections between the NGOs and the government and its agencies as the former are an excellent delivery vehicle for the latter's plans as I see regularly through the deep connections between Plantlife International and the three statutory agencies. But, a word of warning: do not let the connections get so deep and embedded that the NGOs feel that they cannot criticise what government is or is not doing and that they cannot act as the agent provocateurs. I fear a little of this over closeness is occurring in Scotland in the desire to have Ministers' principal advisers sitting at all of the tables of decision-making.

(3) Connections Between Stakeholders

Last, but by no means least, in my list of necessary connections is that between stakeholders and the proper inclusion of stakeholders. The traditional approach is one of stand-offs with those regarded at best as 'not one of us' and at worst as 'the enemy'. Stakeholders should be engaged in strategy and policy development and most significantly in implementation. In defining who the stakeholders are, we must be more radical than cautious. We need to break down the barriers that still exist and we need to view the world not just through our own environmental eyes but seek to understand it from the perspective of others. There is a great deal of good practice that we can learn from. There is also an increasing number of those with expertise and experience in stakeholder engagement. We should use them rather than thinking that those of us in the environmental field have all of the answers.

There are many new relationships that need to be developed, either because there is risk aversion from other interests, or because there are opportunities which would not be taken up.

Let me give three examples from my recent experience. First, seeking financial support from the traditional banking sector for pro-biodiversity business (as it is now called) still proves to be very difficult if not impossible. Fieldfare International Ecological Development plc has found this problem for projects in the Ukrainian section of the Danube delta. Although there are various Europe-wide initiatives on pro-biodiversity business and a great deal of debate, what is needed is leadership from the money lending institutions to set up facilities to encourage pro-biodiversity business. Second, there have been stand-offs for many years between the environmental community and the extractive industries. One of the breakthroughs has been to use the convening power of IUCN – The World Conservation Union to open productive dialogue between the two interests. Third, the PANParks initiative in Europe deliberately focuses on the linkage of core protected areas of wilderness characteristics and sustainable local tourism businesses. There are now seven certified sites around Europe where partnerships between the protected areas authority and local tourism business partners are in progress.

If I have learnt only one thing from my years of roaming around the IUCN world, and especially with my protected area colleagues, it is that ignoring the key stakeholders is a recipe for friction, for non-delivery and for outright opposition, whereas effective inclusion brings so many benefits. I recall at the 5th World Parks Congress in Durban in 2003, my greatest satisfaction in leading the Durban Accord and Action Plan process was the engagement of the statutory sector, the NGOs of all sizes and shapes, the youth constituency, the community caucus and the developmental interests. It was therefore of no surprise that the Durban Accord was approved by all three thousand participants by acclamation. Those who have the legal entitlement to the natural resources and those who have the traditional knowledge of their sustainable stewardship are without doubt key participants in any process of consensus building. The outstanding work done around the developing world by IUCN colleagues, such as Gracia Borrinni-Feyerband, is testament to the progress that can be achieved. Certainly from a more parochial perspective, the consultation processes developed by Scottish Natural Heritage for the proposed Loch Lomond and the Trossachs National Park, and then improved consultation measures to engage with all of the local and national communities of interest for the proposed Cairngorms National Park, meant that the proposals to Ministers and then to the Scottish Parliament were rather more easily agreed to than if there had been the more traditional half-hearted attempts at consultation. It is vital therefore in developing connectivity on the ground that all of the relevant stakeholders, and most especially those that own and manage the land, are involved throughout.

So how do organisations connect all of the pieces together? It needs a combination of visionary and practical approaches, addressing the needs of nature and the environment, considering the factors that drive the current and future circumstances, and developing a clear plan of action. This must be accomplished with the active participation of all staff and the input of stakeholders. Scottish Natural Heritage developed such an approach in the late 1990s and published the outputs in 2002 as its Natural Heritage Futures Programme.

Overview

So the ingredients of a new approach (I hesitate to call it a new paradigm as it is becoming such an out-moded phrase) are:

- ecosystematic functionality understood and practised;
- evolution from the CAP to the Common Environment Policy;
- from protected areas in isolation to whole landscape approaches with protected areas linked by corridors to form ecological networks; and
- from unconnected to connected organisations and policies.

If the three groups of connections outlined are treated separately then it will amount to not very much, but if they are integrated then the outcome will be that the whole is greater than the sum of the parts. In other words, a connected and integrated approach brings substantial benefits.

The Connections

In Nature

- Connecting protected areas through corridors
- Connecting through catchments
- Connecting with the soil

In Policy

- Connecting CBD delivery
- Connecting Natura 2000 sites
- Connecting CAP reform

In Organisations

- Connecting within organisations
- Connecting between organisations
- Connecting with stakeholders

If we can achieve these connections, then I believe that we will build more resilience into our natural systems to withstand natural and human change, such as climate change, and infrastructure development. We will have more effective deployment of public sector resources. Hopefully, we will also gradually overcome fragmentation in the landscape and in institutional mindsets.

What Should IEEM and its Members Do?

There is a clear role for IEEM, beyond its organisation of this important conference and publishing the proceedings. It is essential to get the message over to decision makers and their advisers. Do not be reluctant to do a little lobbying just as other professional institutions do so effectively. Also, I hope that Fellows and Members of the Institute who attended will promote the ideas and practices shared at the conference.

Coupled with this advocacy approach is the need to have continuing professional development focussed on new ideas and new approaches, and also refreshing the good and well tried and tested ideas and practices from the past. IEEM should also have effective CPD that reflects modern ideas and those that have stood the test of time and the hard-won experience of your members themselves. The adage should perhaps be 'do not let the latest fashion blind you to the well tried and tested solutions and approaches of the past'.

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The Natura 2000 Network: The First 15 Years

John Houston CEnv MIEEM
Biodiversity Project Officer, Sefton Coast Partnership and Natura 2000 Ambassador

With the near completion of the Natura 2000 network a vision set out in the EU Habitats Directive some 15 years ago is becoming reality. Already 26,000 sites have been identified; attention has now turned to how we can find the skills and resources to manage this vital global project.

Article 3 of the EU Habitats Directive established Natura 2000 as a coherent European ecological network of special areas of conservation. It also included in Natura 2000 Special Protection Areas (SPAs) classified under the Birds Directive and made clear that Natura 2000 was part of landscape-scale ecological networks (further developed through Article 10). The Habitats Directive and Birds Directive form the cornerstone of Europe's nature conservation policy; Natura 2000 is the flagship.

Sites in the network are selected within biogeographical regions. This approach has had the added value that Member States have been required to work together and across territorial boundaries to prepare the final lists of sites. The selection of sites based on regions rather than political boundaries has enabled Accession Countries to fit in with the existing pattern. Expansion of the EU to 27 Member States has introduced the Black Sea, Steppic and Pannonian regions and numerous habitats and species, adding to the overall high biodiversity value within the borders of the European Union. The EU Interpretation Manual of habitats, which further describes the habitats of Annex I of the Directive, has also been updated.

Sites of Community Importance (SCIs) are proposed by Member States. Then, with the assistance of the European Topic Centre on Biological Diversity, independent scientists, Member State experts and NGOs, the Commission evaluates these proposals with the aim of creating a consistent, coherent and representative network of sites. In most cases the initial lists prepared by Member States were considered inadequate. A series of regional seminars was held to work towards the final provisional lists, which could then be adopted. The provisional list for the Atlantic region, for example, was adopted in December 2004. The provisional status of the list is partly a reflection of the need to add more marine sites at a future date.

After the Commission has accepted the Community lists of Natura 2000 sites Member States are responsible for taking all necessary measures to guarantee the conservation of their sites and prevent their deterioration. The Habitats Directive gives Member States up to six years to designate the areas as Special Areas of Conservation (SACs) (Article 4(4)). The UK, through the Habitats Regulations 1994, fast-tracked this process giving all candidate SACs full protection.

Progress reports are required every six years under Article 17 of the Habitats Directive. The first reporting round could only really report on experiences in adopting the Habitats Directive: evaluation of progress towards biodiversity targets was not possible (report COM(2003)845 final). Currently Member States are preparing their submissions for the second reporting round. These are likely to be more thorough assessments of progress towards favourable conservation status for habitats and species but again it will probably be difficult to prepare an accurate EU assessment. The UK response is being coordinated by the Joint Nature Conservation Committee (JNCC) (see www.jncc.gov.uk/article17).

So Where Are We Now, 15 Years On?

The legal deadline for the adoption of lists of Community importance was 10 June 1998. Thus all SCIs should have been designated as special areas of conservation by 2004 at the latest. These deadlines were obviously not met. The sometimes painfully slow progress with SPA classification and SCI selection is measured on the Natura Barometer, published in *Natura 2000*, the newsletter of the Nature and Biodiversity Unit of the European Commission.

The initial timescale fell well behind and the process often became mired in conflict and concerted opposition from some quarters. However, as dialogue continued, key sectors such as farming, forestry, fishing and hunting have been persuaded that Natura 2000, whilst often being challenging, need not threaten traditional ways of life and can help to sustain the natural resources on which they depend.

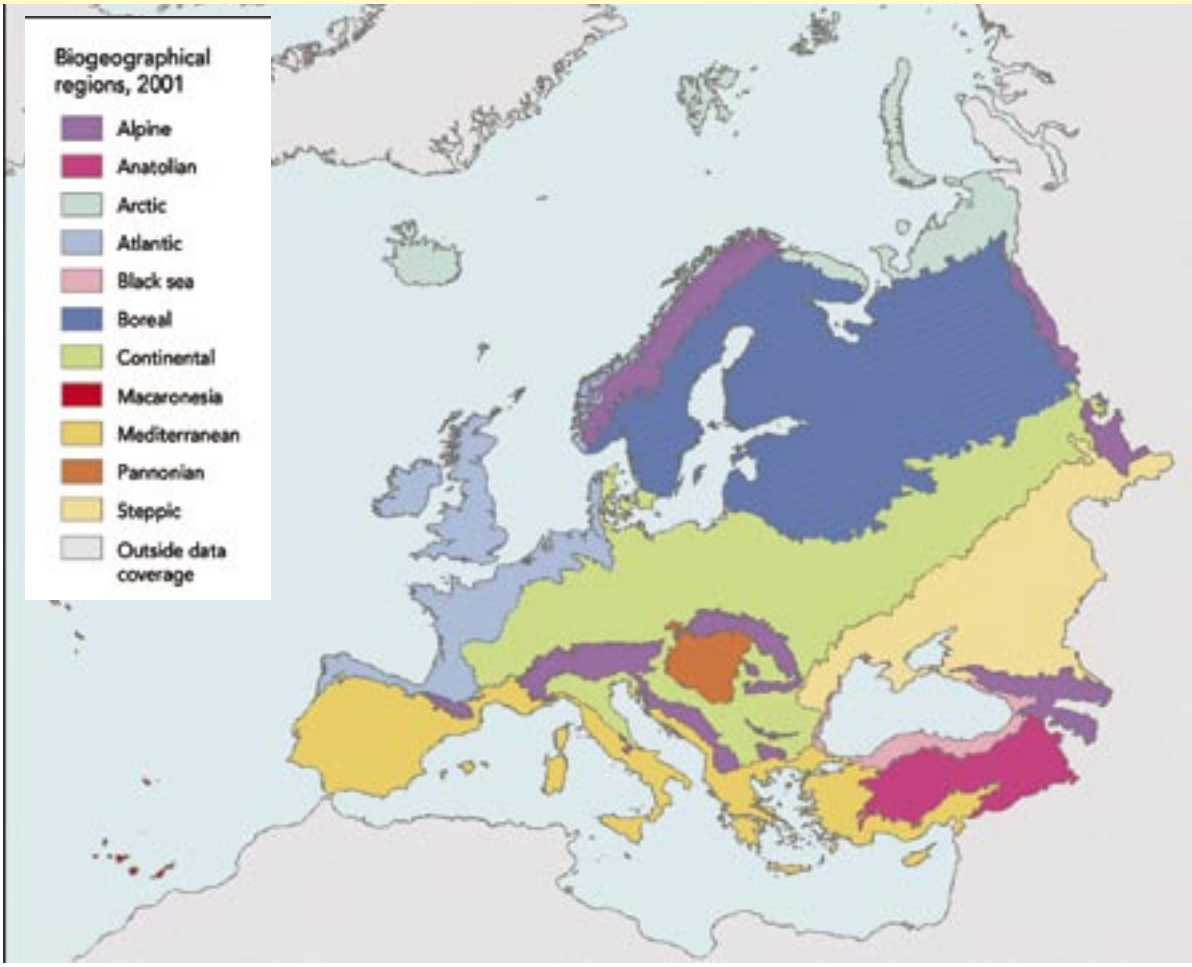
In the early years the LIFE-Nature programme was used to good effect to assist with national inventories (*e.g.* in Ireland) and with the establishment of management plans (*e.g.* in France). More recent LIFE-Nature projects have supported pilot and demonstration projects linking conservation to farming, forestry, hunting, fishing and military activity. Such projects have attracted the support from bodies such as the European Landowners Organisation, now a key partner in the Natura Networking Programme.

The adoption of the Habitats Directive and its transposition into UK law through the Habitat Regulations was efficient and built on existing science and designations such as Site of Special Scientific Interest (SSSI) and Area of Special Scientific Interest (ASSI). But it was hardly enthusiastic and the conservation officers of the statutory agencies appeared to be little more than messengers in the lengthy process of designation. At the time the emphasis appeared to be on the legal aspects of site protection rather than any long-term benefits that might result from taking part in the EU project.

There also appears to have been limited exchange of knowledge between the other Member States in the Atlantic Biogeographical Region compared, for example, with the various pilots associated with the introduction of the EU Water Framework Directive. In hindsight, knowing now how Natura 2000 is linked to a raft of EU funding opportunities, we might have taken more time to think through a new approach to the management of protected sites and perhaps added buffer zones around sites (*e.g.* mire systems) and corridors between sites. The Habitats Directive, however, did encourage the amalgamation of some sites into either larger units or site complexes (*e.g.* the Border Mires) that has helped with management planning and strategic funding bids (*e.g.* to LIFE).

In comparison, several Member States have identified large Natura 2000 sites with core and buffer zones in a landscape-scale approach. The new Member States, rich in biodiversity, but perhaps also recognising the need to access EU funding, not just for nature, but also for agriculture and forestry, have proposed considerable areas of their territory for the Natura 2000 network.

In terms of terrestrial area of SCIs, the UK lies at the bottom with only 6.5% of the land area identified for protection through the Habitats Directive. The average across the EU's 27 Member States is 12.8%. Those Member States with over 15% of their terrestrial area within the network are Estonia (16.5%), Spain (23.4%), Greece (16.4%), Hungary (15%), Luxemburg (15.4%) and Slovenia (31.4%). In terms of marine area, though, the UK does fare better with 41 sites covering over 9000 km^2.



Indicative Map of the Biogeographical Regions of Europe (European Commission, April 2005, Cartography by the ETC Biological Diversity)

Funding for Natura 2000

The maintenance of the Natura 2000 network should in principle be covered by national budgets. However, Article 8 of the Habitats Directive does provide for the possibility of Community co-financing of activities such as management plans, recurring management, habitat restoration and monitoring.

The financing of the network was addressed in the discussions of an Expert Working Group on Article 8 of the Habitats Directive. Its estimate for the funding necessary was over €6 billion a year (EU 15) based on Member State responses to a questionnaire. In its Communication on the Financing of Natura 2000 to the Council and the European Parliament (COM(2004) 431 final 15th July 2004) the Commission presented its ideas about how the financial needs of Natura 2000 could be integrated into the different Community Funds and what measures could possibly be financed by them.

The Commission argued that the preferred 'integration option' will ensure that the management of Natura 2000 sites is part of the wider land management policies of the EU. Thus farming inside Natura 2000 sites will be part of the Common Agricultural Policy financial support. The option will also allow Member States to set priorities and to develop policies and measures which reflect their national and regional specificities.

The *Financing Natura 2000* guidance handbook gives guidance on the new range of funds available in the period 2007-2013. Whilst Community funding for nature conservation has been revised significantly, the funding streams open up the possibility of making much more finance available for nature. The Handbook aims to help national authorities identify opportunities for EU co-financing of Natura 2000 and to encourage these opportunities to be fully incorporated into national and regional funding programmes. It focuses on the main EU funding instruments including the Structural Funds, Cohesion Fund, European Agricultural Fund for Rural Development (EAFRD), European Fisheries Fund, LIFE+ and 7th Research Framework Programme (FP7).

Wider Benefits of Natura 2000

The Natura 2000 network can bring considerable economic and social benefits. These include the provision of ecosystem services, the supply of food and wood products, the creating of employment and reduced local environmental problems.

There is an urgent need for much better communication to the wider public about the benefits of Natura 2000. However, this can prove difficult when trying to explain the difference between the 'hard' side of Natura 2000 (*e.g.* the requirements of Article 6 in relation to development) and the 'soft' side (the partnership between people and nature). Most professionals are more familiar with the contentious issues associated with Natura 2000 and proposed development.

It has taken several high profile disputes, such as the Dibden Bay inquiry, to make Member States, developers and the general public realise that this is a Directive with teeth, which enjoys the general support of citizens and which can be applied evenly across Europe. It is reassuring to know that a port development in, say Greece, should be treated in exactly the same manner in the eyes of the European Commision as a port development in the UK. The Commission has recently published details of several of these cases.

However, it has often been an uphill struggle to get land

managers and conservation bodies to see the big picture beyond their local issues. Rather too late in the LIFE-Nature programme it became a requirement for projects to display and promote the Natura 2000 logo. We are now seeing Natura 2000 on more interpretive material and signs (for example, on all Natural England National Nature Reserve signs) but can site staff talk with enthusiasm and knowledge about the network and its significance? Networking initiatives such as Eurosite's long-running twinning programme and workshop programme can help to break down the knowledge barriers, but we need to disseminate much more information for people working on sites to become champions of Natura 2000.

Best practice examples, drawn from LIFE-Nature projects can be found in the report *LIFE-Nature: communicating with stakeholders and the general public*. This celebrates the 'soft' side of the Directive with the message 'Natura 2000: Europe's nature for you'.

The Natura 2000 Networking Programme

The European Commission is providing an increasing level of funding to help promote good practice in the management of habitats and species and is encouraging networking within and between land management organisations. Ongoing projects include the development of a communications tool to share good practice, management models for habitats which require on-going (recurring) management, the development of electronic libraries and the Natura 2000 networking programme.

The Natura Networking Programme promotes partnership building at local level and raising awareness about Natura 2000 with the public and stakeholders through events such as Green Days. The current programme is led by a partnership between Eurosite (a European network of organisations devoted to nature conservation management), The EUROPARC Federation (the umbrella organisation of Europe's protected areas) and the European Landowners Organisation (representing the interests of large and small landowners and traditional countryside management). Further information can be found at www.natura.org. The main programme involves the sharing of information and experience between the partners and their member organisations, joint training events and a series of national and regional workshops to raise awareness of Natura 2000.

The Natura 2000 Partner Award Scheme

The European Commission is preparing a new award scheme for recognising persons, organisations and institutions in good practice in the management of and communication on Natura 2000 sites. The outline plan is to offer the reward 'Natura 2000 partner' to people who make significant contributions to management and awareness raising. There would be a national selection process and the top awards presented by the European Commission. The new award scheme is expected to become operational as from 2009.

The selection of sites is largely complete in several regions and key stakeholder groups are offering unprecedented support for Natura 2000. We are now at the beginning of a second phase, a stage linked to the European funding streams for 2007-2013 and to partnership, communication and engagement.

References and Sources of Information

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European Commission (2005) *Natura 2000: conservation in partnership.*

European Commission (2005) *Financing Natura 2000;* guidance handbook.

European Commission (2005) *Natura 2000 in the Atlantic region.*

European Commission (2005) *Natura 2000 - Europe's nature for you.*

Commission Decision 2004/813/EC of 7 December 2004 adopting, pursuant to Council Directive 92/43/EEC, the list of sites of Community importance for the Atlantic biogeographical region.

Web Links

Barometer: http://ec.europa.eu/environment/nature/natura2000/barometer/index_en.htm

Table of SCIs: http://ec.europa.eu/environment/nature/natura2000/barometer/docs/sci.pdf

Financing: http://ec.europa.eu/environment/nature/natura2000/financing/index_en.htm

Newsletter: http://ec.europa.eu/environment/nature/info/pubs/natura2000nl_en.htm

Case law: http://ec.europa.eu/environment/nature/legislation/caselaw/index_en.htm

Publications: http://ec.europa.eu/environment/nature/info/pubs/paper_en.htm

Good practice: http://ec.europa.eu/environment/nature/natura2000/management/gp/index.html

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Natura 2000 Networking Programme on behalf of the European Commission

Natura 2000 Networking Programme managed in partnership by project partners EUROPARC Federation, Eurosite and European Landowners Organization (ELO)

Nodes in Green Networks: Local Nature Reserves for Local People Across the UK

John Box CEnv FIEEM, Steve Berry, Peter Cush, Ian Angus and Pete Frost

Planting reeds in Telford Town Park LNR, Shropshire Photo: John Box

People, wildlife and green networks are about the everyday contact with nature that is important for our well-being and quality of life. Local Nature Reserves (LNRs) are important for the conservation of biodiversity and geological features at a local level. LNRs are best seen as nodes in multi-functional green networks because this sets them in a landscape context, values them as part of the environmental resources of a local authority area, and draws attention to their excellence as sites of nature conservation value (Barker 1997).

Local Nature Reserve is a statutory designation and the number of LNRs across the UK has increased from 24 in 1970 to 236 in 1990, 629 in March 1997 and around 1,500 in 2007.

Sustainability demands that environmental capital is not diminished from one generation to the next. The next generation will only know what it finds and will not be able to fully comprehend past losses. Reference to specific LNRs or potential LNRs in local plans, unitary development plans and emerging local development frameworks provides a positive land use for each site and demonstrates to everyone that the primary land use is nature conservation. Such a land use allocation helps to move away from the idea, particularly in urban areas, that nature conservation only occurs on land which has no other use.

Therefore, important sites such as LNRs need systems that can deliver good site management in order to maintain the quality of the resource in the long term. Large sites are more likely to be able to accept multiple use without damage and can provide a greater variety of opportunities for local people to use and enjoy. But in many urban areas the severe constraints of high land values and existing land uses mean that only small sites are practicable as LNRs. It is increasingly being recognised, however, that even very small LNRs are valuable not only in terms of their ecological and educational benefits but also in supporting more sustainable communities, for example through their contribution to people's health and well-being.

The provision of green networks and greenspaces by local authorities, particularly in urban and urban fringe areas, should make more use of the toolkit provided by the accessible natural greenspace standards (ANGSt) (Handley *et al.* 2003). Some may perhaps argue that there is no room for more LNRs or natural places in crowded urban areas. But why not create them? The challenge is for local authorities to turn areas like mown amenity grassland into more interesting and stimulating natural greenspace and to work with developers to incorporate accessible natural greenspace into new developments.

The current position for each of the four countries in the UK is set out below.

England (Steve Berry, Natural England)

When the Nature Conservancy Council was wrapped up in April 1991 there were 231 LNRs in England, meaning that an average of fewer than six a year had been set up in the preceding 40 years. However, by the end of July 2007 the total had grown to 1,380 and the yearly average for new LNRs had, since 1991, risen to 78!

There were especially dramatic increases in the years 1999 to 2006, fuelled by the Wildspace! grant scheme, financed by the Big Lottery. This channelled over £7 million to encourage both more and better LNRs, through projects working for people, places and nature. A vital feature was the funding of 'Community Liaison Officers' whose role included embedding reserves into the heart of local communities, particularly by setting up 'Friends of…' groups, later to become self-sustaining.

Since the late 1980s, LNRs have become smaller and less likely to have the status of Site of Special Scientific Interest (SSSI). New reserves are now more likely to be near population centres than in rural areas. Some are run entirely by their local community, with minimal direct involvement by a local authority.

In 1996, English Nature set a target for a minimum provision of one hectare of statutory local nature reserve for every 1,000 residents (English Nature 1996) as one of the accessible natural greenspace standards in towns and cities (English Nature 2004). Although this looked impossibly ambitious (or visionary!) many local authorities have since met this target. Some have even exceeded it and it is now beginning to look achievable right across the country. This is demonstrated in the findings of a recent survey of 25 urban local authorities in England (Box 2007) which are included with a short commentary in Table 1.

The indications are that Natural England, which has placed the enjoyment of nature by people at the heart of its thinking, can be expected to continue to give both encouragement and practical support to LNRs in the future.

Northern Ireland (Peter Cush, Environment and Heritage Service)

Legislation in Northern Ireland in relation to LNRs only came into effect in 1985. Since then progress in their declaration has been very slow. After 22 years there are still only seven!

However, the Local Biodiversity Action Plan (LBAP) process, which kicked off in district councils in Northern Ireland in 2004

has seen a renewed interest in LNRs with two of the total of seven declared just last year and a further five candidate LNR sites in the pipeline. Within a year, therefore, the total number declared over a 22 year period could double.

The Environment and Heritage Service will publish guidance on declaration this year. Coupled with a lot of local activity and interest in the LBAP process, this should lead to a further significant increase in LNR declaration.

As with England, Scotland and Wales, a significant development in Northern Ireland has been the promotion of LNRs as areas where people can have contact with nature rather than a full scale emphasis solely on the nature conservation value of sites when considering suitable sites for declaration. LNRs in Northern Ireland are now being declared and promoted as areas of land designated by district councils to conserve their nature conservation, earth science and recreational value, with the primary land use being for conservation purposes. This primary land use does not of course rule out the very positive and proactive role that LNRs have in promoting interaction and everyday contact between people with nature. They provide opportunities for a wide range of informal recreation, are a great outdoor accessible educational resource and have an important role in raising people's awareness of biodiversity conservation.

Table 1
Provision of Local Nature Reserves in a selection of urban Local Authorities in England in 1993 and 2006

Local Authority	1993 Population[1]	1993 LNRs Total area (number)[2]	1993 Population per ha LNR	2006 Population[3]	2006 LNRs Total area (number)[4]	2006 Population per ha LNR	Comments
Less than 1000 residents per ha LNR (in 2006)							
Gloucester	91,800	4.3 ha (2)	21,349	109,885	169.5 ha (7)	648	**Large improvement & achieved target**
Canterbury	127,100	143 ha (3)	889	135,278	177.7 ha (10)	761	**Improving & achieved target**
Wakefield	306,300	313 ha (7)	979	315,172	401.5 ha (10)	785	**Improving & achieved target**
Norwich	120,700	52.5 ha (5)	2299	121,550	136.2 ha (8)	892	**Improving & achieved target**
Stoke-on-Trent	244,800	82 ha (1)	2985	240,636	246.4 ha (9)	977	**Improving & achieved target**
1,000 - 5,000 residents per ha LNR (in 2006)							
Dudley	300,400	181.7 ha (4)	1653	305,155	274.6 ha (7)	1111	**Improving & target in sight**
Leeds	674,400	605.4 ha (5)	1114	715,402	613.0 ha (8)	1167	**Static – but very large area of LNR in 1993 – target in sight**
Sandwell	282,000	30.3 ha (2)	9307	282,904	205.8 ha (9)	1375	**Large improvement**
Coventry	292,500	48 ha (3)	6094	300,848	216.7 ha (14)	1388	**Improving**
Derby	214,000	9.3 ha (1)	23,011	221,708	143.2 ha (7)	1548	**Large improvement**
Portsmouth	174,700	119 ha (1)	1468	186,701	119.0 ha (1)	1569	**Getting worse**
Plymouth	238,800	105 ha (5)	2274	240,720	146.1 ha (7)	1648	**Improving**
Peterborough	148,800	51.4 ha (2)	2895	156,061	81.2 ha (5)	1922	**Improving**
Barnet	283,000	4.9 ha (1)	57,755	314,564	158.5 ha (6)	1985	**Large improvement**
Leicester	270,600	2 ha (1)	135,300	279,921	139.0 ha (7)	2014	**Large improvement**
Newcastle-upon-Tyne	263,000	8 ha (1)	32,875	259,936	113.0 ha (6)	2300	**Large improvement**
Liverpool	448,300	21 ha (1)	21,348	439,473	134.1 ha (3)	3277	**Large improvement**
Hereford	49,800	6.1 ha (2)	8164	50,149	14.4 ha (3)	3483	**Improving**
5,000 - 10,000 residents per ha LNR (in 2006)							
Haringey	187,300	36.2 ha (3)	5174	216,507	32.6 ha (3)	6641	**Getting worse**
Southwark	196,500	29.9 ha (1)	6572	244,866	32.4 ha (4)	7558	**Getting worse**
Birmingham	934,900	39.5 ha (4)	23,668	977,807	102.6 ha (7)	9530	**Large improvement**
10,000 - 50,000 residents per ha LNR (in 2006)							
Southampton	194,400	14 ha (1)	13,886	217,445	14.0 ha (1)	15,532	**Getting worse**
Oxford	109,000	2.2 ha (2)	49,545	134,248	6.4 ha (3)	20,976	**Improving**
Islington	155,200	2.5 ha (1)	62,080	175,797	5.3 ha (3)	33,169	**Improving**
More than 50,000 residents per ha LNR (in 2006)							
Camden	170,500	1 ha (1)	170,500	198,020	1.85 ha (4)	107,038	**Improving**

Notes
[1] Population data are preliminary 1991 Census figures (*Whitaker's Almanac*, 1993) [2] LNR areas & numbers for April 1993 (English Nature data) [3] Population data are 2001 Census figures [4] LNR areas & numbers for December 2006 (Local Authority data)

Commentary

There are significant improvements with some local authorities achieving order of magnitude or even greater increases in the provision of LNRs over a period of little more than a decade (Barnet, Derby, Gloucester, Leicester, Newcastle-upon-Tyne). Of these, Leicester City Council has increased its LNR provision by a factor of 67 from one ha for 135,300 residents in 1993 to one ha for 2,014 residents in 2006. The provision of LNRs in Leeds has remained static since 1993 but the total area of over 600ha of LNR in 1993 was far ahead of almost every other local authority in England at that time and still remains exceptional. For some local authorities, the population has increased but the area of LNR has remained essentially unchanged and the provision of LNR per thousand residents has therefore actually decreased (Haringey, Portsmouth, Southampton, Southwark).

Bog Meadows LNR in the heart of Belfast with M1 motorway in background Photo: Ulster Wildlife Trust

With a major local government reorganisation in the pipeline, the potential for more LNRs to be declared has never been greater. The vision is for LNRs to be within easy and sustainable transport distance of everyone in Northern Ireland no matter where they live. Their localness is their strong point. As the local government led LBAP process continues to expand rapidly in Northern Ireland, the hope is that their numbers and distribution will grow rapidly in the next 5 years.

Scotland (Ian Angus, Scottish Natural Heritage)

Scotland has 48 LNRs and a population of 5.1 million. It is clear, therefore, that the rate of declaration in Scotland has not matched that in England but this may be changing as sites which have been 'proposed' for many years are now moving to declaration and new sites are identified.

Aberlady Bay in East Lothian was declared as the first LNR in the UK in 1952 and this was followed by a number of similar large, coastal sites. Resolving conflicts between users was

Kincorth Hill LNR on the south edge of Aberdeen Photo: Lorne Gill/SNH

a key concern in these sites while access, education and interpretation may have been lower priorities.

By 1989 there were still only eight LNRs in Scotland but the rate of declaration increased significantly in the mid 1990s, probably reflecting a push to declare sites in advance of local government reorganisation in 1996. The new LNRs tended to be smaller and within or closer to urban areas and there was more focus on their educational potential.

In 2000, Scottish Natural Heritage (SNH) produced a guide to the selection and declaration of LNRs in association with the local authorities (SNH 2000). Since 2002, SNH has supported a network of LNR managers and community groups promoting good practice and sharing experience. The network has supported the annual LNR celebrations which have grown each year since their launch in Scotland in 2005. A review in 2006 showed that few LNRs have up to date management plans and new guidance on management planning, developed with the network, was launched by SNH in 2007 (SNH 2007). SNH, again with input from the network, maintains pages for each LNR on the SNH website. This useful website also includes information on how to get involved in your local LNR and on grants and guidance on declaration and management

The value of LNRs is increasingly being recognised in action on wider agendas, for example on access, through Core Path Plans, and on health through initiatives such as Paths to Health. The forthcoming Scottish Planning Policy is expected to require local authorities to produce open space strategies and urge the protection of LNRs as important parts of green networks.

Wales (Pete Frost, Countryside Council for Wales)

Since 1993 Local Nature Reserves have become more popular than ever in Wales – judging by sheer numbers alone. Between 1949 and 1993, 21 LNRs were designated and by 2006 this had grown to 62. LNRs had changed in more than just numbers though.

Following the publication of Local Nature Reserves, a review across the UK by the Urban Forum of the UNESCO UK Man and the Biosphere Committee (Urban Forum 1998; Barker and Box 1998), the Countryside Council for Wales (CCW) reviewed its own guidance on the purpose and uses of LNR. This culminated in the publication of *Acting Locally on Behalf of the Environment: the Role of Local Nature Reserves* (CCW 1996), which set LNRs in Wales firmly in the context of the prime purpose of all nature reserves (as defined in the 1949 National Parks and Access to the Countryside Act) – as a place to study nature. In this document, CCW interpreted the word 'study' in its broadest possible sense, as any activity which devoted time and attention to acquiring knowledge – a walk in the woods to listen to bird-song or to look for wild flowers for example.

CCW issued further guidance in 2004 reinforcing the message that LNR were places primarily for people to encounter nature (CCW 2004). We stressed that LNRs did not have to be places of existing high nature conservation interest, as long as they were managed for the conservation of nature in order that people could gain access to it. We encourage LNR designation as a means of safeguarding high nature conservation interest, but we also hope that local authorities will take a more pro-active stance in creating LNRs as places where people can re-connect with nature for the benefit of their physical health and mental well-being. Ultimately it is to be hoped that this will result in a culture which enjoys and respects the natural world, and is prepared to devote resources to sustaining it.

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Volunteers tackling gorse at Parc Natur Penglais LNR in Aberystwyth Photo: Liz Allan/Ceredigion County Council)

The Forest Habitat Network Grant Scheme: The Wiki-Way in the Scottish Highlands

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At the turn of the last century, Canada's Red Lake gold mine was in a desperate state. The gold, it seemed, was drying up, and Goldcorp, the mine's owner, was in danger of collapse. Then came a crazy, new-fangled notion: how about mining on the internet...? With method in their madness, Goldcorp released previously restricted information into the ether. Thousands of pages of maps, surveys and data were put online, with the reward of $575,000 to anyone who could discover undetected veins of gold at the Red Lake complex. From around the world people chipped in: from experts in their field and retired geologists, to chancing gold hunters, and over a hundred new areas were identified, half of which Goldcorp hadn't formerly considered. Eighty percent of these contained gold. Needless to say, Goldcorp's share price is now stratospheric, and disaster has been averted[1].

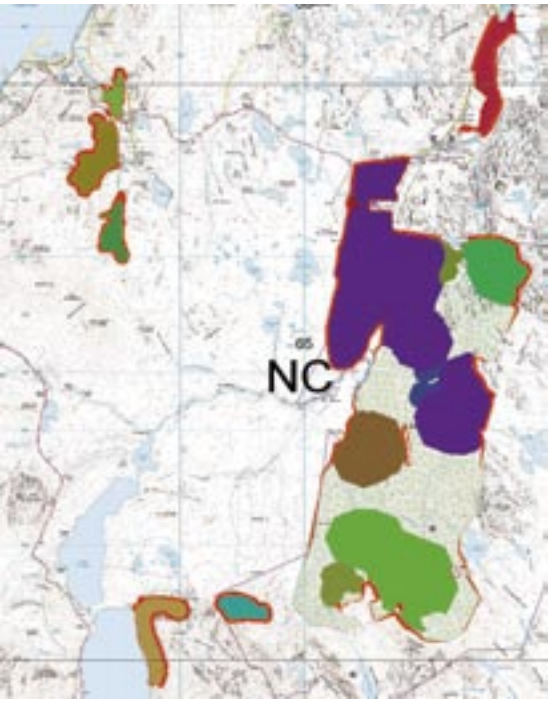


Figure 2. Semi-natural forest habitat network maps were generated for the whole of Highland Region, a land area of c. 2.5m ha. The different coloured areas (i.e. the purples, browns, greens etc.) represent forest habitat networks - a different colour per network. The red area around each network is the 'link zone' – woodland needs to be planted between one network's link zone to another's to create a viable link. Areas of exotic species plantations (centre right) don't contribute as core components of the native forest habitat networks except through inherent pockets of semi-natural woodland.

At the risk of a contrived metaphor about striking it rich for the natural heritage's gold, there are 'thinking outside the box' and 'mass collaborative wikipedia-style' comparisons for today's biodiversity; witness schemes such as the recent forest habitat network forestry grant in Scotland's Highland region. The Highland Locational Premium was, on the surface, a forestry grant scheme like many others from the Forestry Commission with an enhanced payment rate to encourage uptake and fulfil a specific objective.

Figure 1. In a fragmented landscape, where should the network links go?

However, there were crucial things that were new. There was a change in emphasis in what was being asked to land managers. Rather than the unconstrained 'have you suitable land, anywhere, that you're prepared to create woodlands on for which we will pay?', there was a shift to the more specific: 'where is the best possible land that will enhance what is already there...?' With that, there was another shift, from land managers predominantly focussing on their own land, to that of how their and their neighbours interact on the landscape scale, and what's more, how that land functioned. And, possibly for the first time, this grant scheme rewarded that function, as well as the increase in resource.

The scheme was devised to address priorities identified by the Highland Council's Forest and Woodland Strategy[2], in particular 'the importance of habitat networks in improving the connectivity between often fragmented woodlands, allowing them to function as larger ecosystems' which would 'benefit key habitats and increase the ability of associated species to adapt to climate change'. This was translated into a specific action: the planting of 'any native species woodland... which creates a viable link or links between existing native woodland forest habitat networks'[3]. One and a half million pounds was made available by the Scottish Government through Forestry Commission Scotland to enable this. The question which was thrown into the ether was 'where should these network links go?' (figure 1). The reward was up to £1,500 per hectare on top of the usual new planting establishment grants.

In essence, the scheme was simple to engage with. The areas of land which would create viable woodland network links could be identified from the network maps posted on-line[4] (figure 2). These maps were derived using the GIS landscape analysis tools known as BEETLE – developed by Forest Research and Scottish Natural Heritage, and described elsewhere[5] – and a series of maps were produced for every 10 km grid square in the Highlands showing what were considered to be the whole region's native woodland networks[6].

As with Goldcorp, however, there were a few rules: gold just couldn't be dug anywhere. The new woodland created had to fulfill certain criteria – the main ones being:

- **creating a viable link between two or more woodland habitat networks** – the link between two or more networks is not necessarily a physical one, it's a functional one *i.e.* the creation of what is considered to be a permeable link for woodland species between woodland networks;
- **employing a collaborative approach, where appropriate, with adjacent landowners** – networks, almost by definition, may cross boundaries, and the most effective and best value network links may be over two or more landholdings. Through this scheme, land managers were thus considering not only their own land, choices and aspirations, but those of their neighbours, and even their neighbours' neighbours;
- **the woodland creation was for new planting of native species** – due to the time constraints of the scheme, only planting – as opposed to natural regeneration – was eligible, and the only exception to native species was for local biodiversity action plan targets where it could be demonstrated that, for example, the red squirrel interest was such that a native species mix containing non-native conifers (*e.g.* Douglas fir) was desirable;
- **the new woodland is at least 110 m wide at all points** – this criterion reflects what is considered to be the ecological difference in function between a woodland's core habitat and that of its periphery. To take account of the edge effect, an internal buffer of two tree lengths (*i.e.* 50 m) was removed from woodland habitat patches in the modelling and, as 10 m equated to the analyses' pixel resolution, a woodland patch could only be regarded as a functioning woodland at upwards of 110 m;
- **ensuring, and demonstrating where necessary, the biodiversity benefits of the new woodland outweighed any negative impacts on open ground species or habitats** – any conflicts between woodland creation at the expense of other habitats were thus addressed and resolved prior to the formal application stage, and, crucially, that any potential spread of invasive species by creating links (*e.g.* grey squirrel at the expense of red) was identified; and
- **the proposed area of woodland creation is proportional to the area of the networks it was linking** – to ensure maximum benefit to the public purse, the applications were assessed according to all the above criteria (plus the usual checks, such as landscape aesthetics, soil type and appropriateness of proposed species, archaeological impacts *etc.*), and, crucially, with regard to a proposed woodland's 'proportionality'. Various thresholds applied – as described in the scheme's leaflet[7] – to ensure that overly large woodland creation proposals linking only small networks attracted limited payment or weren't eligible, whereas small schemes linking large networks attracted proportionately higher payments (see figures 3 and 4).

Underpinning all of this was an open and approachable application system. It was acknowledged from its inception that the scheme's focus and assessment procedure presented a considerable shift from other forestry grant schemes, and, as such, forest managers, landowners, agents and even the Forestry Commission's own staff needed more than the usual guidance. A series of seminars describing the scheme were held when the scheme was announced. In another departure from other forestry grant schemes, Highland Birchwoods – an NGO who have run many innovative and large-scale community-based projects – were contracted to assist in both the technical assessment of the applications plus to develop a system of one-to-one 'surgeries' to help an applicant refine schemes to maximum value. Also crucially, these surgeries provided a forum for stakeholders to become more empowered by identifying inaccuracies and anomalies in the network maps – and thus feeding into and improving the modelling accuracy – whilst scrutinising and engaging with the BEETLE methodology.

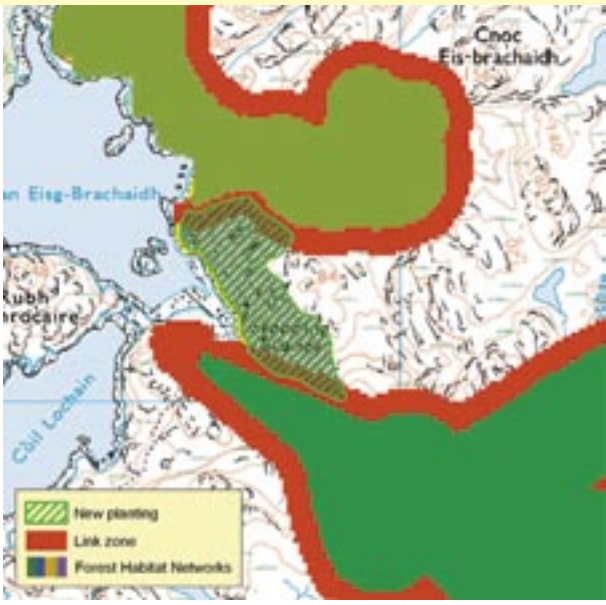
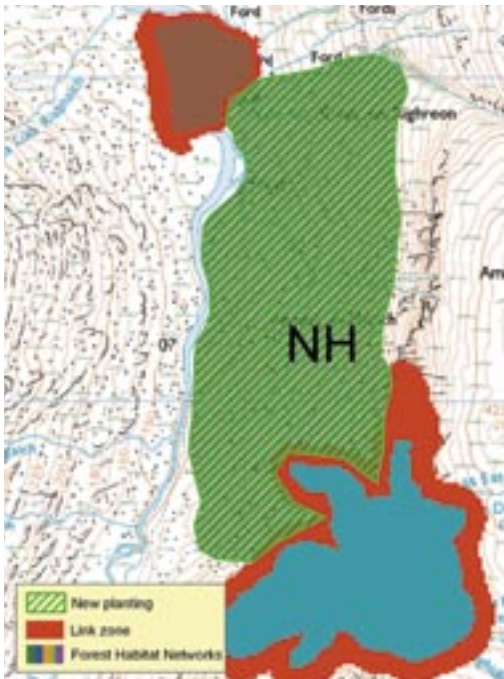


Figure 3. The proposed woodland creation (hatched) is of a suitably proportionate size to the networks it is linking.

The scheme was announced at the beginning of 2006 with launch seminars held soon after. After only a few months, the results were startling. Nineteen applications made the connections between 41 existing networks to create 19 new and larger ones - producing a total of 8,500 ha of functionally linked forests and woodlands. And all this from approximately 575 ha of new woodland, around 400 ha of which created the links and attracted the enhanced Locational Premium payment. What is more, this 400 ha – by creating a functional rather than simply a physical link – had a 'leverage' of 1.2 *i.e.* the new woodland exerted a greater influence at the landscape and ecosystem levels than the sum of its physical parts.

A couple of examples show the range and impact of individual schemes: One application of 16.8 ha linked four networks, creating a new functional network of over 500 ha. The total cost was approximately £78,000; £45,000 of which the land owner would have received for the random establishment of the same woodland elsewhere without the wider functional landscape benefits. Another proposal of 7 ha created a link between two large networks of 2,500 ha and 100 ha. The cost in this case was £36,000, and the premium payment £14,000.

Figure 4. In this case, the woodland creation (hatched) is of a disproportionate size to the networks being linking.



As with Goldcorp's wikipedic internet mining, by Forestry Commission Scotland providing the information to get what they wanted to create the biodiversity

and public benefits, land managers were empowered to buy into the scheme, or not, and claim their reward. There are several conclusions, the main ones being:

- **grant schemes can be easily targeted to best effect in implementing policy and strategy aspirations** – the Highland Locational Premium has demonstrated that new tools such as BEETLE can help identify, objectively, where 'things should be done' to help achieve policy and strategy imperatives. The scheme addressed network linkages, though the objective could quite easily have been 'increase network size' or 'action for woodlands having little or no 'core' habitat' or 'where are the woodland and moorland network conflicts?' As importantly, tools such as BEETLE can help identify where 'things shouldn't be done' or where 'things could be better done', as seen in a recent agri-environment scheme to promote corn bunting habitat shows (figure 5). The corn bunting (*Miliaria calandra*) is a reasonably non-mobile species, yet the agri-environment grant uptake was largely by farmers in areas distant from existing corn bunting areas. Whilst these measures undoubtedly have other benefits (on wider biodiversity, the socio-economic *etc.*), they don't specifically impact on the corn bunting – which, perversely, was the rationale for that particular grant payment. An added layer to the grant targeting mechanism could have easily ensured maximum benefit for both the corn bunting and the public purse;
- **initial reservations that the scheme was too complicated and 'stakeholders wouldn't understand it' were both unfounded and patronising** – admittedly, some, though by no means many, of the early applications were wide of the mark, but following the seminars and surgeries, practitioners – even those of the die-hard traditional forestry school – rapidly engaged with the scheme and, almost by default, became incipient landscape ecologists in the process. The result was a wealth of extremely creative applications having huge biodiversity benefits in relation to their size, at relatively little cost to the tax-payer yet with the proposals attracting sufficient financial incentive for the landowner. Five months after the launch, the scheme was over subscribed and closed early; and
- **a tool such as BEETLE can provide an added decision-support layer** to complement other methods. As a decision-support tool, such modelling layers are at least as good as anything else, and are demonstratedly better, as the missed opportunities of the corn bunting example illustrate.

However, what remains as an undercurrent is the approach BEETLE provides being perceived as a threat – its high-tech mapping pyrotechnics seem to be several steps removed from what has gone before. During one of the early workshops at the scheme's launch, a somewhat bemused forester commented that he remembered when 'forestry was about trees'. And, of course, it still is. BEETLE-type applications are only one of the tools to complement and help inform making the best possible decisions for land-use management. And it's just that: a tool. Just as binoculars to an ornithologist are a means to help a bird's identification, the interpretation of what's seen through them still remains with the user – the binoculars themselves are passive. As a tool, BEETLE is not a black box that spits out the answer. It may generate an answer, but that answer is reliant on the correct question being asked, and the most accurate data being used - just as a binocular's maintenance and focus are essential to its effective use and application. To extend the metaphor further, just as with the BEETLE tool, or others such as the Dutch LARCH landscape program[8], it may be immaterial to the outcome whether Zeiss or Leica are being handled, what's more relevant is using the right tool for the right job. Binoculars, telescopes and the naked eye (and ear) all have their place, but the knowledge and experience of the user is crucial.

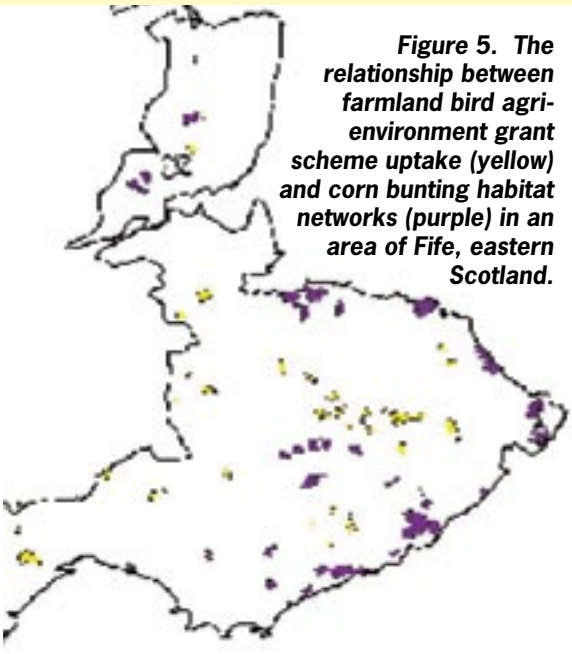


Figure 5. The relationship between farmland bird agri-environment grant scheme uptake (yellow) and corn bunting habitat networks (purple) in an area of Fife, eastern Scotland.

(From Humphrey, J, Smith, M, Shephard, N, and Handley, P (2007) Developing Lowland Habitat Networks in Scotland: Phase 2. Contract report to Forestry Commission Scotland, Forestry Commission GB, Scottish Natural Heritage and Scottish Executive Environment and Rural Affairs Department)

To extend the forester's adage 'a tree in the right place', in this new age of multi-functional aspirations for land use – and the brave new wiki-world of mass collaboration and empowerment – it's not about single dimensions. It's about habitats and species harmonised within a matrix of the land uses that best fits both public and private objectives, with the informed help of those best placed to enable it.

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Notes:

[1] 'The Wiki Way' *The Guardian* 5 September 2007.

[2] The Highland Council (2006) *Highland Forest and Woodland Strategy*. Available on-line at www.highland.gov.uk/yourenvironment/agriculturefisheriesandforestry/treesandforestry/highland-forest-and-woodland-strategy.htm.

[3] Details of the scheme can be found at www.forestry.gov.uk/pdf/HighlandLocPrem06-08.pdf/$FILE/HighlandLocPrem06-08.pdf.

[4] See www.highlandbirchwoods.co.uk and follow the links to 'projects' and 'highland locational premium'.

[5] See Watts, K, Ray, D, Quine, CP, Humphrey, JW and Griffiths, M (2007) *Evaluating Biodiversity in Fragmented Landscapes: Applications of Landscape Ecology Tools* available at www.forestry.gov.uk/pdf/fcin085.pdf/$FILE/fcin085.pdf. For additional information, see www.forestresearch.gov.uk/habitatnetworks.

[6] The most up-to-date landcover and woodland patch data were used from a variety of sources, and the programming followed the checks and protocols established through other analyses. The parameters such as the dispersal distances, woodland 'quality' *etc.* were determined from consultation with stakeholders and expert groups, and through peer-reviewed literature.

[7] Table 2 of the scheme's leaflet; see www.forestry.gov.uk/pdf/HighlandLocPrem06-08.pdf/$FILE/HighlandLocPrem06-08.pdf.

[8] LARCH is one of the suite of similar spatial analyis models developed by Alterra. For further details, see www.alterra-research.nl/pls/portal30/docs/FOLDER/ecological_models/ecological_models/INDEX.HTM.

Brownfields, Greengrids and Invertebrate Biodiversity

Greg Hitchcock and Jane Ellis***
**Buglife - The Invertebrate Conservation Trust*
***Butterfly Conservation*

Dingy skipper
Photo: K Warmington

Over 99% of animal species are invertebrates. Even if we include plants, the proportion of invertebrates is still over 60% of species. When it comes down to it, biodiversity is invertebrates. Despite this, invertebrates are still under-represented in nature conservation and environmental management.

There are a number of reasons for this inequality. The identification of invertebrates is a specialist skill, one that takes time and dedication to master, so the number of workers able to undertake such work is limited. Many of the standard texts for identifying invertebrates are also out-of-print and/or out-of-date. The number of species, variety in seasonality and microhabitat, and the fact that most species cannot be identified in the field also make surveys time consuming, and thus expensive. More widely, there is also a lack of appreciation for the role that invertebrates play in ecosystem function, and a preference towards the conservation of what have been called the 'charismatic megafauna', perhaps as a result of perceived public opinion.

However, on a limited budget, even a targeted survey looking at one or two key groups can have value. Invertebrate conservation is it the most cost-effective way of conserving biodiversity, as many species may benefit from a single action (whether as part of reserve management or mitigating development). As the keystone of ecosystems they also provide food for mammals, birds, reptiles and amphibians, contributing to the conservation of other groups.

It is important to think of invertebrates in terms of metapopulations, rather than as individuals. They are smaller, shorter-lived, with a lower mobility than most other animals. Although this means that an individual invertebrate requires little space and few resources, it also means that minimum viable populations are larger. When combined with a reduced dispersal ability, they are often more susceptible to population decline through loss of metapopulations as a result of habitat fragmentation.

Many invertebrates are very habitat-specific, and exist at the microhabitat level within those habitats. As a result they can be particularly susceptible to small changes to biotic and abiotic factors that lead to the loss of that microhabitat, even if the habitat itself remains. This is complicated by the fact that requirements can be very specific, but totally different, between the immature and adult stage of many invertebrates. This makes an understanding of species ecology, their requirements, and maintenance of habitat connectivity even more important, especially in the face of climate change.

Good quality invertebrate habitat has been lost and damaged through development and the intensification of agriculture resulting in the local and national extinction of many species. Likelihood of extinction is increased with the reduction in size and increased fragmentation of habitat areas. As a result of this, the remaining sites, and the relationships between those sites, are now more important than ever for maintaining viable populations of invertebrates.

With the Natural Environment and Rural Communities Act giving all public bodies a 'duty to have regard for the conservation of biodiversity', and the recent revision of the UK Biodiversity Action Plan adding hundreds of new species and tens of new habitats to the list, more and more emphasis is being placed on biodiversity. This is of course in addition to existing legislation on species protection, and government policy such as Planning Policy Statement 9: Biodiversity and Geological Conservation.

Of particular value to invertebrate biodiversity are brownfields sites, or previously-developed land. There are a number of reasons why brownfield sites have the potential to support large numbers of invertebrates. Artificial substrates, or man-made surfaces that have broken down, produce a nutrient poor substrate. These low nutrient levels contribute to botanical diversity by increasing stress levels and preventing fast growing 'r-selected' species, such as grasses and nettles, from dominating, and giving 'K-selected' species, like orchids, a chance to grow. This stress effect can be increased by contaminants. Each species of plant is likely to have its

West Thurrock Marshes is a brownfield site by the Thames Estuary in south Essex supporting nationally important invertebrate fauna. The area of Sea Aster in the photograph supports three UK BAP species alone.
Photo: Greg Hitchcock

own associated invertebrate fauna, which will attract its own predators and parasites. The five-banded weevil-wasp (*Cerceris quinquefasciata*), a UK Biodiversity Action Plan (BAP) priority species, feeds its larvae on weevils collected from such botanically-rich areas. Open areas of bare ground and exposed earth banks, caused by the low nutrients, contamination or disturbance, can provide a nesting substrate for invertebrates such as the UK BAP black-headed mason-wasp (*Odynerus melanocephalus*). Rubble and bare ground can also provide a sunny spot for thermophilic invertebrates to bask in, and may also be popular with reptiles. Some butterflies will choose food plants trailing over bare ground on which to lay their eggs, as the warm micro-climate allows faster caterpillar development. Artificial substrates, foundations and roads will also affect the hydrology of the site, and can produce seasonal and permanent water bodies, and a varied topography leading to habitat variety. Many invertebrates either live or overwinter in plant stems, leaves or seedheads. For these it is the lack of management on brownfields, specifically the lack of mowing or grazing of grasslands, that makes these sites so important for their survival.

Although no two brownfield sites are the same, the processes mentioned above that lead to the high invertebrate biodiversity present on some of them can usually be explained with a couple of simple principles. The increased level of stress (caused by factors such as low nutrients, contamination, artificial substrates and disturbance) results in a prolonged early-successional habitat of high botanical diversity. The history of previously-developed sites also results in a varied topography and hydrology, leading to increased habitat diversity. It is these prolonged early-successional habitats and habitat mosaics, and associated edge-effects, that provide opportunities to a great number of species, and along with the habitat continuity provided by lack of active management, enable brownfield sites to support high biodiversity. The importance that brownfield sites have in supporting biodiversity has recently been recognised by the government in the new UK BAP priority habitat 'Habitat mosaics on previously-developed land'.

Brownfield sites are relatively young, ecologically speaking, as the habitats only start to develop once a site has been abandoned (although sometimes before buildings have been demolished). In urban areas they are often isolated from semi-natural habitats. For this reason the invertebrate biodiversity is often dominated by highly mobile groups, such as the flies (Diptera), beetles (Coleoptera), bees, wasps and ants (Hymenoptera), true bugs (Hemiptera) and spiders (Araneae). A disproportionate number of Red Data Book and UK BAP species present on brownfield sites are within these groups, and the most effective site assessments should target these groups.

The UK BAP bumblebee* Bombus humilis. *This species' stronghold is brownfield sites in the Thames Gateway. Photo: Sam Ashfield

Buglife - The Invertebrate Conservation Trust and Butterfly Conservation are both undertaking projects to conserve invertebrates on brownfield sites.

Buglife's 'All of a Buzz…' Project

Buglife's 'All of a Buzz…' project is producing a strategy for the conservation of invertebrate biodiversity associated with brownfield sites in the Thames Gateway. The Thames Gateway has a large brownfield resource, and the Buzz project is working in partnership with other NGOs, local authorities and statutory agencies to raise awareness of the biodiversity that is present on some of these sites.

The Thames Gateway is the driest part of the country with some of the highest summer temperatures, and mild winters owing to the warming effect of the Thames. This unique climate shapes its flora and fauna. The area is home to lots of wildlife not found anywhere else in the country, such as the spider *Sitticus distinguendus*, a UK BAP species which is only known from two sites, both brownfield sites in the Thames Gateway. The Thames Gateway is therefore of high significance in terms of conserving UK biodiversity.

The mudflats and saltmarshes of the Thames Estuary support thousands of birds, and have been given a number of designations to recognise their importance, but the importance of the Thames Gateway's terrestrial habitats is often overlooked. The range of geology in the area (sand, gravel, chalk and clay) results in a wide variety of habitats (Harvey, 2000), and each habitat supports its own particular wildlife. Floristically-rich grasslands on the sands, gravels and chalk can be especially valuable, supporting many rare and endangered invertebrates such as the UK BAP red-shanked bumblebee *Bombus ruderarius*. Thames Terrace Grasslands are especially valueable (Plant and Harvey, 1997), but have been largely lost.

The Thames Gateway is the largest growth area in the country. In the past 30 years growth has been especially prolific, and large areas of unique habitat have disappeared under warehouses, powerstations and residential developments. Many brownfield sites in the Thames Gateway now provide surrogate habitats for invertebrates that have lost their natural habitat.

Other species of conservation importance associated with brownfield sites in the Thames Gateway include scarce bumblebees such as the shrill carder-bee *Bombus sylvarum* and the brown-banded carder-bee *B. humilis*. These species are UK BAP priorities, and many other UK BAP and Red Data Book species are known from brownfield sites.

The 'All of a Buzz…' project has been mapping brownfield sites in the Thames Gateway and assessing them for their invertebrate biodiversity potential. This information has been used to produce GIS 'alert maps' to inform planning decisions, both at a strategic development and development control level. It also contributes to the planning of functional green infrastructure, identifying biodiversity hotspots and gaps in connectivity. Survey work has led to greater understanding of the distribution and requirements of UK BAP and Red Data Book species, as well as contributing to local BAP development and implementation. All this enables us to provide guidance to: planners on brownfield biodiversity; developers on designing for invertebrate biodiversity; consultants on surveying and assessing invertebrate biodiversity; as well as raising the general public's awareness of the value brownfields can have to wildlife.

Grizzled skipper butterfly
Photo: Jane Ellis

Up to 40% of brownfield sites in the Thames Gateway have been identified as having the potential to support a high invertebrate biodiversity. These assessments have been corroborated by the collection of thousands of invertebrate records, both actively and as part of desk studies. A number of nationally important invertebrate assemblages have been identified, but in some cases planning permission has been granted without an invertebrate survey having taken place. The goal of sustainable development (Office of the Deputy Prime Minister, 2005) will only be reached once this biodiversity loss has been halted.

Butterfly Conservation Brownfields for Butterflies and Moths Project

For a number of years Butterfly Conservation has been aware that some of its richest sites for butterflies are not within traditional countryside habitats but in areas much less accessible to its large network of volunteer recorders on sites such as former quarries, collieries, disused railway-lines and land left derelict after the closure of heavy industry.

As traditional habitats such as woodland rides and clearings, chalk downland and heathland have declined and contracted

Remnant dingy skipper breeding habitat on a development site

species such as grizzled skipper, dingy skipper and small blue have become more reliant on the artificial habitats of brownfield sites. The key features are similar to those for other invertebrates described above, poor soils which favour growth of fine grasses and nectar rich-herbs, mosiacs of vegetation including tall and short vegetation plus areas of bare ground, warm microclimates and disturbance to maintain these early successional habitats.

The Midlands Brownfields for Butterflies project selected a number of landscape areas which were known to have clusters of brownfield sites holding declining species typical of such sites. In all the areas the threat of development was high and it was felt that there would be good opportunities to manage, restore and reconnect habitat at the same time using these areas to demonstrate the issues of conserving brownfield Lepidoptera. In a number of the areas, an initial stakeholder meeting of local landowners, managers and nature conservation interest groups was held to pool together existing knowledge of sites and to determine where there could be opportunities to reconnect, manage or restore habitat. To encourage survey work to fill gaps in knowledge of species distribution for key areas, the project has run a series of training events. All the information collected has then been used to advise landowners and managers on appropriate management for key species and in some instances trial habitat creation or restoration work has been undertaken and monitored. The site information is to form part of a GIS database and at the end of the project there will be an action plan for each landscape area. Lessons learnt are being promoted through events and newletters and the project will culminate in a National Brownfields for Butterflies and Business Conference on 5 February 2008.

The key species which the project focuses on are now all UK BAPs. They include dingy skipper *Erynnis tages* and grizzled skipper *Pyrus malvae*, which both require the caterpillar foodplants to be growing over bare ground in sunny shelterd locations, chalk carpet moth *Scotopteryx bipunctataria*, which is confined to a handfulful of sites with bare alkaline soils, grayling *Hipparchia semele* a butterfly of poor ground with fine grasses and four-spotted moth *Tyta luctuosa*, which requires warm open conditions and is closely associated with railways in the East Midlands.

The landscape areas include Stoke-on-Trent; Nottinghamshire/Derbyshire Coalfields; Cannock, where there has been rapid development of many former collieries; and the limestone area around Ketton, which had the last record for chalk carpet moth in the region, and four-spotted, a formerly widespread moth which appears to be mainly confined to railway corridors. The Telford and Wrekin was considered a regional stronghold for dingy skipper after a survey in 2003, but most of its sites were earmarked for development and Butterfly Conservation has done much work there to influence the planning system.

Some brownfield species such as dingy skipper seem capable of surviving in very small numbers on relatively small patches of habitat for breeding (*e.g.* 100 m^2). However, as we have said, the survival of many brownfield species depends on a network of suitable sites being available within the locality to support a series of metapopulations. In good years, individuals may spread out from a core breeding area to utilise nectaring or breeding areas further afield. The chances of any individual reaching another habitat patch are relative to the size of a colony. If suitable breeding habitat is found, small breeding colonies may establish. In poor years (*e.g.* very wet or drought) the smaller colonies may die out. However, if they are close enough to a core colony they may well recolonise. The breakdown of these habitat networks though progressive development means that many of the surviving Lepidoptera colonies dependent on these brownfield habitats are small and extremely fragile.

In terms of linking habitat, the project will be working with Network Rail to survey active lines and then to manage 'conservation areas' sensitively. Embankments and cuttings provide warm micro-climates with low nutrient soils and bare ground caused by natural slippages, features which suit brownfield invertebrates. Network Rail lines run north-south through three of the project's brownfield landscape areas providing an ideal opportunity to connect brownfield habitats. Safety issues will be paramount but Butterfly Conservation is in discussion about what

types of habitat management might be feasible.

Butterfly Conservation has made some exciting progress with St Modwen plc (one of the largest landowner developers in the UK) in encouraging them to take on board advice on protecting brownfield habitat within their new developments. Butterfly Conservation has given advice on three trial areas. Anthony Glossop, the Chairman, has been very supportive so far. In his own words: *"Leaving an environment that suited butterflies meant that we created a landscape more varied than a conventional business park approach – perhaps not as neat, but probably more interesting – and its creation was probably less expensive, taking capital cost and maintenance into account, than the conventional alternative."*

Conclusions

The recognition of the importance of brownfields in the creation of the UK BAP habitat 'Habitat Mosaics on Previously-Developed Land' and many of our threatened brownfield invertebrates now also being UK BAP priority species has helped strengthen our influence over the siting and design of new development. Working with land operators and developers, to help them to embrace brownfield conservation as part of sustainable development can secure the future of brownfield wildlife.

Buglife and Butterfly Conservation are not attempting to prevent all development of brownfield land. In fact we appreciate that many of the species require some sort of change and disturbance to maintain early successional habitat. We are also appreciative of the fact that new houses need to be built. However, there does need to be better consideration of the potential wildlife interest of these sites, not just on a site-by-site basis, but also as part of a network of habitats.

It has been said that we do not have enough brownfield to accommodate all the houses that need to be built, and that some may need to be built on greenbelt land (Social Market Foundation, 2007). While building on all brownfield land will be very damaging to biodiversity, and potentially leave our towns and cities devoid of wildlife, building on greenbelt land can be a lot more biodiversity friendly. Not only is much of the greenbelt intensive agriculture with very little value to wildlife, there are a lot more opportunities to incorporate biodiversity improvements into this land, in and around developments. What we need to avoid is a 'free-for-all', and to ensure that the potential biodiversity of all sites, whether brownfield, greenfield or greenbelt, is given proper consideration. This will only happen when the economic value of the ecosystem services provided by biodiversity, as well as its intrinsic value, is realised, and preconceived ideas about the wildlife value of these sites are thrown out.

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Mapping Britain and Ireland's Birds: The 2007-2011 Bird Atlas Project

Bob Swann
Scottish Organiser, Bird Atlas Project

Over the next four years an ambitious and important project will take place to map the distribution of Britain and Ireland's birds, both in winter and during the breeding season. This will be a partnership project between the British Trust for Ornithology (BTO), the Scottish Ornithologist's Club (SOC) and Birdwatch Ireland (BWI). Bob Swann, a well known and long standing SOC and BTO member, has been appointed as Scottish Organiser for the project. Here he discusses the project, which started on 1 November 2007.

As environmental surveyors, many of us are interested in bird numbers, distribution and change. For instance we are intrigued by questions such as what is the commonest bird in a particular area or habitat, which species is most widespread or which has declined or increased the most in recent years. One way to answer these questions is by mapping the distribution of birds in both summer and winter. This has been done before, but almost 20 years ago. There have been two previous breeding atlases (1968-72 and 1988-91) but just one previous winter atlas (1981-84). Now a major new project, Bird Atlas 2007-11 aims to update this information. A lot has changed in the countryside since then. It will be fascinating to see how this will have affected the number and distribution of our birds in both winter and summer.

Distribution of Twite from 1981-84 Winter Atlas Survey

Twite Photo: Jill Packenham/ BTO

Changing Landuse

Intensification of agriculture led to major declines in farmland birds, like lapwing, grey partridge, linnet and corn bunting. Recently steps have been taken to try and reverse these declines. Projects such as the Rural Stewardship Scheme are encouraging farmers to switch to more environmentally friendly practices. Will this boost farmland bird populations? The new atlas project should tell us. How will winter distributions of farmland species have changed? Where are the main concentrations of snipe and lapwing? What about scarcer species like twite? A survey in winter 2006/07 on agricultural land in northern Scotland found very few twite flocks. Is this a general decline or have they switched to new wintering areas? The new atlas project should tell us.

Whinchat Photo: George H Higginbotham/BTO

Distribution of whinchat from 1988-91 Breeding Atlas Survey

Our woodlands are also undergoing change. Young forestry plantations have now become mature woodlands. How is this affecting the distribution of woodland specialists like great spotted woodpecker and siskin, and scrub specialists like lesser redpoll? Deciduous woodlands are currently under pressure with changes in their structure, increased grazing intensity from expanding deer populations and other factors impacting on bird populations. Although species like nuthatch, green woodpecker and jay are increasing in numbers, others such as willow tit, wood warbler and hawfinch are declining. How widespread are these changes? The new atlas project should tell us.

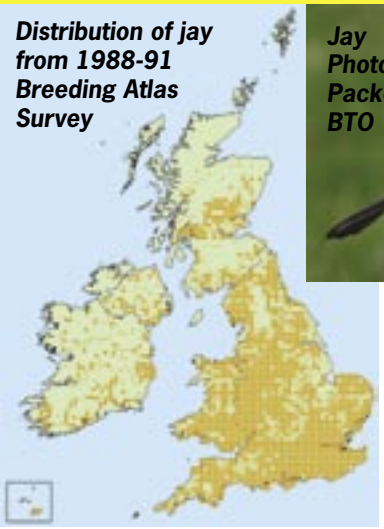
Uplands too are experiencing many regional changes, including declines in sheep grazing, changes in grouse management practices, increased recreational activities and windfarm developments. What affect is this having on the distribution and abundance of meadow pipits, whinchat, ring ouzels and other upland specialists. The new atlas project should tell us.

Changing Behaviours

As food has become scarcer in the countryside more and more birds appear to be attracted to feeding sites in urban and suburban areas. Will this alter the distribution and abundance of common garden feeders such as House Sparrows and Collared Doves? What about species like Goldfinch? Has an increase in feeding allowing these birds to spread further north in recent years.

Changing Climate

Perhaps the biggest change affecting our bird populations is climatic change. As winters have got milder, more and more traditional 'summer visitors' appear to be remaining to over winter. Twenty years ago only a handful of chiffchaffs were recoded by the winter atlas in Scotland, what is the situation now? Pied wagtails are a typical partial migrant, with the northern populations moving out to winter further south, whilst the more southerly populations remain resident throughout the winter. Is this still happening or are more of these birds remaining as all year round residents. As temperatures rise, will more meadow pipits or stonechats remain to winter in the hills. Will that mean more raptors remaining to wintering there as



Distribution of jay from 1988-91 Breeding Atlas Survey

Jay Photo: Jill Packenham/ BTO

well?

What about the true winter visitors? A classic example is snow bunting. The 1980-84 winter atlas showed large numbers wintering in the uplands and along the coast. Coastal populations appear to have declined drastically. Are there now more in the hills? The new atlas should tell us. Our estuaries hold internationally important concentrations of wintering wildfowl and waders. Most of these arrive from high arctic breeding grounds to spend the winter at milder latitudes. There is some evidence that many of these birds are remaining to winter closer to their breeding grounds. How will this affect the current winter distribution and abundance of species like turnstone, purple sandpiper and dunlin?

Summer distributions are also changing. The colonisation of little egret in recent years is a classic example. Other species like nuthatch, reed warbler and dartford warbler are all slowly spreading north. It is important for conservation organisations to have data on current situation regarding these species. The new atlas project can supply this information.

Methodology

In order to ascertain their current distribution, all species will be mapped by 10 km squares, using the grid system found on Ordnance Survey maps. Two complementary methods will be used. The first involves gathering Roving Records. The aim here is to record full species lists for every 10 km square in Britain and Ireland. This can be obtained by a specific visit to a square to find as many birds as possible, but equally well it could just be a list of birds chanced on whilst out doing other survey work. Every record counts and the data can easily be submitted online by visiting www.birdatlas.net or more traditionally on paper on a Roving Records form which can be obtained from: The Atlas Organiser, BTO, The Nunnery, Thetford, Norfolk, IP24 2PU.

As well as mapping the overall distribution of our wintering birds, we also need to map the relative abundance. Many species, for instance starlings are widely distributed. In some areas they are relatively common, being found in large flocks, whereas in other areas they are relatively scarce. From a conservation point of view it is important to know where the main concentrations are.

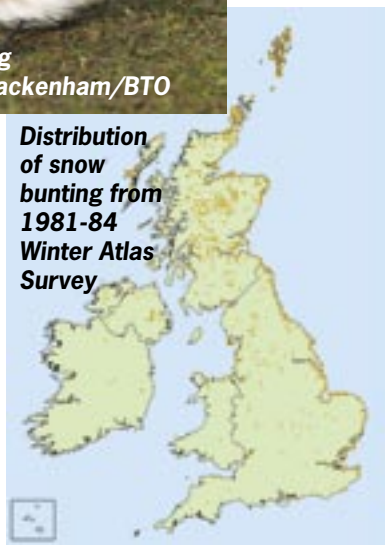
In order to work this out we need to use a different method. This is the Timed Tetrad Visit (TTV). Each 10 km square is composed of 25 tetrads (2 x 2 km squares) of which eight will need to be sampled. Individual observers can choose which tetrads will be surveyed. The aim is to do two hours field work in each of the chosen tetrads in winter and two hours in summer. In winter the first hour should be done in November or December and the second in January or February. In summer the first hour should be done in April or May and the second in June or July. Typically each visit will involve a walk through the tetrad visiting the main habitat types. A note is kept of all birds seen or heard and a tally count kept of the numbers encountered.

TTVs could be easily incorporated into survey work. If you are walking out to a survey point you could count the birds seen and heard as you go through each tetrad. As you head back you could continue the count, particularly if you return following a slightly different route, till you have clocked up the hour in that tetrad. If it is an area you are surveying regularly you should be able to manage the early and late winter visits and/or the early and late summer visits.

Remember it is not necessary to find every bird in the tetrad! We are trying to see how abundant each species is. If a species is very common it is likely you will come across quite a few in each tetrad you visit. If it is scarce then you may only come across one in all visits to all the chosen tetrads in your 10 km square.

In order to help out with the Timed Tetrad Visits you need to contact your local organiser. This can be done by logging onto www.birdatlas.net and clicking on 'Taking Part', then 'Your Regional Organiser'. Otherwise contact the atlas organiser Dawn Balmer by e-mail at dawn.balmer@bto.org or at BTO HQ. Dawn will put you in touch with your organiser. You can volunteer to cover as many tetrads as you wish in as many 10 km squares as you wish. Remember the project will run over four years and each of the eight tetrads just has to be visited ONCE (for two hours in the winter, and two in the breeding season) during the course of the project and not every year. Professional survey workers may be concerned about issues connected with client confidentiality. This should not, however, be a problem as all the data collected by the Bird Atlas project will all be presented at the 10 km resolution and not at the level of individual sites.

Snow bunting Photo: Jill Packenham/BTO



Distribution of snow bunting from 1981-84 Winter Atlas Survey

So given we have already had three previous atlases, and have regular monitoring of bird populations through surveys like Breeding Bird Survey (BBS), Wetland Bird Survey (WeBS) and bird recording through BirdTrack, why do we need another atlas? It's important to remember that long-term surveys such as the WeBS are sample surveys and provide us with information on trends in populations. They do not aim to cover all of Britain and Ireland; rather they aim to have a good geographical spread of survey sites. Atlases give us the opportunity, about every 20 years, to visit all 10 km squares in Britain and Ireland and tell us what is there and approximately how common they are. It's a snapshot of bird distribution and abundance in time.

It is going to be a massive project. Getting full coverage, particularly in winter, with short days and unpredictable weather is not going to be easy. The effort is, however, going to be very worthwhile. Not only is atlasing fun, it is also a good way of putting something back into your birding. The results from this atlas will be the basis for the conservation of birds in Britain and Ireland for the coming decades. Your effort will help conserve our bird populations for years to come. So get in touch with your local organiser and adopt a 10 km square now.

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New Species Protection Legislation: Opportunities and Risks for Consultant Ecologists

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Significant changes have been made in the UK this year to strengthen the European Protected Species legal regime which provides protection for animals and plants covered by the Habitats Directive. The changes result from judgments by the European Court of Justice which found deficiencies in the UK's implementation of the Directive.

The changes will have significant impacts on consultant ecologists. It is vital that ecologists understand the details of the changes so as to maximise the opportunities and minimise the risks which they present. This article summarises the main legal changes, focussing on the new regime in England and Wales, and provides practical advice to consultants on how best to operate within it.

Detailed guidance on the changes can be found at www.defra.gov.uk/wildlife-countryside/ewd/ewd-chang-spec-prot.pdf.

Background

The European Protected Species (EPS) legal regime will be familiar territory for most consultant ecologists. It is, after all, responsible for generating much of the client work carried out by ecologists across the UK. In England, Wales and Scotland consultants will be used to thumbing through the Conservation (Natural Habitats &c.) Regulations 1994 ('the 1994 Regulations') and for those in Northern Ireland the equivalent legislation is found in the Conservation (Natural Habitats &c.) Regulations (Northern Ireland) 1995 ('the 1995 Regulations').

This year the 1994 Regulations have been amended in England and Wales by the Conservation (Natural Habitats &c.) (Amendment) Regulations 2007; and in Scotland by the Conservation (Natural Habitats &c.) (Amendment) (No 1 and No 2) (Scotland) Regulations 2007.

Similarly the 1995 Regulations in Northern Ireland have been amended by the Conservation (Natural Habitats &c.) (Amendment) Regulations (Northern Ireland) 2007.

The amendments seek to redress various deficiencies identified by the European Court of Justice in the UK's implementation of the Habitats Directive. The focus of this article is the changes to the EPS regime. This was one of the main concerns of the European Court of Justice.

Unfortunately, particularly for the numerous ecological consultancies which provide client services across the whole of the UK, the changes brought in this year give rise to separate EPS regimes in the three jurisdictions of England/Wales, Scotland and Northern Ireland which differ from each other in some significant respects. It is not possible within the scope of this article to explore all the differences. This article therefore focuses on the changes to the EPS regime in England and Wales but where possible makes comment about the regimes in Scotland and Northern Ireland. If you require more detailed information regarding the regimes in Scotland or Northern Ireland, please contact the author directly.

Impacts of the Changes: In Brief

The changes in all three jurisdictions result in a new EPS regime which present significant commercial opportunities for consultant ecologists: the regime is now stricter, the potential legal risks and exposures for ecologists' clients are greater and consequently the clients' need for detailed surveying and subsequent advice/mitigation work will be greater than before.

On the other hand the changes in all three jurisdictions present business risks for consultant ecologists, both in terms of potential liabilities to clients and potential exposures to the regulators: the legal regime is now more complex (certainly in England and Wales) and more difficult professional judgments will have to be made than before. Careful consideration needs to be given to the extent to which consultant ecologists are qualified to advise on the non-scientific aspects of the regime, clients need to receive guidance on their new responsibilities and consultancies need to take steps to close off any risk of their own exposure to new offences.

What are the Main Changes?

Some of the offences to protect EPS have become more complex

'Damaging/destroying a EPS breeding site/resting place'

The most problematic offence for consultant ecologists and their clients in all three jurisdictions is the 'strict liability' or 'no fault' offence of 'damaging or destroying a breeding site or resting place of an EPS animal'. This offence remains unchanged (this is the case in all three jurisdictions). As before, the ecologist or his client could be prosecuted even if the damage or destruction occurs accidentally.

However new guidance from the EU Commission offers helpful clarification as to when the offence is likely to be relevant and it should be considered by ecologists when advising clients. In essence it states that this offence is directed at 'safeguarding the continued ecological functionality' of breeding sites and resting places. It states that the offence applies to sites or places all year round if they are used regularly. Therefore a site or place which is not actually being used at the relevant time will fall within the offence where there is a reasonably high probability that the species concerned will return to those sites/places. However a site/place only used occasionally for breeding or resting purposes is very likely to fall outside the offence. The guidance also provides helpful definitions and examples of 'breeding sites' and 'resting places', and makes clear that mitigation measures which ensure the continued ecological functionality of a site or place would allow the

offence to be avoided. This clarification will assist ecological consultants in determining whether the offence is relevant in any specific situation and confirms an approach to interpretation which many consultants have believed for some time to be appropriate.

'EPS disturbance'

'It is an offence to:

Deliberately disturb animals of an EPS in such a way as to be likely significantly to affect -

i) the ability of any significant group of animals of that species to survive, breed or rear or nurture their young or

ii) the local distribution or abundance of the species'

The EPS 'disturbance' offences now differ significantly as between England/Wales, Scotland and Northern Ireland.

The arrangement of the 'disturbance' offences in England and Wales is more complex than before. The result is that ecologists' professional judgments will now need more 'fine tuning', but clients should benefit from fewer regulatory hurdles where disturbance can be said to be 'low level'.

In very simple terms there are now two disturbance offences in England and Wales: one is for deliberate significant (or high level) disturbance of a EPS (under the 1994 Regulations); the other is for intentional or reckless non-significant (low level) disturbance of certain species including EPS whilst they are occupying structures or places used for shelter and protection (under the Wildlife and Countryside Act 1981 (WCA)). Consultants should refer to the legislation to study the exact language of the offences.

The difference between the two offences is crucial because the steps that the ecologist or his client must take in order to avoid prosecution under each are different. If the 1994 Regulations offence is relevant then an EPS licence is required to avoid prosecution; whereas if (in a development context) the WCA offence is relevant no licence is required (or even available) and instead the ecologist/his client has to fall within one of the legal defences. This should be helpful for the client. It means that where the disturbance of a EPS is low level (assuming the disturbance is taking place in an area of EPS shelter or protection) the client does not have to go through the hurdle of obtaining a EPS licence (previously he had to). The client does however still have to make sure he is covered by a legal defence.

The position in NI and in Scotland is different. In Scotland there are five different EPS disturbance offences and all are found in the 1994 Regulations (none in the WCA). Similarly in NI there are two EPS disturbance offences and both are found in the 1995 Regulations (none in the Wildlife (Northern Ireland) Order 1985). This means that if in Scotland or Northern Ireland one of the disturbance offences is relevant in a development context, an EPS licence will be required to avoid prosecution (legal defences will not be available). Furthermore the wording of the Scottish and Northern Irish offences disturbance offences differ from each other as well as from the English/Welsh offences.

Other offences

As before, there are further EPS offences in England and Wales (*e.g.* under the 1994 Regulations: deliberately capturing, killing or injuring an EPS animal; deliberately taking or destroying the eggs of an EPS animal; deliberately picking, cutting, uprooting or destroying an EPS wild plant; and under the WCA: intentionally or recklessly obstructing access to places used by the listed species for shelter or protection; or intentionally or recklessly damaging or destroying any structure or place which the listed species use for shelter or protection). In Scotland and Northern Ireland there are similar further EPS offences although none now in the WCA or the Wildlife (Northern Ireland) Order 1985.

Legal meanings

The expressions 'deliberately', 'intentionally' and 'recklessly' are legal terms which all have different legal meanings. It is important for consultants to understand these terms in order to determine which offences are likely to apply and to advise clients adequately.

'Intention' is the hardest for the prosecution to prove: the result of the accused's act must either have been his actual purpose ('direct intention') or the accused must have appreciated that the result must have been 'virtually certain' to arise from his act ('indirect intention'). However where an EPS offence can be satisfied if the accused acted 'intentionally or recklessly' the prosecution does not have to go as far as proving intention and instead need only prove recklessness (which is easier) to get a conviction. 'Recklessness' depends on showing that the defendant is aware of 'a risk' that a result will occur and, in the circumstances known to him, it was objectively unreasonable for him to take that risk.

The legal meaning of 'deliberate' however is less certain as this term derives from European law and there is very little domestic case law on it. However it is likely to fall somewhere in between intention and recklessness and, according to the EU Commission, would apply either where a result is directly intended or where the action will 'most likely' lead to an offence against the species and the defendant consciously accepts the foreseeable results of his action.

When assessing whether an offence might be relevant to a client's proposed operations, ecological consultants therefore need to focus on how likely it is that the EPS is to be harmed in some way - is it 'virtually certain' (which might suggest 'intention')?; is it a mere 'risk' (might suggest 'recklessness')?; or is it 'most likely' (might suggest 'deliberate')?

EPS licences will be required more often

DEFRA guidance on the Amendment ('Habitat regulation: Q&A: Key messages') states that there will be an increased burden, particularly on the forestry and agricultural sectors.

In all three jurisdictions EPS licences required by ecologists to avoid exposure to prosecution when surveying will remain available as before (*i.e.* for a 'scientific purpose' and subject to satisfying certain legal tests).

However where offences either under the 1994 Regulations (in England/Wales or Scotland) or the 1995 Regulations (in Northern Ireland) are reasonably likely to be committed by a client in a development context, the client now has no option but to obtain an EPS licence to avoid prosecution. He or she can no longer proceed without a licence and rely instead on the old defences that the activity is 'the incidental result of a lawful operation and could not reasonably have been avoided' or that the EPS was in a 'dwelling house'.

By contrast, in England and Wales (only) for offences under the WCA, it is still possible to rely on these defences but in order for reliance to be robust it must be fully justified and the justification must be documented. EPS licences are not available at all for development purposes under the WCA.

Clients are now responsible for EPS licence applications

In the past consultant ecologists would apply for EPS licences on behalf of their clients. Now the regulator expects the client to apply. The client needs to understand that overall responsibility for the application and its accuracy rests with him. Any false statement in the application is his responsibility and could expose him to prosecution. The ecologist also could be prosecuted for any false statement in, say, his/her 'Method Statement'. Furthermore the client will now be primarily responsible as licensee for compliance with all licence conditions (see further below).

EPS licences may be more difficult to obtain

The legal tests which have to be satisfied (in all three jurisdictions) in order to obtain a EPS licence have not changed. However the regulators will be applying them strictly, perhaps more strictly than before, and therefore licences may become more difficult to obtain. Given the key importance of these tests, requiring economic and legal analysis, consultant ecologists need to consider carefully whether they have the expertise and qualifications to advise clients on them. Many ecologists very wisely choose not to involve themselves in this part of the application, instead recommending to their clients that lawyers and economic experts should be consulted . The two legal tests which are particularly problematic are that:

- the operation must be needed 'for imperative reasons of overriding public interest including those of a social or economic nature'. This is challenging for smaller scale operations or those providing mainly local or short term benefits. Evidence and analysis will be required to address this test; and
- there are 'no satisfactory alternatives' to the proposed operation. This is also a difficult test. The regulator will expect an analysis of alternative methodologies, the 'do nothing' option and of alternative locations. An analysis of alternative locations can become complex. Operations which are described as having an 'overriding' need (see test above) may well require an analysis of alternative locations in a large geographical area. Reasons for rejection of alternatives will need to be robust.

The role of obtaining planning permission documents has now been moved from DEFRA to consultants. This is likely to involve more work for consultants.

Clients are now responsible for compliance with EPS licences

All three jurisdictions now have a new offence for breach of a licence condition. In England and Wales this came into force on 21 November 2007. This significantly strengthens the EPS regime and presents a very real threat : It is far easier for the regulator to prosecute under this new offence by proving a breach of condition than, say, under any of the other main offences. If a condition is breached the client, as licensee, will be first in the firing line. However the wording of the offence also leaves open the possibility that the ecological consultant advising the client could be in the firing line. This is especially important given that the consultant's Method Statement (which forms part of the application) will be conditioned within the licence, at least in England/Wales. Most importantly the wording of the offence means that the ecologist could find himself/herself prosecuted for the client's breaches and vice versa. There are two legal defences to this offence, including a 'due diligence' defence. Consultant ecologists should put in place documented procedures to avail themselves of these defences (see below).

The maximum penalty for the main offences has been raised to £5,000 and/or a six month custodial sentence

Whilst the maximum penalty for breaches has been raised (although in Northern Ireland does not include the option of a custodial sentence), the legislation in England and Wales (though not in Scotland or Northern Ireland) does now state that when the court is deciding the appropriate penalty for an offence of 'damage/destruction of an EPS breeding site or resting place' the court will have regard to 'whether the offence could reasonably have been avoided'. This does not however apply to the other offences. In addition decisions to prosecute will be taken in accordance with the tests of the Code of Crown Prosecutors, *e.g.* the public interest test. For both these reasons it is crucial that ecologists' decisions and judgments are justified and documented so as to be able to demonstrate that the ecologist and/or the client were acting reasonably (see further below).

Greater powers of inspection and investigation

There are now greater powers of inspection and investigation for constables and wildlife officers. Ecologists need be aware of these in order to know how to deal with investigations on site if they happen.

The EPS regime now applies to offshore operations

EPS in the offshore marine environment (beyond 12 nautical miles from the coast) *e.g.* dolphins and whales are now also protected (under the new Offshore Marine Conservation (Natural Habitats &c.) Regulations 2007). If ecologists are advising clients undertaking commercial activities in these areas they will need to consider the regime carefully.

Maximising Opportunities

The changes to the EPS regime will assist consultants in building their businesses:

Clients will need more surveys conducted

The greater penalties for committing the offences and the removal of the 'incidental result' and 'dwelling house' defences from the 1994 and 1995 Regulations mean that the risks to clients if they fail to undertake surveys is now far greater. Surveying (pre-operational, pre-development and pre-purchase) is required to reduce the risks.

Surveying must be thorough

The increased complexity of the offences, in particular the crucial differences in England/Wales between the significant and non-significant disturbance offences, mean that surveying will have to be thorough. Ecologists need full information to be able to assess which of the EPS offences now apply and to be able to advise clients what next steps need to be taken.

EPS licence applications will be more common

There will be a greater demand for ecologists' services in terms of supporting clients' licence applications - both in writing Method Statements for clients' licence applications and in advising more generally.

Minimising Risks

There are however commercial risks for consultant ecologists which need to be managed carefully through the following steps:

Understanding and training

Ecologists must have a clear understanding of the new provisions and their impacts. Training in the new regime is essential. Understanding the differences between the offences and the meaning of 'deliberate', 'intentional' and 'reckless' is particularly important, as is appreciating the offences which an ecologist could find himself or herself committing.

Internal guidance

Given that the operation of the legislation involves science, law and economics it is strongly advisable to publish for consultancy staff clear internal guidelines/procedures setting out the scope of the services that you are qualified/prepared to offer clients. It is also important to define to the extent possible (i) the situations in which the consultancy staff need to take external advice (*e.g.* legal or other) to support their advice to clients and/or (ii) the situations in which consultants need to advise their clients to obtain their own external advice. For

example, many consultants take the view that the 'Reasoned Statement' part of an EPS licence application (which deals with satisfying the legal tests) is outside their area of expertise and that clients ought to be advised to take appropriate legal and economic advice from external providers or from colleagues within other areas of the consultancy business.

Educating clients

Clients need to understand the new provisions, their greater responsibilities and obligations and the challenges they may face in the EPS licence application process. It would be advisable to prepare a standard form letter which can be sent to clients at the outset of a project containing this information.

Record reasons for advice

In order for the ecologist to protect both himself/herself and his/her client, there is now an even greater need to document carefully the advice being given and the reasons for it. There need to be detailed records, for example, of why an ecological consultant has concluded that an offence is reasonably unlikely to result. This will greatly assist in the event that a prosecution is being considered by the regulator.

Reviewing contractual documentation

Ecological consultancies need to ensure that their standard form client contracts and other correspondence (such as client letters in which advice is provided on the likelihood of any offences being committed) contain appropriate wording to limit the consultancy's liabilities to the extent possible. Depending on the existing wording of contracts, it may be appropriate to add new wording to deal with the new regime.

EPS licence compliance procedures

It will often be the case that ecologists will assist clients with the practical work required by an EPS licence. If any breach of a licence condition were to occur and the ecologist were prosecuted he/she would need to be sure that he/she could rely on one of the 2 defences available, either the 'due diligence' defence or the 'due to matters outside my control' defence. For both defences, it is important to have in place and agreed with the client documented compliance procedures which make clear who is responsible on the ground for ensuring that each licence condition is complied with, and how each intends to monitor the other's compliance. This will benefit both the ecologist and his/her client.

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IEEM Annual Conference Report

Nick Jackson AIEEM
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Ladislav Miko

The Institute's annual conference took place on 13-15 November 2007 in Nottingham and was entitled 'Making the Connections: A Role for Ecological Networks in Nature Conservation.' The conference considered the case for ecological connectivity from the European policy perspective through to its implementation at the local level. It reviewed the theory, science, drivers and challenges for ecological networks and explored the opportunities for expanding and linking areas for wildlife. It also considered, if and how, current economic instruments could be used to support greater ecological connectivity. It was the best attended IEEM conference to date with over 300 delegates.

Professor Roger Crofts CBE, opened the conference by giving a lecture on the first evening entitled 'Environmental Stewardship: From Disfunction to Connectivity.' Roger's talk was an inspirational start to the conference and he spoke about connecting nature, policy and organisations. In nature - connecting protected areas through corridors, river catchments and through the soil; in policy - connecting CBD delivery, Natura 2000 sites and via CAP reform; and within organisations - connecting with and between organisations and greater stakeholder involvement. His paper is the lead article in this issue of *In Practice*.

The conference theme was developed through several sessions: Wednesday morning set out the challenges and context with an opening address from Ladislav Miko (DG Environment for the European Commission) who gave an overall picture of nature in Europe. Field excursions took place on Wednesday afternoon and the delegates went out to see various local sites and find out a bit more about the local examples of connectivity. Thursday morning looked at practical examples of connectivity - from large scale European projects such as the Pan European Ecological Network (PEEN), down to local level projects such as the Living Landscapes for the South East which is led by The Wildlife Trusts. The conference ended with a session looking at prospects for the future and speakers from Scottish Environment Protection Agency (SEPA), Joint Nature Conservation Committee (JNCC), Forestry Commission, National Farmers Union (NFU), Natural England, Defra and Countryside Council for Wales (CCW) all gave their views. The conference finished with a talk from Professor David Hill CEnv FIEEM who summed up the conference and looked to the future of ecological networks.

The field excursions on the Wednesday afternoon went to the following areas:

1. Rainworth Heath and Rufford Colliery Tip led by Janice Bradley MIEEM and David Sutton MIEEM (Nottinghamshire Wildlife Trust).
2. Attenborough Nature Reserve and Nature Centre led by Charles Langtree, John Black MIEEM and Mark Speck (Nottinghamshire Wildlife Trust).
3. Grantham Canal led by Richard Bennett MIEEM and Deanne Gow AIEEM (British Waterways).
4. Beeston Sidings Local Nature Reserve led by Mark Woods MIEEM (Baker Shepherd Gillespie), Paul Owen (Nottingham City Council) and Gaynor Jones Jenkins AIEEM (Nottinghamshire Wildlife Trust).
5. Birklands & Bilhaugh SSSI, Sherwood Forest led by Paul Barwick (Forestry Commission), Adam Goodall (Sherwood Forest Trust), Izi Banton (Nottinghamshire County Council) and Nic Wort (Greenwood Partnership).
6. Derby City Local Nature Reserves led by David Slinger and Beverley Rhodes MIEEM (Derby City Council).
7. Witches Oak Waters, Shardlow led by Carlos Abrahams

IEEM Best Practice Award 2007 winners: (L-R) Lucy Baker and Lucy Taylor (both Environment Agency), Sean Bennett (FWAG), and Matt Hague (Natura Environmental Consultants)

MIEEM and Andrew Baker MIEEM (Baker Shepherd Gillespie).

8. Bennerley – Erewash Valley Led by David Goddard.

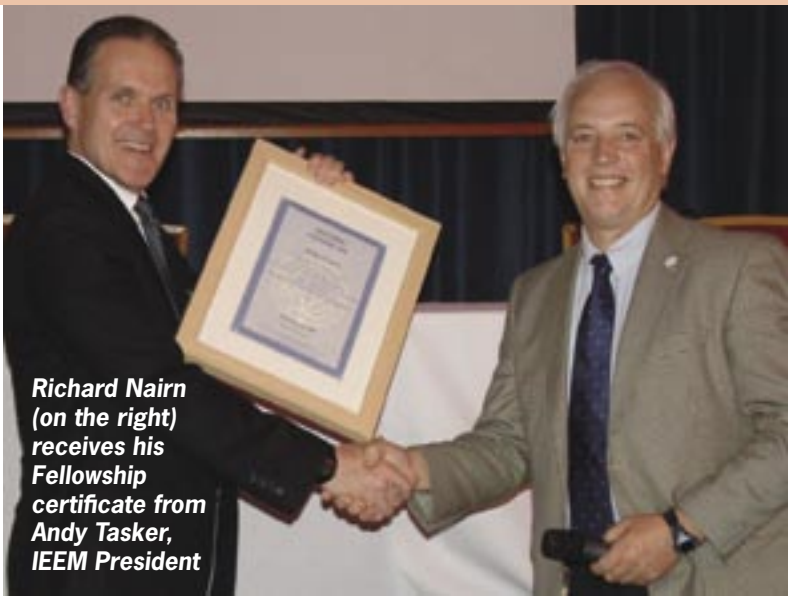
The Institute's AGM took place on Wednesday afternoon and Professor Stephen Ormerod FIEEM officially became the next IEEM President-elect. See 'Institute News' on page 34 for further details about the AGM.

The main conference dinner followed the AGM and the Institute welcomed the following special guests: Paul Bramhill (Chief Executive of Green Space), Paul Learoyd (Chief Executive of Nottinghamshire Wildlife Trust), Ed Green (Chief Executive of Derbyshire Wildlife Trust) and Simon Hodgson (Chief Executive of the Forestry Commission).

After the dinner Steve Pullan CEnv MIEEM was presented with a gift for his more than 10 years of service to IEEM. As a newly elected Fellow of the Institute, Richard Nairn CEnv FIEEM was presented with his Fellowship certificate.

This year IEEM held its first ever Best Practice Awards competition. Projects that showed best practice whilst contributing to the five objectives of IEEM were welcomed from all sectors of the ecology profession (including the public, voluntary and consultancy sectors) and projects of all sizes were considered. The three finalists (short listed by the External Affairs Committee) produced a poster explaining their project and the delegates voted for an overall winner throughout the first part of the conference. The finalists and their projects are listed below:

- Environment Agency: Aquatic Macrophyte Training, Accreditation and CPD Scheme, and River Habitat Survey Accreditation Training Programme.
- Farming and Wildlife Advisory Group (FWAG): Cornwall Farm Environment Link Project.



Richard Nairn (on the right) receives his Fellowship certificate from Andy Tasker, IEEM President

- Natura Environmental Consultants: Green City Guidelines.

Congratulations go to FWAG who were voted, by the conference delegates, as the winners with their Cornwall Farm Environment Link Project.

The conference speakers' PowerPoint presentations are now available on the IEEM website. The proceedings from the conference will be edited then compiled onto a CD and sent to all IEEM members (a printed copy to those who attended the conference).

I would like to thank all the speakers for a very thought provoking and interesting conference, the chairs of each session and the people who led the field excursions for their time and effort. For details of next year's conferences please see the 'Diary' on page 52.

White Young Green

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Leicester or Leeds*

Excellent opportunity to help lead our success forward

White Young Green is one of the UK's fastest growing multi-disciplinary professional consultancies. Operating across the built, natural and social environment, we employ over 3,000 staff located in more than 30 offices across the UK, Ireland and internationally.

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To apply you must be enthusiastic, confident, self-motivated, dynamic and able to work well as part of a team. Commitment to pragmatic business success in the environmental sector and a genuine passion for ecology are also essential.

You must be able to demonstrate considerable professional ecological experience, with a focus on project management, business development and the management and development of a lively team of ecologists. In return we offer an attractive salary, bonus, share incentive plan and benefits package together with outstanding prospects for personal and career development within a friendly progressive working environment.

Please reply in confidence enclosing your CV to White Young Green, Resourcing Dept, Arndale Court, Headingley, Leeds, LS6 2UJ.
email laura.jones@wyg.com.

For an informal discussion please contact Stephen Bolt (Regional Managing Director) on 01162 348100.

*Other office locations may be available by negotiation

Developments in the Ecological Profession: Membership Survey 2007

Jason Reeves AIEEM
External Relations Officer, IEEM

The previous survey of this kind was carried out in 1992, shortly after the founding of the Institute in 1991. This survey has been far more comprehensive and illustrates the present state of the profession and how it has developed.

The survey, done using the online survey tool Survey Monkey, opened to members on 27 March 2007 and closed on 5 June 2007. It was designed to find out about the development and changes in the professional status of the membership and closed with a very pleasing 1,156 respondents (roughly a third of the IEEM membership). Such was the volume of people trying to access the site following the last reminder that the date had to be extended to allow everyone to complete the survey.

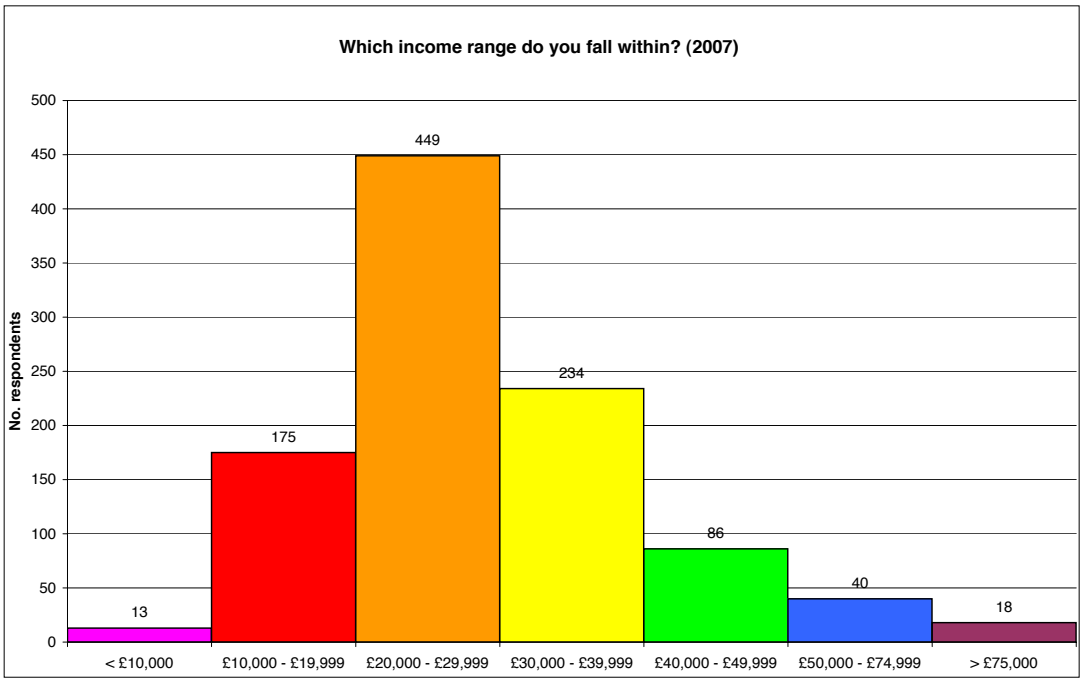
Some of the initial findings have already been used in an article in *The Guardian* newspaper (Missing Monitors by Paul Evans, Wednesday 9 May 2007, http://environment.guardian.co.uk/conservation/story/0,,2074804,00.html).

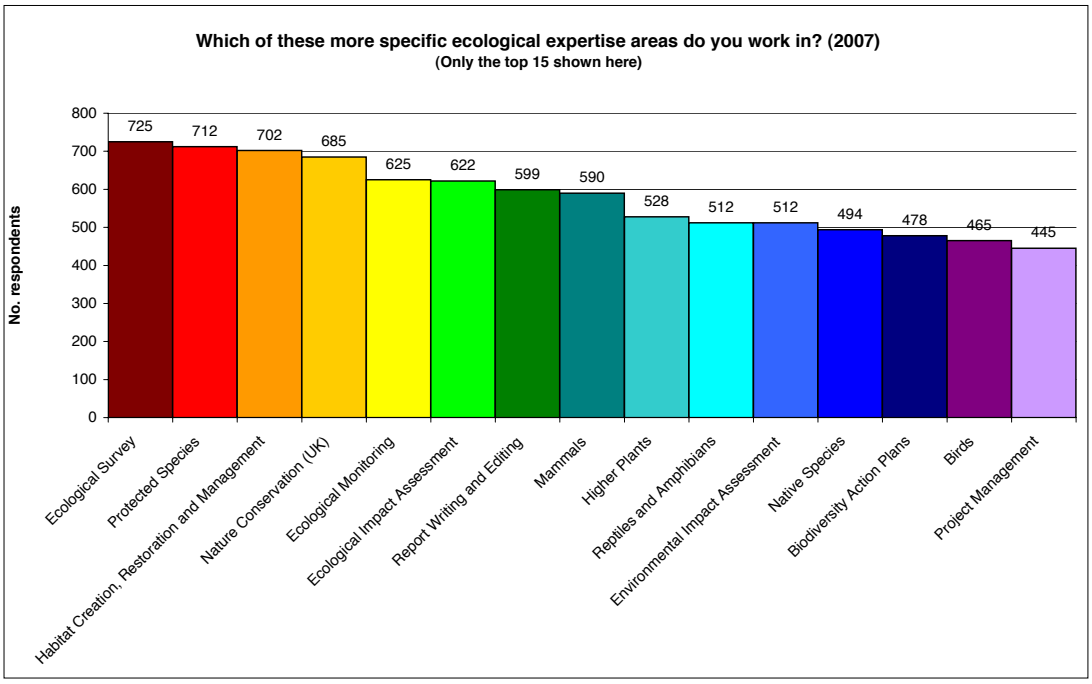
In order to entice members to complete the survey, a book voucher to the value of £50 from NHBS was on offer. The winner, randomly chosen by Andy Tasker, was Mr Paul Gregory CEnv MIEEM from Devon.

I must also thank the Professional Affairs and External Affairs Committees for their input into this survey.

The following is a summary of the respondents' results, and in some cases there is also reference to the surveys that were carried out in 1992 and 1993:

1. roughly two thirds were Full members;
2. over 90% found membership useful in some way;
3. about a third are Chartered Environmentalists (slightly more men than women), of whom over 70% found chartered status useful;
4. although the ratio for male to female respondents was roughly 1:1, the ratio changes considerably with age and membership category. Generally men are older (over 40) and in the more senior membership categories (Fellow and Full), whilst women are generally younger (under 30) and in the more junior membership categories (Associate, Graduate and Student). In 1992 the ratio for men to women was 2:1;
5. over 40% have started work as an ecologist or environmental manager since 2000;
6. there is a broad spread of junior and senior staff;
7. nearly 90% work on terrestrial ecology, whilst fewer than 10% work on marine ecology;
8. the most popular areas of work were: ecological survey; protected species; habitat creation, restoration and management; UK nature conservation; monitoring; and impact assessment;
9. just under 40% work for a consultancy, whilst there is a fairly even spread over self-employed consultants, local authorities, statutory agencies, NGOs, and government. It is also interesting to note that nearly 40% have worked for an NGO at some point in their career. There has been a marked decrease in the proportion of those who work for local authorities (26% to 10%), statutory agencies (15% to 7%) and self-employed consultants (22% to 15%) since the survey in 1992. Conversely, there has been an increase in consultancy employees (8% to 38%) in the same period;
10. the average daily rate for a consultant was £300 - £399;
11. the majority of respondents work in the south of England;
12. it is very concerning to note that a third of respondents do not know if there is a Geographic Section for their area or not. More promisingly though is the fact that most of these said that they would attend a Section event;
13. over 80% devote three or more days a year to Continuing Professional Development (CPD). This is relatively unchanged since the 1993 survey;
14. there is a broad spread in earnings between £20,000 and £40,000 pa, though men earn substantially more

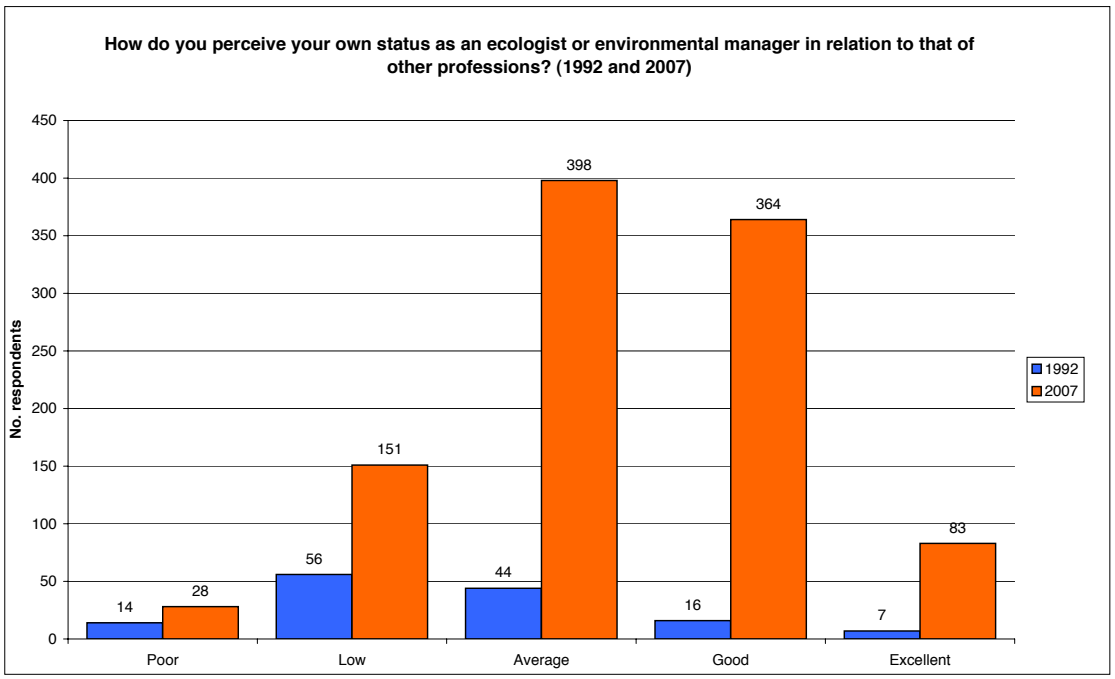




than women even when comparing the same age groups. All groups are more or less satisfied with their income. In the 1992 survey the majority of respondents fell into the £10,000 to £20,000 income range. Nearly 2% now earn over £75,000 pa – who says there is no money in ecology? Unsurprisingly, more respondents are now happier with their income than they were in 1992;

15. the majority of respondents, nearly 50%, work a 30-40 hour week but of the remaining respondents over a third work more than 40 hours a week and nearly 10% work over 50 hours per week. Men also work longer hours than women. Respondents to the 1992 survey worked longer hours than the respondents to this survey;
16. nearly 45% take between 20 and 25 days of holiday a year. Men take more holiday than women and generally the older the age group the more holiday taken. These numbers are relatively unchanged since 1992;
17. most respondents have had two employers and last changed jobs more than five years ago;
18. over half of respondents stated that their organisation was expanding to some degree, though there would appear to be little change in local authorities and statutory agencies, and government departments are slowly contracting;
19. organisations or companies that the respondents work for are generally either very small (one to five employees) or very large (more than 2,000 employees);
20. almost half of respondents do not have a supervisory role, and of the remaining respondents most supervise between one and five staff. Just over 1% supervise more than 50 people. Fewer respondents now have a supervisory role than those in 1992;
21. there is a broad spread of management responsibilities within the respondents from none to high involvement in finance, development and recruitment. Of the three, organisation development ranked the highest, and staff recruitment the lowest. All of these responsibilities are lower now than in 1992, though the 1992 survey only took into account Full, Associate and Student members;
22. the four main groups of senior decision makers that respondents have the most contact with, in order from most contact to least, are local government, landowners, private companies and national organisations. The least contact is with foreign governments. Proportionally, this has not changed since 1992;
23. unsurprisingly, over 85% of respondents have a bachelor's degree, nearly half have a master's degree and over 15% have a doctorate;
24. nearly 50% said that work experience and volunteering had been of the greatest assistance to their careers. Government-sponsored training and sandwich courses scored lowly, and IEEM CPD courses scored moderately. These are relatively unchanged since 1992;
25. nearly 40% of respondents do not see anything as a limit to their career. Just over 20% said that unwillingness to move and ecology not being taken seriously are career limitations. In the 40-49 year old age group 'children' were the most voted for career limitation. There are relatively unchanged since 1992;
26. most respondents had no real opinion on whether ecology and environmental management is limited in terms of career progression compared to other professions. In 1992 nearly 70% said that ecology and environmental management was a limit to career progression in comparison to other professions;

27. over 70% perceived the professional status of ecology and environmental management as average to good, whilst over 70% thought that other professions see the professional status of ecologists and environmental managers as low to average. This is an improvement on the 1992 response;
28. work/life balance was the single largest option indicated by respondents as the most difficult part of their job, though close behind that were 'keeping up to date with legislation' and 'getting your advice acted upon'; and
29. around 75% said that they will probably be an ecologist or environmental manager at the end of their career (this is slightly down on the 1992 response). Naturally the older the respondent the more likely they were to state this.



In short we have found that the profession is healthy and growing. Salaries have gone up and more women are entering the profession. Our members are highly qualified and work long hours but take a lot of holiday. Generally they will stay with an employer for more than five years, and these organisations are for the most part growing. From this survey the future of professional ecologists and environmental managers certainly looks like a promising one.

If you are interested in the full results of the survey please see the members' section of the website or contact jasonreeves@ieem.net

Institute News

IEEM Fellows

Council at its last meeting approved Jacqui Green as the latest IEEM Fellow. Jacqui joined IEEM shortly after its foundation and was a member of the External Affairs Committee from 1992 – 1997 and Council from 1995 – 2001. She is currently a member of the Professional Affairs Committee. The contribution to IEEM for which Jacqui is probably best known is the work on the Sources of Survey methods, which was a major feature of the last London Conference and which is featured in a separate section on the IEEM website. During her career she has held a variety of posts but since 1990 has run her own company – Green Environmental Consultants, which specializes in field work and surveys. Her fields of special competence included EcIA, botanical surveys, mammal surveys, herpetofauna, UK legal and planning issues, expert witness work and project management.

IEEM Commercial Directory

Many members have now signed up to the new Commercial Directory but we still have yet to hear from quite a number who were in the old Directory – do please check on the website to see if you are currently included. Members can be added at any time.

Obituary

IEEM has learned with regret of the deaths of Mr Beverley Heath, an Affiliate Member and Mr Kevin Patrick CEnv MIEEM, a Director of Hankinson Duckett Associates.

University Challenge

IEEM submitted a team for the very first time but on this occasion was not successful. The BBC informs me that competition was very fierce and indeed that must be so judging by the calibre of our team members. I very much hope that we shall have another go next year. Special thanks are due to all those members who allowed themselves to be subjected to a gruelling preliminary quiz, and also to Sue Bell who had the original idea.

Membership Issues

After a slightly quieter period in the summer, new applications are now running at an all time high with no less that 108 new applicants and upgrade applications received in October. November will be very similar. The new Graduate Grade continues to be very popular. This is based on qualifications but the upgrade to Associate will then have to be approved by the Membership Admissions Committee and will be based on the professional work. For those graduates with a first degree, two years of professional experience are now required.

Membership renewals were due on 1 October and many thanks to all those who have responded. Please check whether you have sent off your renewal as there are still several hundred who have not yet done so and chasing up is not good use of your Institute's resources. Although membership is on an individual basis, a welcome number of employers now pay the fees of their employees but sometimes the arrangements get confused – it might well be worth checking if you employer has responded.

2007 AGM

The AGM was held as usual during the conferences and was a very positive occasion with progress being reported on many fronts. Professor Steve Ormerod was elected as the new President-Elect and he will take over from Andy Tasker as President in November 2008. The officers are now Andy Tasker, President, Eirene Williams, Vice President, Mike Barker, Company Secretary and Alex Tait, Treasurer. Steve Pullan and Nick Carter retired from Council each having completed six years of service and Cathy Mordaunt and Adrian Yallop were elected for the first time.

E-mail Contacts

This year notice of the AGM and the associated papers were sent out to all members by e-mail. In order to comply with the Companies Act, all members must be sent this material but there were over 300 members where the e-mail addresses were not valid or where we had no electronic contact details and so we had to post them out. Please check you e-mail details are up to date as it will certainly help with the administration if we could contact all members by this means – also you would get the electronic newsletter which is now produced between each *In Practice*.

New Geographic Sections for IEEM

With the Conference being held in Nottingham, it was an ideal opportunity for the inaugural meeting of the new Shadow Section for the East Midlands of England. Ryan Mellor has agreed to be the contact to develop the Section during the coming year. This is another step forward for IEEM and we wish the new Section every success.

We fully expect that in the near future there will be Shadow Sections for Yorkshire and the Humber, and also London and the South East. Arrangements are being made to hold inaugural meetings in both areas.

Future Conferences

With the Nottingham conference barely finished we are now looking forward to 2008. This time there will be two one-day meetings and the usual two-day residential meeting when we shall be returning to Scotland.

The conferences will be:

1. The implementation of the Environmental Liability Directive, London, 16 April 2008
2. Ecological Economics, London, 3 June 2008
3. Mitigation, Glasgow, 18 – 20 November 2008

This does not include any other conferences organised by the Geographic Sections.

Offers of papers and posters for all three conferences will be most welcome.

IEEM Out and About

We try to attend a number of external conferences and meetings with some of the IEEM display material and publications. Recently, Nick Jackson attended the BES in Glasgow, Jason Reeves, the CMA at Stowe, Gemma Langdon-Saunders the meeting on 'Towards a coherent network of MPA's' at Scarborough, Jim Thompson, the annual Europarc meeting, Jason Reeves, Jim and Anna Thompson, the Mammal Society at London Zoo and Linda Yost, a conference on 'Beyond GDP' in Brussels.

New Workshop Programme for 2008

Nick Jackson has just completed the programme for 2008 and this is included with this *In Practice* mail out. Every year the programme gets more ambitious and attracts more participants and is a major contribution by IEEM to addressing the skills gap. Please note the usual warning that a number of courses do book up very quickly so as they say – 'early booking is advised'.

IEEM Wall Planner

The first IEEM wall planner has been compiled by Jason Reeves and is also included in the mail out. It features adverts by a number of IEEM companies and it is anticipated it will become a regular feature. It's very good publicity for IEEM so please make sure it finds a prominent place on your office wall.

North East England Section News

On 26 September 2007 the NE Section held a very successful AGM and the NE Committee now comprises:

Barry Anderson;
Steve Betts (Treasurer);
Ian Bond (Secretary);
Andy Cherrill (Convenor);
David Feige;
Caroline Gettinby;
Jonathan Mullard (Vice Convenor); and
Glen Robson.

Members stepping down were Maria Hardy, Tony Martin, Andy Westgarth, Jane Young and Steve Pullan. Thanks are due to them, and all last year's Committee, for their work over the year. Steve founded and has served on the regional Committee, in all its forms, for 10 years. The occasion was marked by presenting to him a Northumberland landscape painting in recognition of his outstanding contribution.

Martyn Kelly gave an excellent talk on implementation of the Water Framework Directive, the DARLEQ tool for assessing water quality, quality assurance issues and the future of ecology(ists) in the statutory agencies.

The next meeting for the Section will be held on the evening of 6 February 2008. Professor David Hill CEnv FIEEM will give a talk on his role and view of Natural England from his position as a member of the Natural England Board. This is sure to be a thought provoking and authoritative seminar. The venue will be announced nearer the date but please make a note in your diary today. The seminar will commence at 7.30 pm with refreshments from 7 pm. Further details from andrew.cherrill@sunderland.ac.uk.

The Committee is reviewing the results of the recent questionnaire survey of NE members' training needs - 15 questionnaires were returned. A small response, perhaps, from a NE membership of around 130.

Offers of short courses were received from four individuals/organisations. Further replies are welcome as are suggestions on how to stimulate provision of training opportunities for members in the NE.

The Section's finances are in good health following allocation of £1,500 from central funds, a personal donation, and the success of the 'grasslands' conference in April. Expenses associated with running events and Committee meetings totalled £125.78. The balance of funds stands at £2,571.75.

Members wishing to raise issues, suggest or offer topics for regional events, are invited to contact any member of the Committee.

Andy Cherrill CEnv MIEEM
NE England Section Convenor

North West England Section News

As a recently constituted Section we have enjoyed a strong and successful first year with a series of exciting and well supported events. Following a well earned summer break the Committee are busy putting together a new programme for 2007/8.

The events in preparation include two sessions on coastal managed re-alignment with the National Trust/UK Sand Dune Network on the Sefton Coast, and the Environment Agency on the Ribble estuary, a practical meeting on bat survey techniques with the East Lancashire Bat Group, a climate change project in Cumbrian high fells with Natural England, a session on the Water Framework Directive with the Environment Agency, a couple of events considering restoration and mitigation, one on landfill sites and another on a former large industrial site, and a Christmas social! There is still time to offer more events to add to our busy programme so please drop us a line.

In the meantime please put the evening of Wednesday 23 January 2008 in your diaries – 6.30 pm onwards in Manchester Metropolitan University (booking details will be circulated with the finalised programme of Section events). This will be the Section AGM (short!) followed by a lecture from Professor Rob Marrs, one of the Fellows of the Institute. The intriguing title of the lecture is 'Harry Potter, eagles, dead cows and other things you didn't know about bracken'. Rob is an authority in this area and believes passionately that ecology should be done through a combination of theory and practice.

Now for some real forward planning - early notice of the next AGM and lecture! This will be held at 6.30 pm on Wednesday 3 December 2008 in Liverpool Hope University. Please put it in your diaries, if you have one for 2008 yet!

We currently have a call out to Section members who may be willing to take on a student or graduate aspiring to work in ecology and environmental management. Do you remember how difficult it was to get your foot on the environmental career ladder? We would like to hear from you if you have volunteer or student placement opportunities – paid or unpaid. Please e-mail rooneyp@hope.ac.uk and e.price@mmu.ac.uk and we will compile the material and circulate it to members and local Universities.

The Section benefits from two new members to the Committee, Cameron Cook and Christie Webster. We extend a warm welcome to them both. If you are interested in serving on the Section Committee please get in touch. We particularly welcome approaches from Associate, Graduate and Student members.

Finally, we have around 30 members with e-mail addresses that are bouncing back as failed. Perhaps you have changed job or e-mail address recently? As most of the communications and notifications for the Section and its events are sent by e-mail please ensure that your details held by the main IEEM office are correct.

Paul Rooney CEnv MIEEM
NW England Section Convenor

Irish Section News

Coming of Age

The third annual conference of the Irish Section, held in Dublin on 15 October 2007, marked a significant advance for the Institute in Ireland. With a record attendance of 170 ecologists, sponsorship from all the main statutory agencies in Ireland (north and south), and an opening address by the newly appointed Minister for the Environment, the conference has now become an unmissable event in the annual calendar in Ireland. The theme of this year's conference was 'Irish Biodiversity – Countdown to 2010'. In keeping with the urgency of the campaign, the programme offered a wide selection of summaries of recent research on wild flora and fauna.

The Minister for the Environment, Heritage and Local Government John Gormley TD, is the first member of the Green Party to occupy this important position and there was much interest among ecologists in how this will influence nature conservation. The Minister began the conference by referring to the recent reporting by his Department to the EU Commission under Article 17 of the Habitats Directive. He said: *"Many of our most important habitats have been identified as endangered. While the news on our important species is somewhat more encouraging, I don't believe it offers any cause for complacency. Tackling this problem is not only a legislative requirement under the Directive, it is perhaps the most critical element in our national efforts to protect our biodiversity"*. This set the scene for the rest of the day's proceedings.

The first keynote address from a statutory body was provided by Ciaran O'Keeffe, Director of the National Parks and Wildlife Service. He gave an overview of the recent status reports on the protected habitats and species in the Republic of Ireland. Each one is evaluated using a traffic light system - red for bad status, green for good and amber for borderline. For those habitats listed in Annex I of the Directive, the news is generally bad. Many are under serious threat – for example only 1% of the original area of raised bog still survives and even this is disappearing at a rate of 7% per year. He was followed by Richard Weyl of the Environment and Heritage Service, Northern Ireland, who spoke about the Northern Ireland Biodiversity Strategy. Priority habitats and species have been identified which are dependent on the designation and management of statutory nature conservation sites and wider policies particularly those relating to agriculture, planning and fisheries. The development of local biodiversity action plans, promoting the understanding of biodiversity and the engagement of government departments have been a focus of work in recent years.

The main papers of the conference were grouped into a series of sub-themes – mammals, birds, invertebrates, freshwater, marine and alien species. Mammals covered included the pine marten by Dr Declan O'Mahoney, who is based in Belfast, monitoring of bats by Dr Tina Aughney of Bat Conservation Ireland and the Irish squirrel survey by Dr Michael Carey. Mammals also crept into the conference programme through the marine door with updates on Irish seal populations from Dr Oliver O'Cadhla and Michelle Cronin of University College Cork, and a review of cetacean sightings and strandings from Faith Wilson of the Irish Whale and Dolphin Group.

Of all the issues raised at this conference, the threat posed by the introduction and spread of alien species produced the most vocal reaction from the audience. Sylvia Reynolds spoke about the information available on alien plants in Ireland, but her description of the unrestricted sale of invasive aquatic plants in garden centres brought a clear call for better legislation and control of these species. On the zoological front, Dr Dan Minchen addressed the spread of zebra mussels in Irish waterways and the need for better regulation of the sale and movement of boats.

A session on freshwater fish and invertebrates included an up-to-date evaluation of the status and distribution of rare fish in Ireland from Dr Fran Igoe of the Shannon Regional Fisheries Board. Dr Eugenie Regan decribed the Water Beetles of Ireland Initiative which is being organised under the auspices of the National Biodiversity Data Centre. The level of knowledge of this group is relatively good compared to many invertebrates and they are excellent indicators of environmental quality. The biodiversity trends in land and freshwater molluscs in Ireland were outlined by Dr Evelyn Moorkens.

Birds are always among the best studied organisms as ornithology has long been among the most popular branches of natural science. The enthusiasm for his subject was evident in the talk by Barry O'Donoghue, of the National Parks and Wildlife Service, who spoke about his research on hen harriers in Ireland. Mike Trewby of BirdWatch Ireland, gave us an insight into the research which has been necessary to inform the designation of Special Protection Areas (SPAs) for red-billed chough – the rarest member of the crow family which has a stronghold in western Ireland. Birds of Conservation Concern in Ireland is a status report produced for the whole island by BirdWatch Ireland and the RSPB. The impact of the first report (1999) on conservation priorities and a new update of the list was outlined by Dr Steve Newton of BirdWatch Ireland.

The final session of the conference included a report on the status and prospects for soil data in Ireland by Dr Reamonn Fealy of Teagasc, the agricultural agency. Dr Declan Doogue took a personal look at the practice of plant tranlocation which he considers to be 'forging nature's signature'. The challenges and opportunities facing the new National Biodiversity Data Centre were addressed by its Director, Dr Liam Lysaght, who showed that data management is one of the key building blocks for biodiversity conservation.

The sponsorship of this event by the Heritage Council, the Environmental Protection Agency, the National Parks and Wildlife Service and the Environment and Heritage Service (Northern Ireland) was much appreciated and facilitated the move to a larger, more accessible venue. The presentations from the conference can now be viewed in full on the website www.ieem.net. The informal sessions of the conference, including lunch and tea breaks, are always among the most important times for networking and recruiting new members for the Institute. With over a hundred members spread throughout Ireland, interest is growing and with it an awareness of the importance of the profession of ecology and environmental management.

Richard Nairn CEnv FIEEM
Irish Geographic Section Vice-Convenor

South West England Section News

The Ecological Impacts of Highways Construction - Joint meeting with IEEM SW Section and the IHT

The SW Section and the Institution of Highways and Transportation (IHT) organised a successful evening conference on 'The Ecological Impacts of Highways Construction'. Over 95 people attended the event on 9 October at the University of the West of England in Bristol. Presentations were given by Stuart Wilson CEnv MIEEM, a senior ecologist from the Highways Agency, Melissa Woodcraft, a drainage engineer from Hyder Consulting and Dr Mike Wells CEnv MIEEM and Dr Lincoln Garland CEnv MIEEM from Biodiversity by Design.

Stuart's talk 'Nature Conservation: Advice, Responsibilities and Compromises' was a valuable insight into the current stance of the Highways Agency on legal responsibilities and best practice with regard to retaining ecological value in road schemes. He stated the importance of consulting Highways Agency documents when working on these schemes, highlighting in particular the recently or soon to be updated Manual of Contract Documents for Highways Works (MCDHW), Interim Advice Notes (*e.g.* EnvIS 84/07, July 2007) and the 2008 updates to the Design Manual for Roads and Bridges (DMRB) Volume 10 species and habitats advice notes, which include climate change and for numerous protected species (online at www.standardsforhighways.co.uk). Stuart listed examples in which oversights to Highways Agency Guidance had resulted in damage to ecological features and protected species, including incidents of inappropriate mitigation. The take-home message was the importance of keeping up-to-date with the fast changing guidance, as well as being pragmatic and considered in ecological mitigation design for highways.

Melissa delivered a thought-provoking presentation entitled 'Ecological Issues Associated with Highways Drainage'. She emphasised the importance of integrating the sometimes opposing ecological and hydrological objectives of schemes to find an optimal compromise. She gave a comprehensive overview of the hydrological requirements of highway construction schemes, followed by examples of projects where the water management and ecological requirements overlapped. It was a fantastic opportunity to gain an insight into another area of environmental design for road engineering, and emphasised Melissa's message of the importance of a multi-disciplinary approach to construction projects.

Lincoln and Mike focused on the potential for ecological protection and enhancement within highways work. They raised a wide variety of fascinating issues in the protection of ecological features and potential solutions to these, emphasising the range of habitats and species which can be involved in large-scale projects. Lincoln gave an overview of ecological impacts of highways work and the importance of road verges, which cover a larger area than hedgerows in the UK, with a detailed example provided from his research on barn owls. Mitigation design for barn owls was directed at either reducing road fatalities (*e.g.* by planting to deter swooping over embanked roads and encouraging use of green bridges) or at enhancing foraging and nesting habitat in other areas to boost populations and discourage foraging on roadside verges. Mike gave a detailed example of a previously considered, but now defunct project for a bypass around Stonehenge. He highlighted difficulties in satisfying the Habitat Regulations, namely in proving that there will be no adverse ecological effects, and in making the scheme 'as good as it can be within a reasonable cost'. Light and noise contour modelling, for example, to predict likely impacts on stone curlews within the nearby RSPB recolonisation area, were highlighted as being underused but valuable tools for impact assessment.

In all, the event was a huge success, drawing a wide cross-section of attendants from all over the region from a range of disciplines. The talks gave a clear overview of the considerations and approaches required by highway construction schemes, including practical solutions to complex problems. IEEM is grateful to all speakers and to Tom Johnson from PB/IHT for his initial approach and help in organising the meeting.

Report by Sarah Dale (Graduate member)

Scottish Section News

IEEM Evening Seminar on Sustainable Building Design

Great Glen House, Inverness

30 August 2007

Delegates at the seminar

In August the IEEM Scottish Section held an evening seminar to discuss designing and constructing sustainable buildings, hosted by SNH at their headquarters in Inverness. The issues around sustainable development, and in particular climate change, have become much more mainstream on the political agenda over the last year – particularly because of the Stern report on climate change and the economy which was published in autumn 2006. This has stimulated much debate about issues such as carbon footprints, carbon trading and personal carbon allowances. But sustainable development is not just about addressing carbon emissions – there are many practical issues that need to be addressed too. The design of buildings and the construction methods can have an affect on the environment both positive and negative. Similarly, environmental legislation and guidance on best practice can influence the eventual shape of a development.

At the seminar representatives from the architecture and building industry were brought together with those with an interest in the natural heritage and other aspects of the environment. Sheila Currie (SNH) gave a short introduction to the evening and provided a guided tour of SNH's award winning headquarters, Great Glen House. Sheila has been involved in buildings management for SNH since the start of its planning and design. From the outset SNH set strict sustainability targets for the development, including emission output and water use levels and which were met through its design. Sheila praised all those involved for their enthusiasm and commitment to SNH's remit to promote sustainability during the planning, construction and operation of the building, which SNH hopes will serve as a model of good practice for years to come.

Interior view of Great Glen House

The building currently has very low energy requirements due to the large proportion of natural lighting, use of solar water heaters and the operation of the independent building management system. Great Glen House's building management system has now collected over a year of data, including information about weather conditions and use of the building, and it is becoming progressively more sophisticated at independently controlling conditions in the building. The building also harvests rainwater, has a 'green' *Sedum* roof on the library, and incorporated large amounts of natural, local materials during its construction, the building being dominated by natural light, wood and glass.

The remit for sustainability in this open plan, flexible space also extends beyond building design and encourages sustainability in all areas of work life. Although the building is located outside the centre of Inverness, sustainable travel is encouraged and facilitated through a good relationship with Stage Coach, who run regular bus services to the site, and the provision of a big bike shelter and showers. SNH have also conducted a mapping exercise to show where SNH employees live, to encourage car sharing where public transport access is not available.

During the tour of the buildings and surrounds the delegates discussed some of the key issues in the design and construction of sustainable buildings, and had the opportunity to look first hand at links between ecology, environmental management and sustainable building design, where SNH's building research work has been embedded in the design of the building.

An enjoyable and informative visit was had by all, with interesting discussions taking place about recent progress in sustainable building design and implementation, and some of the difficulties encountered during the construction and operation of Great Glen House. The Scottish Section hope to continue discussions regarding sustainability and building design during further IEEM events during 2008, and would like to welcome thoughts, comments and suggestions from all IEEM members.

Report by Katherine Degenaar AIEEM and Sally Monks MIEEM

Exterior View of Great Glen House

Scottish Section News

People and Wildlife in National Parks

IEEM Scottish Section Conference and Ninth Annual General Meeting

The Buchanan Arms Hotel, Drymen

27 September 2007

Nearly 30 delegates travelled from across Scotland to attend this year's IEEM Scottish Section Conference and AGM, held in Drymen near Loch Lomond. The topic of discussion this year was People and Wildlife in National Parks, which covered a range of issues including land management and access, and the management of National Parks in Scotland. The aim of the conference was to give an up-to-date overview of current issues relating to protected areas and wild spaces in Scotland, and to discuss recent progress in ecology, environmental management and planning in these areas. A diverse variety of delegates and speakers attended the conference, with representatives attending from public, private and NGO organisations including SNH, Forestry Commission Scotland, Sustrans, private consultancies and academic institutions.

Grant Moir, from the Loch Lomond and Trossachs National Park Authority (LLTNPA) began the morning by giving an overview of the aims of National Parks and some of the key issues faced in their management, highlighting the pressures on the Loch Lomond and Trossachs National Park (LLTNP) and some recent changes in land management trends in the park. It is estimated that around 3 million visits are made to the park each year and that up to 90% of these visits are made by car, resulting in intense environmental pressure across the park. There is a reduction in livestock farming and an increase in diversification and local intensification in farming practices, with increasing timber demand and forest restructuring also likely to alter the appearance and land management regimes of large areas of the park. Grant noted that the LLTNPA aim to create stronger habitat networks through local woodland and forestry framework plans and encourage a bottom-up approach to land management. Management in the Glen Dochart and Strathfillan area is currently being undertaken as part of the National Park Land Futures Pilot Area, under which the LLTNPA are working with local land managers to progress their priority projects and address their hopes and fears for future land management in the area. It is hoped that following the success of the project a similar management plan will be implemented across the entire park.

Another protected site in Scotland that requires sensitive management is Loch Leven National Nature Reserve, Britain's largest eutrophic system and a highly important site for wintering and breeding bird communities. Denise Reed of SNH presented her experience of managing access to the site since the introduction of the Scottish Outdoor Access Code (SOAC), which involved an in-depth study of the baseline environment of the site to inform access guidance for the site. Denise noted that the access guidelines are based on a precautionary approach to Natura site protection which are intended to safeguard the nature conservation interests of the site through a process of continual monitoring and review. As part of this process SNH continually monitor visitor numbers and activities in parallel to ornithological monitoring programmes that are designed to highlight changes in bird behaviour. Unfortunately Denise's experience to date has noted a high-level of non-compliance by dog walkers, and whilst many visitors are aware of the sensitivity and value of the site, the majority have little understanding of the impacts of disturbance on the site's important bird communities. SNH are continually working towards addressing these issues and are currently implementing measures to simplify the access guidance and promote wider public understanding of land management practices and their aims.

Further discussion of the SOAC followed with Hebe Carus' talk which provided a mountaineer's perspective of access and conservation. Hebe works for the Mountaineering Council of Scotland (MC of S) and regularly experiences the interface between users of National Parks and other protected areas of Scotland, and land management and conservation issues. The MC of S provides information and guidance to access users and land managers on how the SOAC should be used correctly. Some of the most frequent problems Hebe encounters relate to the conflict between access and the protection of Schedule I (Wildlife and Countryside Act) protected bird species in Scotland. An interesting discussion followed with delegates representing statutory bodies, raptor study groups and amateur mountaineers providing their perspective and experience of this issue.

The final talk of the morning was given by Bridget Jones of the LLTNPA. Bridget gave an overview of the work of the visitor and operational services department of the LLTNPA, giving examples of a range of access projects that the LLTNPA is currently working on. These include ongoing work on strategic path networks (long distance walking routes, national cycle networks) and existing local path networks, the Paths to Health Project and the creation of new paths in the park. The LLTNPA aims to publicise the SOAC and educate access users, encouraging responsible behaviours in the park. The LLTNPA also holds a Land Access Forum (est. 2005) and works had to uphold access rights in the park for all users. The next key milestone of access provision in the park is likely to be the publication of the LLTNPA Core Paths Plan, which is currently in preparation and will be published in 2008.

Following lunch and the AGM the delegates went out into the park for an afternoon site visit which was lead by Adam Samson, a ranger from the LLTNPA. A short boat ride was taken from Balmaha on the western shores of Loch Lomond over to Inchcailloch Island, a popular designation for over 20,000 access users in the park each year. The island is a carefully managed part of the Loch Lomond NNR and Ramsar site with geological, biological and historical importance. The island is predominantly mixed oak plantation, and has a small population of fallow deer, unlike some of the nearby islands in the Loch which support a population of escaped wallabies! Adam showed the delegates round the island with great enthusiasm, demonstrating some of the audio and interactive handheld guides which the Park is testing as part of a European study into interpretation in National Parks. The Scottish weather was kind, giving stunning views over Loch Lomond to Ben Lomond and beyond, whilst the delegates discussed visitor management issues and practical reserve and habitat management practices.

Report by Katherine Degenaar AIEEM and Peter Wright AIEEM

The Society is now making steady progress in consolidating the numbers of Constituent bodies. There are currently five in the pipeline: the Association of Building Engineers, the Chartered Institute of Architectural Technologists; the Energy Institute; the Institute of Materials, Minerals and Mining; and the Society of Environmental Engineers. This is an essential part of building the base from which further expansion will be possible

Salaries for Chartered Environmentalists

Latest industry research shows their CEnv members are earning on average £10k a year more than their non chartered colleagues. The highest earning 10% of CEnvs are reported to be earning up to an additional £15k per year. I have heard somewhat similar reports from IEEM members who are also Chartered Environmentalists – but alas not to the tune of an extra £15k - view the report at www.iema.net/index.php/articles/envnews/17737

Network Opportunity for CEnvs in the Republic of Ireland

There are a number of CEnvs based in the Republic of Ireland and those who would like to be involved in the formation of a network are invited to contact Suzanne Dempsey (suzanne.dempsey@phmcc.com) as soon as possible with a view to forming a group to organize SocEnv events in the Republic.

New Environmental Expert Witness Register

A new joint register of CEnvs who are also Environmental Expert Witnesses is to be launched. Working in partnership with the Academy of Experts, SocEnv has developed a joint register which can be accessed online by anyone trying to find an expert for a planning inquiry or a wide range of other legal claim or dispute situations. All such accredited experts will have their name on the internet register and receive a certificate issued jointly by the Academy of Experts and the Society. If you would like to join the register or would like further details please contact trish.hall@socenv.org.uk.

SocEnv's new Policy Forum

The Technical Committee is now to change to become the 'SocEnv Policy Forum'. The purpose of the Forum will be to engage a diverse range of professionals (primarily CEnvs but also open to others) to debate sustainability policy issues at regional, national and international levels.

The recently circulated EFAEP Bulletin no.11 included the following statement from the President, Jan Karel Mak. It highlights some of the recent progress of EFAEP, and of the key areas of European involvement by IEEM:

'Let me first of all welcome our two latest new members, SVU and AIN. With SVU we welcome the first Swiss organisation within EFAEP; AIN is the third Italian association to join. With their entry, the grand total of environmental professionals within EFAEP has risen to 30,000.

We are a formidable group with an enormous potential to improve European environmental policy, to help develop national environmental policies in parts of Europe, and to serve the development of our profession.

EFAEP is still young and in the process of developing its activities. Today, contacts among professionals across member associations are still scarce, our efforts aimed at improving European environmental policy and legislation are still limited, and international knowledge exchange has not really taken off yet.

In our upcoming General Assembly in December, we will therefore concentrate upon the strategy for the next few years, with the aim of unleashing our potential – to the benefit of the European environment and our profession.

One important tool is the European Network of Environmental Professionals (ENEP) database, a unique, internet-based instrument for the communication of environmental professionals with each other and, if so desired, with potential employers and others. As with all information systems, its effectiveness depends on its content. Let me therefore invite, no, admonish you to enlist today, and so become part of this dedicated internet community!'

The European Network of Environmental Professionals (ENEP) can be found at: www.environmentalprofessionals.eu

For more information on EFAEP please visit: www.efaep.org

Are we meeting the 2010 biodiversity target?

The European Environmental Agency answers with a clear 'no' in its latest report, and presents grim figures on species loss and threats. Yet, 90% of governments claim that they have the right policies in place to protect species and ecosystems.

Unless considerable additional efforts can be mobilized, the 2010 biodiversity target of halting biodiversity loss in the pan-European region by 2010 will not be achieved. At the same time, biodiversity decline continues to be a major concern, and pressures from climate change and alien invasive species are increasing. These are the conclusions of the fourth Assessment 'Europe's environment' . The report – published by the European Environmental Agency at the Ministerial Conference 'Environment for Europe' in Belgrade – confirms concerns that Europe's governments are not taking all necessary actions to meet the 2010 biodiversity target.

To improve the quality of the available data and make comparisons easier, the European Environmental Agency works on streamlining European Biodiversity Indicators. The set of 26 indicators presented previously will be used for an indicator based report in 2008.

The European Commission adds to this in monitoring the implementation of the EC Biodiversity Action Plan by Member States and Commission and assesses the value of ecosystem services. A midterm report to 2010 will be presented next year.

With efforts being made globally to achieve the 2010 biodiversity target, and 2010 rapidly approaching, initiatives are now gearing up to assess and communicate progress towards the target - using indicators.

The 2010 Biodiversity Indicator Partnership (2010BIP) has been established to assess and communicate progress towards the target using indicators. With funding from the Global Environment Facility (GEF), the 2010BIP is promoting the application of existing indicators, such as the Red List Index based on the IUCN Red List of Threatened Species, and the development of new indicators for reporting on the different aspects of the 2010 biodiversity target, such as sustainable use, and threats to species and habitats.

In the Journals

Jim Thompson CEnv MIEEM and Jason Reeves AIEEM

R.H. Gibson, S. Pearce, R.J. Morris, W.O.C. Symondson and J. Memmott.
Plant diversity and land use under organic and conventional agriculture: a whole-farm approach.
Journal of Applied Ecology 2007, **44**: 792–803.

The authors tested whether in comparison to conventional farms, organic farms have larger areas of semi-natural and boundary vegetation, and support higher levels of plant abundance, richness and diversity within cropped and semi-natural areas.

10 whole farm organic farms were paired with 10 conventional farms in the south-west of England. On average, organic farms were 7.3 years post conversion. Plant abundance, species richness and diversity were measured in all crop and non-crop landscape elements on each farm.

Organic farms had greater total areas of semi-natural habitat (woodland, field margins and hedgerows combined). Woodland area on it's own was also significantly greater. Organic farms had more continuous blocks of woodland whereas woodland on conventional farms often consisted of more linear patches.

Semi-natural habitats on organic farms did not have higher plant abundance, richness or diversity than their conventional counterparts. The only landscape element that showed a significant increase in plant abundance, richness or diversity was arable fields.

With the exception of arable fields, no habitats on organic farms were of a better quality than their conventional counterparts in terms of plant abundance and diversity. Conventional farmers may be able to achieve an increase in plant diversity within arable fields by adopting some organic management practices at the field scale (*e.g.* exclusion of synthetic herbicides), and whole-farm conversion to organic practice might not be required.

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M. Albrecht, P. Duelli, C. Müller, D. Kleijn and B.Schmid.
The Swiss agri-environment scheme enhances pollinator diversity and plant reproductive success in nearby intensively managed farmland.
Journal of Applied Ecology 2007, **44**: 813–822.

Agri-environment schemes attempt to counteract the loss of biodiversity and associated ecosystem services such as pollination and natural pest control in agro-ecosystems. However, only a few studies have evaluated whether these attempts are successful.

The authors studied the effects of managing meadows according to the prescriptions of ecological compensation areas (ECA), the most widely adopted agri-environment scheme in Switzerland, on both pollinator species richness and abundance, and the reproductive success of plants in nearby intensively managed meadows (IM).

Species richness and abundance of hoverflies, solitary bees and large-sized pollinators (mainly social bees and butterflies) were significantly higher in ECA than in adjacent IM. Species richness and abundance of small-sized pollinators in IM declined significantly with increasing distance from ECA, whereas large-sized pollinators were not significantly affected by distance. Plant species richness and flower abundance were the major drivers of pollinator species richness and abundance; the area of an ECA had no significant influence.

They concluded that establishing ECA is an effective method of enhancing both pollinator species richness and abundance and pollination services to nearby intensely managed farmland. The study emphasizes the importance of connectivity between ECA in maintaining diverse pollinator communities and thereby providing pollination services in agricultural landscapes.

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H.E. Jenkins *et al.*
Effects of culling on spatial associations of *Mycobacterium bovis* infections in badgers and cattle.
Journal of Applied Ecology 2007, **44**: 897–908.

Bovine tuberculosis (TB), caused by *Mycobacterium bovis*, has serious consequences for Britain's cattle industry. European badgers (*Meles meles*) can transmit infection to cattle, and for many years the British government culled badgers in a series of attempts to reduce cattle infections.

The authors investigated the impact of badger culling on the spatial distribution of *M. bovis* infection in badger and cattle populations in replicated areas in England.

M. bovis infection was significantly clustered within badger populations, but clustering was reduced when culls were repeated across wide areas. A significant spatial association between *M. bovis* infections in badgers and cattle herds likewise declined across successive culls. These patterns are consistent with evidence that badgers are less territorial and range more widely in culled areas, allowing transmission to occur over greater distances.

Prior to culling, *M. bovis* infections were clustered within cattle populations. Where badger culling was localised, and in unculled areas just outside widespread culling areas, cattle infections became less spatially clustered as badger culling was repeated. This is consistent with expanded badger ranging observed in these areas.

In contrast, clustering of infection in cattle persisted over time on lands where badgers were repeatedly culled over wide areas. While this lack of a temporal trend must be interpreted with caution, it might reflect persistent infection within, and continued transmission between, cattle herds in areas where transmission from badgers to cattle had been reduced by badger culling. Continued spatial association of infections in cattle and badgers in such areas might partly reflect transmission from cattle.

The findings confirm that badger culling can prompt spatial spread of *M. bovis* infection, a phenomenon likely to undermine the utility of this approach as a disease control measure. Possible evidence of transmission from cattle, both to other cattle and to badgers, suggests that improved cattle controls might yield multiple benefits for TB management.

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Reviewers note: We often hear the cry for evidence based

decision making which IEEM members would surely support. The Chief Scientist, Sir David King has concluded however that 'it is clear that badgers are a continuing source of infection for cattle and could account for 40% of cattle breakdowns in some areas. Cattle controls remain essential but I consider that, in certain circumstances and under strict conditions, badger removal can reduce the overall incidence of TB in cattle'. Sir David's conclusion appears to relate to areas where once culled, further immigration by badgers would be unlikely so is this going to open up the debate as to which areas can now be considered in this light?

G.M. Siriwardena, D.K. Stevens, G.Q.A. Anderson, J.A. Vickery, N.A. Calbrade and S. Dodd.

The effect of supplementary winter seed food on breeding populations of farmland birds: evidence from two large-scale experiments.

Journal of Applied Ecology 2007, **44**: 920–932.

Low winter food availability is probably critical in the declines of many farmland bird species in Europe, leading to the implementation of ameliorative agri-environment scheme options.

The paper reports the results of two large-scale, three-year, controlled experiments investigating the effects of supplementary winter seed provision on breeding farmland bird abundance. In each experiment, the use of winter feeding sites by birds was monitored and the availability of alternative, seed-rich habitat in the surrounding area was measured. The Winter Food for Birds (WFFB) project also included variable levels of food provision. Breeding bird abundance was then monitored in experimental and control areas. The Bird Aid project targeted yellowhammer *Emberiza citrinella* L., corn bunting *E. calandra* L. and tree sparrow *Passer montanus* L., while WFFB considered 11 species that used supplementary winter food.

Comparisons of trends in breeding abundance between experimental and control areas revealed little evidence for positive effects of feeding, but there was great variation in the use of feeding sites by each species, and therefore in the seed quantity birds received.

Declines for yellowhammer, robin and dunnock were less steep where more food was provided in WFFB areas (a fourfold difference in seed provision across 1.5 times the land area).

Effective winter food provision to farmland bird populations has the potential to halt, and perhaps to reverse, declines in abundance. In practice, this means that agri-environment measures supplying significant quantities of winter food, such as stubbles preceded by low-input cereals, should succeed in changing population trends if they provide resources at the times of greatest need and if there is sufficient uptake.

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M. Watson, N.J. Aebischer, G.R. Potts and J.A. Ewald.

The relative effects of raptor predation and shooting on overwinter mortality of grey partridges in the United Kingdom.

Journal of Applied Ecology 2007, **44**: 972–982.

The grey partridge *Perdix perdix* is a UK Biodiversity Action Plan species because of a marked decline in abundance caused by agricultural intensification. Recently, the number of raptors present on farmland and the commercial shooting of red-legged partridges *Alectoris rufa* have both increased. To inform conservation action, the relative impacts of these two factors on grey partridge populations urgently require quantification.

On this study site areas of low density of grey partridges coincided with areas of high raptor density. However, these areas were managed intensively for shooting and for two areas that suffered local partridge extinction, the 3-year average percentage of partridges shot exceeded 50%.

Grey partridge mortality to raptors between autumn and spring lay between 9.5% of autumn density (assumes losses to raptors occurred before shooting) and 15% of post-shooting density (if all losses to raptors were post-shooting). In comparison, shooting losses across the study area amounted to 35–39% of autumn density, more than double the losses to raptor predation.

Shooting based on large-scale releases of red-legged partridges can lead to local grey partridge extinction. It is imperative that managers of intensive shoots based on gamebird release adopt measures to reduce shooting pressure on wild grey partridges at low density. These include training shooters to distinguish between grey and red-legged partridges and implementing a warning system (whistle) to alert the gun line when birds of the non-target species are approaching. These voluntary measures have greater implications for grey partridge conservation than raptor predation.

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D.B. Roy, P. Rothery and T. Brereton.

Reduced-effort schemes for monitoring butterfly populations.

Journal of Applied Ecology 2007, **44**: 993–1000.

Butterflies are one of the few insect groups that can be monitored effectively and have the potential to develop national and Europe-wide trends in abundance.

The authors assessed the relative efficiency of reduced-effort schemes for 20 widespread butterfly species compared to the existing design and estimated the number of sites required to detect changes of given magnitudes over specified periods of time.

A scheme restricted to three counts during July and August requires twice as many monitored sites on average to achieve comparable precision to the existing 26-week scheme in the United Kingdom. Such a scheme requires 430 monitoring sites on average to achieve 80% power for detecting a 25% decline in abundance over 10 years.

Such a reduced-effort scheme may also mean that volunteers are more willing to record in areas where they are likely to see only a few individuals of a few common species (such as on intensively farmed areas). This could potentially help to ensure that butterfly monitoring schemes achieve a more even geographical coverage and less of a bias towards areas rich in butterflies.

Schemes with few sampling visits per year are cost-effective for expanding butterfly monitoring across Europe, and can be applied to national monitoring programmes and lead to effective assessment of continent-wide trends in populations.

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N. de Vere.

Biological Flora of the British Isles 247: *Cirsium dissectum* (L.) Hill.

Journal of Ecology 2007, **95**: 876–894.

For conservationists who may have wondered in despair about how to control a field of meadow thistles, this useful addition to the series will be very welcome. 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.

In Practice readers are recommended to consult the original article.

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R.H.A. Van Grunsven, W.H. Van Der Putten, T.M. Bezemer, W.L.M. Tamis, F. Berendse and E.M. Veenendaal.
Reduced plant–soil feedback of plant species expanding their range as compared to natives.
Journal of Ecology 2007, **95**: 1050–1057.

As a result of global warming, species may spread into previously cool regions. The authors investigated whether plants originating from southern Europe and recently established in north-western Europe experience less soil pathogen effects than native species.

The results suggest that plant species that expand their range as a result of climate change may become released from soil pathogenic activity. Whether the exotics are released from soil pathogens, or whether they experience enhanced benefit from mutualistic symbionts remains to be seen. Range expansion may result in release patterns that are similar to artificially introduced invasive exotic plant species.

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M.G. Pilkington, S.J.M. Caporn, J.A. Carroll, N. Cresswell, G.K. Phoenix, J.A. Lee, B.A. Emmett and T. Sparks.
Impacts of burning and increased nitrogen deposition on nitrogen pools and leaching in an upland moor.
Journal of Ecology 2007, **95**: 1195–1207.

Upland moorlands are an extensive semi-natural resource, frequently burned either through management or uncontrolled outbreaks of fire. These systems are often situated in areas receiving high levels of atmospheric nitrogen (N) deposition, yet the effects of burning combined with high N deposition on ecosystem N pools and N leaching to surface waters are unknown.

A management burn was applied to an upland *Calluna vulgaris* moor which contained a set of long-term experimental plots treated with simulated increased N deposition at rates of +0, +40, +80 and +120 kg ha^{-1} $year^{-1}$. Leaching losses of total dissolved inorganic N and dissolved organic N from organic and mineral soil horizons and the N pools in these horizons, as well as in litter and vegetation, were compared before and after the burn.

The results suggest that burning approximately every 10 years may be effective in removing N retained in the system at N deposition rates up to 56 kg N ha^{-1} $year^{-1}$. However, extensive burning of moorland or uncontrolled outbreaks of fire over wide areas may considerably exacerbate the threat of N loading to groundwater in areas where moors are more heavily N polluted, increasing the potential for acidification, eutrophication and brown water colouration.

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P.A. Thomas, M. El-Barghathi and A. Polwart.
Biological Flora of the British Isles No 248: *Juniperus communis* L.
Journal of Ecology 2007, **95**: 1404 –1440.

This compilation of information on the juniper and its three subspecies is a welcome addition by Peter Thomas to the series. It follows 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. Again *In Practice* readers are recommended to consult the original.

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F.M. Chambers, D. Mauquoy, A. Gent, F. Pearson, J.R.G. Daniell and P.S. Jones.
Palaeoecology of degraded blanket mire in South Wales: Data to inform conservation management.
Biological Conservation 2007, **137**: 197-209.

Many European blanket mires are degraded and contain few *Sphagna*. More than half of these in Wales exhibit symptoms of degradation. The authors used palaeoecological techniques to chronicle recent vegetation history at two upland localities in South Wales to provide an understanding of the contribution of various factors in mire degradation and to aid wider conservation management strategies. Their findings suggest a major vegetation change since the start of the industrial revolution. There was evidence for increased burning activity, but as this phenomenon was not present in all profiles it seems unlikely that fire was the principal or sole agent in vegetation change. Rather, increased atmospheric input, plus a change in grazing pressure, may have been responsible. The implications for conservation management are far-reaching. The present overwhelming dominance of *Molinia* at Hirwaun Common is unprecedented. So also is a local dominance of *Calluna*, shown in one area at Mynydd Llangatwg. The presence of *Callunetum* in the Mynydd Llangatwg landscape is not long-standing and millennial-scale dominance of *Sphagnum imbricatum* characterizes the earlier record. Its demise and that of *Drosera intermedia* took place in historical times. Both localities show floristic impoverishment within the 20th Century, with relatively recent single-taxon supremacy and thus conservation management to reduce the current pre-eminence of *Molinia* would not run counter to long-established dominance. The methods used in this study are widely applicable in mire conservation.

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A. Britton and J. Fisher.
NP stoichiometry of low-alpine heathland: Usefulness for bio-monitoring and prediction of pollution impacts.
Biological Conservation 2007, **138**: 100-108.

Plant communities in the low-alpine zone are exposed to relatively high levels of nitrogen (N) deposition compared to surrounding lowland areas and this has the potential to alter community composition and ecosystem function. N content and nitrogen: phosphorus (P) ratio of plant tissues have been used as bio-monitors of N deposition impacts in sub-alpine systems but their suitability in alpine habitats is unknown. The authors investigated spatial variation in N content and N:P in *Calluna vulgaris* and *Racomitrium lanuginosum* in low-alpine heathlands across Scotland and related this to nitrogen deposition, climate and soil chemistry. N content in *C. vulgaris* and *R. lanuginosum*

were not well predicted by N deposition estimates and it appears that altitude and climate also have strong influences on plant chemistry which must be accounted for before using these parameters as bio-indicators of deposition. N:P ratios in *C. vulgaris* suggested that most sites are currently co-limited by N and P or P limited. The degree of P limitation was strongly related to P content of the soil and hence to underlying rock type. The authors suggest that this high degree of co-limitation may be the result of accumulated long term N deposition in mountain regions. Vegetation on soils with low P content and strong P limitation on growth is least likely to sequester N inputs in additional biomass production and so may be the most vulnerable to N saturation and breakthrough of N into surface waters.

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T.A. Gardner, J. Barlow and C.A. Peres.
Paradox, presumption and pitfalls in conservation biology: The importance of habitat change for amphibians and reptiles.
Biological Conservation 2007, **138**: 166-179.

The recent shift in research attention by amphibian biologists towards the causes of 'enigmatic' population declines appears paradoxical given the almost unanimous recognition that habitat change is the primary cause of population declines worldwide. Justification for this shift is given by the growing concern associated with more novel stressors, as well as a general presumption that we have a good understanding of the ecological mechanisms that underlie the effects of habitat change. The authors tested the validity of this presumption by conducting a global scale review of the state of research regarding the consequences of structural habitat change for amphibians and reptiles and revealed a number of serious deficiencies. Existing research efforts are characterised by distinct geographic and study biases (most studies are confined to North America and focus on amphibians), a lack of clear consensus regarding the consequences of many forms of habitat change with many studies reporting seemingly contradictory results, and a number of common limitations in sampling design. The recent shift in research agenda towards the study of more novel stressors, and away from a focus on structural habitat change, cannot therefore be easily explained by differences in our understanding of the threats currently facing amphibians and reptiles. If research priorities are to be dictated by differences in scientific uncertainty then the results suggest that the study of habitat change is deserving of considerably more attention.

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A.J. Davies, J.M. Roberts and J. Hall-Spencer.
Preserving deep-sea natural heritage: Emerging issues in offshore conservation and management.
Biological Conservation 2007, **138**: 299-312.

Human activity in the deep sea is extending ever deeper, with recent research showing that this environment is more sensitive to human and natural impacts than previously thought. Some deep-water fish stocks have collapsed and fishing methods such as bottom trawling have raised international concern over the habitat damage they cause. It is likely that in its current form, deep-sea fishing is unsustainable. Diminishing reserves of hydrocarbons in shallow water are pushing exploration and production into deeper waters, which may cause damage to little known deep-sea habitats. The deep sea is also proposed as an environment where anthropogenic carbon dioxide could be stored to minimise the effect of its release into the atmosphere. At the same time, rising atmospheric carbon dioxide levels may be altering the chemical equilibrium of the global ocean by lowering pH. Many countries are now beginning to designate some deep-sea habitats as marine protected areas in measures to reduce the damage caused by fishing and other anthropogenic activities. This review examines these current and emerging issues in deep-sea conservation, conservation status, designation and enforcement of protected areas.

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P.B. Hardy, T.H. Sparks, N.J.B. Isaac and R.L.H. Dennis.
Specialism for larval and adult consumer resources among British butterflies: Implications for conservation.
Biological Conservation 2007, **138**: 440-452.

Specialism is a key issue in conserving organisms. Using a new database of consumer resources the authors investigated specialism among British butterflies. Different measures for the range of sources exploited by adults were compared. Clear evidence for specialism in adult feeding emerged. A number of species depend heavily on alternative substrates to nectar flowers and others on flowers which are also larval host plants. Though many species have varied nectar sources, there is confirmation of the tendency of larval host plant specialists to be adult feeding specialists. Rarity, distribution losses and conservation status are associated with nectar specialism. The authors suggest that habitat fragmentation and regional extinctions are exacerbating resource (nectar and host plant) specialism and draw attention to the importance of resource databases; there is clear indication now which nectar plants are more or less suitable for different butterfly species. Nevertheless, despite the current database comprising 10,539 records, it is deficient for 29 species (<50 records each).

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P.H. Williams, M.B. Araújo and P. Rasmont.
Can vulnerability among British bumblebee (*Bombus*) species be explained by niche position and breadth?
Biological Conservation 2007, **138**: 493-505.

Comparison of the two flagship species of British bumblebee conservation (*Bombus distinguendus* and *B. sylvarum*) with a widespread, common, and more stable species (*B. pascuorum*) shows that the two rarer and range-declining species in Britain had narrower (more specialized) climatic niches in western Europe even before their most severe declines. The areas where they persist in Britain from 2000 onwards are closer climatically to the centres of their pre-decline west-European climatic niches than the areas from which they have been lost. Although data are available for few bumblebee species at present and further tests are needed, the first result supports earlier suggestions that it is bumblebee species with narrower climatic niches that are most vulnerable to decline. The second result supports the suggestion that it is in areas nearer the edges of their climatic niches where these species are most vulnerable to decline, although this can be improved locally by higher food-resource levels. In Britain the authors found that even without climatic change, an interaction between climatic niche and food-plant reductions from land-use change may explain at least some of the broader patterns of which species have declined, where they have declined, and how they have declined.

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B. Fontaine *et al.*

The European union's 2010 target: Putting rare species in focus.

Biological Conservation 2007, **139**: 167-185.

The European Union has adopted the ambitious target of halting the loss of biodiversity by 2010. Several indicators have been proposed to assess progress towards the 2010 target, two of them addressing directly the issue of species decline. In Europe, the Fauna Europaea database gives an insight into the patterns of distribution of a total dataset of 130,000 terrestrial and freshwater species, and provides a unique opportunity to assess the feasibility of the 2010 target. It shows that the vast majority of European species are rare, in the sense that they have a restricted range. Considering this, the paper discusses whether the 2010 target indicators really cover the species most at risk of extinction. The analysis of a list of 62 globally extinct European taxa shows that most contemporary extinctions have affected narrow-range taxa or taxa with strict ecological requirements. Indeed, most European species listed as threatened in the IUCN Red List are narrow-range species. Conversely, there are as many wide-range species as narrow-range endemics in the list of protected species in Europe (Wild Birds and Habitats Directives). The subset of biodiversity captured by the 2010 target indicators should be representative of the whole biodiversity in terms of patterns of distribution and abundance. Indicators should not overlook a core characteristic of biodiversity, *i.e.* the large number of narrow-range species and their intrinsic vulnerability. With ill-selected indicator species, the extinction of narrow-range endemics would go unnoticed.

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K.J. Wallace.

Classification of ecosystem services: Problems and solutions.

Biological Conservation 2007, **139**: 235-246.

Ecosystem values are not well accounted for in decisions concerning natural resources. The concept of ecosystem services offers an important opportunity to develop a framework to underpin the wise use of biodiversity and other natural resources. Ecosystem services are currerntly limited in their contribution to decisions concerning biodiversity because of classification systems and ambiguity in the definitions of key terms such as ecosystem processes, functions and services. After clarifying definitions the paper develops a classification of ecosystem services that provides a framework for decisions in natural resource management. Further work is still required to resolve particular issues, such as the classification of socio-cultural services. Although science can contribute to effective decisions by clearly classifying services and describing their links to processes, final decisions concerning biodiversity and other natural resources are inevitably socio-political, and embedded within a particular cultural context.

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K. Niggebrugge, I. Durance, A.M. Watson, R.S.E.W. Leuven and S.J. Ormerod.

Applying landscape ecology to conservation biology: Spatially explicit analysis reveals dispersal limits on threatened wetland gastropods.

Biological Conservation 2007, **139**: 286-296.

Three gastropods in the UK red data book (RDB) occupy drainage ditches on threatened grazing marshes. *Segmentina nitida*, *Anisus vorticulus* and *Valvata macrostoma* are affected by habitat loss, ditch management and eutrophication, but dispersal and fragmentation effects have also been postulated. The authors used landscape ecological approaches to examine such effects on these and 17 other gastropods on four English marshes, specifically combining ordination to identify suitable habitat with spatially-explicit analysis of occupancy. Among all gastropods, the occupancy of suitable habitat declined significantly as the distance to the nearest occupied site increased. *S. nitida* and *A. vorticulus* were among the species most affected, with median nearest distances from occupied to unoccupied suitable sites significantly greater (3–4x) than distances between occupied sites. *V. macrostoma* was not limited locally by dispersal, but was absent from three out of four marshes with suitable habitat. Eutrophication had no effects on distances between occupied and unoccupied sites and did not contribute to fragmentation. Although four non-threatened species were apparently also limited by dispersal, only two (*Armiger crista* and *Gyraulus albus*) showed some combination of the dispersal effects, low occupancy of suitable habitat (<50%) and small niche extent that characterized RDB species. While dispersal alone cannot explain unfavourable conservation status in these wetland snails, the findings support the hypothesis that limited dispersal between (all species) and within marshes (*S. nitida* and *A. vorticulus*) affect all three RDB snails in their remaining UK range. Action is required to better understand the population and genetic consequences and dispersal mechanisms; and to evaluate re-introduction and reinforcement as aids to recovery.

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A. Bremner and K. Park.

Public attitudes to the management of invasive non-native species in Scotland.

Biological Conservation 2007, **139**: 306-314.

Invasive non-native species are one of the main threats to biodiversity. There is a need to control or eradicate those species that are causing problems in order to mitigate their impact. Such management programmes can be controversial and in some cases have been delayed or halted because of opposition from pressure groups. Public support can be critical to the success of such projects, and understanding the underlying attitudes of the public can help inform outreach education activities. To assess attitudes towards invasive species management and investigate socio-demographic factors influencing such attitudes, a questionnaire survey of 600 randomly selected members of the public in Scotland was conducted, with a total of 248 completed questionnaires returned. The level of support for control and eradication programmes was, in general, high and was higher amongst men, older people, and people who had previously heard of control and eradication projects. The species to be managed influenced levels of support, and projects to control birds were the least supported. Respondents with prior knowledge of control and eradication programmes and members of conservation organisations, in general, showed higher levels of support, indicating the important role that awareness and education has in terms of increasing public support for invasive non-native species management projects.

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R. Naidoo and T. Iwamura.
Global-scale mapping of economic benefits from agricultural lands: Implications for conservation priorities.
Biological Conservation 2007, **140**: 40-49.

Research in systematic conservation planning has focused heavily on biological considerations, even though a growing number of studies demonstrate that integrating economic costs into the planning process markedly increases the efficiency of resulting plans. At the global scale, the availability of biodiversity maps is increasing, but analogous maps for economic factors that affect biodiversity conservation are rare, and no study has examined global conservation planning at high resolution using both biodiversity and cost information. The authors integrated spatial information on crop productivity, livestock density and prices to produce a global map of the gross economic rents from agricultural lands. The authors then illustrated the importance of including such opportunity costs in global planning for the conservation of endemic vertebrate species. Plans that consider costs represent endemic species at 10–33% of the opportunity cost of plans that do not, and produce priority sets that diverge from existing schemes. Given scarce resources and the great cost-effectiveness of plans that consider both biodiversity and costs, mapping of the economic costs of conservation should receive similar levels of research attention as mapping of biodiversity.

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I.J. Mackie and P.A. Racey.
Habitat use varies with reproductive state in noctule bats (*Nyctalus noctula*): Implications for conservation.
Biological Conservation 2007, **140**: 70-77.

Many temperate zone bat species form colonies during the highly synchronised summer breeding period allowing differences in foraging behaviour to be compared between females in different reproductive states. Such comparisons may clarify mechanisms of population regulation. Individual female noctule bats (*Nyctalus noctula*) from the same colony, but in different reproductive states (lactating or non-lactating), were radiotracked and their use of foraging space, in relation to available habitat types, was assessed and compared. A further comparison of relative habitat use, between lactating and non-lactating bats, demonstrated state-dependent differences in use and identified habitats important for foraging in reproducing bats. Broadleaved woodland and pasture were the highest ranked foraging habitats consistently preferred by noctule bats across both levels. Although there was little difference in foraging activity or maximum distances travelled to foraging grounds (mean 4.23 km), non-lactating bats used less preferred marginal habitats (arable land and moorland) significantly more than lactating bats. The authors discuss this observed spatial partitioning in relation to density dependence and the conservation implications of changing land use for bat populations.

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N. Maxted, M. Scholten, R. Codd and B. Ford-Lloyd.
Creation and use of a national inventory of crop wild relatives.
Biological Conservation 2007, **140**: 142-159.

The Convention on Biological Diversity (CBD) 2010 target of achieving a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on earth is particularly pertinent for crop wild relatives (CWR). These taxa are directly associated with wealth creation and food security as they include the wild crop progenitors possessing many beneficial traits that can be bred into crops to address the changing environmental and market demands. These species are being eroded, yet they have been widely neglected by national agencies because agricultural agencies generally have no responsibility for conservation and ecological conservation agencies tend to focus their efforts on habitat or rare and threatened taxa conservation. If the CBD 2010 target is to be achieved for CWR taxa there is a need for a complex interdisciplinary approach that outlines what diversity is present, what threatens that diversity and how it might be best conserved for use by future generations. When attempting to address these issues within the United Kingdom several key topics were identified: (1) creation of a national CWR inventory, (2) analysis of the national CWR inventory content, (3) national patterns of CWR distribution, (4) threat status for CWR diversity, (5) assessment of current conservation actions, (6) identification of priority sites for CWR conservation, and (7) creation of CWR conservation action plans. These issues are used to formulate an effective national conservation strategy for UK CWR diversity.

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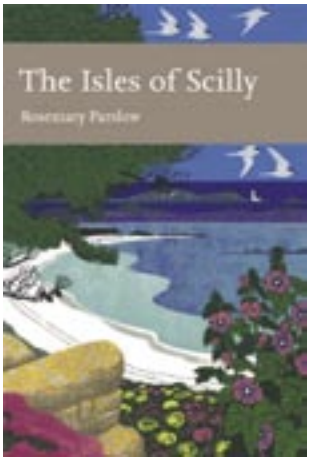
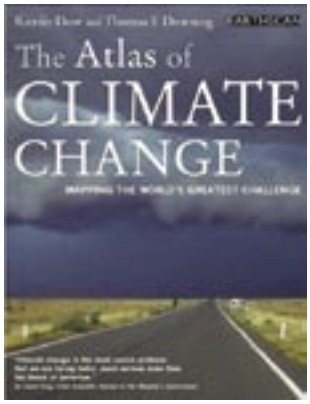
Recent Publications



The Isles of Scilly

Author: Rosemary Parskow
ISBN-10: 0-00-220151-8
ISBN-13: 978-0-00-220151-3
Available from: Harper Collins (www.harpercollins.co.uk)
Price: £25.00

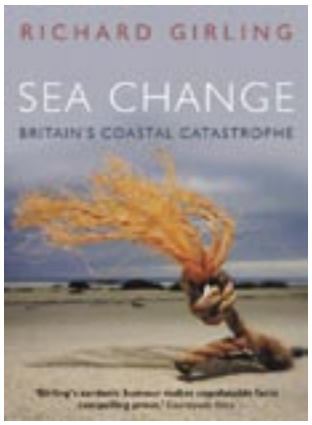
A low group of rocks and islands lie 30 miles south-west of Land's End, these are the Isles of Scilly. The author has an intricate knowledge of these islands, each of which has its own unique character and special plants and animals. In this New Naturalist volume she examines the many aspects that make the islands and their flora and fauna so unique: their geography, geology and climate, the people of the islands, the way they used the land and its present day management. She brings to life the major kinds of habitats found in Scilly: the heathlands, the coast, cultivated fields and wetlands. She also discusses the people who have been important in the study of the island flora and fauna, and tells the story of the rise in popularity of the islands for birdwatchers.



The Atlas of Climate Change

Authors: Kirsten Dow and Thomas E. Downing
ISBN-10: 1-84407-376-9
ISBN-13: 978-1-84407-376-4
Available from: Earthscan (www.earthscan.co.uk)
Price: £11.69

This Earthscan publication condenses the history, causes, dangers and scientific background of climate change into easy-to-read maps, graphics and tables, making it a suitable resource for learning and teaching about the world's greatest challenge. This atlas examines the possible impact of climate change on our ability to feed the world's people, avoid water shortages, conserve biodiversity, improve health, and preserve cities and cultural treasures. It also reviews historical contributions to greenhouse gas levels, progress in meeting Kyoto commitments and local efforts to meet the challenge of climate change. It also covers a wide range of topics, including warning signals, future scenarios, vulnerable populations, health impacts, renewable energy and emissions reduction. With more than 50 full colour maps and graphics, this is an easily accessible resource for policy-makers, environmentalists, students and everyone concerned with this pressing subject.



Sea Change: Britain's Coastal Catastrophe

Author: Richard Girling
ISBN-13: 978190391977
Available from: Transworld Publishing (www.bookattransworld.co.uk)
Price: £16.99

This publication addresses the important issues of pollution by sewage, nuclear waste and dumping, extinction of fish stocks; destruction of the marine environment; the impacts of climate change; coastal erosion and rising sea levels; decline of our seaside resorts; the failure of the integrated transport policy and smuggling in a compelling and entertaining way.

The sea is one of the most powerful drivers of our economy, our lifestyle and our politics. It affects what we eat, how we use the land, how we relate to our continental neighbours and how we travel. Yet we go on taking it for granted by fouling it, plundering from it, poisoning it and stripping it of all natural resources as if it is infinitely resourceful.

Examining the history of many industries that rely on the sea and using personal recollections, the author asks how it has happened? What are the consequences? What should be done? What happens if we fail? Are the solutions buried deep out to sea?

Bird

Authors: Peter Hayman and Rob Hume
ISBN-13: 978-1-84533-338-6
Available from: Mitchell Beazley (www.mitchell-beazley.co.uk)
Price: £25.00

This is a superbly illustrated guide to every species that regularly breeds in or visits Europe. In this expanded new edition, each species is covered in more detail than before. Up to 20 illustrations are provided for each species; males, females, juveniles; season by season; at rest and in flight. A colour photograph is provided of each bird in its natural habitat or exhibiting an aspect of its behaviour; a scale diagram shows how the bird compares to other commonly known species; a distribution map shows at a glance where the bird can be seen; similar species are compared to prevent common identification mistakes; and, fascinating facts provide a wider and richer portrait of the bird. Over 500 pages of wonderful illustrations.

News in Brief

Marine Bill, yet another consultation

The Marine Bill is urgently needed to deliver a marine planning system that will enable sustainable development of industries whilst increasing the protection of our marine wildlife and habitats and ensuring the designation of Marine Protected Areas. Many people have been campaigning for years for this comprehensive new legislation and yet only a commitment to producing a draft Marine Bill was included in the Queen's Speech at the State Opening of Parliament.

Thames local species under threat

Scientists have said that alien species from as far away as China are invading and endangering the native species in the River Thames. Chinese Mitten Crabs, Zebra Mussels and Asiatic Clams pose the biggest threat to local species. On 4 November the Port Authority of London lifted the weirs to allow the River Thames to drain naturally between Richmond Lock and Teddington Lock for annual maintenance work. Experts are using this 3 week period to record the population of non-native species on the riverbed.

Ministry for climate change needed

Britain's MPs say the country needs 'a ministry for climate change'. The Environmental Audit Committee (EAC) warned the Government's failure to meet self-imposed targets to cut emissions by 20 per cent by 2010 was of concern for greenhouse gas reductions but also the UK's international leadership on the issue. The committee called for a Climate Change and Energy secretariat to lead the Government's climate policy and cut inter-departmental conflict.

Beaches meet water quality test

Almost all bathing water at England's beaches have met quality standards set by the Environment Agency, despite the wettest summer on record. Only nine of 414 bathing water sites monitored by the agency failed to meet its mandatory bathing water directive. The Environment Agency said 97.8% of beaches met the mandatory standard, compared with in with 99.5% in 2005. The Department for Environment, Food and Rural Affairs (Defra) said it was likely the slight fall was due to exceptional rainfall during the summer.

Plastic perils in the sea

While decisions are being made over the banning of plastic bags, it has been said that our planet will be haunted by the ghosts of flimsy plastic for the next 1,000 years. Globally we consume more that 1.2 trillion plastic bags every years but each person only uses each bag for an average of 12 minutes. The Marine Conservation Society says sea birds and marine mammals are the largest group to suffer from plastic litter and millions die every year after eating or becoming entangled in plastic. Modbury in Devon was the first in the British Isles to ban plastic bags in May and is now inspiring cities all over the world to adopt the ban as a solution to plastic litter. The UK retail sector has agreed to reduce the environmental impact of plastic bags by 25% by 2008 but so far there is no approach to achieve this. So, next time you go shopping take your IEEM tote bag with you instead of taking a plastic bag from the store.

Council rejects wind farm plans

Plans to build 12 wind turbines have been thrown out by Conwy council's planning committee. Critics claimed the turbines proposed near Llanfihangel Glyn Myfyr would have ruined views and had a negative impact on wildlife and tourism, and the council also received 47 letters from local residents backing the proposals. The 328ft turbines at Mwdwl Eithin would each have generated up to 2.5 megawatts.

Poachers threaten salmon in Taff

Salmon spawning in the River Taff are being threatened by poachers. Environment Agency Officers took some of the fish out of Blackweir pool in Cardiff's Bute Park on Friday in order to transfer them to the agency's hatchery in Brecon. A lack of rain and recent frosts had led to them becoming stuck in the pool making them easy prey, officers said. Peter Gough from the Environment Agency said "several people" had been arrested for poaching the salmon in the Taff. Salmon fishing requires a special licence and it is illegal to remove salmon from pools like Blackweir.

First deep-sea tidal-energy farm

The world's first deep-sea tidal-energy farm will be built off the Welsh coast next year to provide electricity for 5,000 homes. Eight underwater turbines are to be installed on the sea bottom off St David's peninsula in Pembrokeshire, South Wales. Construction is due to start next summer and the proposed tidal energy turbines should be operational by 2010. The Department for Business, Enterprise and Regulatory Reform (BERR) has contributed £2.5 million of the £10 million development costs. The ebb and flow of tidal waters will provide the force to turn the blades of the turbines, which will each have a one megawatt capacity. Tidal energy is perceived as having the potential to provide a reliable source of green energy because it is predictable and guaranteed, unlike wind turbines, which are dependent on the weather.

Scientists question environmental farm schemes

Scientists at Queen's University in Belfast have questioned the value of environmental schemes that pay out millions of pounds of taxpayers' money to local farmers. Department of Agriculture agri-environment schemes pay out £10m annually to local farmers. The aim is to help conserve biodiversity, but rather than helping animals such as the Irish hare, it is claimed the money has simply produced a plague of pests like foxes and rabbits. The scientists say the evidence is that fox numbers can increase by 300% in areas of farmland in agri-environmental schemes.

Irish EPA offers funding for environmental technologies

Companies and researchers from Ireland have been invited to bid for research funding to help them develop new environmental technologies. The Irish Environmental Protection Agency (EPA) will be administering the ambitious research and innovation programme worth €100m. Currently, the EPA is offering research grants of up to €10m for companies and researchers looking at areas like environmental technologies, waste, resource management, sustainable development, and environmental research data management. Recently, the Irish Government announced that it was offering more grants to agricultural businesses to encourage them to use environmentally-friendly technologies.

Bid to help protect the wild lough

Special breeding areas are to be created on Lough Neagh's islands to increase the numbers of common tern in the rich wetlands. Features will also be created along the bridges spanning the rivers in the wetlands to help conserve the rich bat populations found there. All eight of Northern Ireland's bat species occur in the Lough Neagh area. These are just two of the measures listed in a proposed Biodiversity Action Plan aimed at protecting the rich wildlife that makes its home in and around the largest lake in Britain and Ireland. The draft Biodiversity Action Plan for the Lough Neagh Wetlands stresses the need to protect threatened animals such as the barn owl,

tree sparrow, Irish damselfly, common tern, breeding waders, Irish hare, whooper swans and a rare ground beetle which is found nowhere else in Ireland. The plan also advises that action be taken for wildlife hotspots such as rivers and streams, hedgerows, lowland raised bogs, wet woodland, fen, reedbed, wet grasslands, lowland meadow and open standing water. Up to 1,500 hectares of wet grassland habitat are to be restored round Lough Beg near Bellaghy and other sites to encourage breeding waders such as lapwing, redshank and curlew.

Freshwater fish on the brink

More than a third of freshwater fish species in Europe face extinction due to overfishing, pollution and dams which have caused rivers to dry up. The continent's 522 freshwater fish species are under a much higher level of threat than birds or mammals, according to the study Handbook of European Freshwater Fishes, published in collaboration with the World Conservation Union (IUCN). Twelve species are already extinct following a century of development, which has had a devastating impact. The European eel, which reproduces only once on average at around 20 years, is critically endangered. The number of juvenile eels reaching European coasts has dropped dramatically in the past three decades. The jarabugo, found in southwestern Spain and Portugal, is also endangered as its population has declined by more than 50 percent in the past 10 years. Some rivers are drying up in the summer months, a phenomenon which is becoming more acute with the impacts of climatic change. Areas subject to the highest levels of threat include the lower reaches of the rivers Danube, Dniestr, Dniepr, Volga and Ural, the Balkan peninsula and southwestern Spain.

Endangered species found in land allocated to agriculture

Conservationists have found several species of endangered animals living in parts of the Indonesian jungle given over to timber and oil-palm plantations. They warn that the habitats for these rare animals could be destroyed by the plantations and have called on the authorities there to reconsider the way they allocate land for agricultural use. A team of scientists, led by the Zoological Society of London (ZSL), found evidence of Sumatran tigers, families of elephants, sun bears, tapirs, golden cats and clouded leopards in so-called degraded land on Sumatra - areas that are not protected habitats and have been designated for agriculture.

Bush disconnects jaguars

Miles of barriers erected along the US-Mexico border in order to keep out illegal immigrants, drug smugglers and terrorists are having the desired effect, but on jaguars rather than people. Jaguars are returning to the US via mountain wildlife corridors that straddle the borber in New Mexico and Arizona. These biodiversity rich corridors where desert, alpine and tropical habitats converge have become a cross-border refuge for the big cats but 12 foot fences rapidly being erected are dissecting these important habitats.

Time magazine names eco-heroes

Time magazine has published its annual list of the year's heroes, but this year the line-up has focused on those dedicated to the environment. The list includes Nobel prize winner Al Gore, the Toyota Prius design team, entrepreneur Richard Branson, former Soviet Union leader Mikhail Gorbachev, naturalist David Attenborough, geneticist David Suzuki, Russian sociologist Olga Tsepilova, Kenyan environmentalist Wangari Maathaias, Australian scientist Tim Flannery, Bangladeshi scientist Abul Hussam, Japanese rocker Kazutoshi Sakurai and music producer Takeshi Kobayashi, and American Jeffrey Immelt, CEO of General Electric.

Tauro-Scatology and New Directives

Basil O'Saurus, our resident Professor of Tauro-Scatology has, as readers of *In Practice* will know, a great deal of empathy with the hard-pressed employees of our statutory agencies. He's always quick to leap to their defence and make sure that all IEEM members are aware of the enormous burden of responsibility that is laid upon their shoulders. He has also, regrettably, heard the occasional critical comment, implying that some of our esteemed public servants are incapable of organising a piss-up in a brewery. This month, he's going to meet these ill-informed critics head on. Over to you, Prof.

Thank you. I thought it was about time to explain to IEEM members just how hard it is to organise a piss-up in a brewery, especially now that we have to look to Brussels for so much of our legislation. I have been fortunate enough to take part in some of the early negotiations for the EU's forthcoming Piss-up in a Brewery Directive and, let me tell you, it is not as straightforward as some people seem to think.

What's the problem?

First of all, we have to define a 'piss-up', then we have to define a 'brewery' and that's before our troubles have even started.

Let's take it a step at a time. What's so difficult about defining a 'piss-up'?

Plenty. Every member state has a slightly different take on the point at which a night out with friends becomes a 'piss-up'. The Scandinavians, of course, with their high taxes on alcohol start to get giggly after a can or two of lager. On the other hand, some of our Central European brethren are more or less falling over before they admit that they have strayed beyond the boundaries of reasonable consumption.

How do you solve this problem?

Not easily. We did think about setting up special committees to compare and contrast alcohol consumption patterns around the EU. We thought about paying a group of people gathered from all around Europe to compare national alcohol consumption practices. However, that idea was vetoed by the European Parliament.

Why?

Because they resented the idea of competition. In the end, we had to resort to the old fallback of committees of bureaucrats holding lots of meetings to try to reach common ground on what is really meant by terms like 'piss-up', 'brewery' and so on. It's going to be a long process, as I'm sure you'll appreciate.

What's so difficult?

Take the word 'brewery', for example. The straightforward definition, of course, is a premises used for brewing beer but we ran into a problem straight away, as all the southern Europeans wanted to know if this meant that piss-ups in wineries were excluded. Then the Romanians argued persuasively that they were, in theory, as capable of organising a piss-up in a brewery as the next member state but they had lots of cheap plum brandy which did the job much faster and without stretching their bladders.

It all just makes me glad that we don't have the same type of muddle-headed bureaucrats sorting out our environmental legislation.

Ahem. We had better move on pretty quickly now. The really big intellectual challenge came in defining 'piss-up' itself. Are there standard parameters that we can measure that will allow 'piss-up' to be defined in an incontrovertible manner? We examined four options: defining a piss-up in terms of the amount of alcohol consumed, the physiological manifestations, consequences or after effects. None is perfect, as you can imagine.

It sounds like you've done extensive tests.

I'm nothing if not dedicated. But, to cut to the chase, the expert group proposed a simple test which is that a 'piss-up' is best defined as an extended drinking session which leads to at least some of the participants bursting into spontaneous song. This has the great practical advantage of not requiring any invasive tests, as would be the case with measuring blood alcohol. All but one country agreed with this.

Who objected?

Belgium.

Belgium? Why?

Because some of their best beers are brewed by Trappist Monks so it follows that a piss-up in a Belgian brewery is not necessarily going to be a noisy affair.

So is it back to the drawing board?

Not quite. We resorted to Qualified Majority Voting which, as you know, means that we can steamroller any legislation through so long as France, Germany, Italy and the UK agree. Sorry Belgium.

Does this mean that there can be no piss-ups in Belgium breweries?

Not at all. It just means that we need to find an alternative way of quantifiying piss-ups in Belgium. We'll give them an opt-out so that they can define a piss-up in terms of the quantity consumed, but only after a group of European experts have held a hands-on workshop to compare the inebriating effects of Trappist beer and cheap lager.

Tough work, eh, Prof?

I have, of course, nobly offered my services in this, and am helping to derive an appropriate protocol. Like all such activities, it needs a catchy acronym and I came up with Local Evaluation of Alcohol Consumption, or LEAC, which sounded appropriate.

So when is this Piss-up in a Brewery Directive likely to be passed by the European Parliament?

Not long now, I promise you. But it won't actually be called the Piss-up in a Brewery Directive. Once the Brussels Euro-mangle got hold of it, the name changed to the Mass Inebriation (and Associated Activities) in Non-Domestic Alcohol-Production Facilities Directive'. I'm not sure if this really is the best they can do or if they are disguising the real intent so that they don't provoke outraged headlines in the Daily Mail.

And then we can look forward to perfectly-organised piss-ups in British Breweries?

Not quite. In the next issue of *In Practice*, I'll explain the UK's implementation strategy in more detail.

We'll look forward to talking again before too long. Thanks for your time, Prof.

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 Executive Director by telephone or letter before 14 January 2008. 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

Mr Michael J. Cummings, Mr Stephen F. Dangerfield, Dr Sian Davies, Dr Rossa G. Donovan, Dr Simon Duffield, Mr Arnaud Duranel, Dr Nick Giles, Dr Christopher P. Gleed-Owen, Dr Ross M. Jones, Mr Robert J. Parry, Dr Jo-Anne Pitt, Mr Jason R. Reynolds, Miss Emma J. Roper, Miss Jenny Wheeldon

APPLICATIONS FOR ASSOCIATE MEMBERSHIP

Mr Jason Appleby, Miss Elizabeth Coleman, Mr Thomas Goater, Dr Marcus S. Hicks, Mr Guillaume A.S. Marchais, Miss Kathryn Metcalfe, Miss Laura J. Sanderson, Dr Fiona E. Sharpe, Miss Georgina H. Starkie, Miss Sarah E. Wakefield, Miss Heather J. Webb, Mr Gerald E. Westmacott, Miss Sian N.S. Williams, Mr Adam Winson

ADMISSIONS

IEEM is very pleased to welcome the following new Members:

FULL MEMBERS

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UPGRADES

The following have successfully upgraded their Membership:

ASSOCIATE to FULL MEMBERSHIP

Mr Richard J.H. Collingridge, Miss Katherine Cooper, Mr Gerard J. Hawley, Mr Tom Kellett, Mr Robert A. Logan, Mr Jonathan J.D. Pedder, Miss Sarah Simons, Miss Jennifer Sneddon

What's on January – March 2008

The new Bird Atlas 2007-11 Project.
For more details see page 22, visit www.birdatlas.net, or contact dawn.balmer@bto.org.

21-23 January 2008.
Ecology and Management of Lowland Wet Grassland.
Street, Somerset.
jenny@footprint-ecology.co.uk

23 January 2008.
North West England Geographic Section AGM.
Manchester Metropolitan University.
www.ieem.net/nwsection.asp

23 January 2008.
IEEM Careers Event - Breaking into the Environment.
Edinburgh University.
The event will start at 5.30 pm. For more information please contact the Edinburgh University Careers Service (careers@ed.ac.uk).

28 January 2008.
Learning to learn and adaptive capacity for social-ecological resilience and biodiversity conservation.
University of Wales, Aberystwyth.
www.zoo.cam.ac.uk/ioz/seminars.htm

5 February 2008.
National Brownfields for Butterflies and Business Conference.
greg.hitchcock@buglife.org.uk

6 February 2008.
North East England Section Event.
Venue to be confirmed.
www.ieem.net/nesection.asp

7 February 2008.
Wildlife and the Law: An Introduction to UK Wildlife Legislation.
Egypt Mill Hotel Nailsworth, Gloucestershire.
enquiries@biocensus.co.uk

8 February 2008.
Climate Change - Biosphere and Human interactions.
Birkbeck, University of London.
Lecture is free and starts at 6.30pm.
environment@fce.bbk.ac.uk

9-10 February 2008.
ARG UK Herpetofauna Workers' Meeting 2008.
Coventry.
angela.stribling@herpconstrust.org.uk

12 February 2008.
Seahorses and Pipefish in the North Sea – ZSL Scientific Meeting.
www.zsl.org

15 February 2008.
How to Grow a Peat Bog in a Computer: why it is important to be able to do so.
Birkbeck, University of London.
Lecture is free and starts at 6.30pm.
environment@fce.bbk.ac.uk

22 February 2008.
The impact of climate change on coral reefs.
Birkbeck, University of London.
Lecture is free and starts at 6.30pm.
environment@fce.bbk.ac.uk

26-28 February 2008 (Arrive evening of 25 February).
Beyond Consultation - Good Practice in Stakeholder Participation.
training@dialoguematters.co.uk or
www.dialoguematters.co.uk/training.htm

29 February 2008.
Climate change and the polar regions: barometer or timebomb?
Birkbeck, University of London.
Lecture is free and starts at 6.30pm.
environment@fce.bbk.ac.uk

7 March 2008.
How climate change is affecting the African environment and communities.
Birkbeck, University of London.
Lecture is free and starts at 6.30pm.
environment@fce.bbk.ac.uk

7-9 March 2008.
Introduction to Diptera Identification.
Preston Montford Field Centre, Shrewsbury.
enquiries.pm@field-studies-council.org

11 March 2008.
Shark Biology and Conservation – ZSL Scientific Meeting.
www.zsl.org

14 March 2008.
Rainforest Ecosystems and Conservation and the situation of local peoples.
Birkbeck, University of London.
Lecture is free and starts at 6.30pm.
environment@fce.bbk.ac.uk

17-19 March 2008.
Flooding, Water and the Landscape.
Sheffield Hallam University.
E-mail: info@hallamec.plus.com.
Website: www.ukeconet.co.uk

16 April 2008.
IEEM Spring Conference – Environmental Liability Directive.
London.
www.ieem.net/conferences.asp

3 June 2008.
IEEM Summer Conference – Ecological Economics.
London.
www.ieem.net/conferences.asp

18-20 November 2008.
IEEM Autumn Conference – Mitigation.
Glasgow, Scotland.
www.ieem.net/conferences.asp

For IEEM workshops please refer to the Training Workshop Programme, which is included with this edition, or visit: www.ieem.net/workshops.asp

Centres offering course programmes that might be of interest to IEEM members. Information from:

Centre for Alternative Technology
Centre for Alternative Technology, Machynlleth, Powys, SY20 9AZ.
01654 705950
www.cat.org.uk

Field Studies Council
FSC Head Office, Preston Montford, Montford Bridge, Shrewsbury, Shropshire, SY4 1HW.
0845 345 4071
enquiries@field-studiescouncil.org
www.fieldstudiescouncil.org

Losehill Hall
Losehill Hall, Peak District National Park Centre, Castleton, Hope Valley, Derbyshire S33 8WB.
01433 620373
training.losehill@peakdistrict-npa.gov.uk
www.losehill-training.org.uk

Plas Tan-y-Bwlch
Plas Tan-y-Bwlch, Maentwrog, Blaenau Ffestiniog, Gwynedd LL41 3YU.
01766 590324
Plastanybwlch@compuserve.com

BTCV Courses
BTCV Training Programmes Unit, Red House, Hill Lane, Great Barr, Birmingham B43 6LZ.
0121 358 2155
info@btcv.org.uk
www.btcv.org