



In Practice

Bulletin of the Institute of Ecology and Environmental Management

Protected Areas



In Practice No. 66, Dec 2009. ISSN 1754-4882

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

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Editorial

Protected Areas - A Local Government Ecologist's View

The term 'protected area' means different things to different people. For some it may be the exclusive preserve of 'statutory' sites (SSSIs, SPAs, etc.) whilst for others it will be inclusive of the biodiversity and geodiversity resources of 'non-statutory' Local Sites. Yet, what are 'statutory' and 'non-statutory' sites? Certainly SSSIs have statutory protection, however, Local Sites have protection through statutory Local Plans (LPs) or Local Development Frameworks (LDFs). In this respect a straw-pole of planning officers clearly showed they consider Local Sites as protected areas when identified on LP/LDF Proposal Maps.

Planning Policy Statement 9 recognises the role of 'Local Sites', although we are faced with a hierarchical approach in terms of protection, i.e. international, national, and local importance. Yet here is the nub of the matter, should we consider the importance in terms of designation or as the intrinsic importance of the individual site? Simplistically, SSSIs are only representative examples of specified habitats (or areas important for certain species). Conversely, Local Sites 'provides a comprehensive rather than representative suite of sites' (Defra 2006).

In reality, there are significant areas of EC Habitats Directive Annex 1 Habitats outside statutory sites, but which are covered by Local Site designations. Similarly for species there are areas supporting internationally important wintering bird populations with only local designations. Additionally, there are many Local Sites that fulfil the selection criteria for SSSIs (and some even for SPA/SAC status) but have not been so designated. This is recognised by Defra (2008) which states 'Local Sites are sites of substantive nature conservation value and although they do not have any statutory status many are equal in quality to the representative sample of sites that make up the series of statutory Sites of Special Scientific Interest (SSSIs)'. Examples of such Local Sites include the nationally important populations of swans and geese wintering on the Lancashire 'mosslands' and the blanket bogs of the West Pennine Moors with eight to 11 species of bog-mosses (*Sphagna*).

The UK Government has also recognised the importance of Local Sites in making their positive management a national indicator for biodiversity, i.e. Local Area Agreement (LAA) National Indicator 197 (Defra 2008). Local Authorities have a statutory duty to report on the delivery of LAA indicators.

Surely, together, international, national and Local Sites should be seen as supporting our 'Priority Biodiversity Resource'. Therefore, the protection and positive management of all is important. Regrettably, some ecological consultants still take the view that whilst SSSIs are of national importance, Local Sites are **only** of local importance; an opinion that does little for the conservation of biodiversity within development control.

Can there be any doubt that the definition of protected areas should include the full suite of the international, national and locally designated sites?

If a protected area system is to mean anything it must be robust enough to protect priority biodiversity resources. These resources should not be seen as expendable for economic or political expedience or be capable of mitigation by unproven methods. Given the uncertainties of the future, our environment is too precious an asset to be negotiated away piecemeal. As ecologists we have a collective moral and professional duty to provide advice. It is not our job to pave the way for developments that damage or put at risk biodiversity assets.

References

Defra (2006) *Local Sites, Guidance on their Identification, Selection and Management*.
Defra (2008) *Defra Guidance on the Improved Local Biodiversity Indicator (NI 197)*.

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Cover image: The Suffolk Broads, a unique protected area

Photography: Pete Johnstone CEnv MIEEM

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.



Protected Areas: An Overview

Roger Crofts FIEEM

Former Chair of the European Region of IUCN World Commission on Protected Areas

Summary

Protected areas are a key mechanism for securing the conservation of nature and natural resources, and cultural landscapes. Their purpose is defined and the reasons for their importance described. The major issues facing protected areas in the light of best and worst practice are identified and solutions offered on five key aspects: building resilience to change, stakeholder collaboration, effective management, appropriate resourcing, and policy mainstreaming.



Photo 1: Thjorsarver Ramsar Site, Iceland - Example of an area too small in scale to protect natural systems, not sufficiently protected legally and vulnerable to hydro-electric development. Promise of larger area and stronger protection by government in 2010.

What is a Protected Area?

There are many definitions of a protected area nationally and globally. Arguments can be interminable as it depends on the perspective of those involved. Are they places set aside for nature? Is their purpose to secure perpetual protection of species and habitats? Do they have a wider human society connotation as spiritual sites and cultural landscapes? All of these elements are important. That is why since the 2003 World Parks Congress a group of experts, led by Nigel Dudley, has reviewed the definition and clarified the purposes, governance, management effectiveness and all other relevant issues (Dudley 2008). The outcome was endorsed by the International Union for Nature Conservation (IUCN) in October 2008. The agreed IUCN definition is recommended: 'A clearly defined geographical space, recognised, dedicated and managed through legal or other effective means, to achieve the long term conservation of nature, associated ecosystem services and cultural values' (Dudley 2008).

The precise meaning of each element is set out in detail in the guidelines.

The use of the term 'nature' is an important change. In the previous definition '...an area especially dedicated to the protection of biological diversity...' was the primary focus but during the review process

there was recognition that all of nature, including the geological and geomorphological features, and earth systems and processes were also key elements. The elaboration of the definition in the revised guidelines is as follows: 'nature always refers to biodiversity, at genetic, species and ecosystem level, and often also refers to geodiversity, landform and broader natural values' (Dudley 2008).

Why are Protected Areas Important?

Protected areas have been in formal existence since the middle of the 19th century and much earlier in a less formal sense through, for example, sacred areas in West Africa and the Pacific, historic reserves of great antiquity in India, and the royal hunting areas in many European countries. As these uses imply, they are areas set aside for a particular purpose, either to the exclusion of other activities or, at least, where other activities are subordinate. This concept is reflected in the IUCN definition discussed above. The evolution of the primary purpose of protected areas in Europe can be traced and is summarised in Table 1.

Table 1: Changing primary purposes of protected areas in Europe

- Royal recreation and hunting: 12th century
- Romantic period and cultural landscapes: 18th and 19th century
- Alpine period and mountaineering: 19th century
- National parks and national identity: 20th century
- Multiple national approaches: later 20th century
- Natura - a continent wide species and habitats approach: current

Source: Crofts 2007

In a more popular sense, protected areas are areas whose primary purpose is to safeguard and secure the future of species and habitats, and of natural systems and processes. They are places where the world's finest nature, landscapes and cultural manifestations can be celebrated. They are places which can act as a break on, or a barrier to, those types of development which destroy or substantially impair nature and natural systems. In a world which is becoming increasingly urbanised, protected areas are arguably also places where human society can connect or reconnect with nature (Harmon *et al.* 2008). These reasons are important in making the case for an individual new protected area or, at a larger scale, for a protected areas system covering a country or region.

In recent years, it has been increasingly important to consider protected areas in the context of the provision of environmental services and human benefits. This approach is important for two reasons. First, there has been a trend in the later 20th century to consider protected areas as a strict preservation mechanism particularly for species and habitats. Increasing recognition of the importance of their role in securing environmental systems and processes has led to a broader approach. This is illustrated in Table 2.

Protected areas are also important as a means of ensuring compliance with national and international agreements and obligations. Foremost of these, in a UK context, are two EU Directives: Council Directive 79/409/EEC on the Conservation of Wild Birds and Council Directive 92/43/EEC on the Conservation of Natural

Figure 1: Growth in Nationally Designated Protected Areas (1872-2007)

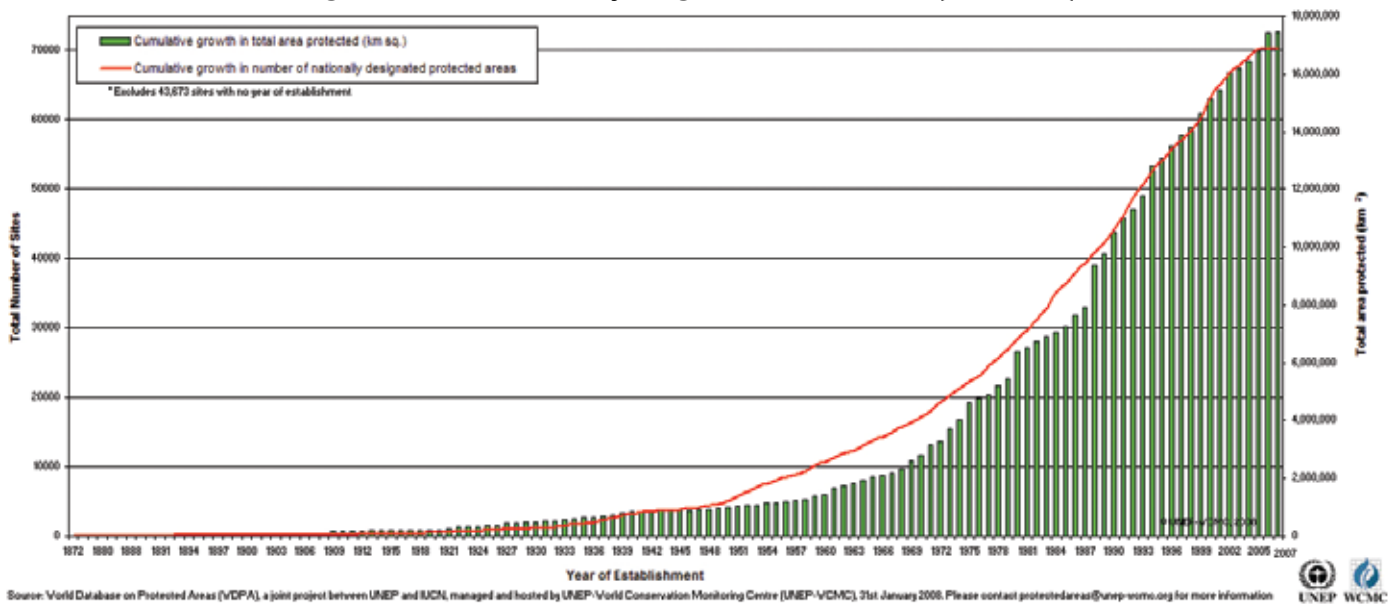


Table 2: Services provided by protected areas

- Buffering the effects of climate change
- Storing water
- Storing carbon and other greenhouse gases
- Maintaining species diversity
- Providing human livelihoods
- Contributing to human health and wellbeing
- Providing inspiration and joy
- Providing beauty and grandeur
- Providing education, learning, research
- Protecting the homelands of indigenous peoples
- Supporting local economies

Habitats and of Wild Flora and Fauna, commonly known as the Birds and Habitats and Species Directives respectively. The former provides for the protection, management and control of all species of naturally occurring wild birds on the European territory of EU Member States. The purpose of the latter is 'to promote the maintenance of biodiversity, taking into account economic, social, cultural and regional requirements'. The whole suite of sites under the two Directives should form a 'coherent European ecological network of special areas of conservation under the title Natura 2000'. There is no other regional mechanism of this type in any other part of the world and many lessons about its development and implementation need to be learnt.

Protected areas have long been recognised as a key mechanism for the conservation and protection of species and habitats *in situ*. This was formalised internationally through the Convention on Biological Diversity. Article 8 states that 'each contracting party, as far as possible and as appropriate: establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity'. At the seventh meeting of the Conference of Parties in 2004, the signatories agreed to adopt a Programme of Work on Protected Areas (Decision VII/28) to 'support the establishment and maintenance by 2010 for terrestrial and 2012 for marine areas of comprehensive, effectively managed, and ecologically representative national and regional systems of protected areas'. Direct actions for planning, selecting, establishing, strengthening and managing protected area systems and sites; governance, participation, equity and benefit sharing; enabling activities; and, standards, assessment and monitoring are component parts of the programme. It is fair to say that there has been insufficient action in the UK and in other parts

of Europe to recognise this responsibility and to take the necessary action.

A World Heritage Site is an international accolade for a protected area in recognition of its Outstanding Universal Value. Sites are inscribed on the World Heritage List of the UNESCO World Heritage Convention. This accolade is a major motivating force for national governments to propose sites, to ensure that they are better protected, and the threat of 'red listing' those sites that are in danger is a motivation for more effective management.

Protected areas are used as a key mechanism to achieve a variety of purposes. The IUCN guidance on their aims (Dudley 2008) is summarised in Table 3.

Table 3: IUCN guidance on aims for protected areas

- Conserve all aspects of biodiversity
- Contribute to conservation strategies
- Maintain diversity of landscape
- Large enough to ensure integrity and long-term maintenance
- Maintain values in perpetuity
- Management plan, and monitoring and evaluation programme
- Clear and equitable governance system

And where appropriate:

- Conserve significant landscape, geomorphology and geology
- Provide regulatory ecosystem services
- Conserve natural and scenic areas
- Deliver benefits to resident and local communities
- Deliver recreational benefits
- Facilitate research activities and ecological monitoring
- Use adaptive management strategies
- Help to provide educational opportunities
- Help to develop public support for protection

Source: Dudley 2008

The Growth of Protected Areas

Evidence of the importance of protected areas as a key environmental protection mechanism is illustrated in the statistics of their growth. Data held by the UNEP World Conservation Monitoring Centre in

Cambridge (www.unep-wcmc.org), as part of the World Database on Protected Areas, shows the following pattern of growth (Figure 1) (UNEP-WCMC 2008). The acceleration in growth of the land surface area designated from the early 1970s is noticeable. Was this, in part, a consequence of the first global environmental summit (The Stockholm Conference) in 1972 or were other factors at work? It is not clear. By the time of the 5th World Parks Congress in Durban, 2003, the proportion of the land surface with protected area status had exceeded the informal 10% target and stood at 11.5% (IUCN WCPA 2004). However, the situation is highly variable between different biomes, with especially low levels of protection for temperate and sub-tropical grasslands, and for tropical and subtropical coniferous forests. In the marine realm, the situation is much worse with only a small proportion protected: 10% of the total global protected area is marine, with very few nations having substantial marine protected areas. It is also highly variable in terms of the existence and strength of protection in practice.

The Challenges Facing Protected Areas

The remainder of this article addresses the key challenges facing protected areas and the action needed to address the position. These are drawn from experience through field visits, independent reviews, speaking engagements, attending conferences and seminars, and listening to experts.

It is all too easy to be complacent about the effectiveness of protected areas. The evidence of their growth presented earlier suggests real success and leads to the assumption that, once established, protected areas will deliver the necessary conservation aims and objectives in practice. Experience shows that this is far from the case. Probing below the high-level statistics shows that there are many issues to resolve. It is possible to characterise the worst and the best characteristics of protected areas from many parts of the world, but particularly around Europe over the last decade and a half. This is done in the hope that IEEEM members will learn from the mistakes made elsewhere and adapt the best practice to the circumstances in which they are working.

The worst protected areas are characterised in Table 4.

Table 4: The worst protected areas

- Unresolved conflict between nature and development
- Unresolved conflict between developers and communities
- Natural assets seen only as money makers
- Species and habitats lost
- Values destroyed
- Natural systems functionality reduced
- Rules confusing and ineffective
- Management unfocussed
- Resources totally inadequate

On the other side of the equation, the best protected areas can be described as having the characteristics in Table 5.

Table 5: The best protected areas

- Protect nature as the primary objective
- Managed as integral unit
- Part of a national system
- Local communities are actively engaged
- All stakeholders engaged in the governance
- Development complements and never undermines protection
- Government is committed
- Resources are available



Photo 2: Yellowstone National Park, Wyoming, USA - Example of 'letting nature takes its course', management of major active volcanic caldera and natural regeneration of forest after accidental fire, alongside visitor management through the 'honey pot' approach.

In the light of experience, five specific issues are identified to define the challenges and the range of solutions available to ensure that protected areas are a more effective mechanism for achieving 'the long term conservation of nature, associated ecosystem services and cultural values' of the IUCN definition.

1. Resisting the development squeeze and coping with climate change by building resilience and connectivity

Many protected areas, especially in Europe, have been developed as bastions against intensive development of farming, forestry and economic infrastructure (UNEP-WCMC 2008). As a result, many protected areas are surrounded by activities which are inimical to their longer term existence as places where natural systems and processes secure the survival of key species, habitats and cultural landscapes. Pesticide transfer, eutrophication, and acidification are just three examples of many cross boundary transfers which affect the integrity of protected areas and undermine their functioning. In Europe, for example, there has been substantial fragmentation of habitats, particularly since the middle of the 20th century. Major causes of this fragmentation have been the EU Common Agricultural Policy's (CAP) objective to provide home grown food for Europe and the expansion of transport infrastructure and coastal settlements (EC 2007). Overall, there remain too many examples of development winning over conservation of nature and natural resources and the erosion of the values of protected areas.

Climate change will have increasingly significant effects on protected areas. It will, in part, reinforce the need to have them as buffers and sanctuaries, and as recipients of migrating species and translocation of species and habitats. But, it will also challenge the traditional



Photo 3: St Kilda World Heritage Site, Scotland, UK - Example of a protected area with multiple designations for natural and cultural heritage with protection guaranteed in perpetuity through ownership and management by a conservation charity - The National Trust for Scotland.



Photo 4: Galapagos National Park, Ecuador - High endemicity and natural values being threatened by inadequate management and control so the archipelago is on the World Heritage Sites endangered list. Removal of non-native species and stricter controls on island development and visitor numbers is needed.

view that protected areas remain in the same place forever. This may not be the case as species migrate toward the poles and to higher altitudes, and as habitats are lost, for example in low-lying coastal areas and through desertification. There have been many assessments of the effects of climate change globally, but it is reasonably certain that regional and local variations will require scenario planning to inform mitigation and adaptation strategies. These should focus on the type and extent of changes expected in temperature, precipitation, sunshine, winds and storms so that strategies for protecting key biomes and tempering the effects of extreme weather conditions are planned for.

Overall, to combat the effects of development and climate change, a more strategic approach to protected areas is needed. This should recognise the need for changes in land use and the development of infrastructure to cope with human needs, including food security and energy supply from renewable sources, and give greater recognition to the fundamental role of environmental systems and processes. This is happening to a degree in Europe through changes in the CAP regime introduced in 2003 and through the adoption of Strategic Environmental Assessment of policies and programmes. But, these have not gone far enough and more fundamental changes are required. In Scotland, for example, the need for a strategic land use policy framework has been advocated (Royal Society of Edinburgh 2008) and this has been translated into a statutory requirement in the Climate Change (Scotland) Act 2009.

It is becoming increasingly recognised that individual protected areas surrounded by development is not a sustainable course for nature. The old adage 'islands of protection in a sea of devastation' unfortunately still rings true. Moving 'from islands to networks' has been a longstanding approach, specifically identified for example, in the mid-term review of the global protected areas programme in 1997 (IUCN WCPA 1997). The methodology and practical techniques of ecological connectivity and whole landscape approaches are now becoming more theoretically convincing, better known and more accepted in practice (IEEM 2007 and Hill 2009). This is especially the case in mountain areas (Worbouys *et al.* in press). Unfortunately, the experience gained through the Council of Europe's PEBLDS ECONET project on whole landscape approaches to ecological connectivity focussing on lowland areas has not been adequately implemented across Europe and certainly not in the UK. There is a pressing need to develop formal ecological corridors and to ensure that, as far as possible, protected areas are connected to each other through whole landscape approaches at regional level.

A major issue will be how to build resilience to change in natural systems without going along the hard engineering route so often used in the past, especially along the coast and in river catchments. An in-

depth understanding of ecological systems and their functionality will be a vital consideration. Also, the techniques for reintroducing extinct species from the experience gained in many countries and the more limited knowledge of translocation of species need to be fostered so that the information can be deployed effectively when needed.

2. Moving from top down dictatorial approaches to more collaborative approaches and modern governance regimes

It is patently obvious in many countries, including the UK, that there are many disagreements between different interests in the establishment and management of protected areas. There is a strongly held view that protected area status takes away the rights of landholders and communities and imposes what is regarded as a negative nature regime. It is easy to characterise the opposing dimensions (Table 6).

NATURE VIEW	versus	COMMUNITY VIEW
Too few		Too many
Too small		Too large
No more tourist provision facilities		More visitor facilities
Better protection		Less protection
More involvement		Less involvement
Too much damage		Stop development
Too few controls		Too many rules
Locals negative		Locals ignored
More conservationists		Run by locals

It is possible to overcome these polarities with conflict resolution mechanisms run by those with relevant experience. But, it takes time, is frustrating and diverts energy and resources from what each side wants to achieve. There are plenty of good examples around the world of moving from polarised situations to ones of mutual respect and effective working (Borrini-Feyerabend *et al.* 2004). Equally, readers will be familiar with those where the divides are too great to bring the sides together, as in the recent Trump development in Aberdeenshire, Scotland. The implementation of Natura 2000 offers one mechanism through the development of alternative sites for protection where it is deemed necessary for reasons of overriding national interest to develop a currently protected area.

Engagement of key stakeholders is essential in the establishment and management of protected areas. This approach has some downsides which should be recognised: there can be too many different interests to accommodate, it slows progress and often the level of agreement is best defined as the lowest common denominator rather than the highest common factor. But, it is not possible to progress a protected area without stakeholder engagement. Recognising and communicating the benefits of this more inclusive approach is a vital part of the process. There is a greater chance of agreement, progress is more rapid and, most important, it recognises the legitimacy of the different interests – resources owners, traditional rights holders, and local communities, alongside the range of conservation interests.

An essential component of stakeholder engagement is the use of modern governance systems. Many protected areas have no governance structure other than the executive management, and others have a largely top down governmental approach. Sadly, this is all too often the case in the UK, apart from the national parks. The revised IUCN guidelines (Dudley 2008) provide a classification of governance structure types which help to clarify the options available (Table 7). These new approaches provide the possibility for more different interests to be involved in protected area management than ever before.

Table 7: Protected area governance types

- A. Governance by government
 - Federal or national ministry or agency in charge
 - Sub-national ministry or agency in charge
 - Government-delegated management (e.g. to an NGO)
- B. Shared governance
 - Transboundary management
 - Collaborative management (various forms of pluralist influence)
 - Joint management (pluralist management board)
- C. Private governance
 - Declared and run by individual landowner or by non-profit organisations
 - or by for-profit organisations
- D. Governance by indigenous peoples and local communities
 - Established and run by indigenous peoples
 - Declared and run by local communities

Source: Dudley 2008

Examples are provided in the IUCN Guidelines and in accompanying publications referred to there. There is no one answer and the system adopted will depend on the particular national and local circumstances.

3. Moving from designation to setting standards and achieving effective management

Too often in the past protected areas have had no or a weak legal status, have not had clearly defined aims and objectives, no formal plans for management, and no means of tracking progress. It is essential to ensure, at the outset, that a protected area or protected areas system exists in reality through legislative provision or other formal agreement. There remain too many instances where all that exists is a 'paper park' with no formal reality on the ground. Often, this is a result of lack of willingness by government to implement policy and statute in practice because of a mixture of opposition from other interests and a lack of resources.

So much effort is often put into obtaining agreement on a protected area that too little effort is put into its longer management and to measuring the effectiveness of designation. Effective management is a basic requirement. The key building blocks are clearly defined objectives, a plan with clear targets, milestones and output indicators, and a means for measuring achievement. The system of Management Effectiveness Evaluation devised by IUCN WCPA (Hockings *et al.* 2006) has been developed and tested extensively around the world and forms the global standard to use. It can be adapted to local circumstances as the published case studies illustrate (Stolton 2008). For example, it has recently been adapted for evaluating the

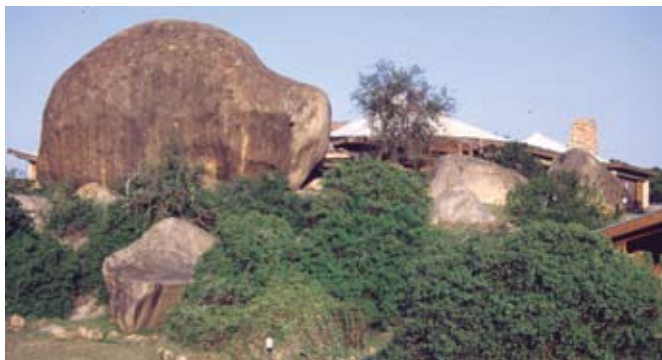


Photo 5: Serengeti National Park, Tanzania - Privately-funded visitor accommodation in the core of the park developed sensitively alongside effective protection of species in their natural habitat.

effectiveness of the Scottish National Nature Reserve network for Scottish Natural Heritage (www.snh.gov.uk).

A related relevant tool for improving performance on management and achieving higher quality standards is the revised IUCN guidelines referred to previously. They have been adopted in primary statute in a growing number of countries as a framework for developing national protected areas systems. There is a great deal of experience and guidance available on national systems planning (Davey 1998). The Categories system has many uses which have evolved over time (Dudley 2008), for example, clarifying management objectives, providing an international standard, and helping to identify management objectives through zoning. Their use in the development of individual areas, in developing protected areas systems, and in practical management will provide valuable guidance, and help to set international standards.

Linking to other international systems provides the opportunity to improve performance on management. For example, the requirement to achieve favourable conservation status on Natura 2000 sites, periodic reviews of the state of protection for World Heritage Sites, and setting of clear government targets for achievement of favourable status for Sites of Special Scientific Interest in England, Scotland and Wales, have all helped to move the focus of attention to effectiveness of management.

4. Acquiring the appropriate resources of funding, expertise and knowledge

The establishment and running of protected areas is a highly professional business. It requires a wide range of technical and professional expertise, well beyond the traditional bedrock of ecological knowledge, to embrace other scientific disciplines, education and communication, business planning and management, fundraising and commercial acumen, stakeholder engagement and negotiation skills, to name but a few. The executive requires a chief officer who can provide leadership and management skills, staff with an ability to be creative in finding solutions rather than being overwhelmed by problems, have the relevant skill set, be prepared to re-skill if appropriate, and be able to work effectively in teams and to work with colleagues across the structure and across the grades. Opportunities for exchange of practice should be taken up and time given by managers to allow this to happen. There are many channels, including the World Protected Areas Leadership Forum of WCPA, the Protected Areas Learning Network (PALNET) and the IUCN WCPA Best Practice Guidelines Series (www.iucn.org/wcpa), and the World Database on Protected Areas (www.unep-wcmc.org), as well as through established groups, such as the Europarc Federation (www.europarc.org), and new training courses, such as the MSc in Protected Areas Management at the University of Klagenfurt in Austria.

There are many opportunities for gaining resources through business arrangements in protected areas, but these should never undermine the purpose of the area. Most important, in many countries, is the provision of resources from government for protected areas because either they are on state-owned land or they are regarded as fulfilling national or international obligations and are deserving of financial support. Unfortunately, the resources available are only a small proportion of the resources required. So strategies for fundraising and the use of professional expertise in this field will become increasingly necessary. No longer can protected areas expect money to be readily available. Calculating the financial contribution made by protected areas in the provision of environmental services, and social and economic benefits (see Table 2) will become increasingly important. This will help to acquire the resources necessary to maintain protected areas through gaining full recognition of their contribution to society (Harmon *et al.* 2008).

5. Securing recognition of the role of protected areas in other agendas and policies

Protected areas will remain isolated in practice and in policy if their needs and their benefits are not mainstreamed into other agendas



Photo 6: Doi Inthanon National Park, northern Thailand - Interesting mix of objectives including celebration of nationhood and monarchy, forest conservation and horticultural activities for migrants to stem drug trafficking.

and policies. Protected areas organisations and non-governmental environmental organisations should strengthen the arguments for policy mainstreaming in all aspects of land use, resource development, energy, transport, etc., and in developing the case for the reversal of those policies which have a negative effect on protected areas. The international agendas for poverty alleviation and water resource management, particularly through the Millennium Development Goals, for biodiversity conservation, for combating desertification and for climate change, through the three key Conventions, should be the targets if the role of protected areas in delivering benefits to society is to be accepted. Within the UK and Europe, arguing for fundamental changes to the Common Agriculture Policy and the Common Fisheries Policy, seeking an environmentally sensitive approach to the infrastructure for the energy provision from renewable resources, and ensuring that protected areas have a key role to play in addressing the challenges of climate change, are major issues that will have to be addressed effectively.

Conclusions

The challenges discussed suggest that an evolution of approaches to protected areas is necessary rather than sticking to the more traditional approaches of the past. Adrian Phillips has perceptively described the need for a new paradigm for protected areas in a seminal paper (Phillips 2003) which should be required reading for all IEEM members engaged in protected areas.

Another way of describing the need for an evolutionary change in approach is shown in Table 8.

FROM	TO
Preservation	Adaptive management
Sectoral	Integrated and cross-sectoral
Scientific	Multifaceted knowledge
Environmental	People and environment
Top-down	Both directions
National	Appropriate geographical level
Conservationist	All stakeholders
Nature	Social and environmental well-being

If the protected areas mechanism is to be used effectively, certain essentials require to be met; principally, protected area systems contribute recognisable benefits to the wider natural world and to human communities, and contribute to the resolution or mitigation of

major human and environmental challenges. This is a perpetual activity requiring commitment from governments and all other stakeholders, learning from the best and worst experience from around the world, and using all of the expertise and experience of professionals in IEEM and further afield.

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I gratefully acknowledge the valuable comments of Adrian Phillips on an earlier draft.

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A Shared Inheritance and a Common Future for Europe's Protected Areas

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On 24 May 2009, Europe celebrated 100 years since the continent's first nine national parks were established in Sweden in 1909, an occasion certainly worth commemorating.

The EUROPARC Federation is the umbrella organisation for Europe's protected areas and practitioners. It represents around 450 protected areas, governmental departments, NGOs and businesses in 39 countries, who themselves manage the green jewels of Europe's land, sea, mountains, forests, rivers and cultural heritage.

Given its leading role representing the protected areas of Europe and the significance of the occasion, the Federation decided to mark this important landmark in the history of European nature protection with a number of activities. This year's European Day of Parks, celebrated by protected areas across Europe on 24 May 2009, was dedicated to the theme *Youth - the future of our parks*; Europarc's annual conference focussed on the topic *100 Years of National Parks in Europe: A Shared Inheritance; A Common Future*; and a project was created, entitled *Celebrating 100 Years of National Parks in Europe*, which saw the production of a book and a travelling exhibition, both entitled *Living Parks: 100 Years of National Parks in Europe*.

The anniversary of the first centenary of national parks has offered a great, not to be missed opportunity to review the history of European nature protection and in particular to look to the future and the fundamental debate concerning the next century of protected areas and their management.

Where Do Protected Areas Come From?

Although the practice of protecting particular areas, particularly sacred sites and hunting grounds, had been around for centuries, the global movement for nature protection can be said to have started during the period of romanticism at the end of the 17th and beginning of the 18th centuries. This sped up as a result of the industrial revolution and the consequent move away from the perception of nature being threatening, to it being thought of as threatened.

Increasing numbers of people supported this belief as the 18th and 19th centuries progressed. A major milestone in the movement was the creation of the world's first national park, Yellowstone National Park, in the USA in 1872 for protection as well as recreational purposes. Following this, further parks were established in Europe's colonies across the globe in the late 19th century before the first were finally created in Europe itself. These Swedish parks were established mainly for scientific research reasons, patriotism, preservation purposes and public use.

Between the two world wars, national parks were established in further European countries. Despite differences to the USA model, the term 'National Park' stuck because of its accessibility and high recognition factor. Many of the first parks

were established because of their iconic value and their size or place was decided upon due to opportunism rather than because of the nature found there. The legislation of the parks and the focus of their protection tended to be very varied and depended on the country's political and economic systems at the time.

The trend of establishing national parks continued throughout the 20th century and, by the year 2000, most European countries boasted at least one national park. In parallel to this the concern for our planet's depleting natural resources grew and bought with it the creation of national and international systems of protected areas of which national parks are just one part.

What Are Protected Areas Today?

Currently, more than 90 million hectares of natural habitats are legally protected in Europe, covering 18% of land across 40 countries. This protection comes in the form of diverse designations from different national systems, many of which are unified by the IUCN's protected area categories, as well as the EU's Natura 2000 network.

This network of protected areas represents what we treasure about our environment: land and seascapes, flora and fauna, habitats and whole ecosystems. The main function of these places is still to protect and conserve our natural surroundings but recently more focus has been placed on other functions and issues such as recreation and tourism, sustainable development, community participation, environmental education and health. Nowadays, a wide range of people across a variety of sectors work with and for these natural sites, ensuring that they are managed well and that the cultural and natural heritage they contain is looked after.

The values and benefits of protected areas are huge. Europe's protected areas play a vital role in safeguarding the continent's nature, its wildlife and landscapes. They protect Europe's most special places: relatively untouched landscapes, as well as those which have been shaped by centuries of man's interaction with the land. They offer refuge to species, conserve ecosystems and help to preserve the natural beauty of Europe in all its variety for us to experience and enjoy.

Recently, as humankind realises how important healthy and intact natural ecosystems are, more attention has been paid to other more specific functions that these areas carry out, which have been neglected before but which are of utmost importance for mankind. These can be summarised under the term 'ecosystem services', a term which has gained recognition over the last few years, and includes carbon storage, fresh water, soil protection, species protection, clean air, food, pest control, photosynthesis, soil formation, nutrient recycling.

However, despite the hugely important role that these areas play, they are still facing numerous challenges which threaten their existence and make their core function sometimes hard to carry out. The main one is perhaps the lack of recognition for the services they provide. Others include infrastructure

development, lack of financial, political and stakeholder support, trying to get stakeholders to see the long-term benefits instead of the short-term gains and an increasingly urbanised public who are more and more unaware of the benefits of nature.

How Does the Future Look for Protected Area Management?

The future of our protected areas remains unclear and further challenges in the form of financial and ecological crises remain likely. There are however also a number of great opportunities for these special places, which should not be overlooked.

Initiatives such as the International Year of Biodiversity in 2010 as well as highly esteemed and publicised studies and developing theories, such as the report *The Economics of Ecosystems and Biodiversity* (TEEB) (www.teebweb.org) or the concept of ecosystem services, should be used more as platforms to communicate the values and benefits of our natural and cultural heritage. It should not be limited to just those that are obvious to the general public and politicians. We need to make a variety of target groups aware of just how many assets these natural places have for society. One way to do this, which is explored in detail in the TEEB report, is to put a cost on the services nature provides.

In addition, there are a number of themes and issues which will become increasingly important for protected areas over the next few years:

Climate change is still a phrase on everybody's lips and certainly an area whose importance for parks and reserves has already been acknowledged. Protected and natural areas have a fundamental role to play in the mitigation of, and adaptation to, climate change, including being the source of much scientific research on the topic.

The role of youth in protected areas poses the question of how to inspire young people where nature protection is concerned when they are increasingly detached from the subject itself.

Health and nature is another interesting topic. Connections have already been made in various studies between natural surroundings and good health, and recently those working in the field of nature protection have been recognising this link to a far greater extent and realising its potential for protected areas.

A further area, which will increase in importance for protected areas, is participation and the need for a holistic approach to protected area management involving stakeholders from across different sectors within and outside park borders. These target groups will also need to be involved to ensure the sustainable development of these regions particularly where tourism is concerned.

Finally, to ensure that the protection of our natural heritage does not just happen in isolated pockets, international cooperation and the need to invest in an integrated network of protected areas across Europe and the globe are extremely important. Europe's protected areas need to work together to ensure that their vision for the future of our natural heritage is realized and identify common challenges. Partnerships between countries working to solve similar problems occurring in protected areas, networking to exchange knowledge on a variety of issues and developing innovative tools together are just three methods which can benefit protected area management.

The Europarc Network

The Europarc Federation was founded on the need to protect and enhance Europe's natural and cultural protected areas. It does this by bringing those people together who look after our protected areas; by facilitating and stimulating collaboration

and partnerships to encourage innovative, forward thinking in protected area management across Europe; and by communicating the values and benefits of these places to a wide range of target groups.

The Federation and its network have already started looking to the future of protected area management in Europe and have a number of tools and projects in place which address the issues above. Europarc's Junior Ranger programme, for example, currently takes place in 30 protected areas in 15 European countries and engages hundreds of children between the ages of 12 and 18. Our European Charter for Sustainable Tourism is an instrument with a holistic approach and step by step guide to the sustainable development of the tourism sector in protected areas. It has been implemented in 75 protected areas in eight countries and its second phase has so far seen the certification of 155 charter businesses. Our transboundary programme has involved the certification of 17 parks, who are working more closely together across national borders.

Furthermore, Europarc is currently developing a lobbying strategy for the European Union looking at how to promote the assets of protected areas more efficiently and to support and enhance the Natura 2000 network. It is also working on developing tools to enable better networking and the exchange of knowledge and ideas between its members.

Europarc firmly believes that protected areas and what they represent are fundamental to and underpin the livelihood of European society and consequently aspires to work closely with its members to create a common future for Europe's natural heritage.

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What the future holds for protected areas is as yet uncertain, but today's youngsters will be tomorrow's managers and employees.

Photo: Europarc Federation

Progress in the Establishment of a Marine Protected Area Network in the Black Sea

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Introduction

On 17 June 2008, the European Union brought in Directive 2008/56/EC on establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive).

The main objectives of this Directive, which reflect and complement those of the Water Framework Directive, are to:

- make an initial assessment of the current environmental status of the waters concerned and the environmental impact of human activities thereon;
- determine good environmental status for the waters concerned;
- establish environmental targets;
- develop by 2016 a programme of measures designed to achieve good environmental status;
- establish and implement monitoring programmes; and
- where practical and appropriate, use existing regional institutional cooperation structures, including those under Regional Sea Conventions, covering that marine region or subregion.

In addition, the Directive recognises that the establishment of marine protected areas (MPAs), including areas already designated under the Habitats Directive 92/43/EEC and Birds Directive 79/409/EEC (i.e. Natura 2000 sites), as well as those designated through other legislation, is an important contribution to the achievement of good environmental status of marine waters. Moreover, according to Article 21 of the Directive, on the basis of the information provided by the Member States by 2013, the Commission shall report by 2014 on progress in the establishment of marine protected areas, having regard to existing obligations under applicable Community law and international commitments of the Community and the Member States (e.g. Conventions on Biological Diversity and Wetlands of International Importance).

Since 2000, with the accession of Bulgaria and Romania to the EU, the Black Sea has become one of the EU regional seas, within the meaning of the Marine Strategy Framework Directive. This article reviews, as a case study for other European regional seas, the present situation regarding MPAs in the Black Sea. It also describes the measures needed to establish additional national and transboundary MPAs in order to create a network that can ensure the conservation and sustainable use of Black Sea natural resources.

Black Sea Described

Physical Characteristics

The Black Sea, with the adjoining Azov Sea, forms an enclosed basin with a catchment area of some 2.3 million km² (Zaitsev 1998) that



Figure 1: Drainage catchment of the Black Sea

wholly or partly covers 22 countries in Europe and Asia Minor (Figure 1). The basin was formed during the Miocene mountain-building period when the ancient Tethys Ocean was divided into several brackish basins. The Caspian, Azov, Aral and Black Seas are the remnants of this evaporated basin. The surface area of the Black Sea is about 423,000 km² and it has a maximum depth of 2,212 m in the Euxine abyssal plain just south of Yalta (Zaitsev and Mamaev 1997). The Azov Sea covers 37,860 km² and has an average depth of 13 m, with a maximum depth of 15.3 m (Bronfman 1995).

The marine basin is sub-divided by the Crimean peninsula (see Figure 2). To the north-west lies a broad relatively shallow shelf up to 190 km wide. In contrast, the southern edge around Turkey and the eastern edge around Georgia has a shelf that rarely exceeds 20 km width and has numerous submarine canyons and channel extensions. The Azov Sea has distinctive and different ecological conditions from the Black Sea proper: it is much shallower and has lower salinity.

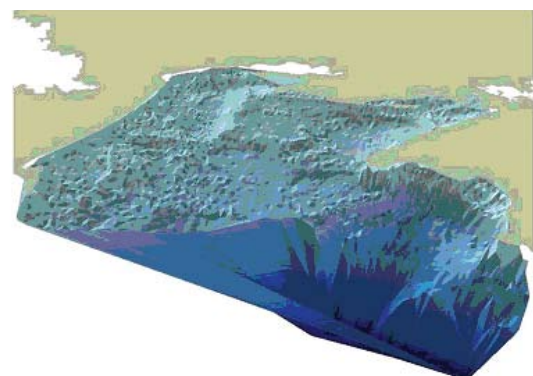


Figure 2: Topography of the northwest shelf of the Black Sea
Source: Ukrainian Scientific Centre for Ecology of the Sea, Odessa

The Black Sea shoreline is about 4,440 km long and is divided between six coastal states approximately as follows:

Bulgaria	378 km
Romania	245 km
Ukraine	1,628 km
Russia	475 km
Georgia	310 km
Turkey	1,400 km

Owing to its small size, the tidal range of the Black Sea is not more than 8 cm (Shveps and Ambroz 1979), meaning that river estuaries tend to take the form of shallow, brackish lakes or 'limans'. Especially along the northern and western shores, the coastal zone has extensive wetland ecosystems which form transitional zones connecting the vast terrestrial drainage basin and the Black Sea itself. These wetlands (many of international importance) are dynamic and highly productive ecosystems that support a very high diversity of flora and fauna.

Biodiversity and Natural Resources – Status and Threats

The Black Sea has a highly specialised marine ecosystem derived from its relatively recent origin as a large periglacial lake that was filled by northern rivers and then seawater from the Mediterranean as sea-levels began to rise about 12,000 years ago; the inland lake gradually rose about 100 m and eventually connected with the Mediterranean through the Bosphorus channel (Aksu *et al.* 2002) - the source of the Biblical flood and Noah's voyage. Once connected to the Mediterranean, a counter-current of heavier saline water began to flow in under the freshwater outflow, creating the brackish Black Sea (the salinity of the Black Sea is about half that of the Mediterranean). The incoming salt water, denser than the freshwater it displaces, plunges to the bottom. The freshwater, flowing in from the northern rivers and out via the Bosphorus, floats on top. This phenomenon represses the natural convective heat exchange that causes water to circulate and re-oxygenate in seas and lakes elsewhere in the world. As a result, while the top 140 m layer of the Black Sea is constantly renewed and can support a vigorous indigenous marine life, below this level the waters are anoxic, and with a high concentration of hydrogen sulphide, inimical to life.

Within the Black Sea itself, living communities are not evenly distributed: some parts are more important than others. Biologically poor areas include the deeper waters which border the hydrogen sulphide zone. The north-western shelf, on the other hand, has relatively low salinity thanks to the inflow of the Danube River, and supports a particularly interesting community of species including so-called Pontic relicts, such as gobies, that originate from the Miocene lake era. Similarly, a small section of the southern shelf close to the Bosphorus is influenced by inflow of Mediterranean water and provides suitable living conditions for a wide variety of Mediterranean species, including sea stars and sea urchins.

At the last count, in the mid-1990s, over 3,770 species had been identified in the Black Sea, including 1,619 fungi, algae and higher plants; 1,983 invertebrates; 168 fish; over 70 wetland birds; and

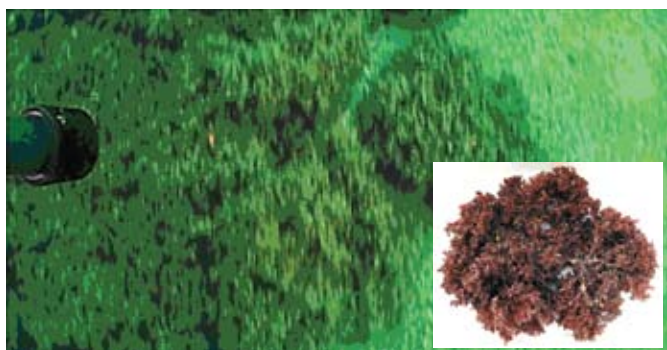


Photo: Spherical (unattached) form of *Phyllophora crispa* (note laser sample point) in Karkinitsky Bay, Ukraine
Inset: *Phyllophora crispa* showing red colour

four aquatic mammals (Zaitsev 1998). However, the Black Sea suffered a severe eutrophication episode between the 1960s and 1980s, when huge quantities of pollutants entered the catchment and were delivered by the Danube, Dneister, Dnipr and Don (UNDP 1997, Schmedtje 2005). In addition, coastal urbanism, industry and tourism directly impacted the marine waters. As a result, some 126 species are recognised as threatened, including 10 plants; 38 fish; 22 birds, and all the mammals.

The greatest manifestation of this impact was on the world's largest area of the red agar-bearing seaweed, *Phyllophora nervosa* (photo). Known as Zernov's field, the seaweed (which forms unattached beds) once covered some 11,000 km² of the north-west shelf of the Black Sea and had a biomass of 7-10 million tons. By the early 1990s, the algal field had shrunk to 500 km² and its biomass to under 0.5 million tons (Figure 3). This decline represented not only the loss of a valuable raw material which was commercially harvested for the extraction of agar, but also the disappearance of an important source of oxygen: photosynthesis by the field once generated up to 2.1 million m³ of oxygen per day. In addition, the field had associated with it a specialised '*Phyllophora* fauna' including 118 species of invertebrates and 47 species of fish. Many species have evolved a reddish colouration to camouflage themselves; with the decline of the algae these animals almost disappeared as well.

Moreover, there are now 217 widespread alien higher organisms: nearly half of them (102) are permanently established, and many are highly or moderately invasive (20 and 35 species respectively). The invasion of *Mnemiopsis leidyi* (a comb jelly) which predated zooplankton contributed to a catastrophic decline in fish productivity in the 1980s. The subsequent invasion of another comb jelly *Beroe ovata*, which feeds on *Mnemiopsis*, means that opinions are now split as to whether *Mnemiopsis* still has a major impact on fish communities and catches.

Establishing a Black Sea MPA Network

Legislative Framework

Black Sea countries participate in various multilateral environmental agreements (Table 1) that provide a platform to enact national legislation (already quite well developed in some countries) for establishing MPAs. This interlocking framework of legislation also creates an institutional framework for common activities and fostering transboundary cooperation.

Table 1: Participation by Black Sea littoral countries in multilateral environmental agreements relevant to Marine Protected Areas

Instrument	Bulgaria	Georgia	Romania	Russia	Turkey	Ukraine
Bucharest Convention	P	P	P	P	P	P
UN Convention on the Law of the Sea	P	P	P	P	—	P
Convention on Biological Diversity	P	P	P	P	P	P
Ramsar Convention	P	P	P	P	P	P
Bonn Convention	P	P	P	—	—	P
Bern Convention	P	P	P	O	P	P
EU Directives	M	—	M	—	A	—
UNEP Global Plan of Action on the Marine Environment	—	S	S	S	—	—

A = Accession; M = Member; O = Observer; P = Party; S = Signatory

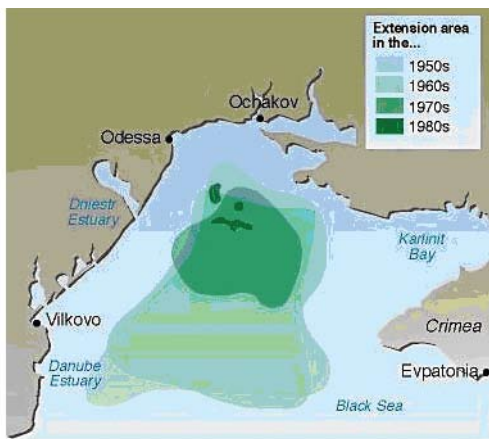


Figure 3: Reduction of Zernov's Phyllophora field in the north-west Black Sea

Source: UNEP-GRID

In particular, all the Black Sea countries are Parties to the Bucharest Convention on Protection of the Black Sea Against Pollution (1994), including its Protocols on Land-Based Sources of Pollution, Emergency Responses and Dumping at Sea. The Convention is administered through a Commission for the Protection of the Black Sea (which consists of one representative from each Party) and has a Permanent Secretariat based in Istanbul (see <http://www.blacksea-commission.org/main.asp>). The Bucharest Convention itself does not stipulate any environmental targets or regulatory mechanisms for exploitation or development of the natural environment. Accordingly, the Government of Ukraine led negotiations on a Ministerial Declaration that was signed by all six countries in Odessa in April 1993 (the Odessa Declaration). The Odessa Declaration laid the foundations on which international donors could assist the Parties to develop and implement a medium- to long-term Black Sea Strategic Action Plan (BSSAP) for the recovery of the Black Sea, implemented through a system of Regional Activity Centres, Advisory Groups and Focal Points that deal with specific sectors of BSSAP.

In June 2002, the Parties adopted a fourth Protocol on Black Sea Biodiversity and Landscape Conservation. According to the first article of the Protocol, the Parties aim to maintain the Black Sea ecosystem in a good ecological state and its landscape in favourable condition, to protect, and to preserve and to sustainably manage the biological and landscape diversity of the Black Sea in order to enrich the biological resources. Through the Protocol, the Parties of the Bucharest Convention extend their area of cooperation to the Azov Sea, which is not covered by the Bucharest Convention proper. However, the Protocol is undergoing a lengthy process of ratification by the Range States (only Ukraine, Turkey and Romania have ratified to date). Meanwhile, in 2009, an internationally-funded update of the Black Sea Strategic Action Plan called for an increase in the number and area of MPAs over the next five years.

MPA Network Planning

The 9th Conference of Parties to the CBD (Bonn, 19-30 May 2008) adopted Decision UNEP/CBD/COP/9/L.20 on Marine and Coastal Biodiversity. This recommends scientific criteria and guidance for identifying ecologically or biologically significant marine areas in need of protection, as well as for designing representative networks of marine protected areas, beyond the limits of national jurisdiction in accordance with international law, including the United Nations Convention on the Law of the Sea (UNCLOS).

The provisions of the EU Birds and Habitats Directives call for the member states to maintain species and habitats of European importance in favourable conservation status, including those present in the marine and coastal zones. The sites established for protecting these species and habitats form a network known as Natura 2000. In 2007, the EU published Guidelines on establishing marine Natura 2000 sites in order to facilitate their designation and

future management (EC 2007).

Combining the provisions in CBD Decision 9/20 (which apply to all Black Sea States), and the obligations of the Birds and Habitats Directives (which are mandatory in Romania and Bulgaria, and progressing in Turkey), and taking account of guidelines and case studies recently provided by the IUCN World Commission on Protected Areas (IUCN 2008), it is possible to sketch out a 'common approach' for planning an MPA network in the Black Sea. The starting point is to establish a standard list of marine habitat types and key marine species in the Black Sea. Then site selection can be done within the context of the Black Sea as a single biogeographic unit, having three inter-connected realms, namely:

1. saline/brackish coastal wetlands and shorelines having a direct hydrological connection with the Black Sea;
2. the benthic/neritic zone from the high water mark to 120 m depth, this being the approximate limit of occurrence of the polychaete worm *Notomastus profundus* and at this depth macrobenthos gives way to meiobenthos (Sergeeva and Zaika 2000); and
3. the wider pelagic zone beyond 120 m depth.

The Habitats Directive currently lists nine main categories of marine habitats for which sites should be identified and conservation measures taken. While many of these habitats are found in the Black Sea, there are some other habitat types, found only in the Black Sea, which also deserve protection. Accordingly, the Black Sea Commission is conducting a review of Black Sea habitats which are of conservation importance, and has constructed a draft classification.

The position with species is more complicated. Those included in the EU Directives, by the Black Sea Convention on Biodiversity and Landscapes (CBL) Protocol and by the Black Sea Transboundary Diagnostic Analysis (TDA) 2007 comprise a total of 320 organisms, but each instrument covers a rather different set of species. Moreover, there is no comprehensive and accepted list of species which need conservation efforts in and around the Black Sea. For most taxonomic groups, except for birds and mammals, additional survey and assessment effort is urgently needed. This situation underlines the need to compile a single list of species of Black Sea importance so as to provide a proper scientific basis for potential MPA identification.

Current Situation of Black Sea MPAs

At present, very few MPAs have been designated in the Black Sea. The most significant sites are (see Figure 4):

- Danube Delta Biosphere Reserve (Romania) which has a marine buffer zone extending out to a depth of 20 m and covering 103,000 ha;
- 2 Mai-Vama Veche (Romania), covering 5,000 ha, is entirely marine;
- Kholketi National Park (Georgia) has an adjacent marine reserve that comprises a shelf extending 6-8 km from the coastline and covers 15,742 ha;
- Zernov's Large *Phyllophora* Field Botanical Reserve (Ukraine), covering 400,000 ha of the central north-west shelf; and
- Chernomorskiy Biosphere Reserve (Ukraine) includes Tendrivsky and Yagorlitsky Bays which cover 74,971 ha (84%) of the area.

The Institute of Oceanology (Varna, Bulgaria), and National Institute for Marine Research and Development (Constanta, Romania), with assistance from the Black Sea Commission and European Union for Coastal Conservation recently completed a Dutch-funded project that identified a number of marine sites of potential community interest for inclusion in the EU Natura 2000 network. In Bulgaria, 14 sites were identified (*Todorova in litt.*), with a total area of 611 km². In Romania, six marine Natura 2000 sites were proposed. However,

all of these sites are still undergoing official approval procedures in discussion with the European Commission.

In Ukraine, the State Programme of National Environmental Network Development for 2000-2015 (Law 198-III/2000) calls for the establishment of additional MPAs, including the Small *Phyllophora* Field (covering at least 30,000 ha) in Karkinitsky Bay. Neither Turkey nor Russia have designated any MPAs at all.

Moreover, all of the existing designated coastal/marine PAs in the Black Sea lie in the 'inshore marine environment', that is the internal waters and the territorial sea, as defined by UNCLOS. Owing to its dimensions, the Black Sea does not have any areas that lie beyond national jurisdiction ('high seas'). However, although all the Black Sea states have determined and registered with UNCLOS their baselines for calculating their maritime zones, only Romania has so far provided a chart of its inshore waters and contiguous zone. At present, there is no overall agreement on the boundaries of the respective offshore maritime jurisdictions in the Black Sea, although some have been settled (e.g. Turkey/Georgia, Turkey/Ukraine). With respect to the Azov Sea, Ukraine and Russia are reported to have started discussions on a boundary line through it in November 2007 (following a major pollution incident), but details are not available.

For these reasons, there is uncertainty about designating MPAs outside the territorial zone of Black Sea states, and there is no obvious opportunity at present for declaring transboundary protected areas in the offshore zone of the Black Sea to conserve migratory species or straddling fish stocks. Within the coastal/territorial sea area, however, one transboundary reserve has already been established between the Danube Delta Biosphere Reserve (Romania) and Danube Biosphere Reserve (Ukraine), which was recognised as a joint Biosphere Reserve by UNESCO in 1998. The two reserve administrations carry out a number of joint activities including monitoring, information exchange and training. Together with the Lower Prut Scientific Reserve in Moldova, a joint management plan for the Lower Danube Protected Areas has been prepared (Baboianu *et al.* 2004).

There is currently an initiative to create a transboundary MPA between Romania and Bulgaria, spanning 2 Mai-Vama Veche and proposed MPAs at Cape Krapets-Cape Sivriburun near Durankulak (Zaharia *pers com.*). Meanwhile, Ukraine and Russia are currently cooperating to establish a Meotida Cross-Border Natural Biosphere Reserve in the Sea of Azov (Karamushka *pers com.*). There appear to be no moves towards cross-border cooperation on MPAs between Turkey and Georgia or (not surprisingly) between Georgia and Russia.

Conclusion

Bulgaria, Romania and Ukraine already have, or are building up, networks of protected areas in the coastal and immediate inshore (benthic/neritic) zone; indeed over 60% of Romania's coastline is already protected. Georgia could probably identify additional areas – a preliminary review of the distribution of key coastal habitats and species was recently undertaken (Goriup *et al.* 2004) – while Russia and Turkey need to make a start.

However, no range state has yet attempted a systematic review of potential marine protected areas in their offshore (neritic and pelagic) marine zones. Establishing a robust, ecologically coherent network of MPAs in the Black Sea as a whole is achievable over the next decade or so, but will entail overcoming a range of financial, institutional, scientific and political issues. These include:

- adopting the methodology for establishing a network of MPAs with a unified list of habitats and species requiring conservation measures;
- achieving a common membership of relevant international legal instruments;
- completing negotiations on maritime boundaries of exclusive economic zones;
- producing joint guidelines on management of Black Sea MPAs (including transboundary areas);

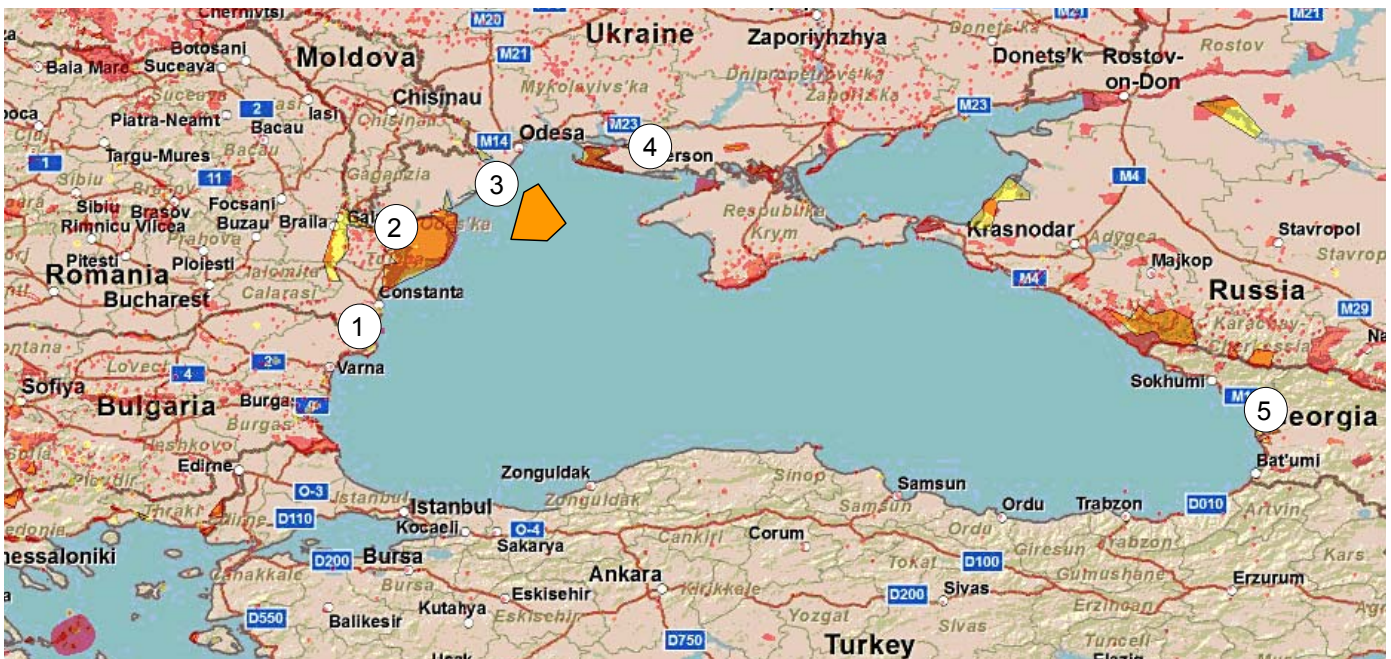


Figure 4: Main Protected Areas in the Black Sea (excluding proposed marine Natura 2000 sites proposed by Bulgaria and Romania)

1. 2 Mai – Vama Veche (Romania)
2. Danube Delta Biosphere Reserve (Romania)
3. Zernov's Large Phyllophora Field Botanical Reserve (Ukraine)
4. Chernomorskiy Biosphere Reserve (Ukraine)
5. Kholketi National Park (Georgia)

- ensuring relevant stakeholder engagement in all stages of MPA network development and management; and
- securing the necessary financial resources and/or self-generating income streams to guarantee the sustainability of the MPA network.

Black Sea countries can already make significant progress in designating MPAs while the above measures are put in place by:

- designating as legally protected areas all internationally important coastal/marine wetlands in the Ramsar List;
- protecting areas known to be important e.g. for fish spawning, nutrient recycling (mussel beds, algae fields), and migration routes of pelagic species;
- banning the use of damaging fishing techniques that result in unacceptable levels of by-catches or destroy seabed habitats;
- enforcing measures to prevent pollution from land-based sources or from shipping; and
- controlling recreational development in sensitive areas.

Finally, a Black Sea system of site monitoring and reporting has to be established to ensure that MPA designation and management is effective in delivering the expected conservation benefits. In this regard, EU Member States must report to the European Commission on the status of their Natura 2000 sites every six years, and Parties to the Bucharest Convention report to the Black Sea Commission annually. It would be helpful if the Permanent Secretariat was provided with the resources to appoint a biodiversity officer to coordinate the required activities.

This article is based on work carried out between 2008 and 2009 under the Environmental Collaboration for the Black Sea Project, funded by the European Union Tacis Programme. However, the views expressed here are the sole responsibility of the author. The work benefitted from inputs from a number of people, to whom the author is very grateful for their expertise and assistance: Boris Alexandrov, Director, Institute of Biology of Southern Seas, Odessa branch, Odessa, Ukraine; Tea Barbakadze, Protected Areas Agency, Ministry of Environment Protection and Natural Resources of Georgia, Tbilisi, Georgia; Viktor Karamushka, GEF-UNDP Black Sea Ecosystem Recovery Project, Kyiv, Ukraine; Vasiliy Kostyushin, Wetlands International Black Sea Program Coordinator, Kyiv, Ukraine; Richard Lisosvsky, Ukraine Scientific Centre for Ecology of Sea (UkrSCES), Odessa, Ukraine; Marina Mgeladze, Laboratory for hydro-ecology and fisheries, Black Sea Branch of the Centre for Monitoring and Forecasting, Batumi, Georgia; Yelena Panina, ECBS Sea National Team Leader, Kyiv, Ukraine; Anna Shatokhina, The Azov Sea and Black Sea Division, Ministry of Environmental Protection of Ukraine, Kyiv, Ukraine; Andrei Ursache, Water Management Department, Ministry of Environment, Chisinau, Moldova; Violeta Velikova, Permanent Secretariat of the Black Sea Commission, Istanbul, Turkey.

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County Wildlife Sites - The Gold That Links the Jewels!

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Summary

After years of close involvement with County Wildlife Site (CWS) systems in different parts of the country, it has become increasingly clear to the author that there remains much confusion within our professional sector with regard to non-statutory designated 'Local Sites'.

This article aims to clear up some of the mystery that surrounds these sites with particular emphasis given to County Wildlife Sites. Themes that will be covered include an explanation of terminology used for these sites, a discussion of the importance these sites, an examination of how sites are selected and administered, and a brief look at the reasons why such sites are threatened.



Photo 1: Illustration of large upland CWS qualifying as a site for its rich mire complex and extensive juniper scrub
Photo: Alastair Ross

Introduction

In early 2008 a new National Indicator (NI197)¹ for biodiversity was introduced by government. Through agreed targets (between central and local governments) the indicator aims to enhance local biodiversity by improving the conservation management of Local Sites. The introduction of the indicator has meant it has been an extremely busy time over the last 18 months for the administrators of many CWS systems, especially for those counties that have included NI197 within their Local Area Agreement (LAA).

The term Local Sites collectively refers to non-statutory designated wildlife sites (County Wildlife Sites, Local Wildlife Sites, etc.) and geological sites (Regionally Important Geological Sites (RIGS), County Geological Sites) that are all of at least county importance. The use of the term 'wildlife' is intended to encompass both species and habitats.

Latest figures from The Wildlife Trusts (2009)² indicate that in England there are at least 37,781 County Wildlife Sites across 90 administrative boundaries; together they cover an area over 500,000 hectares.

An unfortunate historic consequence of the way systems have evolved separately in the different counties, means that there is a multitude of names used to refer to these non-statutory sites. Common terms in usage include County Wildlife Sites (CWS), Local Wildlife Sites, Sites of Importance for Nature Conservation (SINC), Sites of Biological Importance (SBI), Biological Heritage Sites, Sites of Nature Conservation Value. The important thing to remember is that they all refer to the same type of non-statutory site.

Local Wildlife Sites is the preferred term by Defra as given in their 2006 guidance³ for developing Local Sites systems, and it was hoped by them that all counties would adopt this term for their systems. Most counties have declined to follow this suggestion, concerned a change of name would simply add to confusion within their administrative area especially for planning purposes. The use of the term 'Local' is also unpopular with many running Wildlife Site systems, the belief that 'Local' demeans the importance of these sites, which are of at least county importance. There is also potential confusion with the label Local Nature Reserves (LNR) - a statutory designation. The preferred term of the author is 'County Wildlife Site' and this is how the sites will be referred for the rest of this article.

CWS – What Are They and Why Are They So Important?

Whilst Sites of Special Scientific Interest (SSSIs) can perhaps be thought of as the 'jewels in the crown' of nature conservation, CWS can be likened to the gold that links the jewels. Like their statutory counterparts, CWS are places with a rich diversity of habitats that provide refuges for a great variety of species. These sites are recognised as being at least county, sometimes national importance for their nature conservation value; this is defined by the presence of important, distinctive and threatened habitats and species. They are found on both public and private land, varying in shape and size; they include a great variety of valuable semi-natural habitats such as ancient woodland, species-rich grasslands, wetlands, heathland, and hedgerows.

A very important point to keep in mind is that the purpose of statutory designations is to provide a representative rather than a comprehensive suite of sites across the nation. This means that there are many sites of SSSI quality that have not been selected as statutory sites, but will be selected as CWS. So in some counties (especially large rural ones with considerable areas of semi-natural habitat) a significant proportion of CWS may be of similar quality to their SSSI counterparts. CWS networks provide a comprehensive rather than representative suite of sites which means that they have a vital role to play in meeting overall national biodiversity targets. They complement other site networks by providing



Photo 2: Upland hay meadow CWS, now a rare habitat and still under tremendous threat from agricultural 'improvement'

Photo: Alastair Ross

essential wildlife refuges, stepping-stones, corridors and buffers linking and protecting other designated sites and open spaces both in towns and the countryside.

Big rural counties may have a large number of CWS, for example Cumbria has over 1,600 sites, approximately five times the number of SSSIs. Figure 1, using Cumbria as an example, illustrates how CWS and SSSIs can combine to form a strong wildlife network across a county.

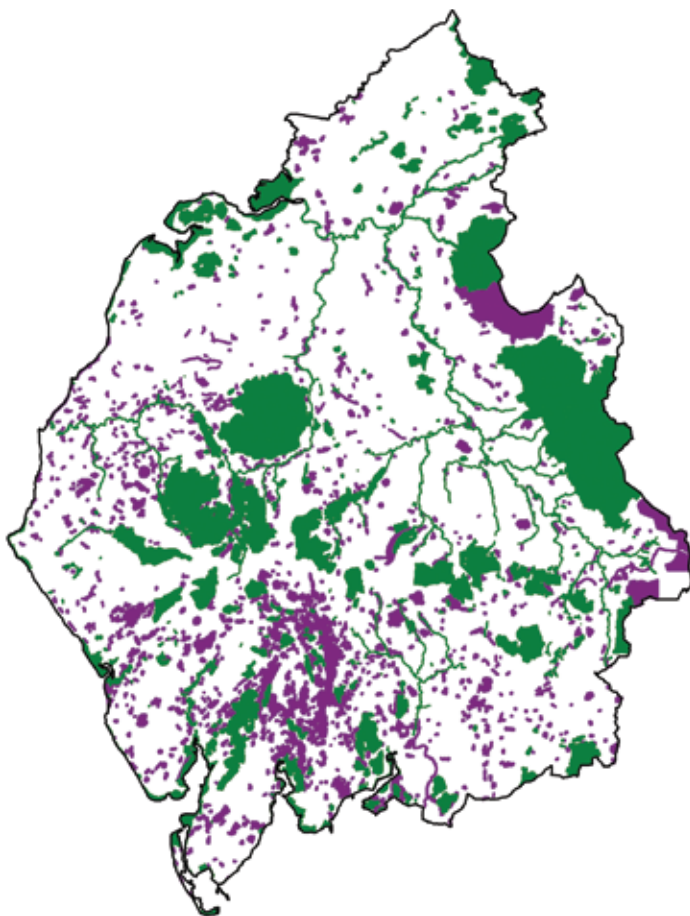


Figure 1: The combined network of CWS (represented by purple) and SSSI (in green) in Cumbria

Selection and Administration of CWS

Whilst it varies from county to county, many CWS systems are administered by a single organisation (often the Local Wildlife Trust, County Council, or Local Biological Records Centre) on behalf of a wider conservation partnership within the county. Such Local Sites Partnerships may also include district authorities, government agencies (Natural England, Forestry Commission, and the Environment Agency) and conservation charities like The National Trust.

For many parts of the country the initial identification of potential CWS began with the Nature Conservancy Council's (NCC) large-scale Phase 1 Habitat Survey carried out in the early 1980s. This information combined with data available from the National Inventories (especially the Ancient Woodland, and Grassland Inventories) and other NCC/English Nature surveys aided identification of candidate sites.

Most counties today have detailed written selection guidelines with strict criteria for selection of CWS. Guidelines are typically based on the SSSI selection guidelines but apply specifically to the individual county rather than the UK as a whole. The selection criteria take into account available information on habitats and species as well as relevant historical and structural aspects. Criteria define what qualifies as substantive nature conservation value in a county context; lower thresholds than those applying to SSSIs are generally adopted. The quality of a habitat is generally assessed according to its diversity and against set thresholds, which are based on the numbers of species that are particularly indicative of naturalness, a lack of agricultural improvement and or longevity of that habitat type. For most habitats a minimum area is also required. The presence of Red Data Book (RDB) species, nationally rare, nationally scarce, locally scarce or Biodiversity Action Plan (BAP) priority species are also taken into account.

Sites will typically be surveyed to National Vegetation Classification (NVC) level with particular focus on habitats and vascular plants found on site. Specialist local recorders/groups may assist the data collection for other species types (e.g. birds, invertebrates, bryophytes, etc.). Following site survey, the results are then assessed against the selection criteria by an expert panel of ecologists. For example in Cumbria this panel comprises of senior ecologists from all the main partner organisations including the Wildlife Trust, the County Council, Natural England, Environment Agency, the Lake District National Park Authority, and The National Trust.

All sites meeting the criteria thresholds will be selected as new CWS. Systems are designed to be flexible so that newly discovered sites can be added whilst those known to have deteriorated may be removed. Every attempt is made to keep landowners informed throughout the process, and management advice is offered where required. Reassurance is sometimes necessary for site owners with regard to fears over public access and potential restrictions on their day to day site management operations. Selection of an area of land as a CWS does not create new rights of access, and there is no requirement to change land management practices.

Threats to Sites

It is somewhat depressing that CWS continue to be lost/damaged at an alarming rate across the UK with causes including neglect, inappropriate land use, intensive agricultural practices, pollution, and development. Species rich grasslands and mires remain particularly vulnerable



Photo 3: Threats to CWS - A CWS that has recently been destroyed; the species rich mire has been drained and the site converted (without planning permission) to a Motocross circuit
Photo: Alastair Ross

to agricultural improvement (application of fertilisers on grasslands, drainage of mires).

Unlike SSSIs, CWS have no legal status and as such are afforded minimal protection. CWS are at least recognised by national planning policy (Planning Policy Statement 9) as having a fundamental role to play in meeting national biodiversity targets. Such measures have been strengthened by the provision of the Natural Environment and Rural Communities Act (NERC) 2006 which requires all public bodies to 'have regard for' the conservation of biodiversity.

Grossly inadequate funding of CWS systems further threatens the survival of sites. Many county systems are forced to operate on shoestring budgets with minimal funding from partners and a reliance on opportunistic funding from charity sources. As noted earlier in the article larger counties may have several thousand sites, yet be fortunate to have a single full-time member of staff to administer the system. Such insufficient resources inevitably mean sites are not monitored on the regular basis that they should be, and provision of advice to landowners is sometimes extremely limited; a far from ideal situation.

A source of hope for CWS is the priority targeting of BAP habitat areas within the new Environmental Stewardship (ES) agri-environmental schemes, especially the Higher Level Scheme (HLS). Ownership of a CWS with one or more BAP habitats may increase the chances of a successful application for landowners wishing to enter this agri-environmental scheme. Receipt of payments for implementation of agreed appropriate management regimes of these habitats, should assist the future survival of CWS and there is the possibility of enhancing sites currently degraded.

Conclusions

CWS form an important network of high quality semi-natural habitats (the majority of which will be BAP habitats) that complement our suite of statutory sites. Maintenance of this combined network is vital to provide safe refuge for a diverse range of flora and fauna, and assist migration of species across the countryside. The linkage between statutory and non-statutory sites becomes ever more important as increasing human pressures are placed on the environment.

This article has attempted to provide a concise overview of the main aspects of a 'typical' CWS system; although it must be remembered that significant differences can exist between individual counties.

Across the country, many different names are used for non-statutory wildlife sites important at a county level. Annex A of Defra's 2006 publication *Local Sites: Guidance on their Identification, Selection and Management*³ gives a useful summary of commonly used terms. They all refer to the same type of non-statutory site designation.

Perhaps the key take home message is that in some counties, CWS may be of similar quality to SSSIs. CWS systems are comprehensive with all sites meeting qualifying criteria thresholds being included, unlike statutory systems which are representative suites of sites. It is therefore extremely important that these vital sites be given proper consideration during the planning process, and information on CWS is obtained by those involved making recommendations on developments that may impact sites.

Disappointingly, at this moment in time information regarding CWS cannot be accessed via Natural England's websites 'MAGIC' and 'Nature on the Map'. For most counties, the best first port of call will be to contact the Local Biological Record Centre or the Local Wildlife Trust. It is hoped that over time this information will become increasingly accessible as counties move gradually towards more user-friendly internet-based information systems.

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- ² Wildlife Trusts (2009) *Status of Local Wildlife Site Systems 2008.*
- ³ Defra (2006) *Local Sites; Guidance on their Identification, Selection and Management.* Available online at <http://www.defra.gov.uk/rural/documents/protected/localsites.pdf>

Useful Websites

<http://www.defra.gov.uk/rural/protected/localsites.htm>
<http://www.defra.gov.uk/corporate/about/what/localgovindicators/ni197.htm>

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North Sea Marine Protected Area Project

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The North Sea is our least studied wilderness. Now 12 Wildlife Trusts are working on a plan to save its endangered ecosystems through a new project stretching from the Scottish border to the Thames estuary.

Due to the lack of information about the North Seas' undersea landscape and the increased demands upon it we fear for the health of its ecosystems. Through the introduction of the North Sea Marine Protected Area (MPA) Project, 12 Wildlife Trusts (Northumberland; Durham; Tees Valley; Yorkshire; Sheffield; Lincolnshire; Derbyshire; Nottinghamshire; Leicestershire and Rutland; Bedfordshire, Cambridgeshire, Northamptonshire and Peterborough (BCNP); Norfolk; and Suffolk) aim to address some of these issues, through discovering more about the environments and species, through raising awareness of marine issues and through new legislation to ensure a network of conservation zones are created by 2012, aiming to aid protection of these key UK ecosystems, benefiting both wildlife and those who use the sea.

Only 2% of the UK's seas have any level of protection awarded for wildlife, and less than 0.001% is considered as fully protected from all damaging activities. The tide is now turning. By 2012 the UK Government has committed to have established an ecologically coherent network of Marine Protected Areas (MPAs) in UK waters. The Marine and Coastal Access Bill (which will hopefully become an Act by the end of 2009) will bring in the laws necessary to create a network of MPAs in English and Welsh inshore waters (out to 12 nautical miles from the coast) and in offshore waters (beyond 12 miles) around the UK. The Scottish Marine Bill, published recently, will bring in comparable powers in Scottish waters, and a Northern Ireland Bill is expected in 2012. This is a very significant and exciting time for the management of the UK's seas. The Wildlife Trusts aim to ensure that the new laws result in an effective and well-managed network of MPAs throughout the UK marine area, so that our seas and sea life receive the protection they have so long been awaiting.

In England, the MPA network will consist of four types of site designation: Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Interest and Marine Conservation Zones (MCZs). MCZs are an exciting new designation, which will be introduced through the Marine and Coastal Access Bill. The MPA network will be established for the conservation and recovery of our marine biodiversity, aiming to protect species and habitats of both national and international importance.

To instigate the establishment of the English MPA network, Natural England and the Joint Nature Conservation Committee have created four regional MCZ projects. These are 'Balanced Seas' (for the Eastern Channel), 'Finding Sanctuary' (for South West England), 'Irish Sea MCZ Project' and 'Net Gain' (for the North Sea). The Wildlife Trusts aim to work alongside and within these regional projects to ensure that they deliver the best possible MPA network for each region – and, in so doing, to help achieve our vision of 'Living Seas'.

'Living Seas' is The Wildlife Trusts' vision for the future of the UK's seas and sea life. Within 'Living Seas', wildlife thrives, from the depths of the ocean to the coastal shallows. In 'Living Seas':

- wildlife and habitats are recovering from past decline as our use of the seas' resources becomes environmentally sustainable;
- the natural environment is adapting well to a changing climate, and ocean processes are helping to slow down climate change; and

- people are inspired by marine wildlife and value the sea for the many ways in which it supports our quality of life.

The North Sea was once teeming with life. Species such as bluefin tuna and common skate – now rarities - were once common occurrences. Over the years, the North Sea has been subjected to increasingly unsustainable pressures and as a result has suffered. Research now suggests that almost 99% of the fish biomass that was once found within the North Sea has been lost. So what does the future hold, as our need for resources continues to increase? The previously mentioned twelve Wildlife Trusts have committed to working together to influence the development of MPAs in the North Sea so as to achieve the greatest possible benefit for the marine nature conservation. As voluntary organisations, independent of governments, we can help drive the MPA process forward, voicing our concerns openly and honestly and responding rapidly to changing situations. On a local, regional and national scale, we can use our resources to make the vision of Living Seas a reality. However, we cannot do this alone.

So 'Make Waves' and help us cause a stir for marine life. All it takes is one action - 'do one thing' and make a difference:

1. Get out and discover your local marine life.
2. Help actively campaign for marine conservation.
3. Get involved with your local Wildlife Trust.

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For more information about how to explore your local hidden undersea landscape, visit www.naturalengland.org.uk/campaigns/marine



Getting a Design Right for Lesser Horseshoe Bats

Experience from the A487 Porthmadog, Minffordd and Tremadog Bypass

Richard Green CEnv MIEEM* and Len Wyatt CEnv MIEEM**

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Location, Location, Location... And Context

Building a new 5.3 km single carriageway bypass within 100 m of a large lesser horseshoe bat *Rhinolophus hipposideros* maternity roost may not seem like a good idea, especially when the roost is associated with, but not part of, a Special Area of Conservation (SAC).



Figure 1: Location map

We explain the background of what informed that decision, and what we feel were the important points about the approach and process undertaken.

Situated in north-west Wales (see location map), Porthmadog and the surrounding villages of Tremadog, Minffordd and Penrhynudraeth sit amongst the stunning landscapes of Snowdonia National Park. The area is famous for three railways, Portmeirion and the Cob - an artificial embankment built to reclaim the estuarine marshland alongside the Afon (River) Glaslyn.

On the route of the A487 Trunk Road between Caernarfon and Gellilydan, Porthmadog and the other villages suffer congestion problems, especially during the holiday periods, which over time are likely to increase, without the provision of the bypass.

The project's main objectives are to:

- reduce journey times for both local and A487 Trunk Road through traffic;
- ease traffic congestion in Tremadog, Porthmadog and Minffordd;
- deliver a sustainable, cost effective project;
- conserve and where practicable enhance biodiversity in the project area, which is ecologically diverse with a number of designated sites;
- assimilate the new road into a landscape covered by various designations, close to and overlooked from Snowdonia National Park.

The project was taken through the Highways Act 1980 process, which involves a different system to that of the Town and Country Planning Act 1990.

Work on the project started in the early 1980's, and by 2003 a large amount of information had been gathered on the various statutory and non-statutory ecological interests within the study area (see environmental designations map). Add to this the proximity of the railways, a working quarry, the various settlements and sensitive landscapes - and the complexity starts to emerge.

During the summer of 2003, bat activity surveys discovered a lesser horseshoe bat maternity roost within a derelict (Grade II listed) hospital building at the eastern end of the project (see aerial photograph). This area is the main focus of this paper, although lesser horseshoe bats were found in smaller numbers throughout the study area.

The roost was not a designated nature conservation site. However, the view was taken by the project team that these

bats were part of the lesser horseshoe bat qualifying feature/interest of the nearby Meirionnydd Oakwoods and Bat Sites Special Area of Conservation (SAC), because of the potential for the bats to use the SAC for foraging or roosting. This meant that the project would have to pass an 'appropriate assessment' process, in addition to an environmental impact assessment process.

Lesser horseshoe bats are potentially vulnerable to impacts from new roads as they can be reluctant to cross open spaces but also can remain faithful to traditional routes for some time after construction, flying low (often less than 1.5 m) over the carriageway. This puts them at greater risk than most other bats of suffering severance of their habitats or being killed on the road, particularly on certain roads in the autumn when emergence time coincides with rush-hour traffic.

In 2003 the proposed road ran approximately 150 m to the north-east of the roost and was predominately in cutting at the eastern end of the route.

Finding Out

Following the discovery of the roost a more detailed assessment was



Figure 2: Aerial photograph

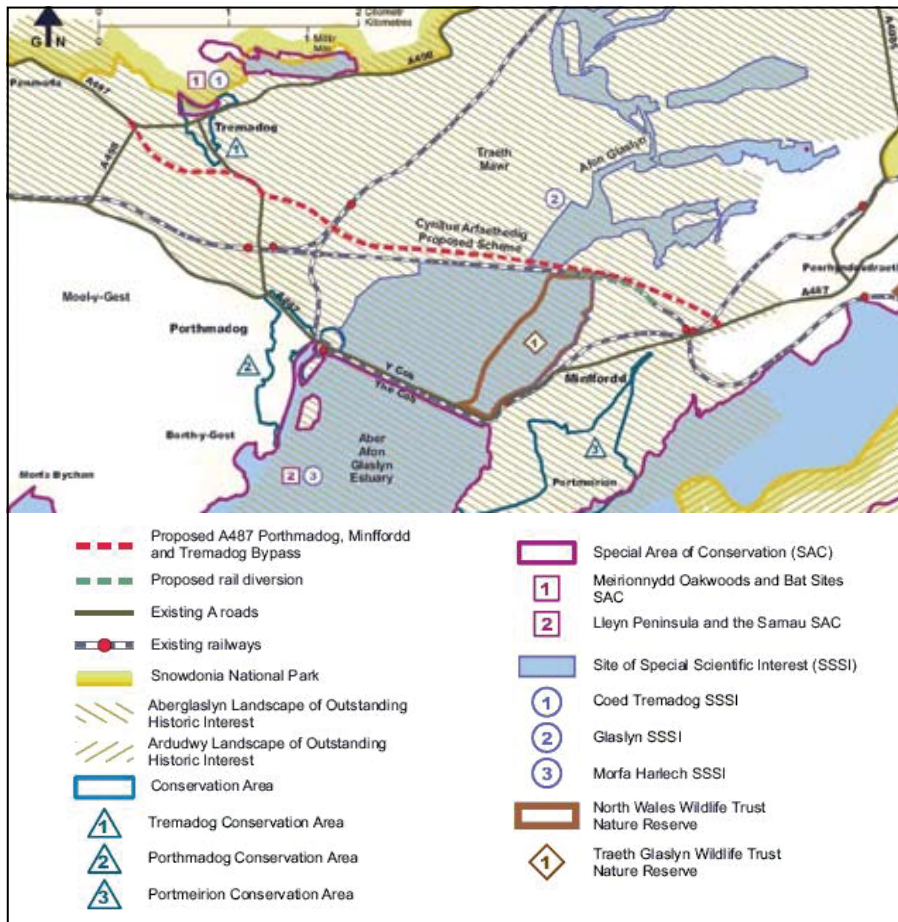


Figure 3: Environmental designations map

required. A thorough baseline was established by further desktop study and making a landscape assessment for all bat species using the following:

- aerial photographs;
- lit area plans to determine those areas lit at night by street lights;
- existing species and site records up to 5 km from the proposed road (including a large amount of data on known lesser horseshoe bat maternity roosts in North Wales held by Countryside Council for Wales (CCW));
- local knowledge by consultation with statutory agencies, local ecological consultants and landowners/householders;
- walkover survey;
- literature review, including *A Review of work carried out on trunk road networks in Wales for bats* by Catherine Bickmore Associates (2003) and the reports which fed into the recent Highways Agency Interim Advice Note 116/08 *Nature Conservation Advice in Relation to Bats* that Richard was developing for the Highways Agency at the time.

Field surveys followed in the 'summer' of 2004. At the time, there was no

published guidance on survey effort required for such cases, other than an example within Natural England's *Bat Mitigation Guidelines* (Mitchell-Jones 2004) for developments over 1 ha within 4 km of a greater horseshoe bat *Rhinolophus ferrumequinum* roost, plus experience from other similar schemes in Wales. Scoping consultation with CCW led to an agreement to undertake surveys of foraging and commuting areas, potential

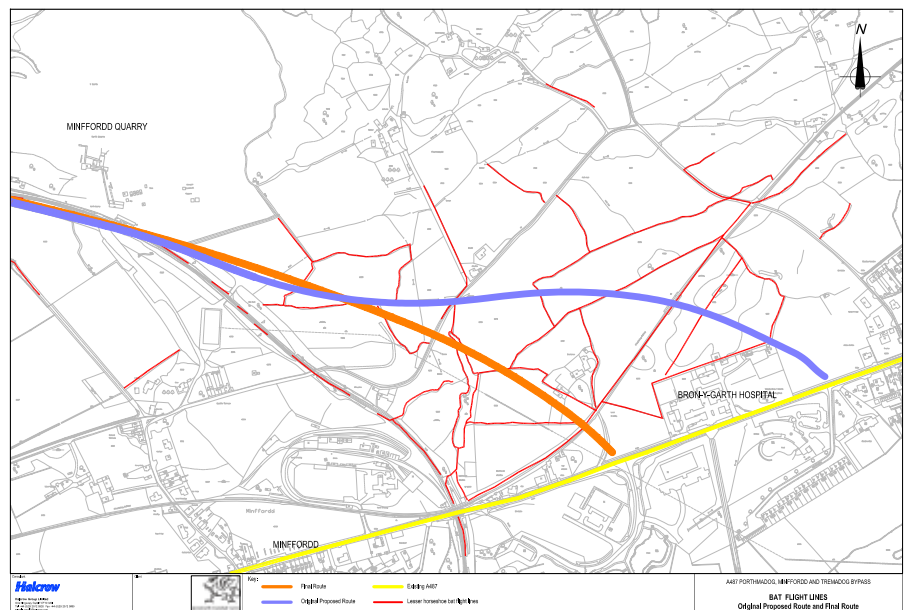


Figure 4: Bat flight lines

roost sites and emergence surveys at the hospital roost.

During the survey in 2004, the importance of the hospital roost and the associated dispersal routes became evident with around 300 adult bats recorded. Every hedgerow or line of trees connected to the roost in the direction of the proposed road was used. One route, alongside the Ffestiniog Railway to the north-east had over 100 bat movements regularly recorded at emergence in the summer months.

No lesser horseshoe bats were recorded crossing over the existing A487 to the south, which is lit at night. However, bats were recorded using an underpass that carries the Cambrian Coast Railway under the road, approximately 400 m to the west of the roost.

Concern was raised to the design team over the significant impacts that the proposed road could have on the bats. The alignment would sever important flight routes to large areas used for foraging and have implications in terms of the cost of mitigation (e.g. several overbridges or tunnels) needed to achieve compliance with the Habitats Regulations.

Because of the implications, alternative road alignments were investigated, with the aim of lessening effects on the bats, whilst maintaining the viability of the project.

Further survey work carried out in 2005, including a radio-tracking study of bats from the roost in May and August of 2005, informed the development of a new alignment that would reduce severance of the roost from foraging areas (see bat flight lines figure) but still meet all the other project objectives.

Between April and September 2006,

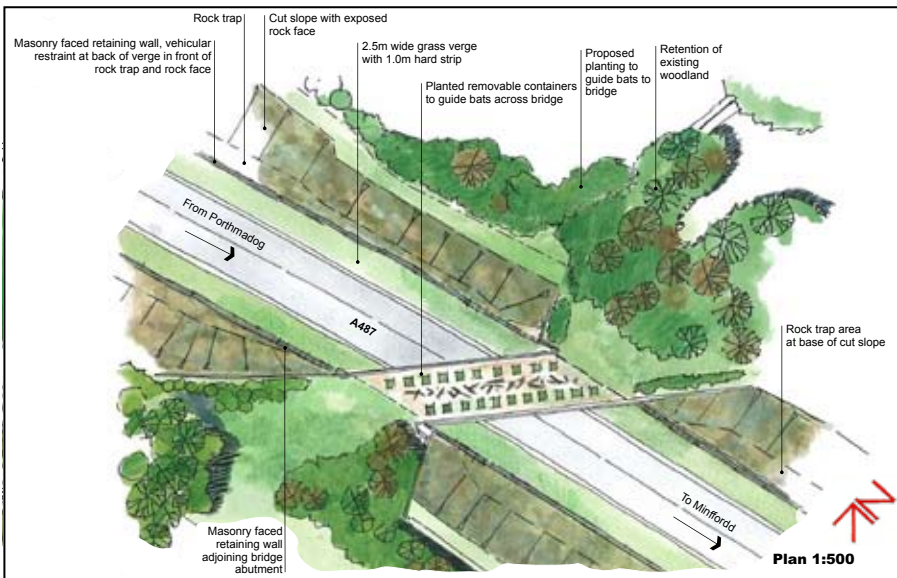


Figure 5: Indicative design of the bridge

further bat flight line surveys confirmed earlier work, but also identified a short section of stock fencing and a gappy hedge between two groups of mature trees, where over 100 bat movements occurred regularly at emergence time.

After public consultation in 2006, the revised route which was supported by the majority of the respondents, still in cutting at the eastern end, now ran 75 m to the west of the roost.

The Devil's in the Detail

As is often the case, there were conflicts between different environmental and other receptors when designing the project and its mitigation. For example, providing views for the driver of the surrounding landscape meant limiting planting of trees and shrubs at key view areas.

Proposed mitigation for the bats includes:

- avoidance of important existing vegetation where possible;
- a vegetated bridge over cutting on the line of the most-used flight line;
- culverts of 2.5 metre minimum diameter under the road embankment on all other flight lines where lesser horseshoe bats had been recorded, except for one (see below);
- planting to provide replacement bat foraging habitat and reinforce flight lines; and
- temporary guide fencing during construction.

On one of the less used flight routes at the other end of the project it was only physically possible to achieve a culvert height of 1.2 metres. Whilst lesser

horseshoe bats have been recorded flying through culverts with a smaller diameter and greater length of the culvert than proposed at this location, it was still considered a risk that bats might fly over the road instead of through the culvert. Lighting designed for the approach to a roundabout was, therefore, extended for approximately 50 metres in order to light the road above the culvert to discourage bats from flying over the road. Lighting design incorporates high-pressure sodium, full cut-off lanterns with light shields, to avoid light spill outside of the road on to adjacent bat flight lines and foraging areas. Additional planting will also be provided to direct bats to the next nearest crossing, which is a watercourse underpass of 3.4 m height and 13.25 m width, approximately 250 m to the east.

The vegetated bridge deck will be:

- 7 m wide and have 1.8 m high solid parapets; and
- 40 m long on a skewed alignment in order to retain the alignment of the existing flight line.

It will be covered by large planting boxes, movable by fork lift truck to enable bridge inspections; and upturned tree stumps (from trees removed as part of the project), with root mass, soil and brash to provide habitat for other species and allow them to cross over the road.

Fencing and planting will connect to retained trees and shrubs to funnel bats onto the bridge, as well as into the culverts. A double-row of temporary screen-fencing will be used during construction to maintain the flight line over the bridge.

Bat foraging habitat lost will be recreated alongside the road in areas in proximity to the roost; and where flight corridors occur. Because of the effects of road

noise and lighting, additional land, over and above that required for landscaping, will be provided, including an existing field of improved grassland over an old landfill site that will be landscaped and planted to provide nutrient-poor grassland, scrub, trees and rocky outcrops within close proximity to the hospital roost. This area will also benefit other ecological interests.

In March 2008, just prior to publication of the Environmental Statement (ES) and Statement to Inform Appropriate Assessment (SIAA), CCW announced areas within the study area as a possible Special Area of Conservation (pSAC). This included some additional lesser horseshoe bat roosts and feeding areas. The assessment for bats, however, did not change.

The need to compulsory purchase additional land for bat mitigation will have an effect on the existing landowners but in order to be certain of no adverse effect on the lesser horseshoe bat qualifying feature it was deemed necessary to do this. It is hoped that existing landowners and tenants will still be able to use the areas and sympathetically manage the land. The land chosen had to be fully justified over, for example, another piece of land that may equally do the job. Much thought was put into why each plot of land was to be chosen, including:

- Would the plot, if managed, potentially increase the ecological value for bats?
- Was it in close proximity to the roost?
- Was it on the preferred side of road (to avoid bats having to unnecessarily cross the road)?
- Was it to be used to provide other types of mitigation, and could bats still use it if it was?
- Would it potentially contribute to corridors along the road linking with safe bat crossing points?

Relationships Matter

As is common with such projects, an Environmental Liaison Group (ELG) was set up, with statutory advisors including Countryside Council for Wales, Environment Agency Wales, Cadw, Gwynedd Council and Snowdonia National Park Authority; and the future maintaining agents, North Wales Trunk Road Agency.

Within the project team, in addition to the formal roles that people took due to their professional status or knowledge base, there were also the following informal roles, all of which were necessary to develop this large and complex project:

- Critic/challenger role – “Why are you

doing this, do you realise what that means?"

- Specialist – "Evidence says this, my professional opinion is..."
- Compliance checker – "That is/is not compliant, the legislation/policy says..."
- Coordinator – "If x wants this and y wants this – what is the way forward/is this the way forward?"
- Consistency auditor – "This agrees/contradicts what was agreed in..."
- Bigger picture viewer – "This would look like this when fitted together with a and b."
- Overseer/decider – taking forward the iterative nature of project work, but having to say "we have to make a decision – it will be..."

At points it seemed that regardless of the person's role – he or she had to understand exactly what was likely to happen from another's viewpoint, as well as their own. Not to do so could have meant that the implications of one activity on another would be missed, and the result could have been a project that did not deliver what was intended – or would deliver it in a disjointed/unsustainable way.

Testing, Testing

Consultation was held regularly through the ELG meetings and site visits. In addition, we formally consulted non-statutory environmental groups, landowners and the public via public exhibitions, letters and the Welsh Assembly Government's website, when the final documents were published.

Following consultation on the project, the RSPB objected, as did several landowners whose land would be taken. The RSPB's objection was based primarily on their view that insufficient ecological mitigation, compensation and enhancement had been provided. We subsequently met with RSPB and explained our assessment and justification for the mitigation that was to be provided, as well as the lack of any current legal power to take land for ecological compensation or enhancements alone. The RSPB subsequently withdrew their objection. Whilst several landowners maintained their objection at public local inquiry, the decision was taken by the Welsh Ministers to include the purchase of land to mitigate the loss of bat foraging habitat.

Following publication of the project documents we were approached by Emma Stone, Bristol University, who is undertaking research on the effect of lighting on lesser horseshoe bats and

was seeking suitable sites to conduct her research. It was agreed that it would be a good study site and she was assisted by the fact that we could tell her, in advance of her field research, how many bats should fly along each hedgerow. Her results were very similar to the results we had already gathered in terms of numbers of bats flying along each flight line, further increasing our confidence in our results.

Post Project Appraisal

The road has passed through its statutory processes, but is yet to be built – the contract for construction should have been awarded by time of publication of this article. Within the contract are requirements for monitoring during construction and for at least the first five years of operation.

Monitoring for bats will consist of:

- monthly counts of bats using flight lines severed by the road, as well as looking at whether they cross the road using the structures provided or over the carriageway;
- emergence counts at the hospital roost between April and October (to be used alongside CCW surveys of other roosts within the wider area in order to identify relevant population trends);
- use of the replacement foraging areas by the bats; and
- corpse surveys along the road at dawn, on a monthly basis between July and September once the road is open.

The success of the mitigation will be defined by the ability not to adversely affect the SAC and recent candidate SAC (cSAC); and the completion of the commitments in the ES.

To assist, up-to-date baseline information was gathered between April and October 2009, in order to assess any changes in number of bats commuting along flight lines and roosting at the hospital.

Lessons Learnt

With the benefit of hindsight, a number of general conclusions can be drawn as follows:

What worked?

- Openness of the discussion within the team and with statutory consultees.
- Willingness of design team members to listen and understand other perspectives.
- Information gathered provided a firm

evidence base for the design details, which was defensible at Public Inquiry.

- Constantly reviewing the results of surveys to inform the next steps in project development.

What could be done better the next time?

- Could there have been ways, not used, to have avoided the RSPB and landowners' objection?
- Could there have been a more cost effective way of carrying out the surveys and assessment process?

Finally, the proof of all the work will of course be in the application of the project, the monitoring results and effects of the new road in operation.

Acknowledgements

- Design team members from Welsh Assembly Government, Halcrow Group Ltd. and White Young Green
- Environmental Liaison Group members
- Emma Stone - Bristol University
- Pete Evans, Jean Matthews and Euros Jones - CCW
- All those individual bat workers who took part in the surveys and provided information

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Helping to Keep the Heart of Europe Beating

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Just imagine: you are a botanist, a biodiversity officer or the director of an important protected area. You want to make sure that you can face up to the multitude of threats facing your national park or your nature reserve. So, with determination and commitment you travel for over 28 hours by coach at summer temperatures of over 30°C along roads of differing quality for well over 1,000 km, including a three-hour wait at the border and another three hours spent in a massive traffic jam – in order to take part in a study programme.

That is precisely what a group of Ukrainian protected area practitioners from Uzhansky National Nature Park, the Carpathian National Nature Park and the Gorgany Nature Reserve endured when they took it upon themselves to complete a programme in which these three areas are reaching out to their European partners, working towards the protection and sustainable use of natural resources in the Ukrainian Carpathians.

The wild Carpathians: for many the last bastion of largely unspoiled biodiversity in Europe's geographical heart. At the pivotal point of these mountains, which span right across seven countries of Eastern Europe, lie several important Ukrainian protected areas where colleagues are working incredibly hard to save a rich heritage in the face of intense development pressures.

This Ukrainian part of the Carpathians is an extraordinary repository of globally important flora, fauna and landscape; a bastion for everything from large carnivores to bats, with a dizzying variety of scenery encompassing old mixed-growth forests and sub-alpine meadows, from the beautiful karst peaks down past the May-flowering *Narcissus* to hidden

milkstone caves. Travelling through this almost forgotten part of Europe with its large contiguous areas of virgin beech woods, interspersed on the lower mountain slopes with wild cherry in blossom, one cannot help but feel passionate about this part of the Carpathians. Higher up, the conifer wilderness with its many different pine and fir species boasts the tallest specimens of silver fir *Abies alba*, some over 50 m high. No felling has ever taken place here. If we are serious about trying to find truly sustainable ways of forestry we can learn a lot from these virgin forests and how they manage themselves in this spectacular way.

Traditionally, the lack of infrastructure and utilities, difficult trans-border crossings and little tourism development have protected much of this natural beauty. However, rapidly changing lifestyles and an emerging economy mean that economic development will increasingly impact on these areas.

Since 2007, several important projects, funded largely by the WWF Danube Carpathian Programme, have been supporting protected area practitioners in the Danube Carpathian Eco region through multi-pronged efforts to protect the sustainable use of natural resources. One of the partners in this work has been the Europarc Federation, Europe's umbrella organisation for all protected areas. Its consultancy arm, Europarc Consulting, was given the task of implementing the various programmes with the help of its Europe-wide network of experts.

Our main task was to concentrate on building a strategic communications approach for all three areas, which will deliver practical, authentic and highly effective two-way communications.

We began in late April 2009 with a journey starting and ending in the beautiful city of Lviv, looping through Trans Carpathia's bright and fresh springtime landscape and returning via the



Gorgany Nature Reserve, Ukraine

Photo: Vasil Kyslyak



Europarc Consulting team on scoping visit in Gorgany Nature Reserve, Ukraine
Photo: Nicky Rowbottom

incredible rocky boulder fields of Gorgany and the mountain town of Yaremche. Here we met and talked with many members of staff in the Uzhansky and Carpathian National Nature Parks, and the remote Gorgany Nature Reserve.

Despite facing many challenges, including lack of infrastructure and resources, the officers we met were enthusiastic about communicating the high value of their landscapes – and eager to be a part of the international family of protected areas. Uzhansky National Nature Park Director Vasil Kopach summed up their ambitions: “We want to look with a fresh eye, and learn from both the good practice and the mistakes made elsewhere. We know we have a wonderful resource here, but local people often don’t feel benefits from the park at the moment.”

The traditional approach to conservation through imposed regulation is being reappraised, rapidly needing to move towards integrated and negotiated sustainable partnerships for regional small scale development. Ukrainian protected area managers are facing up to these rapid cultural changes and the threats and opportunities they present through a process of in depth analyses and forward-looking action plans. They want to avoid the many mistakes other protected areas have made in the past.

One of the greatest challenges is to find the right balance: on the one hand, the conservation of these precious landscapes with its unique flora and fauna, and on the other the much hoped for economic development in or around the protected areas.

Just one example: Bukovel, right on the border of Carpathian National Nature Park, is already a large and popular ski resort. It is undergoing major development and will soon have 278 km of runs and 35 lifts, making it one of the 20 largest ski resorts in the world. The main approach road to Bukovel goes right through the national park. There will be tremendous pressure to widen the road significantly, which would undoubtedly harm the protected area.

Other pressures are more subtle, fully understandable, yet equally threatening. In parts of the three protected areas you find few, if any, motorised vehicles or farm machinery. The small fields worked by horse-drawn machinery or the picturesque carts, laden with smiling families of farmers on their way home, may well look photogenic, however, that will not bring the longed for prosperity or fulfil the ambitions of local people.

There is also some resentment by local people and potential visitors that one of the most spectacular areas, the Gorgany Nature Reserve, is more or less closed to any visitor, local or not. “Why should we”, so they argue, “support with our money the conservation of this landscape when we are not even allowed to see it.”

All these points and pressures need to be dealt with by better communication and interpretation, by a deeper understanding of the problems involved and by intensified outreach to all concerned, here in the heart of Europe. But where to start?

Broadly speaking – very broadly, and this does not do justice to the detailed analyses both by Europarc Consulting and the local protected area staff – we chose a dual-track approach to the problem. The first part of this approach consisted of developing an easy-to-use printed guide, almost a toolkit, which offers practical ideas and a process to help everyone, from community leaders to businesses, from foresters to teachers.

The second part included seminars and workshops with protected area officers and local stakeholders, culminating in a week’s study tour to two national parks, the Bavarian Forest National Park in Germany and Šumava National Park in Slovakia. Here we could see examples of best practice and engage in dialogue with national park officers and foresters.

To get there, 20 protected area officers made the long coach journey in the heat of summer westward to Bavaria. The Bavarian Forest National Park must be Europe’s prime example of the ‘let nature be nature’ principle. Between 1995 and 1997, a vast area of conifers, all uniformly old and weakened by acid rain, was attacked by the dreaded bark beetle devastating hundreds of hectares in no time. Yet the Park Authority stuck to its principle of no human intervention, much to the dismay of local people who feared that no tourist would ever visit the area again. Now, just over 10 years later, the forest is very much rejuvenated, with a much richer flora and fauna in the formerly devastated areas.

Not that it looks pretty in some parts even now. In many sections of the forest there are still dead trees everywhere. More were added by some ferocious storms a few years ago. The windblown trees are not being cleared away, much to the dismay of traditional foresters. However, the return of the capercaillie and other rare species in these areas seems to be compensation enough for the Park Authority, and for the many visitors who find the spectacle of natural forest rejuvenation totally fascinating.

The Bavarian Forest National Park also boasts what must be one of the most spectacular visitor centres in Europe. With a minimum of words and generous helpings of visual media - from photographs and video presentations to a state-of-the-art 3D cinema - the Park not only tells a credible story of how the forest copes without human intervention; it also presents nature conservation in the best possible light. The building itself is a triumph of modern and ecologically sound design. No wonder our Ukrainian visitors were impressed, even if it will be a long time before they can even contemplate visitor facilities on that scale.



Bark beetle attack in Bavarian Forest, Germany
Photo: Olexandr Kysselev



Development work in Bukovel, Ukraine
Photo: Wilf Fenten

However, the purpose of the study tour was not to make them envious but to gather experiences and, with the help of Europarc Consulting experts, find ways of adapting them to their own protected areas.

The brilliantly designed guide, our toolkit, would help them do it in practice. Building up stage by stage, it sets out a clear path to successful, well-planned communication which makes best use of available resources, and could be used to develop successful funding bids. The techniques are illustrated with examples devised by staff members of the three protected areas using these planning techniques.

The examples show that communication is not a separate subject. It is part of everything we do. The process is not static. As you work, you will find new ideas and make new connections. The guide also asks them to run these exercises with colleagues or stakeholder groups, and build up sets of actions. Other procedures and methods are suggested.

The whole toolkit is based on practical examples from the three protected areas, as suggested in the workshops and seminars we held. There is, for example, a rare species of bee which is now present only in the Carpathians. Another area of concern was the lack of 'eco-education' or 'eco-conscience' among many local people in the protected areas. The perceived lack of interesting information for visitors also needed to be explored using the new communications guide.

One protected area would like to set up 'ethnography gatherings' - discussion groups and classes run by expert craftspeople, and exhibitions of traditional folk craft. Their audiences: local school children, older generations of craftsmen and craftswomen, art school teachers and students from art colleges/universities. There are moves to use outreach and communication to help increase the numbers of the critically rare Capercaillie *Tetrao urogallus*, one of the important Red Book species in the area. Ornithologists, bird watchers, hunters, volunteers as well as environmental and other foundations are all on the communications list.

Even school tours for a young audience will take on a new twist - a game component. The whole tour with all its information will be presented in a play-related form, with fairy-tales, legends, proverbs and beliefs. This will make it especially interesting for local children, making it easier for them to remember even serious information.

Through better outreach and communications it may also be possible to solve, with the help of the law, conflicts of private and state interests. Such conflicts arise sometimes over the use of privately owned pieces of land of high nature conservation

value. The audiences identified include local communities, local authorities, NGOs and international organisations. They need to have information about the legislation available to solve problems of this nature.

Europarc Consulting experts also looked at possible improvements to the infrastructure of some eco-tourist routes. There are some very attractive and popular routes which offer new possibilities to improve the eco-culture and win over people so that they may want to help protect nature.

Another problem was described by our experts delicately as 'helping to implement the idea of eco-sanitation' in protected areas. In many parts of Europe, the unsatisfactory disposal of waste is of great concern: solid domestic waste on land and untreated or insufficiently treated sewage in the rivers. It is by no means restricted to the Carpathians but here, at least, it has been identified as something which needs urgent attention. A well thought out communications framework will be helpful even in this difficult area. So we will try to identify people interested in this problem. They could become communicators or champions of the project and help create an information database on useful eco technologies. Common activities with local residents could be organised and practical measures implemented within communities - for example, a demonstration model of gravel and sand filter to use for 'grey' waters.

These are only a few examples of how a good communications and interpretation framework can help with conservation, and not only in the Carpathians. Given the enthusiasm of the protected area staff, freshly invigorated by a well planned training programme, this dual-track approach will lend additional support to the sustainable use of this magnificent part of Europe.

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Carpathian stork

Photo: Vasil Kyslyak

Could Conservation Credits Threaten 'Ecourbanism'?

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Introduction

A Conservation Credit system, sometimes alternatively referred to as habitat, conservation or mitigation banking is a system that 'sells tangible units of habitat (or facilitates land purchase and creation of habitat), termed credits, to a developer to use as compensation for equivalent units that a development would adversely impact upon, termed debits' (Gillespie and Hill, 2007). Such a system would appear at first glance to have many potential benefits in terms of efficiency, reliability, and control of ecological mitigation and restoration. However, there are also potential drawbacks with such systems and professional opinion in the UK is currently divided on the matter, e.g. see Gillespie and Hill (2007) and Latimer and Hill (2007) - generally in favour; and Morris et al. (2006) and Morris and Huggett (2007) - generally against (see Carroll et al. 2009 for a more global appraisal).

Certainly no mitigation or Conservation Credit system must ever become the basis for destruction of habitats that cannot be readily recreated or restored within a reasonable timescale, such as for example, raised peat bogs, ancient woodland or traditional hay meadows. On the other hand there are clear cases where **offsite** compensation, perhaps implemented through a Conservation Credit system, might be the best way to achieve no net loss of ecological features in compensation for development impacts remaining after prescribed mitigation (residual impacts). An example might be enhancement of offsite farmland in compensation for loss of habitat of farmland-associated species, such as skylark and tree sparrow, caused by a new greenfield development, because on-site mitigation for these species was not possible or practical in the changed post-development context. Some have argued that such compensation could entail supporting conservation actions in

the wider countryside far from the site of the development in question, to meet broad national Biodiversity Action Plan (BAP) targets. All of these are important considerations.

In this article we concentrate on one potential adverse consequence of Conservation Credits, which in our opinion has not been adequately explored; that is, a possible reversal (in practice) of the hard-won shift in planning policy that currently promotes strict adherence to the **mitigation hierarchy** and **on-site enhancement** of biodiversity as an integral component of sustainable development. In particular, we are concerned about the application of Conservation Credits where this application could significantly adversely affect the goods and services to society provided by biodiversity close to where people are actually living day to day. This applies most particularly to urban development and hence urban development (encompassing sub-urban development) will be a focus for the remainder of this paper (though many of the arguments could apply to other forms of development).

Adherence to the **mitigation hierarchy** requires that development that adversely impacts on biodiversity should not be permitted prior to undertaking all appropriate avoidance, mitigation and compensation measures (see Royal Town Planning Institute 1999). This is now also a **key principle** in planning policy (see *Planning Policy Statement 9: Biodiversity and Geological Conservation* (PPS9) S.1vi).

Examples of **on-site biodiversity enhancement** in the context of urban development include: provision of various wildlife habitats in public open space; biodiverse ground-level landscape; vegetated roofs and facades; refuges for a wide variety of fauna including rarer species; and ecologically-informed sustainable drainage systems (SuDS). This approach to development relating to the environment on or close to human dwellings is one cornerstone of what has been referred to as **'ecourbanism'**. This term was first coined by Ruano (1999) to describe 'the development of multi-dimensional sustainable communities within harmonious and balanced built environments', and is increasingly a societal imperative linked to wider sustainable urban design, e.g.

including microclimate control, air quality amelioration and adaptation to climate change. Such an approach accords with another fundamental objective of PPS9, this perhaps being most clearly set out in S.14:

'Development proposals provide many opportunities for building-in beneficial biodiversity or geological features as part of good design. When considering proposals, local planning authorities should maximise such opportunities in and around developments, using planning obligations where appropriate.'

The basis for such policy is becoming widely accepted, *i.e.* that the incorporation of rich assemblages of appropriate native biodiversity in and around human settlements will bring multiple benefits (in addition to benefitting wildlife) such as: fostering environmental stewardship; improving societal physical and psychological wellbeing; increasing productivity in the workplace and in education (and reducing absenteeism); ameliorating climatic extremes; SuDS; and landscape/aesthetic services – all collectively described as **ecosystem services** (Fuller et al. 2007, Defra, 2007a; Defra 2007b, Corvalán et al. 2005, Cabe Space undated).

We argue here that whilst Conservation Credits may have a role, as compensation for residual impacts of urban development, they should be used only after full implementation and enforcement of the mitigation hierarchy; and then be implemented generally as close as possible to the habitat and human population that is being affected by the development in question (be it in an existing built-up or relatively rural area). Only when realistic options for successful implementation of local compensation cannot be secured should funds from urban development be considered for allocation towards other biodiversity priorities, further afield.

The authors wish to add that they neither wish to drive a wedge between urban and rural habitat conservation, nor in any way downplay the importance of realising the goals of the UK BAPs. Rather, the position we are taking is to re-emphasise the value of urban biodiversity and the importance of local biodiversity resources to people which we would be loathe to see unwittingly

compromised by a system of Conservation Credits. We also believe that agricultural policies and practices have been the principal causes of biodiversity loss in the UK (UK Biodiversity Partnership 2003), and it is reform of these that is most urgently needed to reverse habitat degradation in the wider countryside. Funds from Conservation Credits secured from urban development may also contribute in some cases, but should not be seen as the key source of future funding for this needed reversal.

Local Biodiversity Protection/Enhancement – An 'Additional Burden' on Developers?

The Conservative Party is presently undertaking some thorough consultation on the feasibility of introducing a system of Conservation Credits, while Defra has recently funded research into a closely related subject area, the potential value of introducing biodiversity offsetting in the UK¹ (Trewick *et al.* 2009). The Conservatives' consultation document (Conservatives 2009), and also a recent speech by David Cameron to the Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust, do provide some reassurances that the momentum towards ecourbanism would be maintained by the Conservative Party should they enter office at the next election. Similarly, in principle at least, biodiversity offsetting also requires strict adherence to the mitigation hierarchy prior to implementation (BBOP 2008, Trewick *et al.* 2009).

However, especially in the case of urban development, rather than ensuring high quality habitat mitigation and compensation is implemented and effectively managed as regards developments **within and adjacent** to human settlements, the apparent simplicity of instead making an offsite financial contribution (likely rural enhancement - see Gillespie and Hill 2007) could be very attractive to both developers and some local authorities. Some might see this as a means of improving efficiency in the development planning process without realising how it could further weaken the mitigation hierarchy and rule out the possibility of there ever being a proper mechanism for the monitoring and follow-up of development mitigation in the UK, *i.e.* it could become 'a licence to trash'. Furthermore, given the lack of compulsion in the wording of planning policy (e.g. inclusion of phrases such as 'where appropriate' and 'wherever possible' – see Garland and Wells 2006), some developers are likely to argue that having to also make local environmental improvements/enhancements could be, in the words of the Conservative's consultation document, 'additional burdens'. Without local protection and enhancement of the areas where we actually spend most of our lives,

which for 80% of us in the UK is apparently now in 'urban' areas (Nicholson-Lord 2003), the majority of the British population could be set again on the road to experiential ecological impoverishment, counter to key emerging treatises on sustainable urban masterplanning and design (see Ruano 1999, Nicholson-Lord 2003, TCPA 2008, ICLEI 2009, Yeang 2009, James *et al.* 2009, Landscape Institute 2009).

Can the Multiple Benefits of Ecosystem Services Alone Drive Local Biodiversity Protection/Enhancement?

Should a system of Conservation Credits be introduced, ecologists and enlightened planners and policy makers would doubtless continue to champion strongly the merits of maximising provision of local biodiversity, and in particular the benefits of associated ecosystem services, in discussions with developers. Such arguments, however, could increasingly fall on deaf-ears if policy aimed at encouraging on-site mitigation and enhancement around our places of abode were to be weakened or reversed through a system of Conservation Credits. This is because many urban developers do not see themselves benefiting financially from ecosystem services that benefit wider society² or, worse, are unaware of such services. Although organisations such as the Construction Industry Research and Information Association (CIRIA) have done much to promote multifunctional green infrastructure in the construction industry in recent years, some developers might sooner pay to simplify their lives rather than concern themselves with the problems of leaving an enriched local ecological legacy for the new denizens of their schemes. This problem can be exacerbated when the aspirations of some architects or landscape architects for a particular design aesthetic, result in biodiversity being seen as detracting from, rather than enhancing, that aesthetic.

We wonder whether such tendencies could be countered by the growing international body of evidence showing that environmental improvements also add real **direct** economic value to urban development and urban regeneration rather than being an additional burden. Examples include the increases in property sale and rental values and the reductions in rental turnover (e.g. see CABE 2005a). A typical uplift figure has been shown to be between 5-7%, although in some cases the increase in property value, as a result of proximity to a high quality green space, can be as high as 34%. Whilst several major schemes have and are now integrating biodiversity on the basis that it adds value, in many other, often

lower budget projects, this is not the case. Entrenched attitudes may have much to do with this. According to Dickon Robinson³, the problem is partly to be laid at the door of 'highways engineers, followed by myopic sales/marketing managers in the private sector who don't believe that investment in the public realm enhances the value of the homes they build' (CABE 2005b). Stern (2008) makes a similar point, if less forthright, with respect to energy efficient housing (a point he also directs at mortgage providers).

Recent studies have also revealed a significant gap between the preferences of homebuyers and the vision of developers (Barker 2003, CABE 2005c), which is also true specifically with respect to provision of 'good quality green spaces' (CABE 2005a). One would hope that market mechanisms would rectify the matter but given the general high level of demand (in spite of the recession and current difficulties in obtaining mortgages), **reliance on this alone** is very unlikely to reveal true consumer preference. Because of this restricted choice, home buyers are still often forced to settle for less well-designed developments, including with respect to provision of a biodiverse-rich public realm. Urban developers have not always recognised the need to innovate and offer alternative designs to the standard formula where it has seemed they could secure as many customers as they could supply without such additional effort. The result has been the seemingly endless number of ecologically sterile and dispiriting new housing estates, devoid of meaningful biodiverse public open space (or for that matter visual interest and a host of other environmental services that enhance quality of life) which have been constructed as additions to our cities, towns and villages (commonly and disparagingly now referred to in US culture as 'Tract' housing). Therefore despite the multiple gains potentially achievable from creating attractive biodiverse open space in development, including the possibility of direct financial gain for developers, we cannot fully rely on being able to simply enlighten all developers with such arguments without the backing of formal policy.

Local Biodiversity Protection/Enhancement - Broadening the Constituency for Nature Conservation

To prevent the continuance of the above failures, it is our contention that any system of Conservation Credits or biodiversity offsetting for urban development and regeneration that adversely impacts on the resources enjoyed or utilised by large numbers of people, should be introduced

only after rigorous **local** application of the mitigation hierarchy, accompanying monitoring and inclusion of **enhancements**, all of which are promoted by PPS9 and other policy and legislation (N.B. enhancement should be interpreted, in our view, as achieving an overall 'net gain' for biodiversity). Simply in terms of fairness, wherever possible the mitigation hierarchy and enhancements should be targeted so as to benefit the local community that has been adversely affected by the development in question rather than positioned relatively remotely and hence only utilised by a select component of society. Thus local habitat creation and improvements should aim to **broaden the constituency for nature conservation**.

The need to enhance biodiversity in or close to our urban areas becomes all the more marked when one considers potential future limitations that may arise in transport due to energy shortages or high fuel costs, which may make people's immediate environs even more important as the financial cost of travelling out to the wider countryside increases. In many of our major cities, financial hardships simply mean that many residents rarely if ever visit the countryside, and yet there can be major successes whereby nature brought into the city changes lives. The visitor books, for example, for the Greenwich Peninsula Ecology Park, London (one of the authors being the ecological designer of this 1.6 ha wetland park) reads like a eulogy, and in hundreds of pages of entries from the c. 10,000 east London school children (many from the most deprived Boroughs) visiting the park each year, the only criticism noted, was 'like a bit of the Norfolk Broads, but wish it could have been even bigger!'

Is Local Biodiversity Protection/Enhancement in Urban Areas Bound to Fail?

While there is much room for improvement, we do not believe we should have a defeatist attitude and assume any habitat protected or created in the urban realm will become immediately neglected and a 'magnet for shopping trolleys', as some proponents of Conservation Credits argue. Certainly, more local authorities (and also local communities) do appear to be appreciating that upkeep of such areas is vital to the functioning of urban society. Current policy favouring on-site conservation and enhancement is starting to deliver, if slowly, well-designed and managed habitat within urban and suburban areas on and off of the built form, examples of which are shown by CAGE (2005d), ODPM, Defra and Natural England (2006), and Landlife (2004). Some of the more enlightened boroughs are seeking new ways of encouraging the general public to assist, an

approach likely to become more and more important in stringent economic times.

Created/augmented/conserved (and managed) urban (and sub-urban) habitats can, in time, support a great diversity of species, within fully functional semi-natural ecosystems, including rarities that have been pushed close to extinction in the countryside by modern farming methods. Kadas and Gedge (undated), who undertook a three-year study examining the value of green roofs for invertebrates in the UK, showed that they supported 'a very high percentage of species of local or national interest'. Techniques are steadily developing to create good approximations of semi-natural habitat on built-form. A wonderful example of what may be achieved over time may be found from Switzerland. Here soil and seed-bank transferred to the roof of the Moos Water Treatment Works in Basel around a 100 years ago, is now a Candidate National Nature Reserve, supporting the only example of the species-rich grassland displaced by the treatment works that is still remaining in the whole Canton (Landolt 2001).

In cases where the mitigation hierarchy is not working and/or being adequately policed, as highlighted by Treweek (1999) and Gillespie and Hill (2007), then that fault needs to be fixed first by strengthening existing policy, guidance and implementation and monitoring mechanisms. Moreover, the fact that the current policy is not always effective does not mean that an alternative off-site approach would not also face problems of unsatisfactory compliance and monitoring. Further still, if stronger policy, or even legislation, could guarantee the success of a system of Conservation Credits (in the opinion of such a system's proponents at least), why could new policies/legislation not also ensure more meaningful protection and enhancement of local biodiversity?

Should the Impact of Urban Development be Offset in the Wider Countryside?

Advocates of a system of Conservation Credits see urban/peri-urban development providing an opportunity to restore large areas of the wider countryside to its former biodiverse-rich condition (Gillespie and Hill 2007). Even if this were to happen, prior to implementation there would need to be, in our view, a system in place for ensuring effective local mitigation and enhancement, including subsequent monitoring and a mechanism for correcting any shortcomings. Conservation Credits should only be used as compensation for residual impacts - not as an alternative to mitigation. But furthermore, wherever feasible, we contend that Conservation

Credits, especially in the context of urban development should usually be targeted towards offsite (but local) **urban or peri-urban** restoration/enhancement. This would be a way of endeavouring to ensure that the compensation provided served the constituency deprived of the original resource.

Certainly there will be exceptions where Conservation Credits could be applied to non-urban areas. For example, of all development between 2000 and 2003, 29% took place on agricultural land, with a further 5% occurring on other non-urban land (Defra 2006). But in such circumstances, for all the reasons we discuss above, compensation (potentially through a system of Conservation Credits) should still generally be implemented to benefit any local communities affected as far as possible.

Conclusions

Our concerns relate to the need to **reinforce** the existing system for mitigation and enhancement to ensure the reliable integration of biodiversity within and close to urban development for local provision of ecosystem services - connected to the ongoing rethinking of urban design that is necessary for the 21st century - as an **absolute prerequisite** to introducing any credits system to offset truly residual impacts. Certainly restoration of biodiversity within the wider countryside is needed although this should be primarily addressed through agricultural policy reform rather than Conservation Credits based on developer contributions. As a predominantly urban society, ever more divorced from the natural processes on which we depend, we also require much greater integration and understanding between town and country rather than reinforcement of traditional divides. Without all such proper controls, we fear that a system of Conservation Credits in the UK could actually undermine biodiversity provision on people's doorsteps in urban and sub-urban areas, and increase rather than reduce society's dangerous separation from, and understanding of, nature and natural processes.

The authors have recently formed part of a consultancy team undertaking a Defra review of opportunities for introducing a system of biodiversity offsetting, while Mike Wells also co-authored the new national guidelines on Ecological Impact Assessment for the Institute of Ecology and Environmental Management. The views expressed here are personal.

Acknowledgements

Thank you to John Box, Peter Brotherton, Ali Carr, Luke Engleback, William Latimer, Peter Massini, Roger Morris, Mike Oxford and Ollie Prudden for their constructive comments. The opinions expressed here, however, remain those of the authors and may not be shared in all respects by the reviewers.

Notes

¹ Biodiversity offsets are measurable conservation outcomes resulting from actions designed to compensate (usually offsite) for significant residual adverse biodiversity impacts arising from development plans or projects after undertaking of the mitigation hierarchy.

² In other words a 'tragedy of the commons', the scourge of many attempts at 'unregulated' sustainable living – e.g. see Diamond (2005) and Sachs (2008).

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Site Mitigation for Barn Owls - A Case Study

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This case study emphasises some of the issues and hurdles that were overcome when it was discovered that a pair of barn owls were breeding and foraging in an area of open grassland and scattered mature trees, which had been highlighted for development near Gloucester. This is the first time that an adjoining off-site area of predominately farmland, largely unsuitable for barn owls, has been enhanced with the result that this species is now breeding and foraging within the area.

Introduction and Background to the Development

Nicholas Pearson Associates (NPA) (landscape architects, ecologists, environmental planners) were instructed by a consortium of developers (Bovis, Westbury Homes (now Persimmon Homes) and Barratt Homes) to undertake an Environmental Impact Assessment (EIA) for a proposed development of 1,900 houses on a 70 hectare (ha) site near Gloucester.

The EIA was required to assess the environmental impacts of emerging development proposals for the site which had been allocated for housing development in the Gloucestershire Structure Plan and the Draft Local Plans for Stroud District Council (SDC) and Tewkesbury Borough Council. As a result of this process, it was revealed that the proposed development would eventually lead to the loss of breeding barn owls from the site and in an area of Gloucestershire where the population density was already low, at an estimated 2 pairs/100 km² (Shawyer 1987). The clearance and construction phases of the development would have significant potential to cause disturbance to barn owls which were traditionally nesting and roosting in veteran oak trees located on the site. Although the trees were to be retained, they were located within the heart of the future development and this together with the eventual disappearance of rough-grassland habitat from much of the site, was likely to preclude future nesting by these birds.

NPA called upon the Wildlife Conservation Partnership (WCP) who, as consultant ecologists to the project, had 25 years experience of field surveying and conducting mitigation and conservation work for barn owls and other protected birds.

Why Survey for Barn Owls?

Barn owls are protected in wildlife law and are a species of conservation concern in the UK. Planning guidance about protected species and habitats is also formally set out in the Government's Planning Policy Statement (PPS9), Biodiversity and Geological Conservation.

Section 1 of the Wildlife and Countryside Act 1981 (as amended) makes it an offence to kill, injure or take any wild

bird, or intentionally to take or destroy its eggs. The barn owl, along with other vulnerable or rare species of birds, is listed on Schedule 1 which also makes it unlawful to intentionally or recklessly disturb such a bird whilst it is preparing to nest or is at the nest with eggs or young, or to disturb its dependent young.

Between 1932 and 1985 the barn owl population of the British Isles fell by 70%, to 4,500 breeding pairs (Blaker 1934, Shawyer 1987). In 1997 a new survey estimated a similar figure of 4,000 (Toms *et al.* 2001).

In the 1995 UK Biodiversity Steering Group Report, the barn owl is listed as globally threatened, being on the list of 'Species of Nature Conservation Concern'. In Europe, the species is listed as a 'Species of European Concern' (SPEC Category 3), having declined throughout most of its European range (Shawyer 1997). In the UK the barn owl is included in *Red Data Birds in Britain* (Batten *et al.* 1990) and Natural England identified the barn owl as 'High Priority, List 2' (Brown and Grice 1993). The barn owl is 'Amber Listed' as a species of Medium Conservation Concern in *Birds of Conservation Concern in the UK* (BTO 2002, Eaton *et al.* 2009).

As a result, Species Action Plans (SAPs) have been developed in the UK to address the causes of decline for those birds which are considered to be of national or local conservation concern. For example, the barn owl is included as a priority bird in the Highways Agency Biodiversity Action Plan (HABAP) following the findings of a research investigation into the impact of roads on barn owls (Shawyer and Dixon 1999) and is also included in over 100 Local Biodiversity Action Plans (LBAPs) in the UK.

Because of its vulnerable conservation status, the barn owl is also the subject of a large number of Species Recovery Projects in the UK which are successfully increasing the breeding population of this bird (Shawyer 1987, Shawyer 1997). Areas where these habitat restoration and creation works are currently taking place are described as 'Barn Owl Recovery Areas' (Shawyer *in press*).

A barn owl survey is required to confirm or deny the presence of the species and its breeding status where there is any likelihood that a proposed development site may be suited to this bird. The failure to conduct a survey and to determine the potential risk to barn owls could be considered 'reckless' in law if subsequent disturbance or damage to an active breeding site were to occur.

Field surveys should be undertaken in June or July as this species is especially vulnerable to disturbance just prior to egg-laying in March and during incubation in April and May. These must be conducted under a license issued by the appropriate countryside agency which permits the disturbance of barn owls by 'the method of nest observation for the purposes of science, education or conservation' or by the British Trust for Ornithology (on behalf of Natural England) for the 'temporary 'taking' of a barn owl for the purpose of ringing and nest recording'.

Licenses to disturb a Schedule 1 bird whilst it is breeding or whilst it has dependent young cannot however be issued for the purpose of permitting a development-related activity (including clearance works or land maintenance/management).

So what determines whether there is a likelihood that barn owls may be present at a site where development is being considered? In order to help establish this, we needed to undertake a desk study within 5 km of the area to reveal whether or not the development site was likely to fall within the geographical range of barn owls. The desk study was followed by a full barn owl field survey using best practice methodology and techniques for proposed development sites, which include road construction schemes (Shawyer in press).

Ecology/Natural History of Barn Owls

Barn owls can utilise a variety of different habitat types, but in Britain are most often found in areas of open grassland and woodland edge (Shawyer 1987) where they typically occupy a home range during the breeding season of 3-7 km². For successful breeding to occur they require about 30-50 ha of rough-grassland in pastoral type farmland, dominated by whole fields (Shawyer 1996, Askew 2006) and in areas of largely dominated arable farmland, 15-25 km of rough-grassland margin, a minimum of 3 m wide (4.5-7.5 ha) (Shawyer 1987).

In most years barn owls in the UK breed between the months of March and August, but because this species is capable of laying a second clutch of eggs after nest failure and can occasionally produce two broods in years of an especially good food supply, breeding can occur during all months of the year (Shawyer 1998.)

There are three main types of natural breeding sites, the interiors of buildings, large tree cavities and rock fissures. Barn owls do not construct a nest, but often lay their eggs on

a cushion of shredded pellets. In most years, barn owls lay an average of five eggs during April or early May, but this can occur earlier in March or be as late as July and occasionally, August. Young remain in the nest for up to nine weeks and it is often 11 weeks before all the chicks of a brood have successfully fledged and vacated the site. The breeding cycle for barn owls is therefore longer than for most other British birds. Outside the breeding season most barn owls are largely nocturnal but are more crepuscular at other times, and often diurnal in some areas of Britain in the first few months of the year prior to breeding or when feeding large young later in the year. This together with the fact that they are sparsely distributed over a wide geographical area of Britain, and are neither particularly vocal nor occupy a clearly defined territory, makes this species one of the three most difficult birds in Britain to survey accurately (Gibbons *et al.* 1993).

Barn owls feed largely on small mammals, mainly the short-tailed vole or field vole *Microtus agrestis* which provides over 50% of this owl's diet by weight in mainland Britain. The wood mouse *Apodemus sylvaticus*, shrews, young rats, bank vole *Clethrionomys glareolus* and water vole *Arvicola terrestris*, also commonly feature in the diet (Shawyer 1998). Therefore, prey-rich habitats of rough, tussocky grassland, especially those alongside ditches and field margins, young plantations and grass moorland, are key foraging habitats for barn owls in Britain.

Mitigation for Barn Owls

Barn owls were found breeding in a veteran oak tree near the centre of the proposed development site during 2000 and in another veteran oak in 2002, 2003 and 2004, close to the proposed development boundary. It was concluded in the Environmental Statement (ES) that in spite of proposals to retain the veteran oak trees and incorporate grass corridors and other 'green space' within the site proposals/masterplan, barn owls were unlikely to utilise these for breeding or foraging due to



Barn owl on eggs

Photo: Wildlife Conservation Partnership



Tree-mounted barn owl nest boxes

Photo: Wildlife Conservation Partnership

the increased human pressures which would accompany the residential development.

It was concluded that without the creation of new off-site habitats, the barn owls would be adversely affected by disturbance during the construction phases of the project and would be displaced from the site and its immediate surroundings, during and post development.

The ES reported that with appropriate off-site mitigation, barn owls were likely to continue to forage and breed in the locality, and consequently there should not be any residual adverse impact upon them. The possibility of developing suitable off-site habitats for enhancement in the vicinity of the site was subsequently investigated.

Following submission of the ES, an adjacent area (approximately 30 ha) of predominately agricultural land, and therefore unsuitable for barn owls, was purchased by the developers with the commitment of creating and enhancing optimal habitats as a mitigation site for this species. A Draft Barn Owl Mitigation Strategy was submitted to the LPAs in 2004 which described the proposed habitat enhancement/creation methods to enable barn owls to continue to breed and forage alongside the development without disturbance or eventual loss from the area.

Outline planning permission was granted in 2005 on the basis that a Barn Owl Mitigation Action Plan was prepared for the approval of the LPAs under a planning condition before the onset of development. This Mitigation Action Plan required a timescale for the start of mitigation measures, phasing of these measures and future long-term monitoring of the site. An annual report was required by the LPAs which would provide results of barn owl monitoring on the site and an update on measures listed in the Action Plan.

Mitigation Action Plan/Habitat Creation

The overall aim of the Barn Owl Mitigation Action Plan was to ensure that the local population of barn owls, which forage and breed on the development site, were not adversely affected by the development and continue to breed in the local area.

In order to achieve this it was necessary to establish sufficient rank tussocky grassland to support a high and stable small mammal population. This required:

- A well-designed network of rough grassland corridors, continuity of this habitat type throughout the mitigation site and connections to the development site and the wider countryside.
- Establishment of a rank tussocky grass sward in a selection of whole fields through a cessation of annual grazing.
- Artificial nest sites (nest boxes) to attract barn owls to breed and roost.

- New habitat features in the Mitigation Area to increase overall habitat quality and discourage human encroachment into the new barn owl habitats to maintain a low level of disturbance to this sensitive species.

The new habitats would be created in the Mitigation Area in advance of the loss of key areas of habitat on the development site, and construction would be managed so as to avoid disturbance to barn owls.

These measures would take account of the traditional methods of farming which had evolved locally, notable wildlife and landscape features, the ecological needs of other species, and items of historic or archaeological interest.

The Mitigation Area

The 30 ha of farmland comprised eight fields, heavily grazed by cattle and divided by wire fencing bounded by mature hedgerow on two sides.

The site contained no farm buildings and about 20 well scattered standard trees, mainly oak, about 300+ years old, none of which contained cavities which might attract breeding barn owls. The site had been heavily grazed by beef cattle with the resulting well-cropped sward providing minimal suitable habitat for field vole. WCP drew up a farm plan aimed at establishing sufficient rough-grassland habitat and artificial breeding sites to support the resident pair of breeding barn owls. An application was made to Defra to upgrade the existing Environmentally Sensitive Area Agreement (ESA) from Improved Permanent Grassland (Tier 1b) to Extensive Permanent Grassland (Tier 1c) which involved a reduction in stocking density to 0.75 livestock units per ha, no use of artificial fertiliser or lime and a restriction in supplementary animal feed. A derogation to the Agreement was also confirmed with Defra allowing certain fields not to be grazed and others grazed lightly on rotation, for the purpose of creating about 20 ha of rank tussocky sward for wildlife benefit.

Habitat creation and enhancements continued in 2005 with the lowering of a stretch of hedgerow to provide an uninterrupted flight path for barn owls between the two areas and the installation of seven tree-mounted barn owl nest boxes (Dewar and Sawyer 1996). The erection of two permanent owl towers or alternatively, special nest boxes on poles (Sheppard and Sawyer 2008) was given initial consideration but was discounted as being unnecessarily intrusive to the landscape quality of the Area of Outstanding Natural Beauty (AONB) within which the mitigation area was located.

To meet the habitat requirements of barn owls, capital works involved the creation of 2.6 km of 6 m wide rough grass margins on the boundaries of each of the eight fields through the excavation of shallow dry ditches protected by 2.5 km permanent cattle fencing. Permission was granted by Defra for these capital works which also included the restoration of four ponds to provide small mammal drinking refuges, although because they were to form part of a mitigation plan formally

required by the local authorities as part of a planning condition, they did not qualify for payment under the terms of the ESA.

Habitat enhancements within the mitigation area were undertaken in 2005. It was estimated that it would take at least three to five years for the grass sward to begin to assume the necessary structure to attract field and bank voles, although wood mice were expected to colonise the area prior to this.

Barn owls began hunting from the fence posts which protected the dry ditches, two years after seeding and in the third year the first attempt at breeding in one of the seven nest boxes, occurred. Towards the end of 2008 three young were found occupying two other sites in the mitigation area, having fledged from a nearby site three months earlier.

The development of the site is anticipated to take about 10 years, and at the outset, development works were phased in order to maintain the rough grassland on the site for as long as possible thus allowing the barn owls' presence there, until full transition in about three years time.

Measures have been taken throughout to protect the original breeding site in the veteran oak from potential disturbance from nearby construction works and heavy plant movements through the use of high netting to screen the tree, and establishment of exclusion zones appropriate to the varying levels of construction activity (Shawyer in press). Cavities in all other trees on the development site which might have conferred potential nest sites to barn owls were capped during the winter of 2006 prior to any construction activities and after installation of nest boxes on the mitigation area, to prevent future nesting at any of these sites.

Kestrels, which are amber listed, were also attracted to the mitigation area and two pairs now breed on the site in two additional nest boxes.

Monitoring and maintenance of the habitats and nest boxes in the mitigation area and natural nest/roost sites on the development site, occurs annually when nest contents are recorded. Maintenance, largely to slacken the mounting bolts of the nest boxes and remove old nest material of jackdaw, stock dove and grey squirrel also occurs in the late autumn or early winter.

In conclusion, barn owls began to roost in one of the nest boxes in the mitigation area in 2006 and first bred there in 2008. In the winter of 2008/2009 three barn owls were found roosting in other nest boxes in the mitigation area, two of which were thought to be the progeny of the resident breeding pair and the third the progeny of another pair which probably bred elsewhere in this part of Gloucestershire. These birds together with the breeding adult were ringed and successfully aged in 2008 which will enable their progress (chick dispersal, adult survival and movement) to be monitored in subsequent years. The owls first began foraging on the mitigation area in 2007 and now utilise it regularly together with the remaining grassland on the development site and adjoining farmland.

It will be interesting to see if the mitigation plan which has already proved successful for the resident pair of barn owls will confer additional conservation benefit, since the mitigation area along with the adjoining farmland, now has the potential to support two breeding pairs. The habitat structure on the mitigation area is continuing to develop but it is unlikely to be optimal for field voles and hence for fully supporting barn owls, for a few more years. Soon after this, it is anticipated that the majority of the remaining rough grassland on the development site which is still partly used by the resident barn owls as a foraging resource, will be lost, having been built upon.

Acknowledgements

We would like to thank Adam Boyden from Nicholas Pearson Associates for his valuable contributions and encouragement throughout this work.

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Ecology Legal Update

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Following the summary of legal developments which appeared in the June 2009 edition of *In Practice* there are two further important developments to report.

1. Important Court Judgment Clarifies Local Planning Authorities' Duty to European Protected Species

Summary

An important judgment was handed down by the High Court at the start of June 2009 in the case of *R (on the application of Simon Woolley) v Cheshire East Borough Council*. DLA Piper UK LLP, the law firm for whom this author works, brought the action on behalf of the claimant.

The judgment clarifies for the first time the legal duty of a Local Planning Authority (LPA) when determining a planning application for a development which may have an impact on European Protected Species (EPS), such as bats, great crested newts, dormice or otters.

The species protection provisions of the Habitats Directive, as implemented by the Conservation (Natural Habitats, &c.) Regulations 1994, contain three 'derogation tests' which must be applied by Natural England (NE) when deciding whether to grant a licence to a person carrying out an activity which would harm an EPS. For development activities this licence is normally obtained after planning permission has been obtained. The three tests are that:

- the activity to be licensed must be for imperative reasons of overriding public interest or for public health and safety;
- there must be no satisfactory alternative; and
- favourable conservation status of the species must be maintained.

This court judgment in *Woolley* makes it clear that, notwithstanding the licensing regime, the LPA must also address its mind to these three tests when deciding whether to grant planning permission for a development which could harm an EPS. A LPA failing to do so would be in breach of Regulation 3(4) of the 1994 Regulations which requires all public bodies to have regard to the requirements of the Habitats Directive in the exercise of their functions.

Detail

This case related to an application for judicial review of a decision by Cheshire East Borough Council to grant planning permission for a development involving the demolition of an existing house and its replacement with a larger property.

It was common ground that in order to demolish the building containing the bat roost that a licence from NE was required. Such a licence was acquired by the developer in July 2008 and the building was demolished the following month.

The judicial review was brought by the claimant, Mr Woolley, on seven grounds. The first ground is the one of interest here.

The claimant argued that in granting planning permission the LPA had failed in its duty under Reg 3(4) of the 1994 Regulations by failing to give consideration to the three derogation tests contained in the species protection provisions of the 1994 Regulations. The Court agreed.

The Court considered that the guidance set out in paragraph 116 of Circular 06/05 which accompanies PPS9 is fundamental to the approach to be taken by LPAs:

'When dealing with cases where a European Protected Species may be affected, a planning authority... has a statutory duty under Regulation 3(4) to have regard to the requirements of the Habitats Directive in the exercises of its functions. Further the Directive's provisions are clearly relevant in reaching planning decisions, and these should be made in a manner which takes them fully into account...' (our emphasis)

The Court considered that in order for a LPA to comply with Regulation 3(4) it must engage with the provisions of the Directive:

'In my view that engagement involves a consideration by the authority of those provisions and considering whether the derogation requirements might be met. This exercise is in no way a substitute for the licence application which will follow if permission is given. But it means that if it is clear or perhaps very likely that the requirements of the Directive cannot be met because there is a satisfactory alternative or because there are no conceivable 'other imperative reasons of overriding public interest' then the authority should act upon that, and refuse permission. On the other hand if it seems that the requirements are likely to be met, then the authority will have discharged its duty to have regard to the requirements and there would be no impediment to planning permission on that ground. If it is unclear to the authority whether the requirements will be met it will just have to take a view whether in all circumstances it should affect the grant or not. But the point is that it is only by engaging in this kind of way that the authority can be said to have any meaningful regard for the Directive.'

Furthermore the Court held that a LPA cannot discharge its duty simply by adding a condition to the grant of planning permission which requires a licence from NE to be obtained. Such a condition would not amount to engaging with the Directive. Similarly a mere reference at the end of the planning permission to the existence of the 1994 Regulations and the need for a licence cannot discharge the LPA's duty.

The Court also made it clear that the LPA can fulfil its duty to engage with the Directive even if NE fails to provide its view (it is not obliged to do so and often responds, as it did in this case, to the effect that it does not have sufficient resources to provide a detailed commentary on the proposed development). Where planning applications are determined by planning committee, the Planning Officer has a key role in identifying the relevant legal duty and should specifically highlight this duty in his/her report so that the planning committee can seek to discharge it.

Comment

This decision has been a long time coming. The lack of engagement by LPAs with the strict derogation legal tests in the 1994 Regulations for European Protected Species will have

largely gone unnoticed in planning decision making, despite Circular 06/05. This judgment has already been welcomed by conservation groups and others including the Bat Conservation Trust.

The judgment should not be seen as a negative result for developers as it is simply clarifying a legal duty which was already in existence but not being appropriately applied by many planning authorities.

Developers aware of the existence of EPS can help smooth the path for planning permission by providing to the LPA a document setting out how the three derogation tests are met and reminding the LPA of its legal duty to consider the tests and the Directive so it does not make a decision which is susceptible to legal challenge on that issue. This should be drafted by the developer's ecologist and lawyer together. DLA Piper has already been asked a number of times to produce such documents for its developer clients; and LPAs alert to the issue are specifically requesting them.

These tests will ultimately need to be satisfied in any event by NE when considering the EPS licence application so additional work or a new obstacle has not been created. The message for developers and LPAs alike is to consider the derogation tests upfront in order to avoid unnecessary costs and delays in the planning process. Otherwise, the judgment will pave the way for increased third party challenge of planning decisions involving EPS. Of course, all of this is good news for the bats!

2. Further Changes to the Conservation (Natural Habitats, &c.) Regulations 1994

The European Protected Species (EPS) provisions of the Conservation (Natural Habitats &c.) Regulations 1994 were substantially amended in 2007 by amending legislation introduced to address the UK's failings in its transposition of the Habitats Directive. My article, entitled *New Species Protection Legislation: Opportunities and Risks for Consultant Ecologists*, in the December 2007 edition of *In Practice* summarises the impacts of those changes.

The 2007 amendments substantially altered the EPS protection scheme and were intended to address fully the concerns of the European Court of Justice. Unfortunately, however, the EU Commission made further complaints to the UK regarding certain aspects of the amended Regulations in England and Wales. This has led to a further set of changes being made in England and Wales through the Conservation (Natural Habitats, &c.) (Amendment) (England and Wales) Regulations 2009. These were made on 5 January 2009 and came into force on 30 January 2009.

The key changes to be aware of from the 2009 Regulations are as follows:

The Disturbance Offences

In 2007, the law in England and Wales was changed so that, in summary, the Conservation (Natural Habitats, &c.) Regulations 1994 contained two different disturbance offences for EPS, both of which were aimed at 'significant' or 'high level' disturbance of EPS. Under this regime 'non-significant' or 'low level' disturbance of EPS would fall outside the 1994 Regulations but could instead potentially fall within the disturbance offence found in the Wildlife and Countryside Act 1981 (WCA).

This was helpful, particularly since the 2007 Regulations also removed from the 1994 Regulations some of the most useful defences that had been available. It meant that (leaving aside the potential relevance of other offences) if it was thought

that only non-significant disturbance of an EPS would occur from a proposed activity, then there would be no need to apply for an EPS licence under the 1994 Regulations. Instead there would be a need to consider whether the non-significant disturbance provisions of the WCA would apply. If the WCA disturbance provisions did apply then reliance on one of the WCA legal defences would then be the only legal strategy to follow (because WCA licences are not available for commercial/development activities). By comparison with the present position, this regime was helpful as the boundaries of the high level and low level offences were at least fairly clear.

The EU Commission however was unhappy about this, regarding it as still too lenient. This has led to the further 2009 changes in England and Wales.

The position now is that there are still in essence two limbs to the disturbance offence in the Conservation (Natural Habitats, &c.) Regulations 1994. However the offence is no longer restricted to significant or high level disturbance as was previously the case. Whilst the two limbs of the new offence do still focus *in particular* on disturbance at the more significant end of the scale, the language is now wide enough to incorporate less significant disturbance events.

The two limbs of the disturbance offence can be summarised as follows (for actual wording of the offence see Reg 39(1)(b) in conjunction with Reg 39(1A)):

1. It is an offence to deliberately disturb wild animals of an European Protected Species including in particular any disturbance which is likely to impair their ability (i) to survive, to breed or reproduce, or to rear or nurture their young; or (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate.

This is the offence which has changed the most. The differences from before are:

- The new non-exclusive wording of the offence (i.e. 'deliberate disturbance of wild animals of a European Protected Species including, in particular,...') means that, strictly, any disturbance of animals (note the plural and so this must mean two or more animals) could now be within the scope of the offence although the offence is 'in particular' focussed on disturbance likely to impair survival, breeding, etc. This change creates uncertainty and does make application of real life scenarios to the offence more difficult.
- Previously, the offence only applied to disturbance linked to the ability to survive, breed or rear or nurture young of a *significant group* of animals. This is no longer the case and so disturbance of smaller groups of animals could now fall within this limb of the offence;
- Previously, the offence only applied to disturbance with *significant effects* on the ability to survive etc. of the significant group of animals. Now the impairing effect on survival, breeding/reproduction, rearing/nurturing young must be a 'likely' consequence of the disturbance (as before) but the effect need no longer be 'significant';
- There is reference now to 'breeding or reproducing', rather than just breeding; and
- The reference to hibernation and migration is new.

2. It is an offence to deliberately disturb wild animals of a European Protected Species including in particular any disturbance which is likely to affect significantly the local distribution or abundance of the species to which they belong.

The non-exclusive wording mentioned above applies equally to this limb of the offence. Otherwise this limb is essentially unchanged from the position in 2007.

3. In addition there is now a discretion (Reg 39(13)) on the Secretary of State (SoS)/the Welsh Minister or for NE/CCW (with approval of the SoS and the Welsh Minister) to issue guidance on the application of the disturbance offences in relation to particular species of animals. If any such guidance is produced it must be taken into account by a court considering such offences. Previously the court had to take into account any guidance on one narrow issue only *i.e.* whether a group of animals was a 'significant group'.

The Damage/Destruction of Breeding Sites/Resting Places Offence

This offence has not been altered but the provision referred to above (Reg 39(13)), under which guidance may be issued which the court then has to take into account, applies to this offence as well as the disturbance offence.

Other Changes by the 2009 Regulations

There have also been changes to (i) the requirements for surveillance of the conservation status of species and habitats; (ii) the remaining legal defences; (iii) monitoring incidental capture and killing of certain species; and (iv) the previous leniency granted to sea fishing under the regime.

Guidance

A 'Questions and Answers' document on the changes from Defra dated 28 January 2009 stated that the Reg 39(13) guidance on the disturbance offence would be published by the end of March 2009 and the guidance for the damage/destruction of breeding site/resting place offence would be published during summer 2009. So far as the author is aware they are not as yet available and are eagerly awaited. As explained above, the guidance once produced will have to be taken into account by a court dealing with these offences. It is hoped that the disturbance guidance will provide as much clarity as possible. However the author's view is that it will not be able to go so far as negating the legal effect of the non-exclusive wording of the offences. Therefore it is unlikely that ecologists can expect the guidance to provide a 'panacea' setting out exactly what does or does not fall within the disturbance offences.

How to Work with This?

With this backdrop, ecologists may find the following comments helpful when working with the disturbance offence:

- a. Clearly where deliberate disturbance of any kind is likely to impair the ability of any group of two or more EPS animals to survive, breed/reproduce or to rear/nurture their young or to migrate or hibernate, then this will fall within the scope of the new offence.
- b. Clearly where deliberate disturbance of any kind to any group of two or more EPS animals is likely to affect significantly the local distribution or abundance of the species, then this will fall within the scope of the new offence.

- c. Circumstances of disturbance falling outside these categories are more difficult to judge as, on a literal reading of the offence, they could still be included (because of the non-exclusive words 'including, in particular...'). A suggestion is that:

- Where there is some concern that one of the two categories a. and b. above could potentially be triggered although the ecologist is unsure as to whether this would be 'likely', then it would be prudent to play safe and treat the offence as being triggered.
- Where some far less serious, *e.g.* transitory or short term, disturbance is likely which will not or is highly unlikely to give rise to the result in either of the two categories a. and b. above then whatever can be done by way of mitigation to reduce to 'very unlikely' the risk of that disturbance occurring should be done (on the basis that you may then have grounds for arguing that the disturbance is not being done 'deliberately') and the activity may then be able to proceed without a licence. The ecologist will however need to check whether it might fall within the WCA disturbance offence. In case of any doubt, legal advice should be sought.

In Scotland

For those ecologists who work in Scotland, the EPS disturbance offences in Scotland are all contained within the 1994 Regulations and even before 2009 the disturbance offences were differently worded to the offences in England and Wales. These have also been subject to minor changes in 2009 by virtue of the Conservation (Natural Habitats, &c.) Amendment (No. 2) (Scotland) Regulations which entered into force on 26 January 2009.

There are now five separate Scottish disturbance offences all contained in the 1994 Regulations. The main difference is that the Scottish disturbance offences can be triggered by either deliberate or reckless behaviour making the offences stricter and wider than the offences in England and Wales.

In Scotland it is an offence to either deliberately or recklessly (i) disturb an EPS animal while it is occupying a structure or place which it uses for shelter or protection, (ii) disturb such an animal while it is rearing or caring for its young, (iii) disturb such an animal in a manner that is, or circumstances which are likely to significantly affect the local distribution or abundance of the species to which it belongs, (iv) disturb such an animal in a manner that is, or in circumstances which are, likely to impair its ability to survive, breed or reproduce or rear or otherwise care for its young, and (v) to disturb such an animal while it is migrating or hibernating.

The limb at (v) is new and is different to the corresponding offence in England and Wales in that the limb is not limited by there having to be a likelihood of impairing the animal's ability to migrate or hibernate. In Scotland it does not matter whether the animal's ability to migrate or hibernate is affected, a mere disturbance is sufficient to cause the offence.

It is helpful that in Scotland each of the offences is fairly well defined, specifically the unhelpful non-exclusive wording of England and Wales *i.e.* 'in particular...' is not present in Scotland.

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2009 Annual Conference Report

Protected Areas: Past, Present and Prospects

Nick Jackson AIEEM

Education and Professional Development Officer, IEEM

With climate change issues taking centre stage, many ecologists are turning away from traditional site-based protection of our most valuable habitats in favour of landscape scale restoration networks and projects. On the other hand, some of our traditional protected landscapes are perhaps too focussed on natural beauty and cultural heritage rather than biodiversity. The 2009 IEEM Annual Conference considered some of the big questions faced by those involved in managing our protected areas, from reserve managers to landscape managers, and took a wider look at the role and value of protected areas in a rapidly changing world.

The conference could not have been timed any better as on the last day of the conference, Thursday 12 November 2009, the Environment Secretary, Hilary Benn signed the Order to confirm the South Downs as England's ninth National Park. The new 632 square mile protected area, home to an estimated 120,000 people, stretches from Beachy Head in East Sussex to the edge of Winchester in Hampshire. On the same day, the Marine and Coastal Access Bill received Royal Assent creating the Marine and Coast Access Act 2009. The Act will create a new marine planning system designed to bring together the conservation, social and economic needs of our seas. A network of Marine Conservation Zones will also be created that will protect rare and threatened species and habitats. So, very apt timing, considering the theme of the meeting!

The conference took place at Center Parcs in Elveden Forest, Brandon, Suffolk and attracted over 200 delegates.

On the Tuesday evening, **Tamas Marghescu**, former Regional Director for Pan-Europe of the International Union for Conservation of Nature (IUCN), opened the conference with an after dinner talk giving an international perspective on protected areas. He outlined some of the great achievements made in the last 100 years which have led to more than 11.5% of the world's terrestrial surface being protected for its nature conservation (a figure reaching 16% in Europe!) He talked about the ever increasing complexity of different protected area types and categories, valuing natural infrastructure, ecosystem services, climate change and finished by considering the current challenges involving marine protected areas.

Stewart Pritchard, from Scottish Natural Heritage, gave the first talk on the Wednesday morning and spoke to delegates about the purpose and scope of protected areas. He introduced the range of our protected areas, reviewed how we categorise them and considered how we might better communicate and compare them by their main purposes and functions.

Howard Davies, Wildlife Trust for Wales, spoke about legislation and policy in relation to protected areas and gave a brief overview of the history, explored some of the tensions that exist in protected area management, looked at key legislation and current policy drivers, and importantly looked to the future. His presentation highlighted the value of our protected areas, not just as entities in their own right but as part of an active, functioning network well positioned to deliver environmental, social and economic benefits for our current and future society.

Rob Cooke MIEEM, Natural England, spoke about the responsibilities of statutory bodies in relation to protected areas. UK statutory conservation bodies have played a key role, both in the identification of sites, and their subsequent protection and management, often in partnership with voluntary conservation organisations and private land owners and managers. His talk reviewed the duties and powers of statutory bodies and explored the challenges faced in the 21st century.

Andrew Dodd, Royal Society for the Protection of Birds (RSPB), finished the morning session by talking about the responsibilities of NGOs in relation to protected areas. Using the RSPB as an example, Andrew's presentation illustrated the breadth of an NGO's involvement and its responsibilities towards the UK's wildlife protected areas.

The afternoon session saw the conference delegates travelling to various local field sites throughout Norfolk and Suffolk showing delegates practical examples of protected area management at various landscape scales. Field sites included Norfolk and Suffolk Broads (led by the Broads Authority), Wicken Fen (led by the National Trust), Thetford Forest (led by the Forestry Commission), The British Trust for Ornithology (BTO) headquarters (led by the BTO), Titchwell Marsh as part of the Norfolk Coast AONB (led by Norfolk Coast Partnership and RSPB) and Redgrave and Lopham Fen (led by Suffolk Wildlife Trust).

The Institute's AGM took place on Wednesday evening. Please see *Institute News* on page 44 for further details.

The main conference dinner took place on the Wednesday evening and was followed by the presentation of gifts to long standing members of IEEM Committees who have



2009 Protected Areas Conference delegates



IEEM Award winners, left to right: Richard Graves CEnv MIEEM, Debbie Bartlett FIEEM, Emma Toovey MIEEM, Penny Anderson CEnv FIEEM, Eirene Williams CEnv MIEEM, Stewart Pritchard, Pam Nolan CEnv MIEEM, Craig Rockliff MIEEM, Steve Ormerod FIEEM

stood down, presentation of a the certificate to the Institute's newest Fellow – **Debbie Bartlett FIEEM**, and the announcement of the winner of the 2009 Tony Bradshaw Best Practice Awards, **Scottish Natural Heritage (SNH)** for their **Scottish Raptor Monitoring Scheme**. As Des Thompson FIEEM was not able to attend the conference, Stewart Pritchard accepted the award on behalf of SNH.

The three finalists and their projects are outlined below:

WINNER: Scottish Natural Heritage - Scottish Raptor Monitoring Scheme (SRMS). The SRMS is a unique partnership between seven organisations and 300 plus volunteers dedicated to monitoring, setting standards for and reporting on, the status of birds of prey in Scotland. It has developed robust guidance for surveys, monitoring, data analysis and reporting. In 2006, the SRMS published a groundbreaking field guide for surveys and monitoring and in 2008, published the golden eagle conservation framework – the first European example of a national conservation tool for birds of prey, outlining conservation threats and opportunities from a survey and monitoring evidence base. Similar conservation frameworks are being developed for hen harrier and peregrine.

RUNNER UP: Environment Agency - Easimap Biodiversity Screening Tool for National Permitting Services. This is an ambitious Environment Agency project, led by national Conservation staff. It covers biodiversity screening for environmental permitting activities (such as waste management licences and discharge consents) across England and Wales. The project began in 2007 following restructuring of permitting activities within the Agency. Pam Nolan CEnv MIEEM and Craig Rockliff MIEEM accepted the runners up award on behalf of the Environment Agency.

RUNNER UP: University of Greenwich and Entec UK Ltd - Partnership Approach to Addressing the Skills Gap. This project is an ongoing collaboration between the University of Greenwich and Entec UK Ltd with the aim of producing competent new entrants to the profession. At the inaugural meeting of the IEEM Skills Gap Project Steering Group, universities were criticised for failing to produce graduates meeting the needs of the profession. The MSc in Environmental Conservation course was then formulated and implemented in September 2007, aiming to give students a comprehensive grounding across a wide spectrum from which to develop their skills and careers. Debbie Bartlett FIEEM from Greenwich University and Emma Toovey MIEEM from Entec UK Ltd accepted the runners up award.

The second day of the conference started with a presentation from **Professor John Rodwell** who spoke on the evolving value of protected areas. He talked about the ecological, cultural, social and economic functions of protected areas. His presentation included how, as professionals, we use various frames to assess the value and condition of species, habitats and landscapes and so prioritise our concern to protect what we rate precious and vulnerable; whereas some landscape characteristics are less readily quantifiable and are considered to have immeasurable value.

Dr Caroline McParland MIEEM, Mott Macdonald, spoke next about ecological management at the landscape level. She said that there is increasing realisation amongst consultants, regulators and academics that habitat and landscape scale management is essential if we are to halt biodiversity loss at any scale, including at multi-national scales under the umbrella of initiatives such as the Pan-European

Biological and Landscape Diversity Strategy (PEBLDS).

Dr Jim Latham, Countryside Council for Wales, gave the next presentation on the subject of the wider environment and the need to connect up protected areas. A prerequisite for this is an understanding of the functional relationships of habitat patches, but this is fraught with difficulty as it must consider the disparate requirements of different species. Recent research has sought to address this problem using least-cost modelling of habitat networks. Jim's talk gave an overview of this type of work in Wales, using woodland as an example habitat, and exploring how key areas of connectivity around and between protected sites can be identified and prioritised for conservation action.

Dr Stuart Otway CEnv MIEEM, Defence Estates, outlined the work of the Ministry of Defence (the largest SSSI landowner in England) in conserving biodiversity on their protected sites (via restrictions in agricultural improvement, urban sprawl, afforestation, trawling and public access). Military activities in these areas do however involve bombing, shelling, driving and flying; and building roads, targetry, magazines, ports, and varied rural and built environments for training. Ecological impact assessment can be challenging, but there is usually only localised and limited conflict with conservation objectives, especially on larger sites where there is 'room for manoeuvre'.

John Wilson, a farmer based at Ingram Farm in Northumberland, gave a landowners perspective of the advantages, disadvantages and expectations of farming on the eastern edge of the Northumberland National Park. John focussed his presentation on how the Breamish Valley has evolved over the years and covered history, archaeology, tourism, farming, landscape, marketing and the future of the Breamish Valley.

Dr Caro-lynn Ferris, Countryside Access and Activities Network (CAAN), gave a presentation considering how recreational trails can 'add value' to landscapes and the importance of good planning and design in this process. Two case studies were used to outline the challenges facing the site managers of two of Northern Ireland's most heavily used recreational landscapes, the Mourne Mountains and the Giant's Causeway, in balancing the desires of the present day outdoor enthusiast with the need to preserve and conserve the unique landscape that has attracted them to the area in the first place.

Edward Holdaway, Europarc Atlantic Isles, gave a presentation on connecting the land and the sea. He spoke about how the new Marine and Coastal Access Act will have significant implications for protected landscapes around the coast of UK. Edward's talk explored the nature



Party poppers launched in celebration of the confirmation of the new South Downs National Park

of the special qualities derived from the marine environment and how an area of sea embracing them might be defined; why coastal protected areas need to engage with the new system; the issues that protected area managers will need to address when engaging with the new planning system; and the need for new techniques.

Phil Belden CEnv MIEEM, South Downs Joint Committee, gave the next presentation with a huge smile on his face, following the news of the confirmation of the South Downs as the newest English National Park. He spoke about the history of the South Downs; from the movement to preserve the downs back in the 1920's; through to the designation of the park in 2002; and

finally the government confirmation in 2009. He said the future must not be about 'protecting' this area but about restoration and re-creation, fit for the 21st century and the challenges ahead (habitat connectivity for our species to adapt to climate change); ecosystem services (the Downs is the drinking water aquifer for millions of people); and managing access in this popular, pressurised landscape.

The final speaker, **Professor Adrian Phillips CBE**, former chair of the World Commission on Protected Areas rounded off the conference with a look at the future of protected areas. He confirmed that protected areas will be with us for as far ahead as can be seen, but that

they need to be planned more as part of wider strategies, showing better how they contribute to mainstream concerns, and implemented with a view to equity and good governance. He concluded with five optimistic propositions as to how protected areas might look in 60 years time: that upland protected landscapes will become resilient, transition landscapes; that climate change and our responses to it will force a rethink about how we manage all protected areas; that green infrastructure and protected areas will be more closely linked; that protected areas of all kinds will form a national eco-network; and that there will be radically different ideas about the governance and funding of protected areas.

The speakers' slides will shortly be available from the IEEM website. The proceedings from this conference will be edited, compiled onto a CD-ROM and sent to all IEEM members in 2010 (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 IEEM conferences in 2010 please see the *Diary* on page 60.

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Forthcoming Conferences

ECOSYSTEM SERVICES

24 March 2010 | London

BEYOND 2010: MISSED OPPORTUNITIES, NEW TARGETS

2-4 November 2010 | Dublin

More details will follow shortly at:
www.ieem.net/conferences.asp

IEEM/FBA Conference Report

The Future of Freshwaters



Michael Dobson
Director, Freshwater Biological Association

The Freshwater Biological Association (FBA) and Institute of Ecology and Environmental Management (IEEM) are natural partners in ensuring the effective management of our fresh waters based on good science. The former has had 80 years' involvement in understanding how our freshwater ecosystems work, and in providing the resources – identification guides, training courses, scientific meetings, research facilities – to enhance the expertise of the scientific and management communities. The latter has rapidly established itself as the professional institute of choice for many of those involved in freshwater assessment and management. It was fitting, therefore, that the two organisations should come together to convene a joint meeting on *The Future of Freshwaters*.

This meeting, the idea of Simon James, a member and staunch supporter of both organisations, aimed to put into context the many issues facing our freshwater environments, the legislative framework within which managers must now work, and the research needs for the future. Indeed, these were the three themes around which the two day meeting - held at the University of Warwick on 16-17 September 2009 - was organised.

The meeting could have had a very negative tone – there are many overlapping pressures on fresh waters, the policy context is complex and requires skills that are in short supply, and there are large gaps in our knowledge and in our ability to carry out research. However, the meeting was generally quite upbeat: yes, we have problems, but those involved in freshwater management are addressing these problems and finding solutions.

The first session covered pressures. A general overview of threats to biodiversity by **Stewart Clarke** (Natural England (NE)) was followed by specific consideration of invasive species (**Trevor Renals**, Environment Agency (EA)), abstraction (**Kathryn Tanner**, EA), hydromorphology (**Mike Dunbar**, Centre for Ecology and Hydrology (CEH)), flood risk (**Helen Dangerfield**, Royal

Haskoning), climate change (**Steve Ormerod**, University of Cardiff) and nutrients (**Mike Hutchins**, CEH). Each one of these presenters gave us the problems, but none could resist also providing examples of solutions and suggesting ways forward to address issues in the future. The final two speakers in this opening session – **Martin Janes** (River Restoration Centre) and **Bella Davies** (Wandle Rivers Trust) – both introduced practical approaches for effective management and community involvement at local scales.

The second session covered policy. A series of case studies by **Catherine Duigan** (Countryside Council for Wales), **David Withrington** (NE), **Roger Owen** (Scottish Environment Protection Agency) and **Ken Irvine** (Trinity College – presenting an independent Irish perspective), showed how different regions of Britain and Ireland were approaching the various legislative requirements, and particularly of course the Water Framework Directive, while **Steve Ormerod** ably summarised the UK Government's perspective on ecosystem services and **Brian Moss** (University of Liverpool) gave helpful suggestions for how our approach to environmental management could be improved with a little more vision about possibilities.

The final session, on training needs and science development, considered what is needed, but also what is going on now. **Pam Nolan** (EA) and **Fiona Bowles** (Wessex Water) gave overviews of requirements from the statutory agency and the water company perspective, respectively. **David Bradley** (APEM) and **Elliot Taylor** (Atkins) jointly outlined what the large consultancies can offer, while **Richard Lansdown**, a self employed consultant, gave an indication of the value that a specialist consultant can bring, with a review of aquatic plant monitoring in the UK, and **Richard Chadd** (EA) outlined some of his employer's initiatives to improve the staff skills base. **Angela Gurnell** (Queen Mary University of London) provided an overview of the potential contribution of universities to applied freshwater science. The session concluded with **Bill Brierley** (EA) and myself presenting the idea for a cooperative research partnership for freshwater science, and gathering useful feedback on how this initiative could become really inclusive.

The meeting was attended by over 130 delegates, a large number considering its length and the short notice provided. It clearly filled a need for those involved in management, both statutory agencies and consultancies. It is unfortunate that the academic research community representation was relatively small, but one of the goals of the meeting – to bring these groups closer together - was at least partially met and future meetings of this type can only improve the situation.

A second goal of the meeting was to demonstrate the value of a relationship between the FBA and IEEM. This was cemented on the evening of the first day, by the signing of a Memorandum of Understanding, a declaration of our intention to continue to work together to improve our understanding and stewardship of fresh waters. Our two presidents – Sir Martin Holdgate (FBA) and Professor Steve Ormerod (IEEM) – provided the signatures; committed members will, like Simon James, no doubt come up with the ideas and the drive to ensure our effective future collaboration.



Sir Martin Holdgate (FBA) and Professor Steve Ormerod (IEEM) with the signed Memorandum of Understanding

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2010 Paper Launched in Parliament

Ceri Margerison* and Jason Reeves AIEEM**

*Policy Officer, British Ecological Society

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On Tuesday 27 October 2009, IEEM and the British Ecological Society (BES) joined forces to launch a position paper entitled *Conserving and Managing Biodiversity Beyond 2010* in Portcullis House in London. Several parliamentarians, individuals from the media and over 120 guests from across the environmental spectrum attended the event.

Professor Steve Ormerod, IEEM President and BES member, opened the evening by introducing our two organisations and outlining the 2010 target. He then handed over to **Lord Selborne**, who sponsored the evening and chaired the event. Lord Selborne spoke of the importance of science and professionalism to parliamentarians and policy-makers. **Sarah Robinson**, from the IUCN-UK Committee, gave an overview of the Countdown 2010 initiative. Sarah kindly agreed to step in for **Sebastian Winkler**, Head of Countdown 2010, who was unfortunately called away at the last minute. **Pavan Sukhdev**, study leader of *The Economics of Ecosystems and Biodiversity* (TEEB), spoke about the economic importance, and the enormous public benefit, of biodiversity. Pavan also emphasised the many severe threats to coral reefs and the importance of forests and the REDD (Reduced Emissions from Deforestation and forest Degradation) initiative. **Professor Bob Watson**, Defra's Chief Scientific Advisor, outlined the UK government's many initiatives that are underway to help halt the loss of biodiversity. Bob reiterated the importance of the ecosystem approach and green infrastructure. **Professor Charles Godfray**, BES President, closed the evening by thanking Lord Selborne, the speakers and the audience for making the event a success.

The position paper, which was put together by IEEM and BES members with input from Countdown 2010 and the UK Overseas Territories Conservation Forum, is available to download from www.ieem.net/positionpapers.asp. The Parliamentary Office of Science and Technology was also a great help in the organisation of the evening.

The position paper and subsequent event are another example of our two organisations working well together and we will continue to collaborate wherever feasible to raise the profile of ecology in the future.

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From left to right: Pavan Sukhdev, Bob Watson, Lord Selborne and Sarah Robinson

International Year of Biodiversity 2010

Jason Reeves AIEEM
External Relations Officer, IEEM



The United Nations General Assembly has designated 2010 as the International Year of Biodiversity (IYB). A global target to significantly reduce the rate of loss of biodiversity by 2010 was agreed by nearly 200 countries back in 2002. The next conference of the Convention on Biological Diversity (CBD) in Nagoya, Japan in October 2010 will assess international progress towards this target.

As part of the IYB, the CBD has called for countries around the world to raise the profile of the year by encouraging diverse organisations to engage with the issues and celebrate the importance of biological resources. The CBD is collaborating with key organisations including IUCN, UNEP and UNESCO.

The IYB-UK partnership, which IEEM joined in May 2009, is an informal partnership of many organisations in the UK from diverse sectors who share a common concern to conserve our biodiversity, and who wish to raise awareness and encourage active participation around the issues that affect biodiversity loss. The IYB-UK

secretariat, hosted by the Natural History Museum in London, is now active and working with diverse partners and organisations around the UK and internationally as plans are developed for activities for the year ahead.

At the heart of its plans, the IYB-UK partnership aims to support the three key messages that the CBD believes will support their goal: (1) to raise awareness of how biodiversity is important for human well-being as well as preserving the quality of the environment; (2) to point out that globally, the current rate of biodiversity loss is severe, by some accounts up to 100 times the natural rate of extinction and that we need to work together to halt this loss; and (3) that there are many 'success stories' which point the way to the future.

Through the activities of the network it aims for everyone in the UK to realise that biodiversity is all around us, and that biodiversity and ecosystems are the very foundations of human well-being.

For more information please visit www.iyb-uk.net or e-mail iyb-uk@nhm.ac.uk.

Correspondence: jasonreeves@ieem.net

Institute News

2009 AGM

We have a new President-Elect! At the AGM, **Penny Anderson** was unanimously elected as the next President of IEEM and will take office at the 2010 AGM - congratulations! Penny established her ecological consultancy in 1972, which is now one of the longest established in the country. Penny specialises in habitat creation and management, especially in the upland environment, grasslands, sand dunes and woodland. She has tried to push the boundaries to improve the ecological approach to habitat creation and EclAs over the years. She has a visiting Professorship at the University of Liverpool and regularly contributes to CPD and MSc courses. She tries to set high professional standards with complete integrity at all times.

Robin Buxton was elected as the new Vice President. Robin is a former IEEM Company Secretary and has served on Council, the F&GP Committee and is currently on the External Affairs Committee where he has recently piloted through the process for selecting the 2010 IEEM Medal winner. He has worked in a variety of locations including the Tsavo National park in Kenya, in Parma, Italy and for many years has been involved in the Northmoor Trust in Oxfordshire. He was awarded an MBE for services to nature conservation and the environment in 2006.

Mike Barker and **Richard Graves** were re-elected, as Company Secretary and Treasurer respectively.

Although not the best attended of AGMs of recent years, it was a very positive meeting. There was the report from the **Steve Ormerod**, the President, based on the work of the Committees over the year; from **Jim Thompson**, the Executive Director, on the work of the Secretariat, and from **Richard Graves**, the Treasurer, on the accounts and outturn for last year. All of the reports were very positive and reflected the material already published in the *Annual Review 2008-9*. The accounts had shown a surplus for the last 10 years, bringing the reserves to just over £200,000 or about four months working figures in the event of a catastrophic breakdown in the fortunes of the Institute. The main topic of discussion was the proposal that IEEM should apply to be a Chartered Institute under the name of the Chartered Institute of Ecology and Environmental Management and this was carried by a large majority.

At the AGM there were several further changes to Council. **Eirene Williams**

came to the end of her period as Vice President and it was also the longest time that anyone had served continuously on the Committees, including Chair of the Professional Affairs Committee. IEEM is extremely grateful to her for such outstanding and lengthy service. **Colin Buttery**, **Mieke Muyliaert** and **Jane Southey** also resigned having given much valuable service to IEEM. **Greg Carson**, **Richard Jefferson** and **Tom Keatley** were elected to serve their second terms of three years each. New members of Council elected were **Keith Ross**, Chairman of the Membership Admissions Committee (previously co-opted) and **Steve Pullan** who returns after his mandatory one year break.

Council now comprises: **Steve Ormerod** (President), **Penny Anderson** (President-Elect), **Robin Buxton** (Vice President), **Mike Barker** (Company Secretary), **Richard Graves** (Treasurer), **Greg Carson**, **Mick Hall**, **Richard Jefferson**, **Tom Keatley**, **Cathy Mordaunt**, **Jenny Neff**, **Pam Nolan**, **Steve Pullan**, **Paul Rooney**, **Keith Ross** and **Andy Tasker**.

IEEM Charter

As the AGM approved the proposal by a large majority, work will now begin in earnest. The first stage is to circulate bodies with which we have dealings with notice of our intention. The next stage is consideration in principle by the Privy Council. After that the petition itself will need to be prepared which will lay out our new Constitution – not necessarily much different in content from our current Memorandum and Articles but couched in appropriate language. Progress reports will appear in future editions of *In Practice*.

New Fellow

Council at its meeting in October 2009 awarded a fellowship to **Debbie Bartlett** - congratulations! Debbie's contribution to professional environmental management covers a broad front, from her various roles as independent consultant, facilitator for community involvement, local authority officer and university teacher. One of her greatest strengths is as an organiser and facilitator for various community-led projects both with schools and adults in urban and environmental groups. She has a significant number of publications in a variety of sources, often at the interface between landscape and conservation. She has been a member of IEEM since 1994, is a member of the External Affairs Committee and sits on the Ecological Skills Gap Project Steering Group.

Obituary

It is with deepest regret that IEEM has learned that **Dr Warren Cresswell CEnv MIEEM** suddenly passed away on Friday 20 November 2009. He was a founder member of IEEM and one of its most stalwart supporters and actively promoted membership of IEEM to many of his staff.

Warren was a leading light in UK ecology and a co-founder with his wife, Stephanie Wray CEnv FIEEM, of Cresswell Associates (Hyder's Ecology business in the UK). His unrivalled knowledge and expertise were instrumental in transforming the discipline of ecology into a recognised and respected profession. Whilst a nationally recognised expert in badgers and other mammals, he was one of the best all round ecologists in the UK, and played a pivotal role, with Stephanie, in developing best practice and shaping Cresswell Associates into the renowned ecological consultancy that it is today.

This has come as a great shock to all who knew him, and our thoughts at this time are with his wife, Stephanie, and children, Natasha and William.

Committee Members Needed

The Membership Admissions Committee is seeking new members to review applications. If you are a Full member and interested in volunteering on the Committee please contact Anna Thompson (annathompson@ieem.net).

Staff Changes

Tanya Waring has joined us on a temporary contract working two days a week as Research Assistant (Student Resources) and we shall soon see an improvement in the student section of the website. She has a PhD in the effects of environmental oestrogens on the shore crab. She divides her week between IEEM, the University of Portsmouth and Atkins. Where spare time allows, she enjoys photography, travel and music.

Mimoza Hember will shortly be leaving the Institute after 18 months in which she has made a real contribution to the marketing, awards and ceremonial side of IEEM and also a notable improvement in the consistency of our house style and presentations. Her contribution is much appreciated and we wish her well for the future.

Irish Section News

East Coast Nature Reserve Field Trip

On 2 October 2009, members were led on a guided walk around the East Coast Nature Reserve near Newcastle, Co. Wicklow, by **Jerry Wray** and **Tom Curtis**. They described how, since acquiring the land, BirdWatch Ireland has been hard at work reinstating the habitats of the reserve which include birch and alder woodland, wet grasslands and calcareous fen.

Prior to purchase by BirdWatch Ireland, the grassland was used for intensive sheep and cattle grazing, with deep drains cut across the land, and botanical diversity was low. The fen was in a degraded state; drains and a plantation of conifers were drying the fen out and creating ideal conditions for the spread of willow trees from neighbouring woodland. The restoration work has focussed on restoring the fen habitat in order to provide ideal conditions for the threatened water bird species which frequent the site - Greenland white-fronted goose, whooper swan, kingfisher and little egret.

Jerry described water management practices on the reserve which have involved raising the water table and controlling water levels through the installation of sluices. Areas of open water or 'scrapes' have been created and have been successful in attracting water birds. We visited one of the bird hides to get an overview of the fen and scrape habitats, before embarking on a walk through the reedbed and wet grassland habitat, along the coastal track and back through the scrub and woodland, stopping to see the Kerry bog ponies. These 'extrovert' ponies were introduced to the reserve by Birdwatch Ireland, in partnership with Genetic

Heritage Ireland. In the fen, low intensity grazing by this hardy breed, which is well suited to soft wet conditions, helps control encroaching scrub and encourage specialised fen plants.

Thanks to Jerry and Tom for an enjoyable afternoon, if any other members are interested in visiting the reserve, directions and further information can be found on the reserves webpage on www.birdwatchireland.ie.

Irish Section AGM

The AGM followed the field trip back at the Glen of the Downs Hotel. **Linda Yost** coordinated the necessary IEEM business, which saw the departure of Convenor **Mieke Muylaert** and long-standing Committee members **Karl Partridge** and **Faith Wilson**. Mieke, Karl and Faith played a fundamental part in establishing the IEEM Irish Section, investing huge time and effort on a voluntary basis for a number of years, and on behalf of all members I would like to say a big thank you to them for all their work.

The new Committee includes myself as Convenor, **Jo Denyer** as Treasurer, and **Paul Scott, Anne Murray, Orla Maguire, George Smith, Aisling Walsh** and **Suzanne Lowry**. There is room for more if anyone is interested in getting involved. We would particularly like a representative from the south and west of the country!

Upcoming Events

The Irish members' survey highlighted the need for more events and training courses for Irish members. There are a number of events currently in the pipeline which will be advertised to members via the Section webpage

and e-mail. Workshops currently being planned will not make it into the IEEM Professional Development Programme booklet for 2010, but fear not, we do intend to run some, subject to trainers coming forward, suitable venues being found, and of course interest amongst members. The IEEM Annual Conference will also be held in Dublin in November 2010.

Once again we would like to appeal for contributions to the coming year's events programme. This could include evening presentations, field events or training workshops. Workshop providers are paid by the IEEM. Please contact me at kharrington@golder.com for more information.

*Kate Harrington MIEEM
Convenor, Irish Geographic
Section*



Kerry bog ponies

South East England Section News

South East England Shadow Section Conference

The South East England Shadow Section will be holding a conference entitled *Great Crested Newts - An Approach for the Future? (Licensing and Mitigation in the South East of England)* on 5 March 2010 (10 am - 4 pm) at Cockcroft Hall, Brighton University, Lewes Road, Brighton.

The conference will focus on great crested newt conservation, specifically through the licensing process, i.e. how can we best use the legal protection currently in place to maximise conservation gain for great crested newts (and for a wider range of species and habitats).

There will be advice from Natural England on the licensing process, and details of case studies illustrating good examples of biodiversity conservation.

The conference will be led by the IEEM South East England Shadow Section in collaboration with Brighton University, and will include talks by speakers presenting a range of perspectives on this issue, including Natural England's Wildlife Management Licensing Unit, NGOs and consultancies.

There will also be a workshop session which will aim to find ways to better resolve specific issues experienced by practitioners in this field.

The attendance fee is still to be confirmed, but please note that booking will be essential.

Further details will be posted on the IEEM website shortly - www.ieem.net/sesection.asp.

Scottish Section News

Scottish Section Annual Conference 2009

Species Reintroductions: Philosophy, Issues and Implications

8 October 2009, Cairnbaan Hotel, Cairnbaan, by Lochgilphead

This year something that has roused a lot of attention in the Scottish press and environmental circles is the exciting and somewhat controversial reintroduction of the European beaver to Scotland. This topic therefore seemed a natural choice for the Scottish Section Annual Conference and what better a venue than the Cairnbaan Hotel, close to the beaver release site in Knapdale Forest near Lochgilphead, Argyll. Around 40 delegates attended the event on a glorious autumnal day in October 2009.

During the morning session we heard from four speakers, each explaining a particular case study of reintroductions in Scotland. **Dave Batty** of Scottish Natural Heritage (SNH) gave an extremely interesting overview of the 'Scottish Beaver Trial', as this project is known. He explained that following extensive research, a licence application for beaver release was submitted to Scottish Ministers in 2002, but was refused in 2005. Following the launch of the Government's Species Action Framework, a second application was submitted in 2007 and approved in 2008. Three beaver families, brought over from Norway were released on 28 May 2009. The Scottish Beaver Trial is a five-year scientific project set up to monitor the beavers and the effects of the beavers. The trial is being run by the Scottish Wildlife Trust and the Royal Zoological Society of Scotland; the Forestry Commission Scotland is the land owner and SNH and partners are the independent monitoring body. A number of research projects are being undertaken as part of the trial including beaver-fish interaction and woodland management. Monitoring will finish in 2014 and SNH will then be submitting a report to the Scottish Government. The findings of the report will then be considered by the Scottish Government to determine the next steps, which could mean that the reintroduction can continue; that further specific trials are required in different environments; or that the reintroduction is not to continue and the beavers need to be removed.

From fur to feathers as **Richard Evans**, of the Royal Society for the Protection of Birds, gave an overview of the more established reintroduction of sea eagles (also known as white-tailed eagles) in western Scotland. Sea eagles were once a familiar sight throughout Britain, but following habitat loss and persecution, the last birds were lost from Shetland in 1916. In 1959 and 1968 attempts were made to reintroduce the sea eagle to Scotland but they did not involve sufficient numbers of birds, or continue long enough to guarantee success. In 1975, the Nature Conservancy Council (now SNH) instigated a longer term reintroduction project and up to 1985, a total of 82 eaglets were imported under special licence from Norway. A second release in Wester Ross was undertaken in the mid-90s, which boosted the population. Research has shown that the wild bird survival rate is better than for released birds. The West Scotland population is now secure, with over 40 breeding pairs. A reintroduction programme is now underway on the east coast.

Heather McHaffie, of the Royal Botanic Garden Edinburgh (RBGE), explained the less well known issues associated with plant reintroductions. It is a subject that can be controversial as reintroducing plants can be seen as interfering with 'nature', it is not always successful and is often undertaken very secretly to protect the plants from the interested public. It can however

be appropriate, for example if previous heavy collecting was the cause for the original decline and only small, fragmented populations remain. It is likely to be most successful where the habitat is still similar to before the plant was lost and where good sources of genetically variable plants are available. RBGE is helping work towards achieving Target 8 of the Global Strategy for Plant Conservation which aims to establish *ex situ* conservation collections of 60% of Endangered or Vulnerable species.

The final talk of the morning was given by **Rose Hanley-Nickolls**, a PhD student at the Scottish Agricultural College, entitled *The Human Face of Reintroductions*. Rose explained the socio-economic issues surrounding species reintroductions and the importance of considering these issues prior to any such project, because they can be the key to success or failure. Through examples of successful and failed reintroductions around the world, Rose gave some food for thought on the potential socio-economic impacts of the reintroductions of beaver to the UK.

Following lunch and the Scottish Section AGM, we were all lucky enough to be given a tour of the beaver release site in Knapdale Forest by **Dave Batty** and **Martin Gaywood** of SNH. We were all surprised and excited to see such obvious signs of beaver. Walking through the woodland, there was no doubt what had felled several birch trees.

We were also amazed by the substantial dam created by one family of beavers; it was quite a structure, almost human in its engineering and clearly had the desired effect as it has flooded an area of woodland creating a new standing water body. With beaver being mainly nocturnal we were not expecting to see them; however, those that patiently stayed late were lucky enough to see one swim past the viewing platform that evening. Whatever your view of the release, we highly recommend a visit to Knapdale and possibly the beginning of one of the most significant changes to Scotland's ecology in recent years.

For more information on the Scottish Beaver Trial, visit www.scottishbeavers.org.uk. For further information on the monitoring of the trial please see SNH's website www.snh.org.uk/scottishbeavertrial.

All of the speakers' talks are available on the IEEM website at www.ieem.net.

Sally Olds MIEEM
Convenor, Scottish Geographic Section



A beaver dam at the beaver release site in Knapdale Forest

Scottish Section News

Helping the Scottish Government with their consultation on the 'WANE' Bill

Scottish Section members made a useful contribution to the consultation process for the Wildlife and Natural Environment (WANE) Bill by way of an innovative evening seminar.

Wildlife and Natural Environment (WANE) Bill

Scotland has a rich and varied natural heritage and some elements of the current legislative framework to protect this have not been updated for a considerable period of time and in others there are recognised weaknesses in how the legislation currently operates. In order to address this, the Scottish Government launched the Bill consultation in June 2009. The Bill was drafted with a view to reforming a number of areas of existing wildlife and natural environment legislation. It covers:

- the management of wild deer;
- the operation of the game laws;
- invasive non-native species; and
- the administration of licences to disturb animal, bird and plant species.

The consultation process was intended to inform the development of a Wildlife and Natural Environment Bill, which will support sustainable economic activity, especially in the countryside, by ensuring that wildlife and natural environmental legislation is efficient, effective and proportionate.

Background

Following the Government's request for feedback on the proposed Bill, the Scottish Section Committee decided that it was about time that Scottish members became involved in the consultation process. The Committee recognised that requesting individual thoughts on a lengthy legislative document is not usually very effective in gathering members' views. It was therefore decided that to generate more interest, to raise the profile of IEEM and to help more members get involved in the consultation process, an evening seminar would be the most effective way for members to discuss the Bill. The aim was to capture thoughts and ideas from members during the evening and for these to form the basis of the IEEM collective consultation response. Given the time restrictions, the seminar was focussed on four aspects of the Bill thought to be of most interest and for

which it was thought that members could contribute their collective knowledge most usefully. These included:

- invasive non-native species;
- species licensing;
- muirburn; and
- SSSIs.

Steven MacGregor, the lead of the Scottish Government WANE Bill team fully supported the evening seminar consultation concept and was instrumental in helping arrange the event including providing speakers on the various elements to be discussed.

Seminar

The seminar was held on the evening of 19 August 2009 at the Scottish Government's Victoria Quay Building, Edinburgh. Steven MacGregor and Thekla Garland of the Scottish Government introduced the Bill. The four elements of the Bill to be the focus of the seminar were outlined by the lead members of the Scottish Government Bill team, including Angela Robinson for invasive non-native species, David Laing for species licensing, Steven MacGregor for muirburn and Steven Dora for SSSIs.

Members then split into groups to brainstorm on one of the four elements of the Bill. Discussion on aspects of the Bill that were good, bad or needed improvement was made and questions listed within the Bill were answered where possible.

Seminar Conclusions

Key points raised for each element included:

Invasive Non-Native Species (INNS)

- Members felt the issue of INNS is a really important topic and one that needs addressing. The proposals within the Bill seem to address most of the key INNS issues.

Species Licensing

- Members agreed that the current licensing system is good and that any change in the licensing system must be a further improvement.

Muirburn

- In general members felt that until the benefits of extending the season are investigated through licensed burns, there is not a compelling reason to extend the whole season.

SSSIs

- IEEM members agree that the concept of Restoration Notices as a 'midway

point' between non-action and prosecution in principal. Members also consider that the process of Restoration Notices will formalise the current informal system used by SNH.

Overall, members provided valuable input into each aspect of the Bill discussed. A formal response to the consultation has been submitted and is available in the members' section of the website.

Members felt that there were many good proposed legislation changes within the Bill and hoped that these would be taken through to Parliament. Members also hoped that the recommendations given during the seminar and responses to the Bill's question document would be taken on board and used to improve the Bill further.

However, members did feel that the proposed legislation changes could have gone further, although it was understood that such changes might have proved difficult in getting approval through Parliament.

Outcome

The Government team expressed their thanks for IEEM's input into the evening and its value in the consultation process in actually reaching out to practitioners likely to be directly affected by the legislation. Furthermore, due to the usefulness of the seminar to the Government, IEEM were asked if they would be keen to have a representative present at the stakeholder forum.

The consultation process for the Bill has now ended and, by the 4 September 2009 deadline, 470 consultation responses had been received. The stakeholder forum (at which IEEM was present) to discuss the prospective bill and consultation responses was held on 17 November 2009. Alex Salmond (the Scottish First Minister) has introduced the Bill to the legislative programme for the 2009-2010 parliamentary session. This is an exciting climax to the legislative process and one for which IEEM has provided a valuable contribution with the help of fantastic input from Scottish Section members.

*Duncan Lang MIEEM
Committee Member, Scottish
Geographic Section*

Partnership News

Society for the Environment

We reported in the last *In Practice* that John Carstensen had been appointed as the new CEO for SocEnv. This is welcome news and he has been getting to terms with the organisation and starting to take it forward. He visited IEEM in September 2009 to get an insight into how we work. The most recent SocEnv event was the dinner held in London at which Dr Paul Leinster, Chief Executive of the Environment Agency, was the speaker, giving some very astute observations on how SocEnv is perceived and on the need to give better recognition to environmental professionals. This was followed by a very positive away-day attended by Eirene Williams and Jim Thompson at which the various options open to progress SocEnv were discussed. The focus was on how SocEnv could demonstrate value to Chartered Environmentalists without duplicating the work of the Constituent Bodies. There was a general feeling that the activities of SocEnv were not as well known to the Chartered Environmentalists as they might be and that the Constituent Bodies had a role in the dissemination of information. Top of the list of easily do-able actions was direct communication with Chartered Environmentalists followed by measures to raise the profile. For instance did you know SocEnv had produced a position statement on climate change in time for the Copenhagen conference and John Carstensen who comes from Denmark will be attending the meeting? Those Chartered Environmentalists through IEEM are recommended to visit the SocEnv website on a regular basis as you will find there are increasingly more activities to report.

www.socenv.org.uk

European Federation of Associations of Environmental Professionals

The second EFAEP General Assembly of the year was held in London on Thursday 17 and Friday 18 September 2009 and was organised by the four UK member associations. The General Assembly opened on the Thursday morning with a side-event on the London Olympics 2012. Three excellent speakers gave talks on different environmental issues relating to London hosting the games. Mike Sinclair-Williams, from the Olympic Delivery Authority, presented the issues relating to transport sustainability and the environment. Rob McCarthy, from the Environment Agency, spoke about how biodiversity is being protected and enhanced by the games. Richard Jackson, also from the Olympic Delivery Authority, finished off the morning by addressing the carbon, energy and waste issues relating to the London 2012 Olympics.

On Thursday afternoon there was a Secretariats Meeting. This was facilitated by Annette Hendlinger (VNU, Germany), with help from Mario Grosso (AIAT, Italy). The main topics of discussion at the meeting were communication issues, the ENEP database, and what EFAEP should actually be doing for its members, which was continued at the General Assembly.

The General Assembly itself was held on the Friday. The main items on the agenda were the new offices at Mundo-B in Brussels, issues relating to the Working Groups, a proposed new vision for EFAEP, the 2010 budget, and the Executive Committee elections. Regarding the Executive Committee elections, Jan Karel Mak (VVM, Netherlands) and Jim Thompson (IEEM, UK) were both re-elected, as President and Treasurer respectively, and Bruno Weinzaepfel (AFITE,

France) and Kristof De Smet (VMD, Belgium) were elected as new Vice-Presidents. Mario Grosso's position of General Secretary was not up for election. Matthias Friebe (VNU, Germany) and Dominique Bernard (AFITE, France) both stepped down as Vice-Presidents and were thanked for their input over the years.

For more information on the General Assembly, or EFAEP generally, please visit the website.

www.efaep.org / www.environmentalprofessionals.eu

2nd European Congress of Conservation Biology

One of the purposes of IEEM is to try to promote the case for ecological professionalism in the workplace to ecological and related audiences and where this role may not always be appreciated. The Congress was held in Prague and there was an excellent attendance of around 1,200 delegates. IEEM had a stand jointly with EFAEP, which attracted much interest. The programme itself understandably focussed on the many specific aspects of conservation and specific habitats across Europe and beyond as was abundantly illustrated in the excellent poster display. However, there was a real attempt to place such work in a professional context in the plenary sessions by Ladislav Miko, Joan Martinez-Alier and Bill Sutherland. The oral presentation sessions by Andrew Pullin (ECCB) and Jason Reeves (IEEM) taking up this theme were both better attended than might earlier have been the case, and in fact considerably better than at the IUCN Congress in Barcelona with its attendance of 9,000. However, the concept of a professional ecologist or environmental manager is still not readily accepted in Central and Eastern Europe where the need is vital and, although progress was made, much work remains to be done.

www.eccb2009.org

Europarc Federation

IEEM is a member of the Europarc Federation and attendance at the annual meeting always produces an interesting combination of plenary sessions, workshops and excursions. When its Parliament passed a law in 1909, Sweden became the first country in Europe to create National Parks and nine were established that same year. It was thus highly appropriate that the meeting was held in Sweden not just to celebrate the centenary but also the opening of their first Marine National Park - Kosterhavets. The IEEM conference in Thetford has just celebrated the creation of the ninth National Park in England, the South Downs National Park, and the passing of the Marine Bill which will pave the way for Marine National parks so we are just a little behind! Not only is Kosterhavets a marine park it is also transboundary (jointly with Norway) and seemingly it had a good measure of enthusiasm from the local communities. The opening ceremonies in both countries were attended by the King of Sweden and the Crown Prince of Norway and with much ceremony. IEEM had a poster on display, contributed to the workshops and it was a very useful networking opportunity. We were also able to cement some of the arrangements for the key speakers at the Parliamentary event on biodiversity post-2010 (reported on page 43) and the IEEM conference on Protected Areas.

www.europarc.org

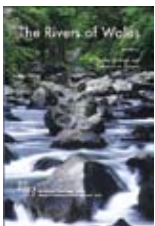
Recent Publications



Flowers of the Forest: People and Plants in the New Forest National Park

Author: Clive Chatters
Available from: www.wildguides.co.uk
Price: £22.50 (special offer including P&P, quote 'IPFlowers')
ISBN-13: 9781903657195

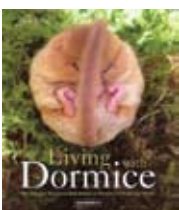
This book is a beautifully illustrated exploration of the botanical richness and cultural heritage of the New Forest National Park. The New Forest has become an exceptional area for wildflowers, many of which were once common throughout the lowlands of Britain. This is because it retains a living tradition of free-ranging domestic animals grazing its coastland, extensive commons and village greens. This book shows how the wildlife of the Forest is the natural expression of the lives and economy of the people of the Forest and features: an introduction to the New Forest and how its commoning economy works; a description of the principal habitats of the Forest and how they relate to one another; accounts of the people who have explored the Forest for wildflowers from the early 17th century to the present day; descriptions of over 100 species of flowering plants and ferns currently known from the National Park which are nationally or internationally rare, scarce or threatened; and a personal account of Forest conservation issues covering participation in the life of the Forest for over 20 years. The book was project managed and co-edited by our very own Jill Sutcliffe.



The Rivers of Wales

Editors: D Dudley Williams and Catherine A Duigan
Available from: www.nhbs.com
Price: £177.00
ISBN-13: 9783823615613

Situated on the western margin of Europe, Wales has been moulded by the erosional and depositional power of its fresh waters. The result is a still evolving landscape of bogs, springs, streams, rivers, lakes and estuaries. The chapters of this publication bring together the combined expertise of a group of scientists whose intimate and collective knowledge of the Welsh aquatic landscape is unparalleled. The publication covers a description of the current knowledge base, reviews the pioneering role of Welsh river studies in the development of running water science, assesses the high degree of human alteration of the principality's riverine ecosystems, and discusses the need for further scientific study, management, conservation, restoration and education. The book is data-rich, very well illustrated, contains an extensive bibliography and has contributions from several IEEEM members.



Living with Dormice

Author: Sue Eden
Available from: www.papadakis.net
Price: £14.99
ISBN-13: 9781901092790

The dormouse is one of the least seen but most loved of British mammals, however they are difficult animals to study because they are so elusive. They have always been portrayed as rare animals with specialised food requirements found only in large ancient woodlands, but this book argues that dormice: are not specialist animals restricted to specific habitats; do not have exacting habitat requirements; are exceptionally versatile and resourceful; and are widespread in England in all arboreal habitats. The publication is a good overview and is superbly illustrated.



Grasses of the British Isles – BSBI Handbook No.13

Authors: Tom Cope and Alan Gray
Available from: www.nhbs.com
Price: £19.99
ISBN-13: 9780901158413

It is now over 50 years since the grasses of the British Isles were last subject to a book of their own (Hubbard 1954, revised 1968 and 1984). Changes have since occurred regarding the taxonomy of the families to justify a new BSBI Handbook. The book attempts to bridge the gap between the taxonomy of the 1980s and new molecular phylogenies that are currently being explored so that what is being offered is something that users will feel comfortable with but which hints at changes that may occur in the near future. The species descriptions have been kept as brief as possible and are supported by keys to, and detailed descriptions of, tribes and genera, a move that has allowed expansion in other sections of the text. These keys are arranged by tribes and then genus allowing the user to check the specimen against a tribal description before moving on to genus and then on to a species. The book contains descriptions of 15 tribes, 67 genera and 220 species and the information includes description, distribution, habitat and additional information as well as plates illustrating the different species.



Communication Skills for Conservation Professionals

Author: Susan K Jacobson
Available from: www.nhbs.com
Price: £18.99
ISBN-13: 9781559635097

Without good communication, even the best conservation and resource management programmes are liable to fail. This book, in its second edition, provides guidance on achieving conservation goals through better communications. It introduces communication approaches - including marketing and mass media, citizen participation, public information, environmental interpretation, and conservation education activities - and offers several real-world examples and straightforward advice that will help conservationists develop effective communication skills. It offers a much needed contribution to the environmental literature and, although aimed at a North American audience, has global relevance.



Ecology of Fragmented Landscapes

Author: Sharon K Collinge
Available from: www.nhbs.com
Price: £36.50
ISBN-13: 9780801891380

From the air the world is often described as a fragmented landscape: a patchwork of desert, woodlands, farmlands, and urban areas. Whether the result of naturally occurring environmental changes or the product of human development, fractured lands significantly impact the planet's biological diversity. This book defines fragmentation, explains its various causes, and suggests ways that we can put our lands back together. Researchers have been studying the ecological effects of dismantling nature for decades and this book evaluates this body of research, synthesising all that is known about the ecology of fragmented landscapes. Expanding on the traditional coverage of this topic, it also discusses disease ecology, restoration, conservation, and planning. The book is useful reading for ecologists, conservation biologists, and students alike.

In the Journals

Jim Thompson CEnv MIEEM and Jason Reeves AIEEM

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British Ecological Society

J Balbontin *et al.*

Individual responses in spring arrival date to ecological conditions during winter and migration in a migratory bird
Journal of Animal Ecology 2009, **78**: 981-989

The authors studied lifetime arrival patterns in the barn swallow *Hirundo rustica* in relation to variation in ecological conditions in the Sub-Saharan winter quarters and at stopover sites in North Africa. They found an advance in the arrival date when ecological conditions improve in stopover areas and a delay in the arrival date when ecological conditions improve in the winter quarters.

They also investigated sex and age of barn swallows as sources of variation in the arrival time with respect to conditions experienced in winter and stopover areas. They found that earlier arrival at the breeding grounds due to prevailing ecological conditions found en route in North Africa was similar for males and females of all age-classes. In contrast, individuals tended to delay departure when ecological conditions improved in the winter quarters, but this delay differed among age classes, with old individuals delaying departure more than middle-aged and yearling birds.

The migratory response of individuals to changing climatic conditions experienced during different parts of their life provides evidence for individuals responding differently to prevailing conditions in the winter quarters depending on their age, but not to conditions experienced en route during spring migration.

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A Millon *et al.*

Predator-prey relationships in a changing environment: the case of the sparrowhawk and its avian prey community in a rural area

Journal of Animal Ecology 2009, **78**: 1086-1095

The authors analysed the dynamics of a generalist predator, the European sparrowhawk *Accipiter nisus*, in a rural area of northern Denmark. Over a 20-year period, the diet of the predator was assessed (>30,000 identified prey items) and quantitative information about its avian prey community, based on standard breeding bird surveys, revealed significant trends for several passerine species, although the overall prey biomass available remained stable.

The growth rate of the sparrowhawk breeding population was negatively related to the previous sparrowhawk density and to winter temperature, but was positively related to available prey biomass. Contrary to expectations for a generalist predator, sparrowhawks seemed to be predominantly sensitive to changes in the cumulative abundance of their two main prey species, the skylark *Alauda arvensis* and the blackbird *Turdus merula*, but less so to changes in the wider prey community. High blackbird abundance, maintaining sparrowhawks at a relatively high density may result in greater competition with song thrushes and to their decline.

In demographic terms, the two-phase sparrowhawk dynamic recorded here (a recovery following an initial decrease) was mainly driven by recruitment of yearling females into the breeding population rather than by variation in the apparent survival of breeding females.

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F A Collier and M I Bidartondo

Waiting for fungi: the ectomycorrhizal invasion of lowland heathlands

Journal of Ecology 2009, **97**: 950-963

In England, the loss of lowland heathland is primarily due to the invasion of birch and pine. In lowland heathlands, the resident dwarf

shrubs form ericoid mycorrhizas whereas invading trees form ectomycorrhizas. This study examined how fungi form mycorrhizas with *Betula* and *Pinus* in lowland heathlands. The authors addressed the question of whether there are mycorrhizal fungi that mediate invasion by comparing the mycorrhizal inoculum potential of soil at three levels of invasion (uninvaded heathland, invaded heathland and woodland) and the fungi forming mycorrhizas on tree seedlings and trees across diverse sites.

They showed that in lowland heathlands seedlings have severely limited access to ectomycorrhizal fungi relative to woodlands; there are few keystone spore-dispersed ectomycorrhizal fungi that can mediate tree invasion; tree seedlings can remain non-mycorrhizal for at least one year when no inoculum is present and mycorrhizal seedlings achieve greater biomass than non-mycorrhizal seedlings. Overall, ectomycorrhizal inoculum in lowland heathlands is rare; most tree seedlings growing in heathland soil are not mycorrhizal due to limited spore dispersal, poorly developed spore banks and weak common mycorrhizal networks.

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I Feeser and M O'Connell

Fresh insights into long-term changes in flora, vegetation, land use and soil erosion in the karstic environment of the Burren, western Ireland

Journal of Ecology 2009, **97**: 1083-1100

The study focuses on species-rich, upland, healthy vegetation with arctic-alpine floristic affinities and *Sesleria* grasslands in the Burren. The investigation aimed at reconstructing the long-term development of these high conservation-value communities and the role of farming in their formation and long-term survival.

The methods used included pollen analysis and ¹⁴C-dating of short monoliths and investigation of grykes (fissures in karstic limestone) for evidence of soil erosion. Special attention was paid to fossil, coprophilous fungal spores as indicators of local grazing. Open pine woodland characterized the Capanawalla uplands between c.1500 BC and 500 BC and it is proposed that such woodlands provided a suitable environment for the present-day, open heath vegetation with species such as *Dryas octopetala*, *Arctostaphylos uva-ursi*, *Geranium sanguineum* and *Empetrum nigrum*.

Burning of vegetation as a management tool was important in the uplands over most of the last two millennia. This seems to have ceased with the onset of more intensive grazing regimes in the 18th century.

The upland Burren supported mainly plagioclimax *Corylus*-dominated woody vegetation and grasslands from c.1500 BC (beginning of present record), until possibly as late as the 17th century AD. In the uplands of the north-western Burren, open, species-rich pinewoods with hazel dominated. The northern Arctic elements in the present-day upland flora survived clearances, involving initially *Pinus sylvestris* (c.500 BC) and subsequently *Corylus avellana* (c.1600 AD).

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The *Journal of Applied Ecology* **46** (5) has three papers on the hen harrier-red grouse conflict that *In Practice* readers may be interested in:

P S Thompson *et al.*

Resolving the conflict between driven-grouse shooting and conservation of hen harriers

Journal of Applied Ecology 2009, **46**: 950-954

N Sotherton, S Tapper and A Smith

Hen harriers and red grouse: economic aspects of red grouse shooting and the implications for moorland conservation

Journal of Applied Ecology 2009, **46**: 955-960

S Redpath and S Thirgood

Hen harriers and red grouse: moving towards consensus?

Journal of Applied Ecology 2009, **46**: 961-963

J A Hodgson et al.

Climate change, connectivity and conservation decision making: back to basics

Journal of Applied Ecology 2009, **46**: 964-969

The authors argue that the importance of connectivity in the context of protected areas and climate change is being overemphasized.

Before investing in connectivity projects, conservation practitioners should analyse the benefits expected to arise from increasing connectivity and compare them with alternative investments such as maintaining and increasing the area of high quality habitats, prioritising areas that have high environmental heterogeneity and controlling other anthropogenic threatening processes.

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A S Pullin, T M Knight and A R Watkinson

Linking reductionist science and holistic policy using systematic reviews: unpacking environmental policy questions to construct an evidence-based framework

Journal of Applied Ecology 2009, **46**: 970-975

The increasing emphasis on evidence to shape environmental management and practice is to be welcomed and IEEEM members have been encouraged to contribute to this pool of knowledge through their practical experiences. The authors investigated the approaches to building policy in the health services as a model to help establish a framework in applied ecology and environmental management by which reductionist science can underpin decision making at the policy level.

A comparison of policy documents in the health and environmental sectors revealed many similarities in identifying approaches and specific interventions that might achieve policy objectives. The difference is that in the health services, information on the effectiveness of potential interventions is far more readily available through the collaborative process of systematic review.

Decision makers are increasingly looking to produce policies that are shaped by evidence through evidence-based policy making. The approach outlined provides a framework for structuring systematic reviews to deliver the evidence on key policy issues in a way that will see a faster return and provide better use of the systematic review methodology in environmental management.

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F Marucco et al.

Wolf survival and population trend using non-invasive capture-recapture techniques in the Western Alps

Journal of Applied Ecology 2009, **46**: 1003-1010

Reliable estimates of population parameters are often necessary for conservation management but these are hard to obtain for elusive, rare and wide-ranging species such as wolves *Canis lupus*. This species has naturally recolonised parts of its former habitat in Western Europe; however, an accurate and cost-effective method to assess population trend and survival has not been implemented yet.

The authors used open-model capture-recapture (CR) sampling with non-invasive individual identifications derived from faecal genotyping to estimate survival and trend in abundance for wolves in the Western Alps between 1999 and 2006. Young wolves had lower apparent annual survival rates than adult wolves and survival rates were lower in the summer than in the winter for both young and adults. The population in the study area increased from 21 wolves in 1999 to 47 wolves in late winter 2005 and the population growth rate was lower

than that recorded for other recolonising wolf populations.

These are the first such estimates for wolves in Italy and in the Alps and have important management implications. This approach can be widely applied to broader spatial and temporal scales for other elusive and wide-ranging species in Europe and elsewhere.

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G M Davies et al.

Rate of spread of fires in *Calluna vulgaris*-dominated moorlands

Journal of Applied Ecology 2009, **46**: 1054-1063

Calluna-dominated heaths occur throughout Europe but are in decline across their range. There is growing interest in using prescribed burning for their management. Understanding fire behaviour is vital but currently no robust models exist to inform management.

Shrub fuels display complex fire behaviour. This is particularly true in UK moorlands which are unusual in their fuel structure and moisture regime, being dominated by live fuel and an oceanic climate.

The authors burnt 27 experimental fires in the Scottish uplands using a replicated experimental design. They estimated a range of prefire fuel characteristics, including heterogeneity in fuel structure and recorded wind speed and direction and estimated rate of spread.

Fuel structure and heterogeneity, wind speed and canopy fuel moisture content were strongly related to variation in fire behaviour.

Careful use of fire for moorland management increases habitat diversity and creates fire-safe landscapes. Escaped fires burn large areas, homogenize landscapes and have severe impacts on ecosystem services. Models can be used to assess fire hazard prior to prescribed burning and to choose fuels that can be burnt safely under prevailing or forecast conditions.

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C Damgaard and C Kjaer

Competitive interactions and the effect of herbivory on *Bt-Brassica napus*, *Brassica rapa* and *Lolium perenne*

Journal of Applied Ecology 2009, **46**: 1073-1079

The probability of a transgenic crop establishing a feral population outside cultivated areas and possibly outcompeting naturally occurring species needs to be assessed to make an ecological risk assessment of the transgenic crop.

The interaction between herbivory and competition is thought to determine the ecological success of insect-resistant plants, and this interaction was investigated in a competition experiment with transgenic insect-resistant *Bt-Brassica napus*, *Brassica rapa*, *Lolium perenne*, and herbivory from the large white butterfly *Pieris brassicae*.

Herbivory had a negative effect on the biomass of *B. rapa* at high plant densities. The competitive ability of *L. perenne*, when growing with *B. rapa*, increased significantly with the level of herbivory on *B. rapa*.

To predict the effect of herbivory in a natural ecosystem, plant competition between the two annual *Brassica* species was analysed in a population ecological model. It was concluded that it is probable that transgenic *Bt-B. napus* plants may invade a natural habitat if herbivory is sufficiently high and the habitat is suitable for *B. napus*.

The results indicate that it is important to study the interaction between herbivory and competition when assessing the ecological risk of insect-resistant genetically modified crops. Furthermore, combining ecological data from manipulated experiments with population ecological modelling is a fruitful approach when conducting environmental risk assessments.

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N Exeler, A Kratochwil and A Hochkirch

Restoration of riverine inland sand dune complexes: implications for the conservation of wild bees

Journal of Applied Ecology 2009, **46**: 1097-1195

Inland sand dunes and dry, oligotrophic grasslands have become rare habitat types in large parts of Central Europe and their restoration and management is of major importance for the preservation of many endangered plant and insect species. Within such habitats, it is important to restore key ecosystem services, such as pollination networks. As wild bees are the most important pollinators in many ecosystems, they represent a suitable key group to evaluate restoration measures.

The authors studied the succession of bee communities in response to restoration of sand dunes and sand grasslands from previous agricultural use and compared these communities with those of old sand dune complexes.

The results show that wild bees responded rapidly to restoration measures indicated by a high species richness and abundance. The community structure of bees at restoration sites converged only slightly to those of the old sand dune complexes. Environmental factors such as the number of entomophilous plant species and moisture had a strong influence on wild bee species composition.

The restoration of inland sand dune complexes provides opportunities for colonization by a diverse wild bee community. Although it is difficult to re-establish a target such as an old sand dune complex, restoration measures gave rise to a high pollinator diversity and abundance, suggesting that community function can be re-established.

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S Haenke *et al.*

Increasing syrphid fly diversity and density in sown flower strips within simple vs. complex landscapes

Journal of Applied Ecology 2009, **46**: 1106-1114

The structural complexity of agricultural landscapes influences the local biodiversity and associated ecosystem services. Developing effective biodiversity management requires a better understanding of the relative importance of local and landscape changes, especially for functionally important organisms such as hoverflies.

The authors examined hoverfly (Diptera: Syrphidae) communities in broad and narrow sown flower strips, in naturally developed grassy strips and in wheat fields (as a control). They also investigated the effects of these four habitat types on syrphid occurrence in the adjacent wheat fields.

The relative influence of local vs. landscape effects was tested by selecting study sites along a gradient of structural complexity from simple landscapes (~100% arable land) to complex landscapes (up to 70% semi-natural habitats such as fallows, field margins, hedges and grassland).

Syrphid density was higher in narrow and broad sown flower strips compared to grassy strips and wheat

Species richness and abundance in the sown flower strips increased as the proportion of arable land in the surrounding landscape increased, suggesting that within structurally simple landscapes syrphid flies concentrated on the most rewarding resources within the sown flower strips.

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G Lye *et al.*

Assessing the value of Rural Stewardship schemes for providing foraging resources and nesting habitat for bumblebee queens (Hymenoptera: Apidae)

Biological Conservation 2009, **142**: 2023-2032

Bumblebees *Bombus* spp. have suffered severe declines as a result of agricultural intensification. Conservation efforts focus mostly on providing forage resources for bumblebees through the summer, but providing suitable habitat during the period of nest foundation

in early spring could be a more effective method of boosting local bumblebee populations. The study assessed the attractiveness of three different farmland habitat types (hedgerow, field margin and grassland), and the relative merits of respective land management prescriptions under the Scottish Rural Stewardship scheme to nest site searching and foraging bumblebee queens during the period of queen emergence and colony foundation. Hedgerows were the least attractive habitat type to spring queens. Rural Stewardship species-rich grassland comprised a complex vegetation structure attracting nest site searching queens, whilst grassland that had been abandoned allowing natural regeneration contained more flowers, attracting foraging queens. Field margin habitats were the most attractive habitat type, and Rural Stewardship field margins attracted both nest site searching and foraging queens at relatively high densities. The findings suggest that it should be possible to develop simple combined management strategies to provide both suitable nesting sites and spring forage resources on farmland, promoting bumblebee colony foundation and therefore abundance in the agricultural environment.

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C J Stevens *et al.*

Identifying indicators of atmospheric nitrogen deposition impacts in acid grasslands

Biological Conservation 2009, **142**: 2069-2075

Calcifugous grasslands (grasslands found on acid soils) are among the most sensitive to N deposition due to their poorly buffered soils and species typical of nutrient poor environments. Indicators have an important role to play in detecting the impact of nitrogen deposition on sites of conservation importance and assessing conservation status. This study investigates potential indicators of nitrogen deposition impacts that could be incorporated into site condition monitoring programmes such as the UK Common Standards Monitoring. Using two national surveys of calcifugous grasslands, the authors examined the potential for using: the presence or absence of indicator species, the cover of indicator species, the species richness and richness of functional groups, and the cover of functional groups as indicators of N deposition impacts. Of all the potential indicators investigated, graminoid:forb ratio was found to be the best indicator of N deposition impacts. It showed a significant relationship to N deposition in both data sets and is quick and easy to assess in the field. Vegetation indicators must be used with caution as there is potential for vegetation management regime and nutrients from other sources to cause similar changes in species composition. Consideration must be given to these before attributing changes to nitrogen deposition.

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J Noordijk *et al.*

Optimizing grassland management for flower-visiting insects in roadside verges

Biological Conservation 2009, **142**: 2097-2103

The decline of flower-visiting insects is a threat to ecological processes and to the services these insects provide. Roadside verges in the Netherlands span approximately 80,000 km and are often covered with semi-natural grasslands. As such, they also provide a suitable habitat for many insects, but this has received little attention so far. The study investigated the effects of different management treatments on flower-visiting insects. The authors studied flower visitation in a three-year old experimental set-up with five mowing treatments. Overall, mowing twice a year with hay removal was the most beneficial treatment for flower-visiting insects, these plots were entirely devoid of flowers for some period right after mowing, indicating that a rotational scheme might further promote insect diversity and abundance.

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M J Carroll *et al.*

Climate change and translocations: The potential to re-establish two regionally-extinct butterfly species in Britain

Biological Conservation 2009, **142**: 2114-2121

Climate change is causing many organisms to migrate to climatically-suitable habitat. In many cases, this will happen naturally, but in others, human intervention may be necessary. Bioclimatic models of the distributions of two extinct British butterflies, *Aporia crataegi* and *Polyommatus semiargus*, were used to investigate the potential for re-establishment in Britain. Generalised additive models and generalised linear models were created to describe the species' European distributions for the period 1961–1990. All models projected the British climate during this period to be suitable for both species. Thirty-year climate projections for the periods 1991–2020 and 2021–2050, and for three climate change scenarios, were then put into the models to generate projections of climatic suitability throughout the 21st century. British climate was projected to remain highly suitable for *A. crataegi*, but to decline somewhat for *P. semiargus*. It was concluded that, with further study of habitat requirements, both species could be reintroduced to Britain as part of a long-term European conservation strategy.

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M C C De Graaf *et al.*

Biodiversity, vegetation gradients and key biogeochemical processes in the heathland landscape

Biological Conservation 2009, **142**: 2191-2201

The northwest European heathland landscape has a high nature value. In order to conserve and restore the heathlands, numerous rehabilitation projects have been performed, with varying success. This is partly due to the fact that the key biogeochemical processes distinguishing the various vegetation types within the heathlands are not known in detail. The authors performed a statistical survey on the main communities and their soil characteristics. In addition, they analysed the data for key factors determining biodiversity in the heathland landscape. Data from previous studies and surveys was used to compile a dataset of 267 habitat types with extensive soil measurements. Analysis revealed that soil acidity explained most of the differences between the habitat types, while soil moisture content and soil fertility were less important. Acidity-related factors were also strongly correlated to plant diversity in the majority of the habitat types. In the dry heaths and over the total heathland landscape, plant diversity was negatively correlated with soil NH_4^+ -concentrations. Only in wet heath was nutrient availability the primary factor in explaining plant diversity. The study presents ranges for all major soil parameters for heathland habitat types, thereby providing clear guidelines for conservation and restoration.

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A D Manning, I J Gordon and W J Ripple

Restoring landscapes of fear with wolves in the Scottish Highlands

Biological Conservation 2009, **142**: 2314-2321

The absence of an organism from a landscape for a long time can be a major barrier to the restoration of that species due to factors such as environmental conditions changing since extinction. This can make it difficult to assess the feasibility of reintroduction when an extirpated species cannot, by definition, be observed in the landscape of interest. In such situations, two important options for conservation scientists include: (1) to draw on insights from analogous ecosystems where the organism is extant, or where it has been successfully reintroduced and (2) to undertake research into the reintroduction in the location of interest under controlled experimental conditions. The idea of reintroducing wolves *Canis lupus* to the Scottish Highlands provides an excellent case study of such a situation. A key argument for reintroduction has been that native red deer *Cervus elaphus* numbers would be reduced through wolf predation. To date, research into the ecological value of reintroduction has focussed on this important issue. However, new research, emerging from wolf reintroduction projects in

North America, suggests that non-lethal 'behaviourally-mediated' effects of wolves also have a profound effect on deer behaviour and consequently on the ecosystems in which they live. Deer avoid places or browse less where there is a high risk of wolf predation, which allows previously inhibited tree regeneration. The implications for wolf reintroduction in Scotland are that changes in deer behaviour could be as important as lethal effects, and that fewer wolves may be needed than indicated by predator-prey modelling to have significant positive impacts on ecosystems in the Scottish Highlands. Understanding the relative likely contributions of both lethal and non-lethal effects in the Scottish context will be challenging because non-lethal impacts result from an interaction between deer behaviour in response to wolf predation and particular landscapes and ecosystem features. The authors suggest establishing a large, controlled experiment (e.g. on an island or in a fenced area) in the Scottish Highlands to examine the relative lethal and non-lethal effects of wolves on deer and ecosystem restoration.

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There are a number of papers in the *Journal of the Marine Biological Association of the United Kingdom* on cetaceans that may be of interest to members:

P L Luque *et al.*

Dentinal anomalies in teeth of harbour porpoises (*Phocoena phocoena*) from Scottish waters: are they linked to sexual maturation and environmental events?

Journal of the Marine Biological Association of the United Kingdom 2009, **89**: 893-902

C R Weir, C D Macleod and S V Calderan

Fine-scale habitat selection by white-beaked and common dolphins in the Minch (Scotland, UK): evidence for interspecific competition or coexistence?

Journal of the Marine Biological Association of the United Kingdom 2009, **89**: 951-960

C Pierpoint *et al.*

Monitoring important coastal sites for bottlenose dolphin in Cardigan Bay, UK

Journal of the Marine Biological Association of the United Kingdom 2009, **89**: 1033-1043

JL Jung *et al.*

Harbour porpoises (*Phocoena phocoena*) in north-western France: aerial survey, opportunistic sightings and strandings monitoring

Journal of the Marine Biological Association of the United Kingdom 2009, **89**: 1045-1050

R Shucksmith *et al.*

Abundance and distribution of the harbour porpoise (*Phocoena phocoena*) on the north coast of Anglesey, Wales, UK

Journal of the Marine Biological Association of the United Kingdom 2009, **89**: 1051-1058

C D MacLeod, T Brereton and C Martin

Changes in the occurrence of common dolphins, striped dolphins and harbour porpoises in the English Channel and Bay of Biscay

Journal of the Marine Biological Association of the United Kingdom 2009, **89**: 1059-1065

News in Brief

Timely news

During the IEEM Autumn Conference, reported on page 39, the South Downs National Park was officially confirmed, along with the Marine and Coastal Access Bill receiving Royal Assent and producing the Marine and Coastal Access Act 2009.

Hilary Benn, Environment Secretary, signed an order confirming the designation of the South Downs National Park, which will stretch from Eastbourne in the east to Winchester in the west, and officially come into being on 31 March 2010.

The Marine and Coastal Access Act 2009 is intended to ensure clean, healthy, safe, productive and biologically diverse oceans and seas, by putting in place better systems for delivering sustainable development of marine and coastal environment.

Scotland's greenspace

The first *State of Scotland's Greenspace* report has been published by GreenSpace Scotland. The report reveals for the first time the extent of urban greenspace in Scotland. *State of Scotland's Greenspace 2009* found that there is nearly 85,000 ha of greenspace in urban Scotland, meaning that across Scotland there is an average of 23 m² of greenspace per person. The report also reveals the distribution of different types of greenspace - private gardens account for nearly a third (30%), with natural spaces making up a further 28%. The amenity greenspace around houses and buildings adds in another 15%, closely followed by sports areas at 13%, and public parks and gardens at 9%. Play spaces, allotments and burial grounds cover relatively small areas.

Wildlife crime on the increase

Crimes against wildlife in the UK, including badger baiting with dogs, hare coursing, poisoning of protected birds and even trapping them to sell as caged pets have soared in the last 12 months. New figures from the police show that the number of wildlife crimes more than doubled in the last year, from 2,177 to 5,854. Incidents are now being recorded at a rate of 120 a week. They cover not only the slaughtering of badgers and rare birds of prey, but also egg thefts, bird trapping, deer poaching and habitat destruction. Rural areas are where most incidents occur, with Northumbria a conspicuous target for wildlife criminals. More than 500 incidents have been recorded there, with Grampian (244), Humberside (195), and North Wales (188) also wildlife crime hotspots.

No plans to drop barrage scheme

The UK Government says it is still interested in the idea of a tidal barrage across the Severn estuary after a report that the plan could be dropped. *The Times* newspaper reported that the project would be abandoned, but the Department of Energy and Climate Change has said that it was waiting on the results of a feasibility study due to be published in 2010. The newspaper said plans to build a 10-mile long tidal barrage, that could generate up to 5% of Britain's electricity and cost up to £23 billion, are likely to be shelved under a government cost-cutting drive.

Green infrastructure plan launched

Natural England has announced a new partnership with major developers to focus on green infrastructure. The partnership, entitled *A Natural Development*, aims to highlight best practice and raise the standard of design and delivery for green infrastructure. The partnership is already supported by several major developers.

Green infrastructure includes green spaces, street trees, green roofs and urban parks and brings a huge range of environmental, health and economic benefits. Pilot studies are now being established and a series of seminars will take place throughout 2010, exploring how best to value, design and create quality green infrastructure and to further engage developers with the scheme.

Wildlife and ecological network review announced

Environment Secretary Hilary Benn has announced a review of England's wildlife and ecological network, including its links with the National Parks and its ability to adapt to climate change and other pressures. To report by June 2010, the review will explore if the suite of sites represents a coherent and robust ecological network for England, capable of responding to the challenges of climate change and other pressures. The review team, still to be announced, will also look at what benefits can be gained by connecting sites within designated areas and outside them through re-wilding initiatives. The team will take account of ecological, economic and social costs and benefits of such a programme and make costed and prioritised recommendations. This work will complement the National Ecosystem Assessment, currently being prepared, and which will take account of the continuing importance of ecosystems to the wider countryside and urban areas.

Wave power impact to be assessed

The potential impact of marine turbines on the seas around the Bailiwick is to be investigated. The Guernsey Renewable Energy Forum has published a plan for an environmental assessment of tidal power generation and is looking for feedback, saying that they want to understand how the devices could impact on marine wildlife, the physical marine environment and commercial fisheries. Guernsey has some of the strongest tidal currents in the world.

Management practices to reduce phosphorus pollution in water

A recent study in the *Journal of Environmental Quality* has investigated best management practices to reduce the over-application of phosphorus and minimise phosphorus losses from agriculture. Although a wide variety of methods are used, the researchers detected some common trends based on a 'mass balance' approach. This tries to achieve a balance between the amount of phosphorus inputs (from fertilisers, feeds and animals) and phosphorus removal (e.g. in crops, animals, manure, animal products).

In Northern Ireland, the use of inorganic phosphorous fertilisers has fallen, but imported feed concentrates have risen. Therefore, overall inputs of phosphorus to the agricultural system are still higher than the amount removed. This has led to research into low-phosphorus diets, regulations controlling manure application which are part of the action programmes under the Nitrates Directive and programmes to develop alternative uses of manure in order to restore rivers and lakes.

Grass biomethane could be biofuel solution for Ireland

New research in *Renewable and Sustainable Energy Reviews* indicates that biomethane made from grass could be an energy efficient and sustainable transport biofuel in Ireland and other temperate northern climates. Its net energy is potentially higher

than rapeseed biodiesel and wheat ethanol systems. The EU Renewables Directive has set a mandatory target of at least 10% renewable energy for transport in each Member State by 2020. All biofuels must meet agreed sustainability criteria to be allowed to count towards the Directive's targets, to count towards Member States' own renewable energy obligations or to be eligible for financial support. However, energy crops indigenous to Europe tend to have low yields. The study examined the potential of biomethane made from grass in Ireland, where grassland makes up 90% of the country's agricultural land. More specifically, it considers grass from relatively small enclosures that are not in arable rotation and are dominated by perennial grasses and scrub.

Europe's endangered vultures

Egyptian vultures *Neophron percnopterus* are one of Europe's endangered species and a Canary Isles' LIFE project has made important progress in ensuring the long-term survival of this unique rapture population. LIFE Nature projects are providing important support and this work includes efforts in Spain to increase the Canary Islands population. Numbers of this endangered raptor species have experienced a dramatic fall, both in terms of overall numbers and its European distribution range, during recent decades. Around 80% of the EU's last remaining Egyptian vultures are found in Spain and significant population declines have been recorded for the Canarian sub-species *N. percnopterus ssp. majorensis*.

Forest soils can recover from air pollutant damage

A recent study in *Science for Total Environment* has investigated the effect of emission reductions on European forest soils under climate change. It indicates that, under current emission reduction plans, most forest soils will recover from changes in soil chemistry within a few decades. The study indicates that the impacts of climate change on soil chemistry are limited, especially compared to the impacts of emission reductions. Climate change tends to have more of an impact on ecological and physiological processes in forests than on soil chemistry (although soil chemistry will ultimately be exposed to these processes too). However, there are a number of climate sensitive processes that the study did not consider, and as such, final conclusions on climate change's impact on soil chemistry are yet to be drawn.

Measuring the ecological impacts of pesticides cost-effectively

According to new research in *Environmental Pollution*, the Species at Risk (SPEAR) system could provide an accurate and cost-effective means of assessing the effects of pesticides in streams. This could prove useful in implementing the EU Water Framework Directive. The SPEAR system assesses the impacts of stressors on freshwater invertebrates that are at risk. SPEAR_{pesticides} specifically examines the effects of pesticides; it is usually applied at species level, but this can be time consuming and costly. To develop a more economical assessment, SPEAR_{pesticides} was modified to assess impacts at the family level. The results indicate that SPEAR_{pesticides} could be used at a family level to monitor waters as it is sensitive_{pesticides} to the impacts of pesticides, cost-effective and applicable across borders.

Multi-national conservation could save money

Multi-national collaboration on conservation can be more cost-effective than action by a single country, according to research published in the *Proceedings of the National Academy of Sciences*. The study indicated that a fully co-ordinated conservation plan for vertebrates in the Mediterranean Basin, involving all countries

in the region, would save €45 billion - 45% of the total cost - compared with unco-ordinated action, where each country acted independently.

17,000 endangered species

The recent *Red List of Threatened Species*, published by IUCN, shows startling numbers of species in decline. Almost one third of amphibians are at risk, making them the most endangered group on the planet. The publication assesses the status of 47,677 species. Of the 6,285 assessed amphibian types, 1,895 are in peril. Of the world's 5,490 mammals, 79 are extinct in the wild, 188 critically endangered, 449 endangered, and 505 vulnerable. The new list features 293 reptiles which were not there last year, bringing the total threatened to 1,677, including 469 that face extinction and 22 are that are believed extinct. On the Philippine islands alone, 165 endemic species of reptile have been included for the first time. The new Red List also includes 12,151 plants. There are also 7,615 invertebrates; and 3,120 freshwater fishes, of which 1,147 are close to extinction.

Coastal ecosystems at risk from global loss of seagrass meadows

Seagrass meadows are declining around the world at an accelerating rate at both high and low latitudes, threatening the health of coastal ecosystems, according to recent research in the *Proceedings of the National Academy of Sciences*. Seagrass areas provide valuable ecosystem services including recycling of nutrients, providing habitats for many species of fish, birds and invertebrates (which in turn supports commercial fishing), and acting as a food source for larger species, and additionally, help prevent coastal erosion. Globally, seagrass meadows are endangered by a range of causes, including overexploitation, physical modification, nutrient and sediment pollution, the introduction of invasive species and global climate change.

Analysis of fisheries suggests marine ecosystems can recover

A recent study in *Science* provides evidence that efforts to rebuild depleted fish stocks are worthwhile, finding signs of recovery in five major marine ecosystems. The paper argues that diverse management tools can successfully balance conservation with commercial fishing, allowing fish stocks to recover in overexploited areas. Overexploitation of fish stocks has serious consequences for the sustainability of fisheries and for the healthy functioning of marine ecosystems around the world, yet efforts to restrict fishing are often resisted by fishermen concerned by short-term social and economic impacts, especially those whose livelihoods depend on fishing. A trade-off between allowable catches under fisheries and conservation of vulnerable or collapsed fish stocks is possible under well-designed management systems. Collapsed stocks can be rebuilt if traditional methods such as catch quotas and community management are combined with strategically placed fishing closures (depending on local conditions), gear restrictions, widespread ocean zoning to separate areas managed for fisheries and for species and habitat conservation. Rebuilding may take decades and will involve short-term costs, especially reduced yields and the loss of jobs. A global view is needed as those who depend on fisheries in poorer regions may have no alternative food sources and incomes. In addition, developed countries should not shift fishing pressures to less developed areas of the world: strong governance is required to enforce compliance with rebuilding efforts. Local differences between fisheries, ecosystems and governance need to be considered when developing management strategies. Ideally countries should take action before overexploitation becomes evident, but the study found that only Alaska and New Zealand had the foresight to act before that stage was reached.

Tauro-Scatology and Reality TV

Topicality is an awkward subject for a regular *In Practice* contributor. You, dear reader, are no doubt expecting something with a Christmas flavour but the deadline for copy is mid-October and Basil O'Saurus, our resident Professor of Tauro-Scatology is finding Yuletide inspiration hard to come by. Indeed, he's still digesting the last issue of *In Practice*; in particular, Steve Pullan's article asking if the time was right for IEEM to move to a membership exam. What do you think about this then, Prof?

I do, in fact, have a lot of sympathy for Steve's proposition. However, I'm not convinced that a membership exam really is the way we should be going. It is so last century. No, the IEEM needs to move with the times.

So what do you have in mind?

Britain's Got Ecologists.

I had a suspicion that something like this was coming. Tell us more, Prof.

Simple. We ask all aspirant IEEM members to stand on stage and tell us why they should be admitted: "I'm Katie, I'm 24 and I'm a bat surveyor", for example. Then they perform a bat survey, and, at any point, one of the panel of judges can press a buzzer to show their disapproval.

You seem remarkably well-informed. Are you a secret devotee of TV talent shows?

No way am I compromising my bourgeoisie, liberal credentials by admitting to that. There is nothing in this article that can't be corroborated via Wikipedia or YouTube.

OK. We believe you. What happens next?

We'll need a Simon Cowell-like figure to take the Svengali role, an experienced IEEM member with dubious fashion sense who is prepared to undergo some botox treatment for a noble cause. He can then make some pithy comments to the cowering candidate, telling them that bat surveyors are two-a-penny, before they are ushered off, accompanied by some lingering close-ups of tearful faces.

Then what?

The next candidate is introduced. First, of course, we get the intimate back-stage interviews where they tell us that they are passionate about Collembolas and that they believe in their talent. Then we cut to the audition, with our judging panel staring impassively at the candidate whilst he tells them that he is a Collembola expert. Our Simon Cowell-lookalike's eyebrows rise ever so slightly at the mention of this.

Really?

No. The last nip-and-tuck put paid to that. We'll use computer generated imagery to insert this during post-production. But back to the action, our Collembola expert now has to demonstrate his credentials, blowing everyone's minds with a demonstration of the extraordinary diversity of springtails in Britain...

Stop. Let's break with convention in this column and insert a reference, rather than pretend that you are more learned and erudite than is really the case...

OK. If you insist. www.roehampton.ac.uk/collembola. A fine set of webpages, and just reward for the time I had to spend surfing YouTube clips of reality TV in order to research this article.

Thank you. Continue.

So our tyro IEEM member demonstrates that he knows lots about springtails, at which point the entire judging panel leap to their feet and start applauding. Sharon Osborne is so excited that that her wig almost falls off.

Is it a wig?

No normal hair would look like that, would it? It's not Sharon Osborne either. She's on X Factor. I need to drop in a few mistakes like that to show you that I'm not really a TV talent show junkie. But you're distracting me again. Simon Cowell now does that decisive I-know-talent-when-I-see-it thing – the unerring eye for genuine artistic genius that has given us such stars as Will Young and Michelle McManus - and says "you're in the semi-finals".

Meaning that we have to go through this whole charade again?

It gets better. This is an opportunity for genuine democracy within the IEEM. We can all vote to decide who joins the Institute and who doesn't.

Meaning what exactly?

A premium-rate telephone line, generating much-needed income for the Institute.

...whilst maintaining, ney, enhancing our prestige and credibility. Any more bright ideas?

No more long-winded application procedures for Fellows. How about *I'm A Fellow Get Me Out of Here?* We put aspirant Fellows in a remote location, ask them to catalogue the biodiversity in order to demonstrate their technical proficiency, and then tell them to eat it.

Sounds like a great idea. Especially since both you and Mr Pullan have already got FIEEMs under your belts.

Exactly. Now we're in the exclusive coterie, we need to fiddle with the rules to keep the riff-raff out.

A bit late for that, eh, Prof?

Maybe. But I can't stop to chat. I've got to set the video recorder for this week's *Strictly Come Dancing*. It might generate some new ideas that the Membership Admissions Committee can use.

And if we believe that...



Chief Executive Officer

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The Institute of Ecology and Environmental Management (IEEM) represents and supports ecologists and environmental managers in the UK and abroad. Established in 1991, IEEM has over 4,000 members in local authorities, government agencies, industry, environmental consultancy, teaching, research and NGOs.

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www.press-ads.co.uk/guardian

www.press-ads.co.uk/ieem

Closing date: Monday 14 December 2009

Interviews will be held on 11 and 12 January 2010 in London, with a possible second interview in Winchester on 21 January 2010.

Conservation Land Management

Conservation
Land
Management

Since it was first published by English Nature under the name 'enact' in 1992 and more recently as *Conservation Land Management*, this quarterly magazine has been providing quality information on managing land with wildlife in mind. Since mid 2008, the magazine has been published by British Wildlife Publishing and is now *British Wildlife's* practical sister publication!

Every aspect of CLM is designed for those involved in managing land. The main articles focus on a wide range of issues, from new approaches in fencing to installing swift boxes in buildings, using up-to-date case studies to support practical solutions. Each issue also contains a range of regular features, including events listings, new products and conference reports.

Now, with a more independent voice but working with the major conservation bodies in the UK, we hope that CLM will continue to develop its position as a key forum for discussion and publication of innovative techniques and ideas. CLM is always keen to discuss any suggestions for articles; please contact us at editor@britishwildlife.com. For further information, telephone 01747 835511 or visit www.conservationlandmanagement.co.uk where you can also take advantage of a special introductory subscription offer which includes the first two issues free.

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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 **12 January 2010**. Any communications will be handled discreetly. The decision on admission is usually taken by the Membership Admissions Committee under delegated authority from Council but may be taken directly by Council itself. IEEM is pleased to welcome applications for Membership from the following:

APPLICATIONS FOR FULL MEMBERSHIP

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

Dr Susie Brown, Mr Matthew Crabb, Dr Lewis J Deacon, Miss Mandy J Elford, Mr Kevin Johnson, Dr Kelly Moyes, Ms Saoirse O'Donoghue, Mr Charles E Perez, Mr David Sanger, Mr Alex R Watson, Mr Paul L Wilkinson

APPLICATIONS FOR ASSOCIATE MEMBERSHIP

Miss Mary Campling, Mrs Naomi Condron, Dr Carys A Davies, Ms Aoife Delaney, Miss Katie Gaisford, Miss Deborah J Marchant, Miss Suzanne C Melhuish, Mr Lee P Schofield, Miss Carly Smith, Mr Jack Sykes, Miss Laura A Turner

APPLICANTS WISHING TO UPGRADE TO ASSOCIATE MEMBERSHIP

Miss Joanna Barker, Mr Richard Barnard, Miss Hayley Bishop, Mr Thomas J Docker, Miss Judith Eley, Mr Robert Fennelly, Miss Rebecca A Gill, Mr Stephen Hancock, Mr William M Holden, Miss Carly Jefferies, Ms Liz Juppenlatz, Miss Katherine Kennedy, Miss Crystal Leung, Dr Kevin Linnane, Miss Shona McCombie, Mr James Mullholland, Miss Melanie Pritchard, Mrs Rebecca M Purslow, Mr Daniel Reynolds, Miss Elizabeth K Richell, Mr Simon Thomas, Mrs Jayne A Walker, Ms Helen Ward, Miss Natalie White

ADMISSIONS

IEEM is very pleased to welcome the following new Members:

FULL MEMBERS

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ASSOCIATE MEMBERS

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GRADUATE MEMBERS

Miss Sarah E Atkinson, Miss Emma L Ball, Miss Teresa K Beadman, Miss Lucy E Boyett, Mr Joshua Broster, Mrs Josephine C Buckley, Miss Camilla Call, Mr Matthew Catton, Mr Shawn M Clements, Miss Louise V Compton, Miss Tanith Cook, Miss Victoria Coulthard, Mr Christopher Crow, Miss Anna R Davies, Miss Sarah Dillon, Miss Rebecca C Faulkner, Miss Anne Goodenough, Mr Tom Gray, Ms Annemarie Greenwood, Miss Katherine Harrington, Miss Rachel L Hobbs, Miss Sally-Ann Hurry, Miss Natalie D Jones, Mr Robin A Kelly, Mr George Knights, Mr Simon Knott, Mr Andrew P Leese, Miss Sarah Love, Miss Sarah Lynes, Mr Rory M McLeod, Mr Stephen J McNee, Miss Ruth M Mellon, Ms Claire Minett, Ms Roisin Nighfhoinn, Mr Paul J Parker, Mr Russell A Payne, Ms Abigail Powell, Mr Robert Purdew, Mr Andrew Rattey, Miss Helen Rutherford, Mr Arnaud Sepulchre, Miss Rebecca L Shepherd, Mr Robert J Styles, Miss Nia R Sutton, Miss Aimee E Taylor, Miss Natalie Ward, Miss Valerie A Wheeler, Mr Chun Yuen Wong, Miss Nicola Yarker

AFFILIATE MEMBERS

Miss Natalie Andersen, Mr Andrew Birdsey, Ms Marie-Ange Chevrier, Miss Emma Dowler, Mr Adam S T Griffin, Mr Andy Hambly, Miss Clare J Nisbet, Mr Christopher Parsons, Mr Steven J Peters, Mr Erwyn Rentzenbrink, Mr Luke Stevens, Mr Mark A Walker, Mr Richard M A Walsh, Mr Adam P Young

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UPGRADES

The following have successfully upgraded their Membership:

UPGRADES TO FULL MEMBERSHIP

Mr Daniel R Atter, Mr Lee Bagnall, Miss Rebecca Barker, Mr Christopher Booler, Dr Claire V Dowding, Mr Joris Driessen, Mr Pete Etheridge, Miss Katie Finlinson, Mr Adam Fitchet, Mr Timothy D Foster, Mr William Gaudie, Miss Sarah Gooch, Mrs Deanne Gow, Mr Richard Gowing, Dr Katherine S E Henson, Miss Heather Hickman, Miss Maria Hoggett, Miss Kimberley J Jelbert, Mr Benjamin J R Kite, Miss Katheryn Leggat, Mr Terence C Loughran, Miss Colleen Mainstone, Mr Nicholas P Masters, Mr Richard May, Mr Duncan C McLaughlin, Dr Steve McMellor, Mr James S Mepsted, Mrs Marjorie Nadouce, Dr Martin Page, Mr Philip J Pointon, Mrs Ceri A Richards, Mr Edward Robinson, Miss Tessa C Rutty, Mr Michael Sharp, Dr Rebecca Sykes, Dr Sarah E Toogood, Mrs Jen Turner, Mr Daniel E Walker, Mr Paul Whitby

UPGRADES TO ASSOCIATE MEMBERSHIP

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UPGRADES TO GRADUATE MEMBERSHIP

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Forthcoming Events

IEEM Conferences

DATE	EVENT	LOCATION
24 March 2010	IEEM 2010 Spring Conference - Ecosystem Services	London
2 - 4 November 2010	IEEM 2010 Autumn Conference - Beyond 2010: Missed Opportunities, New Targets	Dublin

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

IEEM Training Workshops

19 February 2010	Native Tree and Woody Shrub Identification in Winter	South East England
25 February 2010	BS 5837 (Trees in Relation to Construction) and Bats	South East England
26 February 2010	Trees and Bats	South East England
1 - 2 March 2010	Lichen Identification for Beginners	South West England
3 March 2010	Introduction to Habitats Regulations Assessment	North West England
9 March 2010	Bat Survey and Mitigation	South East England
10 March 2010	Making the Most of BREEAM and the Code for Sustainable Homes	South East England
10 March 2010	Surveying for Bats and Development – The Consultants' Approach	South East England
11 March 2010	An Introduction to Managing Uncertainties in EclA	Wales
13 - 14 March 2010	Outdoor First Aid and Incident Management	North West England
15 March 2010	Water Vole Ecology	South West England
16 - 17 March 2010	Water Vole Conservation and Development	South West England
17 March 2010	Making the Most of BREEAM and the Code for Sustainable Homes	South West England
18 - 19 March 2010	Water Vole Conservation and Development	South West England
22 - 23 March 2010	Bryophyte (Mosses and Liverworts) Identification for Beginners	South West England
24 March 2010	Field Signs and Habitat Management for Water Voles	Scotland
25 March 2010	Breeding Bird Surveys	Scotland
30 March 2010	Great Crested Newt Survey and Mitigation	South East England
31 March 2010	Habitat Management for Reptiles	East of England
7 - 8 April 2010	Introduction to Phase 1 Habitat Survey	North East England
8 April 2010	How to Complete a Farm Environment Plan (Preliminary Data Collection and FER) (Workshop 1 of 3)	South West England
10 April 2010	Great Crested Newt Survey and Evaluation	South East England
12 April 2010	Freshwater Invertebrates Identification and Survey Skills	West Midlands
13 April 2010	Great Crested Newt Survey and Evaluation	South East England
13 - 14 April 2010	Survey Techniques and Habitat Management for Amphibians (focus on Great Crested Newts)	Scotland
14 - 15 April 2010	Introduction to Bryophytes and the New BBS Field Key	North East England

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

IEEM Section Events

21 January 2010	IEEM East of England Shadow Section Event - The Future of Woodlands (with Keith Kirby FIEEM)	Peterborough
5 March 2010	IEEM South East England Shadow Section Conference - Great Crested Newts - An Approach for the Future? (Licensing and Mitigation in the South East of England)	Brighton

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