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In Practice

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Cardiff Climate Change Conference

Focus on Wales - Wetlands, Water, Energy

Sir David Attenborough Awarded the IEEM Medal

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British Ecological Society
Countryside Council for Wales
McParland Finn

Editorial

It was Robert Kennedy who first coined the phrase: 'We live in interesting times,' back in 1966. Forty years later these words ring even more true, especially for us as ecologists in the light of our changing climate.

Firstly, climate change itself is in the media as never before. Times are interesting because science predicts that we have much bigger changes in store than we've seen so far. And, as those of you at IEEM's Cardiff Conference will know, there are many species changes that are already underway here in the UK. These include comma butterfly breeding over 100 km further north than just a few years ago, migrants like dunlin and ringed plover over-wintering along the north-east coast rather than the south-western seaboard of Britain, and even pilchard found in the North Sea.

Secondly, as ecologists, we have known about population dynamics ever since we first started learning about the subject. We know that exponential growth only occurs until a limit is reached, and that the human population is no different from any other species in this respect. Whether population size is limited by food shortage, or limited habitat, or the build up of a pollutant waste product ultimately makes no difference: there are limits to growth. The interesting times here are that the CO_2 we keep producing is as much a pollutant as CFCs or lead in petrol. The unknown elements are precisely how the CO_2 build-up will impact on global and local climates, over what time-scales, and what we as a species are prepared to do about it. As ecologists, we need to ensure that our profession drives the agenda forwards, proposing practical ecological solutions when some are still denying there is a problem. We need to work with politicians, nationally and locally, and with business decision makers, in order to provide for biodiversity as our climate changes. The risk to us as ecologists is that the climate change bandwagon presses ahead with strategies and plans that ignore biodiversity completely, thinking only of energy, water and social impacts.

Thirdly, the interesting times for us as an Institute relate to our continuing and dramatic growth, with well over 2,500 Members, and new Geographic Sections in Wales, Ireland and South West England. The challenges here are both internal and external. Internally we need to develop new systems and structures to help the Institute grow and develop, harnessing the skills and enthusiasm of our Members to achieve the ambitions of our Business Plan. Externally, we are uniquely placed to link ecology and environmental management with society, in ways that everyone can understand. This will mean as consultants, ensuring that clients are building climate change mitigation into new developments. Within the public sector there are new strategies needed to make a real difference to biodiversity across these islands. And for the not-for-profit sector there are opportunities to link plans into action, bringing together new partnerships for delivering large areas for wildlife and ecological networks.

Over the next two years of my Presidency, I'd like to see the Institute raising its profile, helping to shape and form government policies, and ensuring that ecologists' voices are heard and taken notice of. We do indeed live in interesting times, and our role as ecologists moves closer to the centre of the stage. Are we up for this challenge?

Dr Andy Tasker CEnv MIEEM
President, IEEM

CHRISTMAS AND NEW YEAR

Members of Council, the Directors and Secretariat would like to wish all Members a Happy Christmas and a productive and ecologically active year in 2007.

Contents

Cover image: Sir David Attenborough receives the IEEM Medal from Dr Andy Tasker
Photography: Paul Tennant

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

IEEM Fellow
Peter Bridgewater

Myths and Legends in the Miasma of Climate Change

Peter Bridgewater CEnv FIEEM
Secretary General, Ramsar Convention on Wetlands

INTRODUCTION

On 16 Nov 1989 the BES and Linnean Society held a joint symposium in London on 'Biospheric Aspects of Global Change.' This was the first real attempt to put focus on the issue, even though much of the symposium was on non-climatic aspects of global change. Even so, many of the contributions recognised the intrinsic all-pervasive nature of climatic changes as drivers of other aspects of the global change equation. Following this, in early 1990 the Nature Conservancy Council published its first issues paper on nature conservation in the face of climate change.

Looking back at these notes and papers it was interesting how much was being clearly stated then and how little has actually been seriously picked up on. In the decade and a half since then nature conservation faced the worries of expanding species populations on the one hand, and the more dramatic shrinking on the other. Site-based conservation seemed transfixed, like a rabbit in the headlights of a car, unable to decide what to do in the face of climate change, but opining that protected areas were even more important than before. Yet there are no real justifications for this view, indeed, a good case can be made for the opposite!

On 29 March 2002 the *International Herald Tribune* (IHT) published a feature on climate change, one of the first serious looks at the issue in the popular press. In part the article noted:

'Australia is the biggest contributor to global warming, relative to its population, even though its hot, dry climate makes it particularly vulnerable to hotter temperatures. This contradictory position means the country risks both international criticism over global warming, and potential environmental damage. Yet Australia is reluctant to ratify the Kyoto protocol……'

And of course it is, as I write, trying, with like-minded countries to produce a 'post-Kyoto' global agreement on climate change. Herein lies the problem – in many ways the Australian position is a correct one, *i.e.* that Kyoto is not really working. Yet trying to put in place something else which may or may not be in the stable of the UNFCCC is also a risk What is encouraging is that suddenly, it seems, there is almost global unanimity that something must be done. But what, exactly?

In early October 2006 the *IHT* featured again an article on climate change, but this time in the 'Your Money' section – called 'Weathering the storm of Climate Change.' The article was interesting in that it points to the role of the private sector in managing climate change – a role that is increasingly evident as the only likely way human society can start to adapt to the changes now set in place.

Then as recently as 4 November 2006 *The Economist* magazine had an article entitled 'Stern Warning.' It was of course about the highly topical, technical yet wide-ranging review performed by Sir Nicholas Stern on climate change for the British Government. Again, little space is devoted in the report to the consequences of climate change on the status of, for example, Dryas populations in the UK, but we must assume it will have more impact on government thinking, which can ultimately translate into support for conservation and wise ecosystem management. The article ends; 'The costs are not huge. The dangers are.'

From a conservative economic journal this is welcome realism indeed!

Indeed 2006 may well be seen as the year in which climate change moved from scientific curiosity to media star. There is abroad what one might call 'The new Climate Change Chic.' By this I mean a popularising of the effects and dangers of climate change like never before. But, as always, not necessarily in the most useful of ways, from the perspectives of nature conservation and ecosystem management. One could point to the awful 'Day after Tomorrow' as an example of what may come to be called the climate change genre. It was truly awful, however, and there are many other, rather better, activities now around.

For example:

- Advertisements on the BBC World TV channel by an assurance group – featuring prominent IPCC scientists;
- 2 documentary Films on global warming win at the 22nd *Festival Médias Nord Sud - Grand Prix de Genève*;
- Prince Albert of Monaco… who has now a key interest in the arctic and the fate of Polar Bears; and
- The ever inconvenient Al Gore…

THE MYTHS

Myth 1: There is No Climate Change

This should not really be in question but alas in quite some politician's minds, as well as key Industry heads, and even some scientists, this is still seen as an open question. Albeit circumstantial, the recent increase of extreme weather events seems in line with the predications of the models. In the last few months, we have seen:

- severe typhoons in China and Korea;
- snow on Piton de la Fournaise,

Rèunion Island;

- hottest and driest time in Tasmania for 40 years - followed by crop killing frosts; and
- and no hurricanes seriously affecting the USA.

Yet last year, we certainly saw major impacts in the south of the USA. So the pattern of extreme events is well established, and underscores the view that the only certainly we face is uncertainty!

Myth 2: Legislative Protection will Help in Managing, Adapting to or Mitigating against Climate Change

This is an example of what the French call *politique d'autruche* – and has a certain charming naivety. It can take the form that 'if everyone signs Kyoto, all is OK,' or be more fine grained. Some Australian scientists recently encouraged listing climate change under the Australian threatened species Act(s) as an important part of 'facing the future in an honest and clear-headed manner.' At one level this is a view with which one can little argue; yet in fact by concentrating on this legal aspect the possibilities for promoting quick action recede. They do however correctly identify a key issue, which is the disconnect between the normal agency response of promoting action on particular reserves, and the fact that action against climate change must take place at a broader land- or seascape scale.

Myth 3: Communities and Species will Move Gradually Pole-wards and take increasing altitude with the effects of Climate Change

Clearly there is some movement of species especially insects, which can move rapidly and have short generation spans. In North America and Europe around 40 species of butterflies have been shown to have a northward range shift of up to 200 km over the last 27 years. There is also evidence for some clear changes in migration times for migratory species, and much evidence of earlier flowering/fruiting times. In the arctic shrubs are spreading into previously shrub free areas, and in the Antarctic there are distributional changes for some species. In Canada the red fox is moving northwards, and correspondingly the arctic fox appears to be contracting its range. And the marine environment is not immune, with increasing abundance of plankton and fish from warmer waters being recorded along north Atlantic coasts.

Despite these pieces of evidence, for many species and ecosystems there will be little change possible, since they are now in highly fragmented landscapes. For many species and ecosystems therefore an increasingly precarious or stressed existence is their likely future – until a major environmental event (drought, fire, flood, etc.) causes a major disruption. And in this sense many species and systems will have, simply, 'nowhere to go.' Those with responsibility for conservation and ecosystem management may thus find themselves, like nurses in an emergency ward, exercising triage for species, and even ecosystems.

A likely result from this impact will be the development and establishment of novel or emerging ecosystems. These novel ecosystems will result from the synergies between climate change and other global changes, including especially the ever-increasing spread of invasive alien species. This aspect was also picked up by the recent Gran Canaria Declaration II from Botanic Gardens Conservation International (BGCI) which noted:

'Many plant communities are dynamic and adaptable, but their composition will be inevitably altered by climate change in the future. As a result, we may need to create and/or manage the ongoing development of novel communities to optimally fulfil the need for ecosystem functions and services.'

Myth 4: An Increase in Temperatures Might be Helpful…

Here we can look at the nexus between climate change and an increase in fire frequency. Recent evidence of the rates of charcoal accumulation at an Australian site are unprecedented in the late Holocene. At the same site increased prehistoric fire activity was always correlated with periods of warmer climates. The key question is 'Was human activity involved here?,' and the authors prefer to keep this an open question. However, like many other studies it is clear that overall increased temperatures are going to be an additional problem for ecosystem management, especially in dry or fire-prone systems. This becomes a classic positive feedback loop, as wildfires are unleashing ever more CO_2 into the atmosphere. Certainly the smoke and haze from the Indonesian peat fires is a health hazard, yet the vast quantity of CO_2 also released goes largely unnoticed and uncommented on.

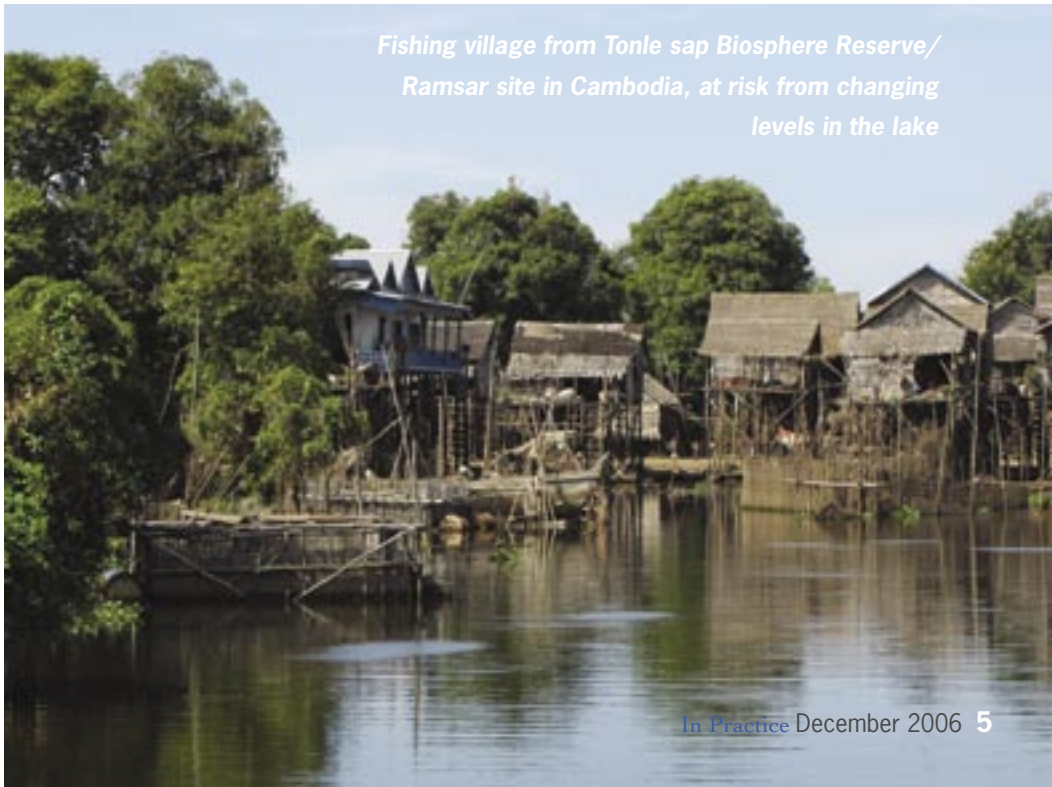
Myth 5: If We Stop Actions Contributing to Climate Change, All will be Fine…

The synergies between climate change and other environmental activities are well documented – but stopping climate change will not, by itself reverse these other changes. Even if all anthropogenic additions of greenhouse gases to the atmosphere were to be stopped immediately, global warming and associated impacts such as sea level rise would be expected to continue for centuries.

THE LEGEND

Maintaining Ecological Resilience will Help Mitigate Against Climate Change

Resilient ecosystems are able to



Fishing village from Tonle sap Biosphere Reserve/ Ramsar site in Cambodia, at risk from changing levels in the lake

maintain biodiversity and continue to deliver ecosystem goods and services under climate change. The relationship between biodiversity and ecosystem resilience is an area where much more research is need to help develop the right management. Biodiversity research is what is needed – not simply research on species or ecosystems labelled as Biodiversity research!!

However, taking a precautious approach, we should attempt to minimise biodiversity loss, which not necessarily halts biodiversity change. Such slowing of the rate of biodiversity loss is best achieved via directed adaptation activities. The *ad hoc* Technical Advisory Group to the CBD (CBD, 2006) contains much useful material on this subject.

A high level mountain mire in Andorra, at long term risk from change in snow levels

Many factors confer resilience to ecosystems - including population size, habitat area and shape, presence of environmental gradients, existence of habitat refugia, degree of habitat connectivity, presence of ecotones and regeneration and sucessional stages, degree of genetic heterogeneity, species richness, regenerative capacity, and stable hydrological cycles. The Gran Canaria Declaration II notes *inter alia*, 'natural vegetation is of vital importance in water management under current and future climate change scenarios, and coastal ecosystems are essential as buffers to rising sea levels and extreme weather events.'

Directed adaptations are already being implemented to reduce many of the adverse impacts of climate change to produce economic and social benefits in the future. These adaptations can have positive, neutral or negative effects on biodiversity and ecosystem goods and services. Understanding changes of biological diversity due to climate change may include active participation of local and indigenous communities.

A WAY FORWARD?

The paradox is that we need a global response to this global issue, yet the responses are frequently targeted and usually effective only at local levels. On top of this, the International environmental governance architecture is incapable of swift response, and has difficulties with locally-based responses.

BCGI (2006) noted that 'plant communities have vital importance as 'carbon sinks' with the potential to off-set some carbon emissions.' Of course we know that maintenance of biodiversity requires natural disturbance regimes while management for maximal carbon storage tends to avoid disturbance. So we have to seek management regimes which include both.

Much of the attention given to ecological systems as buffers against the effect of climate change has focused on forests. While forests have a role to play, and the re-introduction of trees to landscapes where they have been removed is an important step forward, ignoring wetland systems on land and in the near shore environments is bad policy. Wetlands have an even greater role than forests in balancing the global carbon equation, and thus in maintaining ecological resilience to mitigate against climate change.

Resilient ecosystems maintain biodiversity and continue to deliver ecosystem goods and services under climate change. And we know that directed adaptation activities are urgently needed to slow the rate of biodiversity loss. Thus a key focus, especially on landscapes rich in wetlands, should be that ecological resilience be maintained and restored.

In order to measure the success of our ecosystem responses we need a robust monitoring regime. But what do we monitor?? What indicators do we develop? And how can success be measured? And finally, but importantly, how does Countdown 2010 link to climate change? Again, this is an area where more research can help point to the range of indicators we need to make sense of which modes of adaptation will work, and which not.

We need a global response to this global issue - yet the biodiversity response is effective only at local levels. Another conundrum! Somehow we need a global set of responses, tailored to local conditions.

Perhaps we should adopt the view that the world is a garden and that we are the gardeners. With this view in mind, it is clear that our future lies then with 'global gardening' (landscape management) in the most effective way.

This gardening then means:

- promoting ecological resilience;
- improving carbon sequestration;
- maximising delivery of ecosystem services;
- managing at system level not species;
- using a robust assessment process, with dependable; and
- definable indicators.

And all this within a global governance framework that sets the key parameters and priorities. So finally, if we have the science right, local national and international governance mechanisms that will respond rapidly and in an interconnected way, we can hope to manage the effects of climate change.

But I finish with a plea to think beyond forests to the vital need for the inclusion of wetlands and other ecosystems in the management framework for adaptation and mitigation against climate change! Despite the myths and the legends there is a viable future visible through the miasma – and while we wait for the politicians to decide what to do we can already get started on our global gardening.

Capability Brown, where are you now??!!

Climate Change Conference in Cardiff

Sponsored by

Cyngor Cefn Gwlad Cymru
Countryside Council for Wales

The Institute's annual conference took place on 14-16 November 2006 in Cardiff and was entitled 'Practicalities of Climate Change: Adaptation and Mitigation.' There was a very practical slant to the conference, as the title suggests, informing delegates about various different approaches for adapting to and mitigating against the effects of climate change 'on the ground'. It was another very well attended conference with 230 delegates descending upon a wet and windy Cardiff.

Peter Bridgewater accepting his Fellowship certificate from Chris Spray

One of the Institute's newest Fellows, Dr Peter Bridgewater FIEEM, opened the conference by giving a lecture on the first evening entitled 'Myths and Legends in the Miasma of Climate Change.' Peter's talk was an inspirational start to the conference, he spoke not only about Ramsar sites but about the global effects of climate change. His paper is the lead article in this issue of *In Practice*. Peter was presented with his Fellows certificate after his talk.

The conference was split up into different sessions: an overview, agriculture/land use, flora/forestry, a debate between the main countryside agencies, a ministerial address, aquatic issues, and finally a session on fauna.

Various field excursions took place on the Wednesday afternoon and luckily the rain just about held off for these. The trips were to the Gwent Levels - Magor Marsh (led by Julian Branscombe MIEEM - Gwent Wildlife Trust), Kenfig NNR (led by David Carrington - Bridgend Council), Newport Wetlands (led by Kevin Dupe - CCW), Cardiff Bay (led by Joanne Davies - Cardiff Harbour Authority) and The National Museum of Wales (led by Tim Rich – Head of Vascular Plants at the museum).

There was also an indoor session running in parallel with the field excursions – this session was to get a few people together to write an IEEM position statement on Climate Change. The position statement will be issued early in the New Year.

The AGM took place on Wednesday evening and Andy Tasker CEnv MIEEM took on the reins of IEEM President. See 'Institute News' on page 25 for further details about the AGM.

The main conference dinner followed the AGM and the Institute welcomed the following special guests: Professor Charles Gimingham, Jan Karel Mak (president of EFAEP), Chris Mils (Regional Director of Environment Agency), Julian Banscombe (Chief Executive Gwent Wildlife Trust), Morgan Parry (Head of WWF Cymru), Tim Stowe (Director RSPB Wales) and David Jenkins (Director of Coed Cymru). After the dinner David Parker, David Hill and Chris Spray were each presented with a Past Presidents Medal.

On the Thursday we tried something a bit different from the normal IEEM format and invited a representative from each of the main countryside agencies to come and speak for 10 minutes each to outline their organisation's climate change priorities over the next few years and then opened it up to questions from the delegates.

David Hill, David Parker, Andy Tasker and Chris Spray with awards for Presidents old and new

This was followed by an address from Tasmin Dunwoody (Deputy Minister for Environment, Planning and Countryside, Welsh Assembly Government). Read her full address on page 8.

The abstracts for all the papers presented are included as an insert with this issue of *In Practice* and the PowerPoint presentations are available on the IEEM website. The proceedings from the conference will be edited then compiled onto a CD and sent to all IEEM members (a printed copy to those who attended the conference).

I would like to thank all the speakers for a very thought provoking and interesting conference. For details of IEEM's 2007 conferences please see the 'Diary' on page 40.

Report by Nick Jackson AIEEM, Education and Professional Development Officer, IEEM

Three crows at Cardiff Bay
Photo: Mathew Frith

Ministerial Address

Tamsin Dunwoody, Deputy Minister
Environment, Planning and Countryside, Welsh Assembly Government

Deputy Minister Tamsin Dunwoody

It's a great pleasure to speak to you today and to welcome members of the Institute of Ecology and Environmental Management to Wales.

You have selected a hugely important, and hugely challenging, issue as the theme for this conference.

There is no doubt that climate change is one of the most serious issues facing the world.

There is overwhelming evidence that it is occurring, and increasing indications that things are moving more quickly and more damagingly that previously thought.

I know that the conference programme reflects this, with contributions from experts in different fields all illustrating the same basic message: the evidence for climate change all around us and we must take action now.

The publication of the Stern Review two weeks ago has added further weight to the case for a decisive and rapid response – and perhaps more importantly – it has dispelled many of the misconceptions about the true cost of action; and of inaction.

The Assembly Government is committed to taking action on climate change. Put simply, we must:

- Reduce greenhouse gas emissions; and
- adapt to the changes that are already way as result of previous emissions.

Earlier this year, Carwyn Jones, Minister for Environment, Planning and Countryside – published the Environment Strategy for Wales and its supporting Action Plan.

The Environment Strategy makes a clear commitment to reducing greenhouse gas emissions and to ensuring an effective response to the impacts of climate change. This reflects the importance that people placed on Assembly Government leadership in this area during the consultation on the Strategy.

We know that we face a big challenge in cutting emissions in Wales.

The latest figures show a decrease in greenhouse gas emissions compared with 1990 – but they also show that during the same period, CO_2 emissions rose in Wales.

In Wales, as in the UK and beyond, we recognise that much more needs to be done to achieve the scale of cuts in emissions that scientists advise are required to prevent dangerous climate change.

A lot of work on reducing emissions of greenhouse gases is already underway in Wales.

The Cabinet has signed up to taking action in each portfolio and work to tackle climate change is underway in all policy areas within the Assembly Government.

Other organisation across Wales are making similar commitments. For example, earlier this year the Assembly Government signed the Welsh Declaration on Climate Change with all local authorities in Wales.

Climate change is also being reflected in key strategic programmes – for example the new Convergence Programme.

The award of a second round of European funding for 2007-2013 means an extra £1.3 billion of grant will be available to help West Wales and the Valleys complete its economic transformation.

'Creating An Attractive Business Environment' is one of six proposed priorities of the new Convergence Programmes. And actions to combat climate change will be included in this priority.

The Convergence consultation document emphasises that this priority can help limit the growth of greenhouse gas emissions, by working hand in hand with environmental technologies to produce viable and affordable alternatives to the car.

It will also support the growth of the environmental goods and services sector. And help respond to environmental risk, such as by developing clean and renewable energy and encouraging energy efficiency.

Energy is clearly an important sector and the Assembly Government is committed to the development of renewable and low carbon generation and to encouraging greater energy efficiency.

Our Energy Route Map, which is currently being developed, has a vital role to play in setting out how we will put ourselves on a pathway to meeting Wales's energy needs while reducing greenhouse gas emissions.

We have produced planning guidance – TAN 8 – that gives a clear framework to encourage the development of renewables in Wales and will help us move towards our targets of 4 TWh of electricity generation from renewables sources by 2010 and 7 TWh by 2020.

TAN 8 has not been without controversy, and this is indicative of the hard choices we must make if we are serious about tackling climate change.

The Environment, Planning and Countryside Minister has announced his intention to produce a Ministerial Interim Planning Policy Statement on climate change and planning to help strengthen the focus on climate change action in the land use planning system.

Promoting more sustainable forms of energy generation is just part of the picture - encouraging greater energy efficiency is also vital.

The Carbon Trust and the Energy Savings Trust are working with businesses, the public sector and the public to help improve energy efficiency. The practical advice they provide and their high profile public awareness campaigns are invaluable.

Various Assembly Government initiatives also make an important contribution to improving energy efficiency.

Our Home Energy Efficiency Scheme, which is addresses fuel poverty, has helped over 64,000 households since 2000. This year, £19.6 million is being spent on the Scheme, which includes

an extra £5 million specifically for pensioners this year.

We have also provided planning guidance on design issues which includes measures to achieve resource efficiency through the design process; such as ensuring the siting, layout and design of buildings maximise natural heating and ventilation.

Across the public sector in Wales, progress is being made on energy efficiency and encouraging low carbon technology.

In the Assembly Government estate, the Green Dragon Standard has been used to design a robust Environmental Management System (EMS).

An EMS was achieved at Green Dragon Level 5 (ISO 14001) for key buildings in Cardiff in March 2006. The aim to extend the Level 5 standard to the rest of the Core Administrative Estate of 97 buildings by July 2009.

The EMS includes targets to reduce CO_2 emissions from gas and electricity consumption by 2% per annum year on year.

By 2010, the aim is to supply 100% of electricity used in all Welsh Assembly Government buildings across the Core Administrative Estate from renewable sources or good quality embedded generation; 92% of total electricity consumption was purchased from renewable sources in 2005-06.

Current policy agreements with local authorities include jointly agreed targets to reduce energy use and CO_2 emissions in local authority housing stock and to reduce CO_2 emissions in the non-domestic public stock.

Local Authorities are also working to meeting the Welsh Housing Quality Standard (WHQS) in their own stock by 2012. The WHQS states that "All cost-effective opportunities to upgrade the thermal and ventilation performance of the dwelling must be taken" and sets minimum standards for the annual energy consumption for space and water heating using the SAP methodology.

Within the NHS, the latest figures indicate a 6.5% reduction in net energy use and a 16% improvement in efficiency using the NHS performance indicator from a 1999/2000 baseline.

To continue to improve performance the NHS in Wales has introduced a central energy fund of £3.1 million. Funding is allocated on the basis of approved Trust energy emissions reduction plans for a three-year period starting in 2006/07.

The progress in the public sector is encouraging and we will be exploring the scope for further partnership working focused around climate change as part of Delivering the Connections and in response to the Beecham Review.

I have been leading a review of carbon emissions and transport in Wales, which will be reporting shortly.

The Transport Strategy, published for consultation earlier this year, makes a strong commitment to reducing the contribution of transport to greenhouse gas emissions.

The final Transport Strategy will be drawn up in the light of consultation and will reflect the results of the SEA. The outcomes it seeks to achieve, including those on climate change, will be embedded in decision-making on transport programmes at national and regional level in future.

The devolution of responsibility for railways and the development of a strategy to promote the take up of alternative fuels in Wales provide new opportunities to address transport's contribution to emissions.

This is in addition to the support we already provide to bus services, travel planning and walking and cycling across Wales.

The recently published draft Transport TAN indicates how we will encourage more sustainable patterns of transport provision through the planning system.

Tackling climate change requires action at all levels and there is an important UK, European and international context for our activity.

The UK Government has recently announced its intention to bring forward legislation on climate change.

The proposed legislation will include provisions to:

Conference delegates take in the address

- put the UK goal of a 60% reduction in CO_2 emissions by 2050 on statutory basis;
- establish an independent external body to advise on climate change;
- introduce new measures to reduce greenhouse gas emissions; and
- strengthen reporting arrangements.

We will be working very closely with the UK Government in developing the legislation and exploring the scope for powers for the Assembly Government in line with the new Government of Wales Act.

So far, I have focused mainly on the action that government is taking to reduce emissions, but climate change is not an issue that can be solved by government activity and regulation alone.

Everyone contributes to greenhouse gas emissions; but this also means that everyone can contribute to reducing them.

Catalysing action and helping people see how they can contribute to emission reduction is crucial – but it is not easy.

Government, NGOs and others need to work together to provide consistent messages on the action people can take – and to make it easier for them to make the right choices.

We will be using our newly established Cross Sector Climate Change Group, and linked into our Sustainable Development Communications Group, to develop a collaborative approach to climate change communications in Wales.

Action to cut emissions of greenhouse gases must remain a key focus of our response to climate change – as that addresses the root cause of the problem – but we cannot ignore the need for an effective response to the changes that are already occurring.

Previous emissions will change our climate over the next 30 – 40 years; so we must be prepared.

These changes, be it increased flood risk; hotter, drier summers or increased storminess, will have a profound effect on our natural environment and on every aspect of our lives.

We are developing a Climate Change Adaptation Action Plan to help shape and direct work to adapt to the impacts of climate change in Wales.

We are not starting from scratch; the need to respond to the impacts of climate change is reflected in activities across the Assembly Government.

For example, TAN 15 on Flood Risk strongly reflects the increased risk of flooding posed by climate change and the need to think seriously about the consequences of that increased risk in making decisions on developments.

Again, there is an important national and international context to this work, and the opportunity to learn from activity at local and regional level across the UK and beyond.

We are working closely with UK Government and devolved administration colleagues on the development of a UK Adaptation Policy Framework and keeping a close watch on the development of the Commission's Green Paper on Climate Change Adaptation.

Biodiversity will be profoundly affected by a changing climate – as many of the speakers during this conference have highlighted, but the issue is – how should we respond?

- What do we need to do to make the natural environment more resilient to climate change impacts?
- How can resources and action be best focused to deliver maximum benefits?

The answers to these questions will be crucial in enabling effective intervention and informing the approach to land management policy in the future.

The Assembly Government, other organisations and individuals across Wales are taking action to tackle climate change, but the scale of the challenge means that more needs to be done.

Scientists, researchers and sectoral experts have an essential role to play in advising government and others on how best to target our response.

Managing Wales's Water

David Lloyd Owen CEnv MIEEM
Managing Director, Envisager

The process of devolution means that water management and policy in Wales is becoming distinct from that in England. This note looks at some of the issues and implications.

When Gwyn Alf Williams wrote his polemic 'When was Wales?' in 1985, he argued that 'Wales' has never existed, which was news to many. Looking at water policy today, we are faced with a rather real Wales and need to ponder where this Wales in fact is. There is the political Wales as more or less defined by county boundaries since 1536, which has been adopted by the Environment Agency Wales (with the addition of West Kirby beach). Then there is the hydrographic Wales as defined in the 1974 organisation of the water and sewerage entities and defines Glas Cymru's operating boundaries and finally there is a wider Wales, which exists as disparate demand centres for water resources originating in Wales.

The evolution of Glas Cymru came about in extraordinary circumstances. Hyder plc was the holding company for Dwr Cymru Welsh Water (DCWW, water and sewerage in Wales), Swalec (electricity and gas distribution in South Wales) and a number of related infrastructure service and investment activities. Despite its name (Hyder means 'confidence' in Welsh), the multi utility strategy came at a high price in terms of the debt taken on when Swalec was bought in 1995. By April 2000, Hyder realised that its debts would rise above its allowable levels by the end of 2001. After a bitterly contested bidding war between Nomura, a Japanese brokerage, and WPD, a US power utility, the latter company acquired Hyder in June 2000 and divested DCWW to Glas Cymru, a not for profit company in return for Glas Cymru taking on the £1.9 billion in corporate debt.

Glas Cymru is unique amongst the ten water and sewerage companies privatised in 1989 in that it can report directly to The National Assembly for Wales as a regional/national entity. With the partial exception of the London Assembly nothing similar exists in England at a regional level, let alone one that can address a river basin's needs. Glas Cymru has inherited a utility which has higher than average operating costs (and tariffs) with a lower than average personal wealth, meaning that its environmental performance is subject to particular economic constraints.

Building a modern infrastructure

Water and sewerage services in Wales have been under private sector ownership and management since 1989. During this period of time, a modern sewerage and sewage treatment network has been installed, making up for decades of under-investment. In 1989, 50% of sewage effluents were treated, 2% to an advanced level. 56% received full treatment in 1996 and between 2001 and 2005 a population equivalent (PE) of 2.56 million people were provided with full treatment connected to sewage treatment works. This has been something of a catching up exercise.

River water – clean, but not quite green

Wales's rivers have long been portrayed as pristine, especially away from the industrialised areas. In chemical water quality terms this depiction is a reasonable one, but when you consider the biological quality, a more complex picture emerges.

GQA: chemistry quality (percentage length)

		Good (A+B)	Fair (C+D)	Poor-bad (E+F)
England	1990	43.5%	40.1%	16.5%
	1995	55.4%	34.6%	10.0%
	2000	64.4%	29.3%	6.3%
	2005	64.2%	28.7%	7.1%
Wales	1990	86.3%	11.3%	2.4%
	1995	93.2%	5.3%	1.5%
	2000	93.4%	5.2%	1.4%
	2005	94.7%	3.5%	1.8%

GQA: biological quality (percentage length)

		Good (A+B)	Fair (C+D)	Poor-bad (E+F)
England	1990	59.7%	29.7%	10.6%
	1995	66.3%	27.2%	6.5%
	2000	67.3%	27.1%	5.6%
	2005	71.0%	23.9%	5.0%
Wales	1990	78.5%	19.8%	1.7%
	1995	87.0%	12.8%	0.3%
	2000	78.3%	20.4%	1.2%
	2005	80.0%	19.1%	0.9%

Environment Agency

In terms of biological quality, while there was an 8.3% net improvement in England and Wales between 1995 and 2005, in Wales there was a net fall of 21.2%. 45.9% of inland water in Wales was classified as Very Good in 1995 (4,401 km tested) but only 29.3% in 2005 (4,626 km tested). In chemical quality terms, there was a 5.7% upgrade in Wales between 1995 and 2005 compared with a 17.2% upgrade for England and Wales. This lower increase is partly accounted for by 72.1% of rivers already being of a Very Good quality in 1995 and (26.9% for England and Wales), which rose to 75.8% in 2005 (32.8% for England and Wales).

The fall in biological quality is partly due to improved monitoring and understanding of the issues involved. It also reflects changing patterns in the use of pesticides (sheep dip disposal being a particular issue); diffuse pollution from septic tanks, acidification, localised over-abstraction, and run offs from forestry plantations and felled plantations. While regional data breakdowns have yet to be published, it is evident that a significant proportion of these rivers are at risk of failing the EU's Water Framework Directive.

Bathing waters – the green, blue sea

DCWW's Môr Glas has been a useful example of Welsh exceptionalism. Môr Glas aimed to have all 50 designated beaches in Wales operating to the EU Bathing Water directive's Guideline standard by 2000. The £40 million scheme was launched by DCWW in 1994 in alliance with a broad coalition of stakeholder groups. It was bitterly opposed by the City, which believed this money ought to be returned to shareholders.

The dramatic improvement in Wales especially at the Guideline Standard reflects the poor state of sewer discharges in 1990 and an innovatory approach towards technology since 1995. Membrane filtration, ultra violet and ozone treatment being used in small treatment works instead of the traditional policy of discharging partly treated sewage at long sea outfalls. This

Compliance with the Bathing Waters directive, 1990-05

Guideline standard	1990	1995	2000	2005
Wales	14%	38%	43%	91%
England	32%	41%	44%	74%
Mandatory standard	**1990**	**1995**	**2000**	**2005**
Wales	70%	89%	99%	100%
England	79%	89%	94%	99%

National Assembly Government, DEFRA & EA

scheme remains in action and will need to be modified to meet the revised bathing water standards coming into force between 2015 and 2023.

Sewer flooding and climate change

While the current climate change scenarios for Wales are broadly similar with those of much of western England (wetter winters, drier summers) it has become evident that rainfall and related flooding incidents have been changing appreciably fast in Wales and as a result, Glas Cymru has had to prioritise replacing combined sewerage systems with separate rain and foul water systems well ahead of their expectations in 2000.

Again, although discretionary spending has been focussed on the area of preventing sewer flooding in domestic properties, this remains a serious issue. 45% of sewer floods are the result

Properties at risk of flooding from sewers and actually flooded, 2003-06

	2003-04	2004-05	2005-06	N
Once in ten years				
Dŵr Cymru	0.014%	0.011%	0.023%	312
England & Wales	0.029%	0.027%	0.022%	5,259
Twice in ten years				
Dŵr Cymru	0.005%	0.008%	0.015%	202
England & Wales	0.013%	0.012%	0.012%	2,804
Overload incidents (per 100,000)				
Dŵr Cymru	6.1	11.2	8.7	
England & Wales	4.0	10.0	7.8	

Ofwat, Levels of service, 2005-06 report

of hydraulic overload due to exceptional rainfall. Flatter areas such as the Anglian region are less affected than Wales.

In England and Wales, there were 30,500 properties at risk in 1995-96, showing that progress has been made in the previous decade. The jump in Dwr Cymru's figures reflects a reclassification as well as the increasing vulnerability of certain properties. A further 690 households in the Dwr Cymru area to be secured against flooding in 2005-10.

In England and Wales, remedying a single household between 2002 and 2004 costs anywhere between £1,000 and £534,000 depending on the cause and the region. These are sobering figures as is the cost of flooding: damages range between £10-30,000 per property per incident, costing £270 million each year including £70-200 million for the insurance industry. Under the current climate change scenarios this could rise to £2-15 billion per annum by 2080 (Future Flooding, Office of Science and Technology Foresight Programme, April 2004), with the number of urban properties in the UK vulnerable to sewer flooding rising from 80,000 today to 300-380,000 by 2080. It is likely that further targeted investment will be needed here in Wales than compared with most of England.

'000 households	Unmetered	Metered	% metered
Dwr Cymru	944.4	226.4	19%
WASCs	12,988.2	4,636.0	26%
WOCs	2,934.6	956.2	25%
Total	15,922.8	5,592.2	26%

Water metering in time and place

By law meters have had to be fitted to all new buildings since 1990 and the prospects of cost savings have seen its popularity rise. By 2005, 26% of households had meters, although the average annual uptake has eased since 2000 due to the most obvious beneficiaries having installed meters by then.

The current 25 year plans are generally pretty feeble, with many companies aiming for 35-73% coverage by 2230. DCWW's 63% target is rather far reaching, given the generally high quality of water resources available. Even so, it somewhat is difficult to make a case for metering where water availability is not an issue, although even within areas such as Wales and North East England, regional disparities abound. Again, while there has been limited progress in England, DCWW's distribution losses have been reduced from 410 ml.day^{-1} in 1996/97 to 230 ml.day^{-1} in 2004/05, meeting Ofwat's targets. Within Wales, distribution losses are arguably a priority in only certain areas.

Slaking another's thirst – water transfers

Compulsory purchasing Welsh land to build reservoirs for providing water for English cities highlighted Wales's political impotence within Britain in the 1950s and 1960s and is indeed one of the drivers towards the current political settlement.

Approximately 50% of water abstracted within DCWW's catchment area is exported to England (Water resources for the future, A strategy for Wales, Environment Agency Wales, 2001). In total, approximately 975 ml.day^{-1} of water is transferred to England from Welsh catchment areas, or slightly less than half of the licensed abstraction capacity. Some new schemes have recently been mooted, ranging from Severn Trent's plan to expand the Craig Goch reservoir to a water grind transferring water from central Wales to south East England. Political change means that these proposals are unlikely to get very far, especially given the need to move from mobilising more water to using what they already have more efficiently.

Does Wales need to be different?

It can be argued that the development of leisure and tourism including game fishing in poorer rural areas is increasingly important, especially given the need to diversify rural incomes. A distinctly high quality of inland and coastal waters is central to developing sustainable tourism, leisure and food industries. The need to be seen to lead Britain in water quality means that Glas' discretionary spending priorities ought to be focussed here. This will be highlighted between 2008 and 2015 as the first compliance cycle for the Water Framework Directive gets underway. The ability of the not for profit corporate model to deploy discretionary spending over and above its regulatory obligations is becoming a significant differentiator for Glas Cymru over the past five years.

In contrast, Ofwat has somewhat 'southern English' concerns over waster resources and availability, which mean that metering and distribution loss issues are not equally important. While climate change will change this, it is not as rapid a priority as for example, further enhancing the security and capacity of the sewerage networks. As the Welsh Assembly Government accrues further powers, the basic settlement between the water industry and its regulators will not be greatly altered, but some practical differences, will assume greater significance than any lack of legislative change would suggest.

Wetlands For Wales

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Water levels raised in a reprofiled ditch

At the end of 2006 the first phase of the Wetlands for Wales Project will be complete. This large-scale habitat restoration project has been a successful working partnership between voluntary and statutory nature conservation organisations, and the Heritage Lottery Fund.

Ideas and enthusiasm emerged initially from the island of Anglesey in north Wales where a group was working together to look at the problems of the area's wetlands. Within this small area these habitats face problems that are representative of Wales as a whole. These include a history of agricultural drainage, nutrient enriched lakes, neglected and unmanaged reedbeds and fragmentation of the remaining resource of bogs, wetlands and wet grasslands. All are factors that have contributed to the loss of biodiversity and decline in wetland species.

An ambitious vision grew from its beginnings in 1996, of reversing this decline and restoring some of the lost heritage of wetlands, wildernesses and vanishing species. Although the developing ideas included the whole of Wales the practicalities of putting together a bid for funding eventually constrained the vision of the partnership. It retained the name 'Wetlands for Wales' but the ideas were developed in detail for a series of sites that extended from mid-Wales to the north and Anglesey, but leaving ideas for the south of Wales to be developed as a second phase in the future.

Such ambitious work needs money and when the Lottery was launched there seemed, for the first time, to be a potential source for the large sums of money that would be needed. The first bid was made to the Millennium Fund and when that was eventually unsuccessful the development continued until in November 2000 the Heritage Lottery Fund agreed to fund a package of work with a total grant of £3.6 million pounds.

As an example of the development of a bid and the working of a partnership this has been both a successful project and a valuable learning experience. The original partnership was led by the Environment Agency who provided the staffing resources that saw the bid developed to fruition. From an original team of 12 partners the final contract saw only four names on it, a strong partnership of Statutory and Voluntary bodies. Still led by the Environment Agency (Wales) it also included the Countryside Council for Wales (CCW), RSPB (Cymru) and the North Wales Wildlife Trust. Other bodies, including voluntary bodies and local councils fell by the wayside during the process. The reason lay in the way that the bid had to be constructed to meet the requirements of the Heritage Lottery Fund and the rules they have to apply to ensure that they are accountable for the distribution of their funds.

The ideal arrangement from the point of view of the conservation organisations would have been an 'umbrella' arrangement where projects that met certain approved criteria could be funded within the overall scheme as they were brought forward. Instead, the bid had to identify every single piece of land that was to be acquired, including boundaries drawn on maps. Values had to be attached to the land and the work to be done on that land identified and costed to the level of listing and mapping the locations of sluices to be installed and ditches to be cleared. For some sites this was done five years in advance of the first approach to purchase the land being made. Faced with this level of detail some partners found that their ideas could not be sufficiently developed, in one case, a local council, the finance committee of the council was asked to sign a contract binding them to fund a project four years ahead and found that they were unable to give that level of commitment.

This is the fundamental problem that arises with any large and complex bid for funding, no matter what the funding body. If an organisation owns all of the land where the work will be done then the situation is predictable and can be controlled. Where land purchase is involved however, the element of certainty that is required in order to guarantee the proper use of public funds is difficult to find.

In reality land becomes available at short notice, either through auction or on the open market. Even where a landowner is prepared to enter into a private negotiation, they would usually be interested in selling within a short timescale. Achieving a commitment from both the vendor and the grant giving organisation within a realistic period is a dream that is difficult to realise. The Lottery is not uncommon in their approach to this and in the case of Wetlands for Wales they were as flexible as they could possibly be.

Despite these early difficulties the programme was launched successfully with a series of purchases made by the RSPB of land adjacent to it's Ynys hir reserve, on the Dyfi Estuary in mid-Wales. When the reserve was bought in 1970 it was purchased as the country estate of the late Hubert Mappin, of Mappin and Webb the jewellers, and the main interest was in the western oak woodlands and the estuary. By the Millennium the focus of conservation concern had shifted to wetland bird species, in particular to the lapwing, a bird of the wet grassland meadows that has suffered an enormous decline in Wales.

Two farms of lowland grassland alongside the estuary were purchased and also the tenancy of the farmer at Ynys hir was purchased. The farm land of the estate had been bought originally with a sitting tenant under the Agricultural Holdings Act 1986, which meant that in practice the RSPB had no control over management on the land. With the funding of the project the management of the land came under the RSPB's direct control for the first time in 30 years. The land is now farmed on behalf of the RSPB by a tenant, one of the original owners, who has enthusiastically embraced the vision of bringing lapwing back to the land. The change in the law to introduce Farm Business Tenancies since 1995 has meant that land can now be farmed by a tenant with the landlord retaining a realistic control of the way in which it is farmed.

A series of capital works was undertaken on the land to create the conditions needed to attract lapwings and for them to breed successfully. Firstly scrub and shooting coverts were removed, taking out the places where predators can hide. Ditches across the land were re-profiled by removing fencing and grading the steep sides to produce shallow edges. These provided 'wet fences' to control cattle without the use of fencing and the shallow sides are friendly to lapwing chicks, which can tumble into steep sided ditches and drown. With the installation of sluices the water levels were raised giving water close to the surface providing ideal conditions for insects that are the food for lapwing chicks. Additional shallow water features were introduced for the same purpose.

An important part of the management for lapwing is to have the ground heavily grazed, even poached, by cattle by the start of the nesting season in March. This provides the kind of sward that attracts lapwing, a background against which their camouflage is effective. The mottled brown of the eggs and the dark colours of a sitting adult are vulnerable on the bowling green of a heavily fertilised uniform grass sward. An alternative to the cattle poaching that has been used successfully at Ynys hir has been the use of a mole plough to break up the uniformity of the sward. One further addition to the ideal conditions for lapwing has been missing at Ynys hir: research in Holland has shown that lapwing productivity is significantly increased by heavy applications of farmyard manure. Here though we were committed to an organic farming system without the ability to house the cattle to produce farm yard manure. This is now being rectified and we intend to increase the manure application rates.

The results of the work have been impressive as can be seen from the graph of lapwing numbers on the Penrhyngerwyn Farm. From a population of five nesting pairs before the work began a figure of 39 nesting pairs was reached within three years. This increase in numbers is a result of pulling in nesting birds from all over the Dyfi Estuary; clearly the conditions being created are those preferred by lapwing. Lapwings nest in colonies that can provide protection from predators. Smaller groups are more vulnerable and the effect of aggregating these groups is to increase their ability to defend themselves but also carries risks in concentrating the resource and creating a feature that could attract predators. Work is continuing to monitor productivity of the birds and cameras have been used to monitor the success or loss of nests in order to understand the factors affecting the success of this colony.

Installing a sluice at Ynys hir

This has been a highly successful element in the grant funded programme, the land was purchased, the work carried out and the numbers of birds delivered, a demonstrable success that provided an early boost to the confidence of all partners in the project.

A different aspect of the project is seen at the RSPB Malltraeth reserve on Anglesey. Here the focus is on the creation of reedbeds, a habitat that has virtually disappeared in Wales, and with it characteristic biodiversity including an iconic bird species, the bittern. The Malltraeth reserve lies on the rough grazing marshes alongside the river Cefni. This tidal estuary was canalised and drained in the 1780's to produce rough grassland and continues to be defended by tidal flaps at the Cob in the village of Malltraeth. With the aid of the Wetlands for Wales project and with the assistance of European Life funding the RSPB now manages a total of 284 hectares of land and is in the process of turning poor grazing land into a mosaic of freshwater marsh and wet grassland.

Following initial levelling surveys of the site and hydrological investigations an area was identified and acquired over a period of five years from six different owners. The hydrological unit has been isolated from adjacent farmers by the use of low bunds and water levels can now be controlled in a series of separate compartments across the site. Initially water was pumped onto the land but a recent engineering project has provided an inlet by which a local stream is diverted onto the site, when levels allow, giving a flow of water across the site.

The marsh element of the site has been developed progressively and some of the earliest areas are now mature reedbed that require ongoing maintenance. Many of the reeds were planted by hand, some were purchased as seedlings and some were raised in a polytunnel on the site. This wetland creation has been successful and current work is focussing on the fish populations of the site, an essential element for nesting bittern. Following recent monitoring, Environment Agency (Wales) has agreed to introduce fish to provide the necessary food supply. Although we have not yet had the first bittern nest we have seen increasing numbers of birds wintering on the site and a male has 'boomed' on the site - the display to attract a female - unfortunately unsuccessfully.

Malltraeth can also illustrate some of the difficulties of the project. One landowner eventually decided for reasons of inheritance taxation that he would be prepared to lease his area but not to sell it. The land is therefore managed as part of the project but a portion of the capital funding remained unspent.

A similar problem was faced by other partners who negotiated for land that they needed within the project. The landowner was willing to sell, however they were unable to agree on the price. For the Heritage Lottery Fund all valuations have to be agreed by the District Valuer, an essential element of their accountability in the use of public funds but all too often landowners can have unrealistic expectations of the value of their land.

The result of a number of such disappointments within the project resulted in a pool of unspent money at the end of the five-year period allowed in the bid for acquisition. During the five years of running the project we had built up a good relationship with local representatives of the Lottery and they were understanding and sympathetic about what we were trying to do. They were then able to allow us some flexibility

within the purposes that they had originally approved so that we could submit some additional small land purchases to them, on the understanding that they were linked to the original approved sites. In this way the CCW have been able to acquire two small areas of land adjacent to their National Nature Reserve at Borth Bog and the Montgomeryshire Wildlife Trust were welcomed as additional partners with their purchase of a piece of land on their reserve on the Dyfi Estuary.

The phase of the project that allows acquisition has now come to an end and there is a further period in which establishment work and management continue to be funded on these sites. As this project comes to a tidy and successful conclusion the partners and others in Wales are looking at the continuing issues surrounding wetland conservation and re-creation in Wales and are wondering where to go next. Ambitions and experience have grown. We have shown that big things are possible and that partnerships are both important and productive. The Lottery has become a valued partner who understand our vision but the reality is that the sums needed for a 'Wetlands for 'all of' Wales' project would be beyond the current funds available for grant aid and the complexities of such a project would be magnified by the increased scope. We are currently looking at the visions of all potential partners and assessing common interests and potential partnerships.

There is an immense amount of practical work that can be done for wetlands in Wales and the strengths of a partnership between voluntary and statutory bodies with the assistance of specialist consultants is needed to deliver this vision. The result may be a series of projects that will require the assistance of many funding partners over a long period but the original Wetlands for Wales, through the Heritage Lottery Funding has shown that the combination of vision, skills and a willing funding partner can deliver significant gains for biodiversity.

Renewable Energy – Ecological Implications in Wales

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Cefn Croes wind farm

Wales has a long history of using renewable energy – from many small-scale watermills and water power used in the mining industry, through hydro schemes in North Wales to wind power developments and most recently marine projects. There are now many projects under construction or in planning across Wales, but it is not clear how well the ecological implications are being addressed.

As part of the UK target of producing 10% of electrical power from renewables by 2010 the Welsh Assembly Government has set a target of 4 TWh (TeraWatt Hours) to be produced by renewable energy. Current and approved renewable electricity production falls far short of this target.

Current and approved renewable electricity in Wales

	Currently installed	Additional approved
Offshore Wind	60 MW (0.21 TWh)	90 MW (0.32 TWh)
Onshore wind	173 MW (0.45 TWh)	120 MW (0.32 TWh)
Other (e.g. Hydro/biomass)	148 MW (0.52 TWh)	10 MW (0.06 TWh)
Total TWh	**1.18 TWh**	**0.70 TWh**

If the shortfall of 2.12 TWh is, as seems likely, to come mainly from wind generation it will require a massive increase in developments both on- and offshore.

Wind Power

After an initial surge in the early 1990's, windfarm development in Wales slowed. Following the first developments there was a large backlash and many projects were refused planning permission. This co-incided with the opening up of NFFO (non-fossil fuel obligation) in Scotland and the industry more or less seemed to decamp north. The only large development since the mid 1990s has been Cefn Croes, on the edge of the Cambrian Mountains – as a large development this was permitted under the electricity act with the final say being with DTI in London, and it would probably not have been granted permission through the local planning system.

Last year, as part of the drive towards its target, the Welsh Assembly produced Technical Advice Note (TAN 8) on Renewable Energy (TANs are the Welsh equivalent of Planning Guidance). TAN 8 considers that 'in considering Wales' renewable resources and mature renewable technologies, wind power is the only clear and realistic deliverable over the lifetime of the TAN.' TAN 8 produces the results of a supposed 'Strategic Assessment' of Wales, mapping constraints on development and suggests seven 'Strategic Search Areas' that are considered to be capable of accommodating large (25 MW+) wind power developments. Following publication of the TAN, windfarm companies have moved back into Wales with exceptional amounts of interest within the strategic areas.

The Strategic Assessment was badly flawed. Firstly, it assumed that we need large scale developments, rather than a more devolved generation system. Secondly, it's weighting of 'constraints' seems to ignore most ecological issues. The only absolute constraints to strategic areas seem to be National Parks and MoD objections to developments within their Tactical Training Areas. SSSIs are generally to be avoided, but not absolutely. In fact, at least two of the Strategic Areas have important ecological features. The Denbigh Moors in north Wales includes large areas of important heather moorland SSSI where wind developments have already been turned down on ornithological grounds, and also covers Clocaenog Forest, the main refuge for the red squirrel in Wales. In mid Wales, the Nant y Moch area includes part of the Plynlymon SSSI – designated for its upland birds and the surrounding valleys are home to probably 2% of the UK red kite population. One existing windfarm in the area has already seen the death of three kites by collision.

Despite the 15 years of wind developments in Wales, we still do not know their full ecological effects. Whilst environmental assessments are required before developments there has been precious little post construction monitoring. We do not know to what extent developments displace birds or kill them, and bats are increasingly becoming an issue of concern. While it appears that effects are low, these will grow with increased developments and monitoring work is vital. It is sad that an industry that promotes itself, and is promoted by Government, as 'green' has put so little effort and resources into monitoring its own ecological impacts. Also, despite having had 15 years to develop them, the Countryside Council for Wales still has no guidelines as to what ecological assessment or monitoring is required.

The strategic area approach is also throwing up problems with assessing cumulative impact. The approach means that windfarm developments will be bunched into relatively small geographic areas. With developers rushing to get projects to the consenting stage within these areas the paranoia of 'commercial confidentiality' means that often adjacent projects are being developed in parallel and possible cumulative

effect cannot be assessed until the projects become public knowledge when consent is applied for. In addition, with some projects going for consent via the electricity act, and others via local authority planning permission, there is no overall view being taken by any one authority of the possible cumulative impacts. With some evidence that windfarms cause displacement of species such as curlew, large areas covered by turbines could have serious effects on this rapidly declining bird.

Whilst the surge of development is providing welcome employment for ecologists across Wales, it seems a shame that there is no central collection of survey results. Very large areas of upland Wales are being surveyed using similar techniques – a scale of survey not seen since the former NCC upland bird surveys in the 1980's. If only this information could be centrally collected it would give a valuable baseline for future monitoring of both effects of windfarms and populations levels of many species generally.

As well as birds – formally the main focus of assessments – the possible effect on bats is now a major issue, with evidence from Germany and the USA of significant bat kills by collision. New survey techniques are having to be developed to try and assess bat movements over large areas. Many of the Strategic Areas contain large areas of Forestry Commission land, which are being proposed for windfarms. The Commission have indicated they want to see turbines 'keyholed' into the forestry, with most trees remaining. As well as raising concerns with turbine manufacturers over possible turbulence problems, this goes directly against recent guidance from Eurobats that turbines should not be placed above trees due to the collision risk to canopy flying bats. In addition there is concern over the possible effects on peat habitats of both the large excavations for turbine bases, and the associated road infrastructure on the overall hydrology of sites. The windfarm at Cefn Groes in mid Wales has reportedly experience problems with peatland drying out and eroding – a problem that was not envisaged at the assessment stage. Surveys are also throwing up some surprises, with great crested newts being found at considerable altitudes.

Hydro power

Wales already has two large hydro electric schemes in North Wales, as well as smaller schemes more recently developed for existing dams in mid–Wales. New micro schemes are now being looked at in several sites. These involve a fairly short pipeline taking water from relatively small streams through a turbine. As long as a certain level of flow is maintained in the stream, these schemes seem to have a low ecological impact, and could provide welcome incomes to upland farmers.

Offshore

The Welsh coastline provides a further large resource for renewable energy. There is one existing offshore windfarm – North Hoyle – off the North Wales Coast, and two more in that region in the consents process. There is also consent granted for a windfarm at Scarweather sands, off Porthcawl, although construction is on hold due to financial and supply problems.

Ecological assessment of offshore sites has been better co-ordinated through the Collaborative Offshore Windfarm research into the Environment (COWRIE) Project. It is an independent company set up to raise awareness and understanding of the potential environmental impacts of the UK offshore windfarm programme. COWRIE Ltd is governed by a Board of Directors drawn from The Crown Estate, the Department of Trade and Industry (DTI), and the British Wind Energy Association (BWEA). It is chaired by an independent member. Results of research are publicly available on their website (www.offshorewindfarms.co.uk). Although there have been some problems getting results of initial monitoring into the public domain, generally work has been much better co-operation offshore than with the secretive situation onshore.

Offshore surveys have had some interesting results. For example, in Liverpool Bay, an area that was thought to be fairly well known, aerial surveys found many more common scoter than had previously been recognised. The area is now considered so important it is in the process of being designated as an SPA. What effects this will have on the proposed windfarm developments is unclear. Surveys off Porthcawl are coming up with interesting porpoise sightings.

Following on from windfarms, there is now a move into 'wet' renewables – wave and tidal power. The experimental 'Wavedragon' project is due to be installed off the Pembrokeshire Coast next year. This ingenious machine involves using the power in waves to run water up an incline to the top of the device, where the head of water obtained is used to run back through conventional turbines to generate electricity. If the trial model is successful there are plans for a larger array further offshore. Plans are also being developed for tidal current turbines in areas of good tide races such as South Stack off the Anglesey coast. The possible ecological effects of these devices are unclear. The areas of the Welsh coast with good tidal races have been shown to be important areas for porpoise, and good baseline data and monitoring will be required to assess any possible effects. This is likely to require the development of new techniques and remote monitoring.

Unfortunately the 'wet' renewables are not included within the COWRIE

Cefn Croes wind farm

scheme. There is however some co-ordination of research through a Research Advisory Group situated within the DTI. The DTI also co-ordinate the Offshore Renewable Energy Environmental Forum (OREEF) – a forum for Government (including the country agencies and JNCC), industry and NGOs to discuss the main issues surrounding the ecological effects of proposed schemes.

On tidal power, the Severn Barrage has surfaced as an idea again after lying dormant for the last decade. Any large-scale development here would have massive ecological effects, and needs very careful consideration.

Grid

If Wales is to generate all this power it obviously needs to get it to those areas where it is to be used – generally the main areas of population along the North and South of Wales. However, much of the generation will be remote from these areas, requiring new grid connections. Wales' current transmission system does not have the capacity to take much more power, and the renewable developments will require a large amount of upgrading. In some cases this will involve just renewing existing cables, but in some cases it will involve new grid routes. For example, the offshore windfarms in North Wales will require several miles of onshore underground cabling before reaching the current pylon routes into which they will plug. The cost of grid connections is a major constraint on some developments, and the ecological effects are not always being assessed in conjunction with the power scheme, but treated as a separate project.

Conclusions

Climate change has been big news recently, emphasising our need to move to low carbon technologies. Wales has a large energy resource, and is set to play a large part in renewable energy generation. However, the Klondike-like rush that is now occurring, with companies rushing to get consents in, means that there has been insufficient consideration of overall ecological impacts. Although most individual projects are being subjected to rigorous assessments, these are new or relatively new technologies and we have insufficient knowledge of their ecological impacts to accurately predict effects in many cases. The cumulative impacts of windfarms over large areas of upland Wales, where many species are already in serious decline, should be assessed, and monitoring offshore developments is going to require novel techniques and technologies. It is also important that rigorous post construction monitoring schemes are put into place to enable us to understand the effects of these developments and to improve planning of future projects.

Sirs Martin and David relax before the ceremony

Sir David Attenborough Awarded the IEEM Medal

Leading Members, Patrons and Past Presidents were among 75 guests gathered in Richmond Park on 7 December 2006 to celebrate one of the most significant events in the history of IEEM.

David Attenborough arrived in good time and there was ample opportunity for a chat with everyone and to sign a few books. The proceedings began with a call to order by Dr Jim Thompson who introduced our new President, Dr Andy Tasker. Andy gave a brief overview of the Institute and introduced Sir Martin Doughty, Chair of Natural England and IEEM Patron, who outlined the strategy of Natural England and stressed the importance of integrating access and biodiversity.

After Martin Doughty's talk David Attenborough was kind enough to present three Past President Medals to Ms Sue Bell, Prof Tony Bradshaw and Prof David Goode. David Goode thanked the Institute on behalf of the three recipients and reflected on how the Institute had developed since its early days.

And lastly, the IEEM Medal was awarded to Sir David Attenborough for his outstanding, lifelong contribution to the public understanding and appreciation of ecology.

Following the presentations, informal networking continued over lunch and the day was rounded off with a guided walk in the park, kindly provided by Mr Mike Turner, Royal Parks Tree Officer.

Report by Jason Reeves AIEEM, External Relations Officer, IEEM

David Goode, David Attenborough, Sue Bell, and Tony Bradshaw

The following is an extract from David's response to being awarded the IEEM Medal:

'In the 1940s, I was a schoolboy, and my father said to me "What do you want to do at university?"'

'And I said "I think I'd like to do biological sciences of some kind."'

'And my father said "Well, in that case I would like to introduce you to one of my ex-pupils, who is a botanist in Cambridge."'

'And I said "Yes father" and duly I was taken down and I met this engaging, humorous, lovely man who I hope you may recognise. His name was Harry Godwin. And Harry Godwin was one of the great pioneers of ecology, and with Prof Tansley the two of them between them really founded ecology in this country.'

'I met this man, and he had a Midlands accent, and he said "Now I understand, David, you want to be a biologist" and I said "Well, yes Uncle Harry" because you called everyone uncle, and he said "Well now, let's see what you know" and he took me out of his house in Cambridge and down into a ditch down the road and he bent down and picked up a flower and said "What is that, David?" and I said "It's a flower" and he said "Yes, but we have to do a little better than that. Could you give it its name?" and I said "Um, no."'

'And he said "Let's try again," so he picked up another, pink, flower and said "What is this, David?" and I said "It's another flower."'

'"Yes" he said "Could you give it its name?"'

'And I said "No" and he said "I think you have a little way to go."'

'Now I have improved a little, but honestly, not that much. And in your presence I am awed, because I know my inadequacies as a taxonomist. I know how ignorant I am, and you lot are the professionals.'

'So to start with, I take this [clutching the award to his chest] as a great complement, which I shall treasure, but I know other things too. I may not be a good ecologist, or a knowledgeable ecologist, but I do know enough of what is happening to the world, and I have seen enough of the world, to know what is happening in the world, to know that you are crucial people. You really and truly are. Back in the 40s and 50s you couldn't have said that. If I had said to anybody "Ecologists are important," they would have thought that I was crazy, but the future, as we know, is troubled. And it's in your hands, and your expertise, and your persuasion, and that your insight and your wisdom, and your pertinacity to deal with a lot of the problems that the world is going to depend on. And they are problems. I think people outside your profession don't understand how tangled and complicated and controversial many of the things that you do are. And hearing about Natural England, I, having served on the Nature Conservancy Council and knowing how controversial this is and how muddied the waters can get with nationalistic issues and political issues, know it is not easy, and I know that. But I don't know it as well as you know it.'

'So, I am proud, if undeserving, that I should have an award from an ecological group of people. I am truly proud and I thank you very much for it. But most of all, I wish you the greatest success in years to come, because, my goodness, the world needs you. Thank you very much.'

Countryside Management Association Conference

British Camp, Malvern Hills

Towards Natural England was the title of the 40th annual meeting of the Countryside Management Association (CMA) held at the University of Worcester on 14-15 September 2006, just prior to the launch of Natural England – bringing together English Nature and parts of the Countryside Agency and Rural Development Service.

Day one consisted of presentations and workshops and Mike Woods, Chairman of the CMA, welcomed everyone to the conference.

Maurice Broomfield, Chairman of Worcestershire County Council, who was born, raised and educated in Worcestershire, welcomed the delegates to Worcestershire – a county that has 'everything but a coastline.' He stressed the importance of farming in Worcestershire and praised its natural beauty.

Jon Cree, Training Co-Ordinator for Bishops Wood Education Centre, spoke on Enjoyment of the Natural Environment. He gave an inspirational talk on education and the natural environment and praised Poland for the advances that it has made in this field.

Sir Martin Doughty, Chairman of Natural England and an IEEM Patron, gave an introduction to Natural England and how he hoped the new organisation would take on its new role with the help of people like countryside rangers.

Stephen Preston, a landscape ecologist for English Nature (now Natural England), gave a talk on A Healthy Natural Environment – Biodiversity and Landscape. He spoke of the importance of bringing landscape and ecology together.

Abbey Park, Evesham

Wendy Thompson, Recreation Strategy Programme Manager for the Countryside Agency (now Natural England), spoke on the Enjoyment of the Natural Environment – Recreation and Access. Her talk stressed the importance of a recreation strategy for Natural England.

The presentations were followed by questions to the panel (including the above speakers plus Ceri Daugherty, Senior Countryside Officer, Countryside Council for Wales). Most of the points to come out of the discussion related to the lack of funding and resources. Other issues included: the need for strategy and delivery to be more closely linked and people on the ground to have more input into strategies; Natural England should follow the example of Sport England and recruit influential people for the countryside cause, Sport England has Lord Coe who is well known and involved in politics; and funding for the countryside must be guaranteed for longer periods of time than it currently is, three years is not enough time, funding should be for five years or more.

The three workshops, Biodiversity and Landscape, Environmental Education, and Recreation and Access, aimed to gain feedback from rangers working on the ground and proved to be thoroughly productive.

A conference summary was presented by Mike Woods before CMA members congregated for their AGM and afterwards everyone was invited to the conference dinner. Dinner was followed by two speakers. David Newman told tales going back as far as 1966 when he became the very first ranger of the Brecon Beacons. And Wade Muggleton concluded the evening with some cynical yet hilarious views on the world.

Day two comprised three field visits: An Introduction to Grazing: Malvern Hills by Ian Rowat, Director, Malvern Hills Conservators and David Armitage, Assistant Manager, Malvern Hills AONB; Raising Standards in Country Parks: Worcester Woods Country Parks by Dan Barnett, Senior Countryside Sites Officer, Worcestershire County Council; and Parks and Riversides as a Focus for Regeneration: Abbey Park, Evesham by Phil Merrick, Head of Community Services, Wychavon District Council and Lynn Stevens, Parks Manager, Wychavon District Council, which showcased the progress made in the Worcestershire countryside.

For more information on the CMA please visit countrysidemanagement.org.uk.

Report by Jason Reeves AIEEM, External Relations Officer, IEEM

NE England Meeting Report

Wind Farms, Birds and Bats

The NE Section's first presentation of the 2006/07 season provided an insight into the challenges faced by ecological consultants when undertaking Environmental Impact Assessments for proposed wind farms. 'Windfarms: Environmental Impact Assessment for birds and the bats' was presented by Glen Robson (Principal Consultant) and Hugh Watson (Associate Director) from Entec UK Ltd, both of whom are based in the company's Newcastle upon Tyne office. The venue was Northumberland National Park Authority's office in Hexham; a fortunate choice given a record attendance of over 60 (compared to our usual 15 or so). Additional space was provided by opening a partition into the library, but even then there was standing room only.

Between them, Glen and Hugh have over 20 years of consultancy experience, with wind farm EIAs being a major component of their workload. In some respects their current work is a far cry from backgrounds in ornithological and otter research respectively, though perhaps not that far given the almost inevitable protected species issues that need to be addressed on most wind farm sites.

The presentation began by providing a general overview of the main ecological issues that tend to arise when undertaking wind farm EIAs. After briefly covering wind farm layout and mitigation measures for habitat loss, potential run-off to water courses during construction, and protected species, Glen went on to consider the evening's first big issue - birds.

There are three main wind farm ornithological issues: direct habitat loss (never the greatest concern); displacement due to disturbance; and collision with turbines, drawing attention to a number of guidance documents that have been produced by Scottish Natural Heritage (SNH) and RSPB. Entec's approach to ornithological EIA draws upon the guidance documents produced by SNH in particular (which are applied in England and Wales as well as Scotland). SNH's approach to ornithological assessments for wind farms was discussed in detail, in particular collision risk analysis - and the potential for the over-interpretation of the results by those with little understanding of the limitations of the modelling process.

Examples of collision risk analysis, which suggested high collision rates were discussed and contrasted with published wind farm mortality studies that show collisions with turbines are uncommon at appropriately located and designed wind farms. Also discussed were the features of some of those exceptional sites where collision of birds has proved to be an issue, for example Altamont Pass in the USA and Tarifa in Spain.

Glen concluded by describing two case studies where collision risk analysis had proved superfluous to the assessment of potential impacts on two key species. For red-throated diver, an understanding of flight behaviour had required a more focussed approach than that required to collect data for the collision risk modelling; while for a site with breeding hen harriers, the core area of activity was clearly identifiable from flight line data. In each case, potential impacts were mitigated by redesigning the turbine layout to avoid areas used by the birds.

Hugh Watson then took over with a resume of the emerging concerns about the potential for wind farms to affect bats. These are much the same as for birds, but are harder to investigate because of the small size and nocturnal behaviour of bats. As far as collisions are concerned, there seems to be a link with wooded mountains and migration routes. In these situations, bat mortality is well known in America and Germany, but the scale of the problem is unclear in the UK – if indeed there is a problem at all. Hugh pointed out some of the practical problems associated with the draft EUROBATS bats and wind farms impact assessment guidelines. He expressed his hope that the focus of effort would be put on the development of generic guidance for the siting and design of wind farms, and on well-planned monitoring studies of bat behaviour at wind farms. Hugh ended with the observation that if any wind turbines do pose a serious threat to UK bat populations, they are more likely to be the small household turbines that could appear in their thousands in our bat-rich gardens, towns and villages, rather than the full-size turbines sweeping the air high above our bleak uplands.

The meeting concluded with a lively discussion suggesting that mixing wind farms with birds and bats is likely to prove a topic of continuing debate for the foreseeable future. It is difficult to highlight any two issues from the discussion, but key topics to emerge were the need for post-construction monitoring data to be made publicly available, and the need for studies of interactions between bat and household wind turbines.

Readers seeking further information on 'birds, bats and wind farms' may contact Glen Robson at Entec: robsg@entecuk.co.uk. Further information on the programme of NE meetings may be obtained from the regional convenor: andrew.cherrill@sunderland.ac.uk.

SW England Meeting Report

The Royal Agricultural College, Cirencester was the venue for September's meeting on ecological evaluation and assessment. There were two presentations: Measuring biodiversity quality and The IEEM Ecological Impact Assessment Guidelines.

The IEEM Ecological Impact Assessment Guidelines *Karen Colebourn MIEEM*

The new Guidelines for Ecological Impact Assessment (EcIA) in the UK cover terrestrial, freshwater and coastal habitats and set new standards for the assessment of the ecological impact of projects and plans for all those involved in the process. They can also be used, for example, to provide environmental information to accompany an application for consent, to guide a development brief or to inform a management plan.

Karen covered a number of areas within EcIA which the Guidelines aim to improve:

Consultation - it is important that all those involved in the assessment process get involved at the outset. This includes ecologists working for the determining authority and third party consultees.

Focus - ecologist's need to focus on impacts not 'the site'.

Reviewing the development activities - a thorough review of activities likely to generate impacts is required. Often fundamental site preparation activities, such as dealing with disused mine shafts, are not considered. Ecologists need to be familiar with all aspects of the development process; this can be difficult as the information required is not always available, but where assumptions have to be made these should be made clear in any report. If new information comes to light during the assessment process, it may be necessary to revise the extent of the 'zone of influence' or the assessment of impacts on features within that zone.

Geographic frame of reference - features should be valued using a defined geographic context. If it is finally determined that there is likely to be an impact on a feature, its value should indicate the relevant policy/legislation.

Legal protection - sometimes features which are not of sufficient importance to meet the threshold value for inclusion in the assessment process are subject to legal protection. This should be clearly identified and discussed outside the assessment of potentially significant impacts.

Confidence in predictions - the Guidelines move away from traditional matrices to provide a clearer, meaningful impact assessment based on the structure and function of the system which is supporting the affected feature.

Baseline conditions and cumulative impacts - it is necessary to describe the conservation status or integrity of the feature in the absence of the proposal. This should include consideration of all the natural and man-made changes that can reasonably be predicted.

An assessment of impacts on status or integrity thereby incorporates cumulative impacts.

Mitigation - within the Environmental Statement (ES) chapter it should be made clear the mitigation that needs to be subject to legal obligations or conditions. Mitigation needs to be agreed prior to the production of the ES chapter so that it states mitigation WILL be undertaken and is not just a suggestion of mitigation. If the requirement for mitigation is key to the decision making process, mitigation must be firmly agreed and going to happen! It also needs to be clear who is going to do it and pay for it!

Monitoring of mitigation – currently, unless there is a requirement for a licence there is no enforcement of monitoring of ecological mitigation works. There is pressure to move in this direction but as yet there is no legislation that addresses this issue.

IEEM will be running introductory and advanced training courses on the application of the Guidelines. It is also inviting members to submit examples of EcIAs undertaken using the Guidelines to its Technical Group, which will put the best on the IEEM website.

Report by Hannah Powell MIEEM, Waterman CPM.

Measuring Biodiversity Quality *Alan Feest MIEEM*

Most of us at some point in our career are faced with devising a method to measure biodiversity. This may be related to monitoring, such as progression of a restoration site, assessing long term impacts of development or monitoring site condition. Alternatively we may wish to compare sites, perhaps for management purposes or making site purchase decisions. Even with a project specific sampling strategy, we are often left making subjective comparisons of species lists or focusing on a restricted range of "indicator" species.

With a well argued presentation, Dr Alan Feest from Bristol University showed that we can do much more to quantify biodiversity quality. He demonstrated that where biodiversity is the ultimate goal, collecting data in a systematic way to allow several simple biodiversity indices to be calculated, provides us with a more powerful and reliable tool for monitoring change and making comparisons between sites.

Alan's method can be applied to many different taxonomic groups. It relies on taking 20 sub-samples along a transect within a delimited area (Feest, 2006). The sub-samples can be pitfall traps for invertebrates, butterfly observations/ counts, birdsong counts, macrofungi quadrats or other suitable samples.

The data collected is used to calculate a range of indices representing different characteristics of biodiversity including: species richness (total number of species for the site), biodiversity index (*e.g.* Shannon-Weiner, Simpson's or Berger-Parker indices), density (number of individuals per unit area or sample), species value index (based on arbitrarily assigned values related to, for example, rarity), biomass (assumed to be proportional to parameters measurable in the field *e.g.* cap area of macrofungi).

Alan has developed a simple computerised system and database to speed up these calculations.

The particular value of the method seems to be its ability to provide reliable and meaningful results with a wide range of habitats and species. It would be well suited to monitoring impacts from development where baseline periods are often short, ecological staff turnover is high and it is difficult to be precise about the outcome of habitat creation/ restoration proposals.

Feest, A (2006). Establishing baseline indices for the quality of the biodiversity of restored habitats using a standardised sampling process. Restoration Ecology Vol. 14, No. 1 pp.112-122

Report by Louisa Kilgallen CEnv MIEEM, Wiltshire County Council.

Scottish Conference and AGM

Natura In Practice: International Obligations at a Local Level

28 September 2006, The Moorings Hotel, Banavie, Fort William

Crona O' Shea AIEEM and Oyunn Anshus

Nearly 40 delegates braved the west coast weather to make it to Banavie near Fort William for this year's IEEM Scottish Section Conference on Natura in Practice and its AGM. There were representatives from organisations in the public and private sectors and academic institutions, from as far and wide as Edinburgh, Glasgow, Aberdeen and Argyll to the Shetland Islands. The conference was an opportunity to hear about experiences of working with Natura sites, to discuss how things have recently moved on. The field trip was a chance to see how the Sunart Initiative is being implemented to encourage the local community to actively manage the Sunart Atlantic Oakwoods for mutual benefit.

Ian Strachan, SNH Advisory Officer on species and habitats, presented a useful overview of Natura, its background in Europe, the management of Natura sites, and both current and future issues. The latter of the two included agri-environment schemes, land management contracts, ecological networks and a review and revision of both the Birds and Habitats Directives. The brief discussion that followed emphasized the difficulties associated with identifying 'favourable status' of a site and whether or not Natura has perhaps been isolated from the principles of sustainable development.

With the scene set by Ian's introduction, Jake Willis, an Environment and Community Forester (FCS) working on the Sunart Initiative, presented the issues of managing and delivering Natura 'on the ground'. The Sunart Initiative is an exemplar project that demonstrates the principles of partnership in conservation underpinning rural development. Most significantly, it illustrates the importance of community involvement in the successful environmental, economic and social regeneration of rural areas.

Gill Calver spoke on how policy has been translated into local action. Gill currently acts as an agent for local land owners and has a wealth of hands on experience when it comes to ridding the Glen Barrowdale area of Rhododendron. His talk was beautifully and impressively illustrated with before and after slides that revealed just how quickly a site can regenerate. The key message from the talk was the importance of involving and properly informing the local community and providing necessary training.

Annie Say from Natural Capital Ltd. gave the consultant's view of experience of working with Natura sites. Annie's presentation was well illustrated with topical case studies that highlighted some of the strengths of Natura as well as the uncertainties that it presents. One of the key issues for consultants is the amount of baseline information that can often be required but difficult to obtain or which has simply not been collected. Annie ended by pointing out that economic growth and development is an important aspect of the sustainable development of Scotland and asking the question 'what role can IEEM play in this?' A good discussion followed, covering issues such as the importance of sharing best practice and developing the skills base within and amongst the IEEM community, the issues associated with cumulative impacts and the important role that communities have to play.

The trip to the Sunart Initiative began with a visit to a wood pavilion used for community projects, which was built with local wood using traditional techniques and powered by solar panels. Jake discussed the issues associated with the use of local timber and how community initiatives such as the recent construction of a saw mill and a deer fence as well as furniture making projects are proving very successful in the area. The group then moved on to a wildlife hide at the end of a forest trail, which was constructed with a great deal of skill and consideration for the local landscape, and where the group enjoyed watching seals and seabirds on Loch Sunart. Jake discussed the relearning of silviculture skills (*e.g.* pruning and thinning) to improve tree quality as well as the Baccleugh project, which aims to raise the profile of hardwood.

With the mild afternoon weather and the picturesque surroundings at Sunart, it was an excellent finish to a very informative and enjoyable day.

The IEEM Annual Scottish Section Conference was held during the conference. Daniel Gotts has agreed to continue as the Section Convenor for the coming year and several new Members were welcomed to the Committee: Elaine Cameron and Kathryn Mordaunt. Several Members stood down from the Committee: Crona O'Shea to pursue her GIS career and Geraldine McGowan. Crona was thanked for her help and commitment as the Scottish Section Secretary and Geraldine although no longer on the Scottish Committee will continue her sterling work on the Membership Admission Committee.

Visiting the Sunart Initiative

NW England Meeting Report

Farming and Wildlife

The alarming decline in farmland bird populations since the 1970's is well documented. Although largely halted in recent years, overall numbers of specialist farmland birds is still well down on those 30 years ago and species such as Grey Partridge continue to decrease in numbers. A recent field event for the NW Shadow Section looked at how government agri-environment schemes are addressing the issue.

The title of the event on the 27th October 2006 was 'Farming and Wildlife: Agri-environment Schemes and the Future' and the 17 attendees highlighted that this is one of the most topical issues on the environmental management agenda. The meeting was led by Graham Walsh from Natural England and the generous host was James Tomlinson, owner of Clifton Marsh Farm on the north side of the Ribble Estuary close to Preston.

As members enjoyed a cup of tea in one of the beautiful offices converted from old cattle housing on the farm, Graham Walsh gave a presentation on the newly created Natural England. The organisation launched on 2 October 2006, brings together the environment activities of the Rural Development Service, English Nature and the Countryside Agency's Landscape, Access and Recreation division. One of its roles is to deliver Government agri-environment schemes, including the Environmental Stewardship Scheme (ES), which superceded the older Countryside Stewardship (CSS) and Environmentally Sensitive Area (ESA) Schemes in 2005. Reference was made to the multi-objective nature of the schemes, incorporating wildlife, landscape, historic environment and access as well as new aims of ES; resource protection, genetic conservation and flood management. These objectives were related to wider UK and European targets of biodiversity conservation, SSSI management and the reversal in the decline of farmland birds.

Clifton Marsh Farm signed a 10-year Countryside Stewardship Scheme (CSS) agreement in 2004 and since then the Farm has also taken up some additional options under the Entry Level of the Environmental Stewardship Scheme. The main aim of the options is to provide year-round habitat for a range of farmland birds that had been identified in the area by RSPB Volunteer and Farmer Alliance surveys. This part of Lancashire has relatively good populations of specialist farmland birds such as corn bunting, grey partridge and lapwing, all of which have shown an severe decline in numbers since the early 1970's. One of the targets for Natural England is to reverse the decline, before 2020, of a suite of farmland birds that are seen to reflect the overall health of the farmed environment.

Most of the day was spent giving attendees the opportunity to see the agri-environment scheme options on the farm. Overwintered stubbles and strips of wild bird seed crops were particularly evident and both these options provide key food sources for seed-eating birds such as yellowhammer and corn bunting. Most of the bird seed crops were in the their second year, with biennial kale dominating. The small kale seed from were just beginning to be released and cover afforded by the plant's leaves also seemed ideal for ground-feeding grey partridge. Mr Tomlinson has begun a comprehensive programme of hedge restoration across the farm and explained how he has enjoyed the art of hedgelaying for the first time. The resulting thick, healthy hawthorn hedges should help to boost the food supply for fruit and insect feeding birds as well as increasing potential nesting habitat and conserving the local landscape character.

Lapwing are also well served on the farm. To help provide and to bring to the surface the worms and insects preferred as food by the breeding adults and their chicks, large areas of grassland on the farm have been subject to wetting up, by blocking or diverting drains. The birds favour nesting on recently ploughed areas where they are very well camouflagued and there was a discussion about the variation in ploughing dates that could be applied on stubble option fields in order to attract lapwing. They often arrive as early as the 1st February, but at present, ploughing is not allowed until after the 14th. Nevertheless, the juxtaposition of bare ground in the spring sown crops and the wet grassland areas is proving beneficial for the bird.

The most unusual part of the day was the walk down to the Ribble Estuary. There are a number of historic sea defences that could be seen and Mr Tomlinson explained how floods had once come right across the fields. Since the 1980's though, a major landfill site has occupied much of the land by the river and some of the recently reclaimed areas now being managed as extensive pasture and attract breeding lapwing and skylark. Alongside the river is an area of accreting saltmarsh, formed since dredging of the river bed ceased and this land has been recently included in the farm's Entry Level Environmental Stewardship agreement.

The day showed how easily measures to attract a range of farmland birds can be fitted in to the management on a productive farm. The challenge for the future is to apply these simple tools across a major part of the British countryside to benefit the wider farmland bird population. The new Environmental Stewardship Scheme should help to do this, both through its simple Entry Level and targeted Higher Level options. For more information readers are welcome to contact by email Graham.walsh@naturalengland.org.uk. Details on the Environmental Stewardship Scheme are available at http://www.defra.gov.uk/erdp/schemes/es/default.htm.

It was a rainy day in the North West
Photo: Paul Rooney

Institute News

IEEM Fellows

Dr Jeff Kirby, Managing Director of Just Ecology was approved by Council on 7 December 2006 as a Fellow. Throughout the course of his career, he has made an outstanding contribution to ecology, by innovative techniques for wildfowl, contributing advice to government departments and promoting high standards in the profession.

At the Conference in Cardiff Dr Peter Bridgewater was presented with his Fellows certificate after having delivered a first class and thought provoking Fellows lecture. This edition of In Practice contains the printed version of his talk.

AGM

The recently produced Annual Review really covers most of the substance of the reports in the AGM. During the AGM, the following were elected:

President:	Dr Andy Tasker
Vice President:	Dr Eirene Williams
Secretary:	Dr Janet Swan
Treasurer:	Dr Alex Tait

Members of Council are : Mike Barker, Colin Buttery, Greg Carson, Nick Carter, Karen Colebourn, Richard Graves, Richard Jefferson, Tom Keatley, Jenny Neff, Pam Nolan, Steve Pullan, Paul Rooney, John Rose and Jane Southey. Chris Spray was warmly thanked for his efforts as the two year term of his presidency came to an end and at the later dinner, was presented with a celtic bird designed in Welsh slate.

The IEEM Past Presidents Medal

The Cardiff conference saw an innovation for IEEM – the awarding of a medal for Past Presidents - David Hill, David Parker and Chris Spray. The presentation of the award to Sir David Attenborough in Richmond Park provided the ideal opportunity to present the medals to the remaining three Past Presidents, Tony Bradshaw, David Goode and Sue Bell. This is fully deserved recognition of the contributions that all six have made to the development of the Institute.

News of Members

The Environment Agency recently invited experts to name the people who have done most to save the planet. In fourth place and deservedly so was Sir David Attenborough. But nestling between Charles Darwin and the Dalai Lama was our very own Professor Tony Bradshaw – a great tribute to a real exponent of the practice of ecology and listed as an urban ecologist - congratulations. The list included some truly distinguished names Al Gore, David Bellamy (an IEEM Patron), St Francis, Gro Harlem Brundtland, Max Nicholson – oh, and Jamie Oliver!

IEEM Staff News

Christine Searing has now left IEEM after being employed as a temporary administrative assistant until 30 November 2006. She made a very useful contribution to the Institute at one of our busiest times of year. Gemma Langdon-Saunders started in a full time capacity on 1 November 2006 and will be covering a wide range of administrative tasks for the Institute.

Gemma has recently completed a degree in oceanography from Southampton University and is currently undergoing a Sage accounting course. This has been a busy time for Gemma who also got married in October, just before starting with IEEM.

Revision of Membership Regulations

The revised membership regulations seem to be working well and there is absolutely no let up in the number of people applying. 35 Graduate members had been approved by the end of November 2006. To avoid any future confusion do please note that entry as a Graduate is on the basis of your qualification. When you come to upgrade to Associate Member you will be assessed on your professional experience and its relevance in the IEEM context.

Membership Renewals

My annual plea for prompt payment of fees appears to have been heeded only marginally better than last year! Reminder letters have now been sent out to all those concerned – so could those who have not yet paid please do so promptly. At first sight though there has been a rise in members returning their CPD records and acceptance of this requirement is gaining ground all the time.

Welsh Shadow Section

David Parker (CCW and past IEEM President) chaired a meeting to launch a Welsh Section at the IEEM Annual Conference in Cardiff. This was attended by nearly 30 people; many others, unable to attend the meeting, emailed to give their support and to offer assistance or possible topics for events. Several Welsh Members including Abbey Lee, Chris Formaggia, David Parker, Fred Slater, James Gillespie, Mike Willis and Steve Crosby, volunteered to help form a Welsh Shadow Section Committee; Chris has agreed to be the 'Convenor' for the Section. Chris will shortly be in touch with the Welsh Members to find out what they want from their Section and to draw up a programme of events for 2007.

If your main contact address is not in Wales, your email address will not get 'picked up' for Wales. If you would like to be on the Welsh email list please can you send us your email address in Wales. Once set up there will be a Welsh Section page on the IEEM web site and it will list activities and events.

Irish Section

Less than two years after the launch of a Shadow Section in Ireland, the Section has been formalised. The Shadow Committee has worked hard to build a visible presence across Ireland and its efforts have been rewarded through the increasing numbers of ecologists and environmental managers across Ireland that now attend their annual conference.

Ireland's first AGM was held during their third conference at the Botanical Gardens, Dublin on 16 October 2006. Mieke Muyllaert has been elected as Convenor, Richard Nairn as Vice-Convenor, Pascal Sweeney as Secretary, Paul Scott as Treasurer with Committee Members: Sasha Bosbeer, Pat Doherty, Katherine Duff, Norma O'Hea, Janet Slattery, John Wann and Faith Wilson. Two proposals for future work in Ireland were considered: a Republic of Ireland version of the Guidelines for Ecological Impact Assessment in the UK and partnership with the production of Guidelines for EcIA Marine and Coastal.

This year's conference on Habitat Creation and Restoration was attended by nearly 120 people. The abstracts from the presentations are included as an insert with this *In Practice*, and can be found online at http://www.ieem.org.uk/Dublin%202006%20conference.htm.

Reducing Risks from Lone and Remote Working

In response to a Member request IEEM have investigated providers of 'wireless monitoring solution' services. These are 24 hour 365 days a year safety cover systems to reduce risk associated with remote location and lone working. If you are interested in the service for yourself as a sole trader or as IEEM Members in a company please contact lindayost@ieem.net.

The Society continues to develop in a positive way and is now beginning to reap the benefits of the establishment of its offices in Atherstone and having support staff all under the same roof.

A Board meeting was held on the 30 November 2006 attended by Eirene Williams and Jim Thompson at which the main item was approval of the Business Plan and the accounts for the previous year. This was the first meeting of a major new member, the RICS, and the Landscape Institute has now also decided to join. Several more Institutions are in the pipeline as potential members. As more and more join it will be necessary to re-assess the direction of SocEnv and its governance and this process will start with an away day for Board members in March.

The new SocEnv website is now operational and is well worth a visit. This was originally set up by IEEM and has been managed by IEEM until just recently - www.socenv.org.uk. The idea is that this will be built up gradually and one of its features will be the creation of an environmental knowledge hub. One issue under consideration is the development of position statements and hot topic, the views of the Society on energy. This requires further work and one issue certainly for debate is the future role of nuclear power and its role in limiting carbon emissions.

Applications from IEEM Members to become Chartered Environmentalists by the main entry route have been slow in coming but are now starting to accelerate – there are currently seven applicants to be interviewed in January 2007. This entails the production of written work and a professional interview. The first two Members to be approved in the post grandparenting route are Andrew Gardner and Jonathan Benge – congratulations.

The rules on applying to be a chartered environmentalist are reasonably clear but it is worth stating that members who have only just acquired sufficient experience for Full Membership of IEEM may find may their breadth of experience is insufficient. If this appears likely we now advise members that their application may not be successful before effort and expense of a Professional interview are actually undertaken. However, providing the specifications are met, no member still wishing to be interviewed will be refused. The spirit of being chartered is that members should have well rounded experience.

On 17 October 2006 the Secretariats of the various constituent bodies of EFAEP met at the VDI-Office in Brussels to discuss and share information on the various organisations and how they could work better together in the future.

The assembled representatives were welcomed by the EFAEP President, Jan Karel Mak, and then each representative introduced their respective organisation and highlighted their particular strengths and aims. It became clear that the associations are very different in structure and objectives. Some have thousands of members and are engaged in a broad range of environmental topics like the VDI-KUT (the environmental branch of the VDI), CIWEM or the VVM. Others are small with only a few hundred members and are very focused on one or two special issues like the VNU, which specialises in Environmental Management Systems. Some Secretariats have paid staff, others work on a voluntary basis. It is also clear that very different professions are organised within the various associations, for example, engineers, scientists, ecologists and management experts.

To support the co-operation of associations who work on the same issues, a table of specialisms was drawn up. IEEM has agreed to contribution to the following areas: Communication; EIA; Education; Climate Change; Health and Safety; Ecology and Biodiversity; Land Use Planning; and Participation at Fairs.

Also discussed were issues and projects on which the member associations may like to work together. The VNU plans to organise an EFAEP European Environmental Verifier Day in May 2007 in Brussels and asked the other Secretariats to help with the promotion of the event in their own organisations and countries.

Lastly, the new database for environmental professionals was presented. The database was designed by AIAT and AISA with the support of IT-developers. The program is unique and was generated especially for the needs of EFAEP. The new system places great importance on access to and security of the information on the database. EFAEP is setting great hopes on the database, and for its promotion, a special task force is at work. The database will become active from early 2007.

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

The pan-European members' meeting of the World Conservation Union (IUCN) held under the theme 'Towards 2010 and Beyond – A Vision for European Nature' took place in Barcelona on 20 and 21 October 2006. About 150 invited delegates reviewed progress on the achievement of the Countdown 2010 goal. Views were mixed as to whether within a European context the goal was likely to be achieved with some countries being quite positive. The picture in the UK is mixed. The recent report from Defra – Working with the Grain of Nature makes some positive reading. The underlying concern though is that the message is not getting across in society at large and the profile needs to be raised.

Part of the meeting was taken up with a signing ceremony and Jim Thompson signed on behalf of both IEEM and EFAEP. The IEEM support had been approved at the last Council meeting. By signing the Countdown 2010 declaration, an organization becomes a partner of Countdown 2010.

The objectives are:

1. to encourage and support the full implementation of all existing binding international commitments and necessary actions to save biodiversity;

2. demonstrate clearly what progress Europe makes in meeting the 2010 commitment;

3. gain maximum public attention across Europe for the challenge of saving Biodiversity by 2010.

More information about Countdown 2010 is available from the website www.countdown2010.net

Jim signs up IEEM and EFAEP to Countdown 2010

In the Journals

Jim Thompson CEnv MIEEM and Jason Reeves AIEEM

W.J. Sutherland.

THE TANSLEY LECTURE

Predicting the ecological consequences of environmental change: a review of the methods.

Journal of Applied Ecology 2006, **43**: 599–616.

The major lectures in the BES are usually well worth an entire read and this is certainly no exception.

The lecture reviewed the main approaches available in the context of increasing our ability to predict the consequences of environmental change. These are: extrapolation, experiments, phenomenological models, game-theory population models, expert opinion, outcome-driven modelling and scenarios. Each approach has different strengths and weaknesses. In practice, several approaches are often combined.

Adaptive management aimed at testing hypotheses is excellent in principle and widely advocated. But it is almost never carried out because the changes in management usually have to be severe in order to bring about detectable changes in a reasonable time, and the political risks of such management are usually considered too high.

Game-theory population models are used to determine population-level phenomena based upon the decisions individuals make in response to resource depletion, interference, territoriality or rank. This allows predictions to be made regarding responses to novel conditions. The main drawback is that for some models considerable information is required.

Much of conservation practice is not based upon evidence. Evidence-based conservation is the practice of accumulating, reviewing and disseminating evidence with the aim of formulating appropriate management strategies. Evidence-based medicine revolutionized medical practice and similar opportunities exist to improve conservation practice.

The conventional approach of making assumptions and deriving models to make predictions about the consequences of environmental change is often unsatisfactory for complex problems, with considerable uncertainty. Tackling such problems is likely to require greater exploration of techniques such as expert opinion, output-driven modelling and scenarios.

The paper concludes by citing several scenarios and a strong plea for the widespread adoption of the principles of evidence-based conservation.

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G.M. Siriwardena, N.A. Calbrade, J.A. Vickery and W.J. Sutherland.

The effect of the spatial distribution of winter seed food resources on their use by farmland birds.

Journal of Applied Ecology 2006, **43**: 628-639.

Agri-environment measures providing winter seed are central to current management activities aiming to reverse granivorous farmland bird declines. To examine the effect of spatial distribution of food sources the authors set up a field experiment with seven artificial feeding stations separated by different distances, to investigate bird movements between discrete winter food resources.

Feeding sites were established and bird use monitored over two winters. Habitat type in the areas surrounding the feeding sites was also recorded. Two measures of feeding site use were analysed as functions of the distance from the nearest alternative feeding site for 11 passerines (including chaffinch *Fringilla coelebs*, reed bunting *Emberiza schoeniclus* and yellowhammer *Emberiza citrinella* and non-granivores such as blue tit *Parus caeruleus*).

The results suggested that species such as chaffinch and blue tit made disproportionately more use of food at isolated sites than at clumped ones, but that reed buntings and yellowhammers used food in proportion to its availability, moving freely between more clumped patches. In both cases, birds tended to share resources separated by 500 m or less. At greater separations, resources tended to be used by discrete groups of birds.

The response of birds to the experimental food resource distribution implies that creating resource patches more than 1 km apart should be most cost-effective. This has implications for agri-environment scheme planning.

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M.J. Whittingham, C.L. Devereux, A.D. Evans and R.B. Bradbury.

Altering perceived predation risk and food availability: management prescriptions to benefit farmland birds on stubble fields.

Journal of Applied Ecology 2006, **43**: 640–650.

European farmland bird populations have fallen dramatically and sympathetic management of key habitats is one crucial way to help boost these populations. Maximizing the value of habitats for foraging birds has largely focused on practical measures to increase food abundance, but energy intake is also affected by food accessibility and perceived predation risk.

The authors tested the importance of manipulating perceived predation risk and access to food on the distribution of birds on stubble fields. They investigated the effects of changing vegetation height (via topping) and scarification on vegetation structure, seed density and distribution of farmland birds. In a second experiment the temporal effects of scarification on bird distribution were examined.

Scarified plots supported higher abundances of invertebrate feeders (*e.g.* thrushes). Plots that were scarified within the last 1–13 days were used more by invertebrate feeders and granivores (*e.g.* yellowhammer) than plots scarified 2–4 months ago.

Granivorous passerines and invertebrate feeders preferred plots with shorter stubble while numbers of skylarks, partridges, pigeons and meadow pipits were higher on plots with taller stubble. This was probably the result of differing anti-predation strategies.

On stubble fields, topping of part of the field in the autumn could be combined with successive strip scarification treatments throughout the winter, to provide optimal conditions for a range of species. This could be incorporated as a management option in agri-environment schemes such as the english Environmental Stewardship Scheme.

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D. Bonte, L. Lens and J-P. Maelfait.

Sand dynamics in coastal dune landscapes constrain diversity and life-history characteristics of spiders.

Journal of Applied Ecology 2006, **43**: 735–747.

In fragmented landscapes where natural disturbance acts at the local level, community composition can be altered either by 'species-by-species matching', with community-wide character displacement, or by 'constrained species sorting', whereby disturbance favours species with distinct ecological traits.

This study looked at spider diversity and life-history variation in relation to sand dynamics in stabilized and dynamic grey dune landscapes located along the coasts of France, Belgium and the Netherlands.

Local diversity appeared to decrease with increasing local sand dynamics in both stable and dynamic landscapes. In dynamic dune landscapes, diversity decreased significantly and approached regional diversity under local grey dune stabilization; in stabilized landscapes, diversity was not affected by local sand dynamics.

Comparative analyses of ecological traits revealed shifts in life-history patterns, suggesting that patterns in local diversity resulted from species sorting. Species from fragments characterized by high sand dynamics showed narrower niche breadths, larger body sizes and longer generation times, while summer-active species tended to become residential after sand stabilization. This provides evidence for constrained species sorting in which natural disturbance (through local sand dynamics) allows only species with distinct ecological traits to persist.

Shifts in species composition were found to be more pronounced in dynamic landscapes. Hence ensuring conservation of sand dynamics at a landscape level rather than at a local level is of prime importance when aiming to conserve typical *psammophilous* spider species within local assemblages in grey dune habitats.

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W. Härdtle, M. Niemeyer, T. Niemeyer, T. Assmann and S. Fottner.

Can management compensate for atmospheric nutrient deposition in heathland ecosystems?

Journal of Applied Ecology 2006, **43**: 759 –769.

Atmospheric nutrient deposition has contributed to widespread changes in heathlands throughout Europe. As a consequence, management is now being considered as a potential tool with which to compensate for increased nutrient loads.

In order to improve heathland management schemes, the authors evaluated the effectiveness of different management measures in reducing the impact of ongoing atmospheric nutrient loads. They compared the effects of mowing, prescribed burning (low-intensity management) and sod-cutting (high-intensity management) on heathland nutrient budgets in the Lueneburg Heath nature reserve.

Nutrient losses by increased leaching following management measures were negligible compared with nutrient losses caused by the removal of above-ground biomass or humus horizons. The total quantities of nutrients removed by sod-cutting were equivalent to between 37 and 176 years of atmospheric input (for N, 89 years).

In contrast, the quantities of N removed by mowing and prescribed burning were equivalent to only 5 years of atmospheric input. Thus, heathlands subjected to such treatments will accumulate N in the long term.

This study shows that low-intensity management cannot compensate for atmospheric N loads in the long term. Consequently, high-intensity management measures are an indispensable tool in preserving a long-term balanced N budget in heathlands. In order to maintain a diverse structure, managers need to combine low- and high-intensity management measures. Prescribed burning proved to be the best means of avoiding an increasing P shortage, because this measure causes very low P outputs.

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M. Leira, P. Jordan, D.Taylor, C. Dalton, H. Bennion, N. Rose and K. Irvine.

Assessing the ecological status of candidate reference lakes in Ireland using palaeolimnology.

Journal of Applied Ecology 2006, **43**: 816 –827.

The European Union (EU) Water Framework Directive (WFD) requires that member states establish type-specific reference conditions for all waterbodies, including freshwater lakes. This presents a problem in those locations where human activity has resulted in significant changes to the biological, chemical and physical characteristics of waterbodies.

Seventy-six oligotrophic and meso-oligotrophic lakes thought to be relatively unimpacted by human activity have been nominated as candidate reference lakes (CRL) by the Irish Environmental Protection Agency. This research used palaeolimnological (lake sediment-based) techniques to test the actual and historical ecological site-specific status of a representative selection of these CRL. Where the temporal record of sedimentation was sufficiently long, the study adopted c.1850 AD as the primary baseline date for reference conditions.

Twenty-three (68%) of the CRL sampled showed biologically important deviation from the reference condition, with acidification and nutrient enrichment the main causes of change. Catchment disturbance, notably peat erosion possibly linked to recent afforestation, also appeared to have been a factor in some cases.

This study provides the first systematic examination of changes to water quality in pristine lakes over the last c.150 years for Ireland, and demonstrates the potential of palaeolimnology to support the implementation of the WFD. The results indicate that diatom communities in low alkalinity lakes have been particularly altered, and acidification and nutrient enrichment appear to have been important drivers for some lakes although climate change may also be important.

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P.E. Hulme.

Beyond control: wider implications for the management of biological invasions.

Journal of Applied Ecology 2006, **43**: 835–847.

This is an excellent review of an issue which is often cited as one of the major threats to biodiversity. The pressure is now on to address and resolve a diversity of invasive alien species (IAS) problems but research has been primarily concerned with quantifying the scale of the problem rather than delivering robust solutions.

Three successive steps, prevention, eradication and control, form the cornerstones of recommended best practices aimed at managing IAS. The goal of such actions is the restoration of ecosystems to preserve or re-establish native biodiversity and functions.

The assessment of management options will benefit from an ecosystem perspective that considers the manipulation of native competitors, consumers and mutualists, and reviews existing management practices as well as mitigates other environmental pressures. The ease with which an IAS can be targeted should not only address the direct management effects on population dynamics but also indirect effects on community diversity and structure. Where the goal is to safeguard native biodiversity, such activities should take into account the need to re-establish native species and/or restore ecosystem function in the previously affected area.

A comprehensive approach to IAS management should include consideration of the: (i) expected impacts; (ii) technical options available; (iii) ease with which the species can be targeted; (iv) risks associated with management; (v) likelihood of success; and (vi) extent of public concern and stakeholder interest.

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T.C. Ings, N.L. Ward and L. Chittka.

Can commercially imported bumble bees out-compete their native conspecifics?

Journal of Applied Ecology 2006, **43**: 940–948.

Although invasive species are major topics of research, little consideration has been given to the implications of introducing non-native subspecies or beneficial organisms such as pollinators. Within regions in Europe, the importation of non-native commercially reared subspecies of *Bombus terrestris* could endanger native bumble bees through competitive displacement and/or hybridization.

This study coompared commercially imported and native *B. terrestris* colonies growing in the wild in the UK.

Commercial colonies performed well in the field, with substantially higher nectar-foraging rates than native colonies in four out of five locations. Nectar-foraging performance was positively correlated with forager size, with commercial bees being consistently larger than native bees.

All seven commercial colonies studied produced new queens, with two colonies each producing in excess of 50. In contrast, only two out of seven native colonies produced queens, and those only produced small numbers. Males were produced by all colonies but there were no significant differences in numbers between commercial and native subspecies.

The high reproductive success of commercial colonies indicates that there is an appreciable risk that they will become established and spread within the UK. Their superior foraging ability and large colony size could lead them to out-compete native bumble bees. With respect to the current importation of commercial bumble bees, the authors strongly recommend a precautionary approach: native species and subspecies should be locally reared and the use/disposal of bees should be strictly regulated. Legislation in this respect now exists in Norway, Japan and the Canary Islands.

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R.E. Green, M.A. Taggart, D. Das, D.J. Pain, C.S. Kumar, A.A. Cunningham and R. Cuthbert.

Collapse of Asian vulture populations: risk of mortality from residues of the veterinary drug diclofenac in carcasses of treated cattle.

Journal of Applied Ecology 2006, **43**: 949–956.

This issue has been the subject of a successful campaign by Birdlife International and the Bombay Natural History Society with considerable press coverage and which has resulted in a ban on the production of diclofenac and substitution by other suitable alternatives. The populations of three species of South Asian vultures (*Gyps bengalensis*, *Gyps indicus* and *Gyps tenuirostris*) have declined rapidly within the last decade and all are now critically endangered. Veterinary use of diclofenac appears to be a major cause of the declines due to feeding on carcasses of livestock that were treated with diclofenac before death. The authors measured the concentration of diclofenac in the tissues of treated Indian humped and European cattle (*Bos indicus* and *Bos taurus*) in relation to the interval between dosing and death. Diclofenac concentration was enough to cause appreciable mortality if oriental white-backed vultures *G. bengalensis* were to take a large meal from an animal that was given its last dose of the drug within a day or two before death. Vultures that feed selectively on tissues with high concentrations of the drug, such as kidney, liver and intestine, would be exposed to a higher risk and for longer after dosing.

Withdrawal of diclofenac from veterinary use on animals whose carcasses may become available to scavenging vultures was recommended in the paper. In conservation projects, vultures should be fed on carcasses of animals that are known not to have been treated with diclofenac in the week before death.

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S. Bevilacqua, A. Terlizzi, S. Fraschetti, G.F. Russo and F. Boero.

Mitigating human disturbance: can protection influence trajectories of recovery in benthic assemblages?

Journal of Animal Ecology 2006, **75**: 908 –920.

Understanding whether Marine Protected Areas (MPAs) can be considered as a suitable tool for restoring the structure and function of populations and assemblages is urgently needed to achieve an effective policy of mitigation of human impact in coastal management.

This study was designed to test whether full protection in marine reserves facilitates recovery of benthos impacted by the date mussel *Lithophaga lithophaga* fishery, one of the most harmful human activities affecting subtidal rocky habitats in the Mediterranean Sea.

The effects of this destructive fishery were reproduced at one fully protected location (P) and at two unprotected control locations (Cs) in the SW Mediterranean Sea. At each location, three plots (4 m^2) of rocky surface at 4–6 m depth were disturbed experimentally, while another three plots served as reference. In each plot, the species composition and relative cover of the sessile benthic assemblages were then sampled during a period of 20 months.

The patterns of assemblage recovery showed that, at the fully protected location, recovery was faster than at the unprotected control locations. The results suggest that MPAs have the potential to change the trajectories of recovery of disturbed assemblages by accelerating the processes of recolonization.

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T.G. Gunnarsson, J.A. Gill, P.W. Atkinson, G. Gélinaud, P.M. Potts, R.E. Croger, G.A. Gudmundsson, G.F. Appleton and W.J. Sutherland.

Population-scale drivers of individual arrival times in migratory birds.

Journal of Animal Ecology 2006, **75**: 1119–1127.

In migratory species, early arrival on the breeding grounds can often enhance breeding success. Timing of spring migration is therefore a key process that is likely to be influenced both by factors specific to individuals, such as the quality of winter and breeding locations and the distance between them, and by annual variation in weather conditions before and during migration.

The Icelandic black-tailed godwit *Limosa limosa islandica* population is currently increasing and, throughout Iceland, is expanding into poorer quality breeding areas. Individuals breeding in lower quality, recently occupied and colder areas arrive later than those from traditionally occupied areas. The population is also expanding into new wintering areas, and males from traditionally occupied winter sites also arrive earlier than those occupying novel sites.

Annual variation in timing of migration is therefore influenced by climatic factors such as the North Atlantic Oscillation, but the pattern of individual arrival is primarily related to breeding and winter habitat quality. These habitat effects on arrival patterns are likely to operate through variation in individual condition and local-scale density-dependent processes. Timing of migration thus appears to be a key component of the intricate relationship between wintering and breeding grounds in this migratory system.

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M. Kéry, J. Madsen and J-D. Lebreton.

Survival of Svalbard pink-footed geese *Anser brachyrhynchus* in relation to winter climate, density and land-use.

Journal of Animal Ecology 2006, **75**: 1172-1181.

Several Arctic goose species have increased considerably during the last decades. Climate and land-use changes outside the breeding area have been invoked as causes but have not been tested. The authors analysed the relationships between conditions on wintering and migration staging areas, and survival in Svalbard pink-footed geese *Anser brachyrhynchus*. Using mark–recapture data from 14 winters (1989–2002) they estimated survival rates and tested for time trends, and effects of climate, goose density and land-use.

The authors conclude that climate change may affect goose population dynamics, with warmer winters and earlier springs enhancing survival and fecundity. A possible mechanism is increased food availability on Danish wintering and Norwegian staging areas. As geese are among the main herbivores in Arctic ecosystems, climate change, by increasing goose populations, may have important indirect effects on Arctic vegetation. The study also highlights the importance of events outside the breeding area for the population dynamics of migrant species.

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J.M. Reid, E.M. Bignal, S. Bignal, D.I. Mccracken and P. Monaghan.

Spatial variation in demography and population growth rate: the importance of natal location.

Journal of Animal Ecology 2006, **75**: 1201–1211.

Understanding the pattern and magnitude of spatial variation in demography and population growth rate is key to understanding the structure and dynamics of natural populations. However, such spatial variation is difficult to quantify. The authors used > 20 years of individual life-history data to quantify small- and large-scale spatial variation in demography and population growth rate within a population of red-billed choughs *Pyrrhocorax pyrrhocorax* on Islay. They were able to demonstrate a major importance of an individual's natal rather than current location in spatial variation.

Breeding success (the number of offspring fledged per breeding attempt) varied among individual chough nest sites but did not vary on a larger spatial scale across Islay.

The proportion of fledglings observed to survive to recruiting age varied markedly among individual nest sites and also varied more widely across Islay – choughs fledged in one region were more likely to survive than choughs fledged in another.

Spatial variation in adult survival was better explained by an individual's natal region than the region where that individual settled to breed. Spatial variation in population growth rate would consequently have remained undetected had survival been measured across resident breeders rather than across individuals fledged in each region.

Life-long monitoring of individuals of known origin may therefore be necessary to identify accurately subpopulations of intrinsically high and low population growth rates.

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100 Ecological Questions

This *In Practice* article takes the unusual step of reproducing virtually *verbatim* an article in one of the BES Journals. The reason for this is its thought provoking nature and through being a distillation of a great deal of background work relating to policy and how practical science, policy and ecology interact. The process reflected the increased interest in evidence based ecology over a range of issues and not least climate change.

Evidence-based policy requires researchers to provide the answers to ecological questions that are of interest to policy makers. To find out what those questions are in the UK, representatives from 28 organizations involved in policy - including IEEM (Chris Spray and Jim Thompson), together with scientists from 10 academic institutions, were asked to generate a list of questions from their organizations.

During a 2-day workshop the initial list of 1,003 questions was used as a basis for generating a short list of 100 questions of significant policy relevance based very much on the preferences of the representatives from the policy-led organizations.

The areas covered included most major issues of environmental concern in the UK, including agriculture, marine fisheries, climate change, ecosystem function and land management.

There was the preference for general questions rather than narrow ones reflecting the fact that policy is driven by broad issues rather than specific ones. In contrast, scientists are frequently best equipped to answer specific questions. This means that it may be necessary to extract the underpinning specific question before researchers can proceed.

The workshop concluded that greater communication between policy makers and scientists was required to ensure that applied ecologists are dealing with issues in a way that can feed into policy. It was particularly important that applied ecologists emphasize the generic value of their work.

This exercise attracted useful media attention but it is interesting to consider how the questions, topical at the time of the exercise, have now moved on. For example questions on bird flu would undoubtedly feature if the same exercise were conducted today. It is likely that the number of questions relating to climate change (10) would have increased and stronger connections made between climate change and ecological networks.

For those interested the full reference is:
W.J. Sutherland, S. Armstrong-Brown, P.R. Armsworth, T. Brereton, J. Brickland, C.D. Campbell, D.E. Chamberlain, A.I. Cooke, N.K. Dulvy, N.R. Dusic, M. Fitton, R.P. Freckleton, H.C.J. Godfray, N. Grout, H.J. Harvey, C. Hedley, J.J. Hopkins, N.B. Kift, J. Kirby, W.E. Kunin, D.W. Macdonald, B. Marker, M. Naura, A.R. Neale, T. Oliver, D. Osborn, A.S. Pullin, M.E.A. Shardlow, D.A. Showler, P.L. Smith, R.J. Smithers, J-L. Solandt, J. Spencer, C.J. Spray, C.D. Thomas, J. Thompson, S.E. Webb, D.W. Yalden and A.R. Watkinson.
The identification of 100 ecological questions of high policy relevance in the UK.
Journal of Applied Ecology 2006, **43**: 617–627.
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ECOSYSTEM SERVICES

1. What are the benefits of protected habitats in terms of water resources, carbon sequestration and other goods and services, relative to non-protected land?
2. What is the role of biodiversity in maintaining specific ecosystem functions (*e.g.* biogeochemical cycles)?
3. What are the roles of soil biodiversity (and specifically little-known groups such as mites or nematodes) in ecosystem function, resilience and recovery?
4. How does soil biodiversity both influence and respond to above-ground biodiversity?
5. What is the role of marine biota and benthopelagic coupling in ocean–atmosphere carbon cycling and primary production?
6. How can we measure natural capital (renewable and non-renewable resources) and integrate such a measure into gross domestic product (GDP)?

FARMING

7. How will CAP reform affect biodiversity at the landscape scale?
8. What are the environmental consequences of farming patterns ranging between the extremes of widespread extensification vs. complete segregation of agricultural production and conservation areas?
9. How do farming systems such as conventional, integrated farm management and organic compare in terms of their effects on biodiversity and other environmental impacts?
10. How do current agricultural practices affect the conservation value and extent of non-agricultural habitats such as woodland edges, hedgerows and ponds, and how can detrimental impacts be mitigated?
11. What are the impacts of agricultural activities and practices (*e.g.* fertilizers, pesticides and physical disturbance) on soil biodiversity and soil functions?
12. What are the ecological consequences of changes in upland grazing regimes for biodiversity and soil ecology?
13. What are the impacts on soil and surface-active invertebrates of poaching (trampling of flooded soil by livestock) and soil compaction at different stocking levels?
14. What are the impacts on biodiversity of prophylactic treatment of farm livestock with antibiotics, anti-fungal and anti-helminthic compounds?
15. What lessons can be learnt from agri-environment schemes to optimize their biodiversity gain and ecological benefit?
16. How does the ecological impact of UK farming compare internationally?

FORESTRY

17. What are the environmental benefits of large-scale

woodland planting schemes such as community forests and the new national forests?

18. Where should new woodlands be located?
19. What overall number, age structure and spatial distribution of trees are necessary for the long-term survival of species dependent on ancient/veteran trees?
20. What are the relative benefits for biodiversity of the re-introduction of management to ancient semi-natural woodlands vs. the continuation of an absence of active management?
21. Why have many woodland birds declined?
22. Which approach to the removal of plantations on ancient woodland sites (*e.g.* clear-felling and sequential removal) yields the greatest biodiversity benefit?

FISHERIES, AQUACULTURE AND MARINE CONSERVATION

23. What is the biodiversity impact of the harvest of forage fish for the production of aquaculture foodstuffs?
24. What are the ecological impacts of faecal matter, pesticides and undigested food flows from aquaculture?
25. How important are caged fishes as reservoirs of parasites and pathogens that have detrimental effects on wild populations?
26. What are the direct (catch) and indirect (food supplementation by discards, prey depletion) impacts of commercial fishing on cetaceans and seabirds?
27. How large should marine protected areas be, and where should they be located to protect biodiversity and enhance surrounding fisheries?
28. What will be the impact of marine protected areas on wide ranging migratory species such as cod Gadus morhua L. and haddock Melanogrammus aeglefinus L.
29. How important are coastal, estuarine and fluvial habitats for endangered migratory fish populations (*e.g.* lampreys, shad, eel and sturgeon)?
30. What is the range of minimum viable population sizes for broadcast spawning marine species?
31. How long does the seabed take to recover from disturbance such as dredging, wind-farm construction and oil and gas extraction?

RECREATION AND FIELD SPORTS

32. What are the impacts of recreational activities on biodiversity?
33. Which ecological principles should guide the choice of the list of UK species appropriate for game exploitation?
34. What overall impacts do introductions of game species for field sports (including recreational fishing) have on biodiversity?
35. What are the ecological impacts (both direct and indirect, through shifts in habitat management) of a ban on hunting with dogs?

URBAN DEVELOPMENT

36. How can provision for wildlife be maximized in existing and new urban development, urban greenspace and brownfield sites?
37. What are the consequences for biodiversity of fragmentation by development and infrastructure?
38. What are the ecological impacts on semi-natural habitats and ecosystems of adjacent large developments (*e.g.* housing and airports)?
39. How can sustainable urban drainage systems be optimally designed to maximize biodiversity in the urban environment?

ALIENS AND INVASIVE SPECIES

40. What criteria should be used to determine when to intervene to deal with invasive species?
41. How can we manage microbial ecology to control invasive plant pathogens?
42. How can we understand better the epidemiology of existing and emergent diseases within wildlife reservoirs to better protect humans and livestock?
43. What are the genetic threats to UK biodiversity posed by introgression from genetically modified organisms and what measures are available to reduce these threats?
44. What is the optimal method of managing bracken-dominated habitats for the benefit of associated biodiversity action plan priority species?
45. What are the effects of domestic cats on vertebrate populations in rural and urban environments?

POLLUTION

46. What impact does plastic-derived litter have on the marine environment?
47. How can one ameliorate the effects of aerially deposited nitrogen on habitats and species?
48. What are the critical thresholds for nitrogen and phosphorus inputs into waterbodies of high conservation value?
49. Of those chemicals currently or potentially released into the environment, which (individually or in combination) are now, or are likely to become, significant environmental problems, and what will these problems be?
50. What are the long-term impacts of depositing sewage sludge and other organic wastes on to agro-ecosystems?
51. How can catchment management be used to reduce diffuse pollution?
52. How will acidification of surface water from rising CO2 concentrations affect planktonic productivity and other marine organisms?
53. What are the effects of light pollution from built development and road lights on wildlife behaviour, mortality and demography?

CLIMATE CHANGE

54. Which species are likely to be the best indicators of the effects of climate change on natural communities?
55. Which habitats and species might we lose completely in the UK because of climate change?
56. What will be the ecological impacts of changing agricultural patterns in response to climate change?
57. What time lags can be expected between climate change and ecological change?
58. What is the likely relationship between the extent of climate change and the pattern of species extinction?
59. How does climate change interact with other ecological pressures (*e.g.* invasive species and habitat fragmentation) to create synergistic effects?
60. How can we increase the resilience of habitats and species

to cope with climate change?

61. How well suited is the current UK protected area system for conserving biodiversity in the face of climate change, and how can it be enhanced in light of this?
62. How will changes to oceanographic conditions as a result of climate change affect marine ecosystems?
63. What actions are required to recreate the full range of coastal landscapes, habitats and species distributions to compensate for their loss, for example as a result of sea-level rise?

ENERGY GENERATION AND CARBON MANAGEMENT

64. What are the consequences of biofuel production for biodiversity at field, landscape and regional levels?
65. What are the potential impacts of (a) terrestrial and (b) marine wind farms on biodiversity?
66. What are the comparative biodiversity impacts of newly emerging types of renewable energy, such as wave energy?
67. How can soil carbon be retained and further carbon sequestered in the soil?

CONSERVATION STRATEGIES

68. How can biodiversity action plans be designed to take account of larger scale population processes?
69. How can we best measure favourable conservation status for each of the species and habitats listed within the EU's Habitat Directive?
70. How effective is the current UK protected area network for protecting wildlife under current conditions?
71. With what precision can we predict the ecological impact of different policy options and the ecological effects of management action?
72. At an international scale, what are the ecological implications of conservation actions and policies adopted within the UK?
73. How effective as indicators of overall biodiversity are current indicators (especially birds)?
74. Why are common moths declining and are their declines driving declines in other taxa (*e.g.* bats)?
75. What scale and type of land-use change is required to halt the decline of biodiversity by 2010 (EU heads of state committed to this in the 2001 EU summit in Göteborg)?
76. Are there reliable ways to predict the long-term sustainability of populations of poorly known species (*e.g.* most invertebrates) using a knowledge of life history and other ecological characteristics?

HABITAT MANAGEMENT AND RESTORATION

77. What are the costs and benefits of concentrating conservation work on designated sites in comparison with spreading efforts across the wider countryside?
78. What are the ecological consequences of 'wilding' (that is, conservation of sites using only, or very largely, natural processes) as a long-term conservation strategy?
79. What are the consequences of different moorland management techniques (especially burning, cutting and grazing) for the upland economy, carbon storage, water quality and biodiversity?
80. What measures of habitat condition should we use to measure habitat change in protected areas?
81. How should ditches, dry and wet, be managed for the greatest benefit for biodiversity?
82. What hedgerow structure and what type of hedge management produce the greatest wildlife benefits?
83. How do recreated habitats differ from their semi-natural analogues?
84. How can we effectively prioritize the most important large-scale ecological restoration projects that could be undertaken in the UK?
85. What is the most appropriate and ecologically sustainable way of dealing with excess nutrients during terrestrial and freshwater habitat restoration?
86. What are the implications of changing deer densities for agriculture, forestry and biodiversity in different landscape types?
87. In reintroductions, does local provenance matter? Will the use of non-local stock cause loss of local genetic variation, outbreeding depression or genetic rescue of depauperate gene pools?

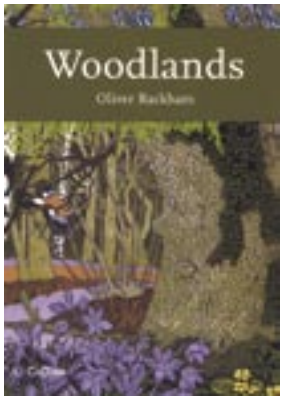
CONNECTIVITY AND LANDSCAPE STRUCTURE

88. What are the lag times between habitat fragmentation and the loss of species of different taxonomic and functional groups?
89. Is it better to extend existing habitat patches or create further patches within the landscape?
90. How should we manage landscape mosaics for the conservation of diverse taxa that operate on different spatial scales?
91. What are the relative merits of different indices of habitat connectivity? Which of them best predict conservation value?
92. What is the value of linear habitats, such as hedgerows, railways, road verges and riparian strips, as corridors for dispersal between fragmented habitat patches?
93. For species where the concept is applicable, how can 'source' and 'sink' populations (Pulliam 1988) be identified and how should their status affect conservation management?
94. How important are core vs. peripheral areas in the conservation strategy of a species?
95. How reliant are animal and plant populations in small nature reserves on the maintenance of habitat in surrounding non-protected areas?

MAKING SPACE FOR WATER

96. What have been the consequences of past and present riparian engineering works, such as weirs, culverts, gravel removal, habitat fragmentation and damming, on biodiversity within and alongside rivers?
97. What would be the ecological implications of large-scale river and floodplain restoration schemes in the UK, and would they be more cost-effective than traditional hard flood defences?
98. What are the likely consequences for biodiversity of changes in water quality and sedimentation in rivers?
99. What methods most accurately measure 'ecological status' in the EU Water Framework Directive?
100. How can flood control be assisted by appropriate habitat management and restoration, and what are the impacts on biodiversity?

Recent Publications



New Naturalist Woodlands

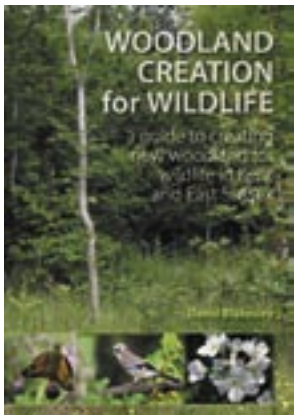
Author: Oliver Rackham
ISBN-10: 000720244X
ISBN-13: 978000720244X
Available from: www.collins.co.uk
Price: £25.00 paperback

The book starts with what woods are and why they are so diverse and defines different types of tree-land, from woodlands to savanna, and uses a variety of evidence to show why British woodland exists as it does. It explains how trees and woods behave, including how they coppice and pollard, how they are affected by fire and storms, the function of tree roots, the life and growth of trees and how and why they decay, and also reconstructs British woodland through the ages, from evolution of wildwood, through man's effect on the landscape, modern forestry and its legacy, and recent conservation efforts and their effects. It also offers invaluable advice on how to research woodlands and history, through names, surveys, mapping and legal documents, archaeology, photographs and works of art. Lastly, it also explores the characteristics of woodland soils, ancient-woodland plants, ground vegetation and introduced species and it also examines highland and lowland woodland, and looks at the Forest of Blackmoor as a case study in field research.

Woodland Creation for Wildlife

Author: David Blakesley CEnv MIEEM
ISBN-10: 095535790X
ISBN-13: 9780955357909
Available from: www.eastmallingresearch.com
Price: free download

This is a book about creating new native woodlands for wildlife, particularly on agricultural land and transport corridors, in Kent and East Sussex. To design new woodland for wildlife, it is important to have some knowledge of how wildlife colonises a new habitat, and how this process can be accelerated. Consequently, the ecology of natural succession is introduced, together with a description of some of the more visible elements of woodland flora and fauna; birds, bats, insects and plants. The core of this book describes how to create new native woodland for wildlife. This includes not only high forest – the traditional focus of the forester – but also shrubs of the woodland edge, and tall herbs and short turf of rides and open spaces. All provide important habitat for wildlife, but it is the woodland edge and open spaces that contribute most to biodiversity in the early life of a new wood. Descriptions of case study woodlands illustrate many of the issues raised in the earlier sections on woodland design and management practices.



The Butterfly Handbook

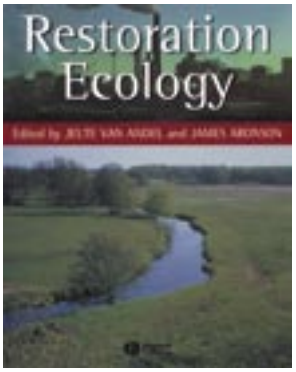
Author: Adrian Spalding MIEEM
ISBN-10: 1903798256
Available from: www.spaldingassociates.co.uk
Price: free download

This is a general advice note on mitigating the impacts of roads on butterfly populations. It includes a case study on mitigation for the Marsh Fritillary butterfly along the A30 Bodmin to Indian Queens road improvement scheme that was jointly funded by English Nature and the Highways Agency.

Ecodesign: A Manual for Ecological Design

Author: Ken Yeang
ISBN-10: 0470852917
Available from: www.wileyeurope.com
Price: £60.00 hardback

This book reconstructs and revises how and why our current design approach and perception of architecture must radically change if we are to ensure a sustainable future. He argues that this can only be achieved by adopting the environmentalist's view that, aesthetics apart, regards our environment simply as an assembly of materials, that are briefly concentrated on to a single locality and used for living, working and leisure whose footprints affect that locality's ecology and whose eventual disposal has to be accommodated somewhere in the biosphere. This manual offers clear instructions to designers on how to design, build and use a green sustainable architecture. The aim is to produce and maintain ecosystem-like structures and systems whose content and outputs not only integrate benignly with the natural environment, but whose built form and systems function with sensitivity to the locality's ecology as well as in relation to global biospheric processes, and contribute positively to biodiversity. The goal is structures and systems that are low consumers of non-renewable resources, built with materials that have low ecological consequences and are designed to facilitate disassembly, continuous reuse and recycling, and that at the end of their useful lives can be reintegrated seamlessly back into the natural environment. Each of these aspects is examined in detail with regards to how they influence design and planning. The book provides designers with a comprehensive set of strategies for approaching ecological design and planning combined with in-depth analysis and research material. Bio-integration is the key to saving our environment from continued degradation.



Restoration Ecology

Editors: Jelte van Andel and James Aronson
ISBN-10: 063205834X
ISBN-13: 9780632058341
Available from: www.blackwellpublishing.com
Price: £32.50

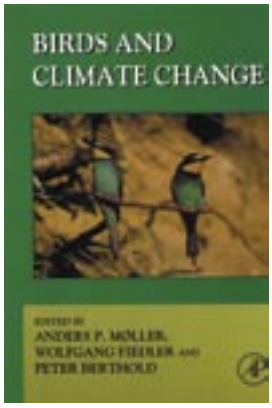
This book explores the interface between restoration ecology and ecological restoration. It aims at introducing students, teachers, researchers and natural resource managers to interactions between theory and practice. It challenges ecologists to explore the applicability of current theories and concepts, recognising that these have not been developed with such applications in mind. The academic foundations of restoration ecology are revisited for this purpose, to pave the way towards a review of the causes of successes and failures and to identify the perspectives of ecological restoration in different ecosystem types. These are dealt with biome by biome and consider the historical perspective of land use. The final section addresses problems of ecological restoration in a societal context – ecological restoration is meant to achieve sustainable, resilient and interconnected ecosystems and socioecological systems. The book covers both the ecological concepts involved in restoration ecology and their practical applications and is written by an excellent group of ecologists from centres across Europe with a strong reputation for restoration ecology.

Do Conservation Targets Help?

Editors: Edward Maltby, Conor Linstead and Vernon Heywood
ISBN-10: 0955409608
ISBN-13: 9780955409608
Available from: www.nhbs.co.uk
Price: £15.00

The Second Sibthorp Seminar considered the question: Do conservation targets help? This question was based on an article published in *Science* by Soulé and Sanjayan, and then broadened to take a wider look at nature conservation in the light of major changes that have influenced our underlying assumptions about conservation since the mid 20th Century. These changes are the internationalisation of the conservation agenda following Agenda 21 and the coming into force of the Convention on Biological Diversity, the widespread adoption of the aim of sustainable development, the different time scales of concern, demographic growth, climate change, and the changing relationships between science, society and government. From these different influences come various agendas, and the aims, goals and priorities proposed by the conservation and biodiversity communities may not be recognised or accepted by other constituencies. The seminar examines and discusses these various perspectives and, where necessary, challenges them and attempts to see how far these often conflicting aims may be reconciled.

Birds and Climate Change



Editors: Anders P. Møller, Wolfgang Fielder and Peter Berthold
ISBN-10: 0123736145
ISBN-13: 9780123736147
Available from: www.elsevier.com
Price: £28.99

Temperature and other climate variables are currently changing at a dramatic rate. As observations have shown, these climatic changes have serious consequences for all organisms and their ability to adapt to changing environmental conditions. Birds are excellent model organisms; they have a very active metabolism, they are highly sensitive to environmental changes, and, as they are highly mobile creatures, they are also extremely reactive. Birds and Climate Change discusses our current knowledge of observed changes and provides guidelines for future studies, so we can document and understand how patterns of changing weather conditions may affect birds. The book is based on 'Bird Migration in Relation to Climate Change' workshop that took place in March 2003 and is very scientific in content with contributions from over 20 authors.

Surveying and Report Writing for Lichenologists

Editor: David J. Hill
ISBN-10: 0954041879
Available from: brian@regreen.co.uk or info@summerfieldbooks.com
Price: £15.00 (£10.00 to British Lichen Society members)

These Guidelines provide advice on how to commission and conduct surveys, and prepare reports for both organisations and individuals commissioning surveys, and for lichenologists carrying out the work. These guidelines provide a single information source available to all and will also be essential reading for anyone needing to assess a lichen survey report.

The four main chapters dealing with the four stages in preparing a survey report for a given site are as follows: Commissioning Surveys (Tenders and Contracts), Fieldwork, Identification, Report Writing.

The guidelines are very practical and of value for anyone commissioning, carrying out or reporting fieldwork whether about lichens or any other group of organisms. It provides very useful and sound advice on good fieldwork practice and is packed with references, information sources, web resources etc. Those concerned with lichen surveys will find it essential. The section on identification is particularly detailed and thorough, containing a large amount of useful information. Any lichenologist will find it a very useful manual for identification whether with lichens in the field or from specimens afterwards, and whether for professional or scientific reasons or for systematic recording for environmental monitoring.

News in Brief

Environmental Liabilities Directive

The Government has issued a consultation document on options for implementing the Environmental Liability Directive in England, Wales and Northern Ireland. The Directive strengthens the 'polluter pays' principle for environmental damage caused to biodiversity, water and land contamination that threatens human health. Under the Directive, companies that threaten or cause environmental damage will be held strictly liable for prevention of fixing of the damage at their own expense. It applies to damage occurring from 30 April 2007. The consultation document can be found at http://www.defra.gov.uk/corporate/consult/env-liability/index.htm and the deadline for responses is 16 February 2007. A second consultation on draft legislation is likely to take place in the spring. IEEM will be responding to this consultation. If you would like to contribute to the IEEM response to the consultation please forward your comments to jasonreeves@ieem.net.

GIN - a Tonic for the Northern Way!

A major study is set to establish the importance of green infrastructure (trees, woods, parks and other landscape elements) in the future success of the Northern Way. The Green Infrastructure for the North (GIN) is a group of organisations that have been emphasising the importance of environmental quality in attracting inward investment and building a successful and sustainable economy. Now the three Regional Development Agencies who are leading the Northern Way initiative have acknowledged that the region's green infrastructure is vital to the success of the programme. The 20-year, £100 million Northern Way Development Programme was set up to help enable the northern half of England to compete economically, socially and in future growth terms with the southern half of England.

Flora locale: Call for Experts

Flora locale, the wild-plant restoration charity, is to establish a countrywide network of Associates. These will provide technical expertise to the organisation and may be asked to help design projects for future funding or to help deliver Flora locale projects in local areas when projects become fully funded. Associates need to have expert knowledge in British (and Irish) Plant Communities with experience in creating and restoring habitats in at least one region. Interested – contact Flora locale via their website at www.floralocale.org.

Starving Guillemots Hint at Seabird Crisis

Reports of hundreds of dead or starving young seabirds around Scotland - including some many miles from the coast - and Northern Ireland are leading to speculation among experts that these incidents may be linked to a much larger problem. Most of the casualties are guillemots. Post mortems on the birds have shown that many of the birds are underweight and have empty stomachs, suggesting they are suffering from a chronic shortage of food. Counts of seabird colonies around Scotland and in Northern Ireland have revealed that they have had another disastrous year with food shortages leading to a low recruitment of young birds.

Environment Agency welcomes Natural England as new partner to protect and improve the environment

The Environment Agency has welcomed Natural England as an important new partner to improve and protect the environment and create a better place. Natural England brings together the environmental land management functions of the Rural Development Service, the landscape, access and recreation elements of the Countryside Agency and the responsibilities of English Nature. The new organisation's responsibilities include biodiversity, wildlife and landscape, delivering sustainable farming and land management, protecting Sites of Special Scientific Interest, and promoting access and recreation.

Add an Adder

The Herpetological Conservation Trust is running a web-based recording project called "Add an Adder" at www.adder.org.uk. The aim is to record as many adder locations as possible, past and present, in the hope that we can build a picture of how adder populations have been lost in Britain. The website therefore asks you to record simple information on where you've seen or heard about adders, and whether or not you think the population is still there.

Breeding Area for Rare Dolphins Found off Llyn Peninsula

A rare sighting of a group of Risso's dolphins, including calves, has been made off Bardsey Island, at the tip of the Llyn Peninsula. This very unusual sighting illustrates the potential importance of the area to Risso's dolphins for breeding and as a place for rearing their young. More information about dolphins in Welsh waters is available in CCW's free booklet Dolphins, porpoises and whales in Welsh waters. To get a copy call 0845 1306229. General information about dolphins, whales and porpoises and the threats they face can be found at www.wdcs.org.

Scottish Badger Distribution Survey

The Scottish Badger Distribution Survey is a three-year project to determine badger distribution and density across a range of habitats in Scotland, using a network of volunteers. A random sample of one thousand squares will be surveyed for the presence or absence of badger setts and signs, and for evidence of human disturbance. The results will be used to determine likely density in any given area, and will provide a baseline from which to measure future change. In return for surveying a pre-selected 1-km square, which should only take one day to complete, volunteers are offered a free, one-day training session on badger surveying essentials, with a field trip to a local sett to test out new skills. Briefing sessions will take place January - April 2007. The survey itself will run from September 2007 to April 2008. If you would be interested in being part of the survey, please contact elaine@scottishbadgers.org.uk or by telephone on 0131 657 4125.

Biodiversity Minister Outlines the Global Challenge to Help Wild Animals Adapt to Climate Change

Barry Gardiner, the Minister for Biodiversity, Landscape and Rural Affairs has said that climate change is already affecting wild animals and all countries must take measures to help them adapt to ensure both wildlife and people around the world are not seriously affected. The UK-funded international report, "Migratory Species and Climate Change: Impacts of a changing environment on wild animals", says unprecedented changes in climate will affect wildlife and their habitats - both directly found changes in temperature and precipitation, and indirectly through disturbances such as fires, hurricanes and storms. On average, many species have moved 6.1 km per decade towards the poles or 1 metre per decade in elevation, while spring events like flowering and leaf flushing are occurring on average 2.3 days earlier per decade - in turn affecting seasonal movement of wildlife. In Europe, plants typically growing in the Atlantic climate with mild winters will expand their range eastwards. Winter green species like English holly could double their range by 2050, and where it is found in Germany, could significantly change in the beech forests in the east of the country. The UK will commission further research to identify migratory species that can act as indicators of climate change and the specific threats they face.

Official Opening of Largest Flood Storage Scheme in Europe

The largest flood storage project in Europe, the Alkborough Flats Tidal Defence Scheme in Lincolnshire, is hoped to reduce the risk of flooding for 300,000 people and become a haven for wildfowl and wading birds. The scheme, which will involve breaching the existing flood defences, will help lower high tide levels by allowing water from the estuary to run over the Alkborough Flats to create a massive flood storage area. The managed re-alignment at Alkborough allows flood water from the Humber estuary to spill out of the river during the highest tides to fill the low lying land. The project will also create a huge new inter-tidal habitat, attracting more species of wildfowl and wading birds to the area including shelduck, wigeon, teal, avocet and redshank. The site is being used as a demonstration project to help promote new approaches to the impacts of sea level rise across Europe. The effects of climate change are expected to increase high tide levels in the Humber Estuary, which, if defences were left as they are, would increase the risk of flooding for the 300,000 people who live in the area.

The Newest EU Nations must Learn from the UK's Experience of Farmland Wildlife Loss

The governments of the newest members of the European Union must learn from the UK's experience of catastrophic wildlife loss, that is the message from the RSPB who commissioned a report looking at the development of schemes for wildlife-friendly farming in the EU's newest member states. The report released by BirdLife International – represented in the UK by the RSPB – shows that nine countries that joined the European Union in 2004 – largely from central and eastern Europe - possess significant populations of farmland birds under threat or close to extinction elsewhere in Europe. This is a direct result of having retained large areas of high nature value land, especially low-intensity farmland.

Using the report, the RSPB and BirdLife International are urging governments of the new EU member states to embrace wildlife-friendly payments to help farmers preserve the natural treasures of these areas. By contrast, similar payments in the UK and elsewhere in the EU are largely made to farmers trying to restore populations of threatened species that once populated a wildlife-rich countryside. The report highlights that many of the new countries also risk losing their farmland wildlife by missing the unique opportunity to capitalise on the payments.

RSPB Secures Foreign Land Purchase to Protect Europe's Rarest Songbird

For the first time in its 117-year history, the RSPB – working with its Polish partner, OTOP - has secured the purchase of land overseas. The deal has seen the purchase the first of what will eventually be 1,000 hectares of protected wetland in Poland - in the Biebrza Marshes – to ensure a future for mainland Europe's rarest songbird, the aquatic warbler. The RSPB has provided a guarantee of £400,000 of funding as a contribution to a £3.67million European Union LIFE project to manage land for the benefit of the aquatic warbler, which includes land purchase where necessary. The majority of the project is centered on the Biebrza marshes of eastern Poland. Currently, the marshes are the European Union's aquatic warbler stronghold.

World Cup Airport Threatens Icon of British Spring

The bird that heralds the start of British spring is being put at risk by the 2010 World Cup. The South African government wants to transform a runway for light aircraft into an international airport on a site near Durban that lures more than three million swallows to roost every night. Many of the Kwa-Zulu Natal swallows are thought to migrate to Britain and elsewhere in Europe to breed and in the UK, spotting the first swallow and following the birds' progress from southern England into the rest of the UK is one of the joys of spring. The swallows' roosting site, the Mount Moreland Reedbed, 20 km north of Durban, is about the size of four football pitches. In 2007 it will be classified as an Important Bird Area by BirdLife International because of its importance to swallows. The reedbed is thought to host more than eight per cent of the millions of swallows breeding in Europe, from Denmark to Britain to Belarus. It is also used by lesser kestrels, corncrakes and crowned eagles, all of which are now uncommon. Mount Moreland lies on the flight path of aircraft that will arrive and depart from the proposed La Mercy airport. BirdLife South Africa fears the reedbed will be cleared because the birds could threaten aircraft safety. An environmental impact assessment is under way at La Mercy but BirdLife South Africa suspects an adverse outcome will be overturned in favour of potential economic opportunities including new jobs and trade. BirdLife and its UK partner, the RSPB, say the airport proposal should be scrapped and the site be turned into a protected area instead, to safeguard the swallows it harbours.

Intelligent Design Tauro-Scatology

No edition of *In Practice* would be complete without Basil O'Saurus, IEEM's very own Professor of Tauro-Scatology providing his own distinctive take on current affairs and environmental management. What Sacred Cow is getting it in the neck this time, Prof?

Sacred Cow is perhaps an appropriate turn of phrase here as I thought that it was time to provoke religious fundamentalists. I've been following the debate about 'Intelligent Design' in the US and, frankly, I'm not impressed.

Intelligent design is, if I remember rightly, the belief that certain features of the universe and of living things are best explained by an intelligent cause and not by an undirected process such as natural selection.

Exactly right. The irony is, of course, that many of the people who believe in intelligent design also vote for Geoge W Bush, who would seem to be a strong argument against Intelligent Design.

So what is your response?

I cast my mind back several years to a time when I was in a zoo in Africa watching two giant tortoises copulating. Two thoughts occurred to me at the time. The first was that this was the only literal example of 'bonking' I had ever encountered.

The second was that Rudyard Kipling couldn't have imagined such a bizarre scenario for his 'Just So' stories. The poor male seemed to be having an enormous amount of difficulty impregnating and the female's face was the very picture of stoicism as this enormous lump clunked up and down on her back.

This encounter laid the germ for a new hypothesis that I am going to promote. Prepare yourself for 'Unintelligent Design', in which I highlight some of nature's more bizarre outcomes. I will boldy go where even Richard Dawkins dare not tread.

Give us an example.

The orange. You remember undergraduate lectures when seed dispersal is given as one of the rationales for the evolution of fruit?

Vaguely ...

Think about it ... the orange has delicious flesh but is packaged in a tough, impenetrable skin. How can an animal enjoy the fruit and ingest the seeds without considerable manual dexterity? They would take one mouthful of the bitter peel, spit it out and leave the proto-orange to rot on the forest floor.

Leaving aside the possibility that the orange that we know today is the result of millennia of plant breeding, your paradox does, in fact, make me wonder if this is an example of intelligent design after all.

Tell me more.

Simple. As the orange rots on the forest floor the sugar-rich flesh is attacked by yeasts, leading to the production of alcohol. All you need to do is imagine herds of late Cretaceous mammals smashed out of their minds on the equivalent of homebrewed Cointreau and suddenly your seeds are being dispersed left right and centre. And through every available orifice.

OK. Perhaps not my best ever example. How about this as an alternative: the human adolescent male intestine.

I'm intrigued.

Conventional wisdom is that the small intestine needs to be long in order to maximise the surface area through which the body can absorb nutrients. So, in order to squeeze it into the abdomen, it has to be folded back on itself several times.

Sounds like a good example of intelligent design to me.

The exact opposite. In fact, this could even count as an example of sadistic design as the mammalian digestive system is not especially efficient, and quite a lot of gas is evolved at the same time as food is broken down. Folding the intestine into the abdomen means that our teenage boy's inefficient intestine has lots of nooks and crannies in which these gases can accumulate. Do you want me to spell it out from here?

I think that we have got the idea.

What makes it worse is that this so-called benevolent deity has also hard-wired the adolescent male's mind to believe that this is some kind of on-board musical instrument. Quite frankly, most teenage boys could survive with a straight, kink-free gut no longer than a metre in length. That would provide the energy needed to drag themselves from bed to computer and back.

OK. That example is a little more believable. Where can we learn more about this?

In my latest book 'The Stupid Gene'.

Somehow I might have guessed. Thanks for your time, Prof.

My pleasure.

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 29 January 2007. 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

Dr Iain V.P. Adderton, Mr Richard A. Baines, Mr David Barker, Dr Linda Barnett, Mrs Barbara A. Bell, Miss Laura Black, Mr William R. Black, Mr Murray C.D. Bracewell, Dr Phoebe Carter, Mr Patrick Crushell, Mr Paul J. Dansie, Mr Stephen P. Daworiye, Mr Olugbenga S. Dehinbo, Mr Alexander Ewing, Dr Jonathan P. Fairbairn, Mr Chris Forster Brown, Mr Robert C. Grabowski, Mrs Margaret M. Haggerty, Mr Kevin D. Hand, Miss Kate Harrington, Mr Karim V.D. Hodge, Mrs Alison C. Hogan, Dr Kevin D. Hume, Mr Michael D. Jones, Mr Duncan Lang, Dr Anthony M. Langan, Mr Alastair Laverty, Dr Marion P. Leppitt, Miss Beverley F. Lewis, Mr David R. Lewns, Mr Guy Lowndes, Dr James R. Martin, Miss Tracey J. McLean, Mr William Moreno, Mr Joseph B. Murphy, Mr Simon H. Mustoe, Mr James J. Packer, Mr Stephen J. Parr, Mrs Katharine J. Pilcher, Dr Katie A. Pollard, Mr David Prince, Mr David A. Rees, Mr Tim Roderick, Dr Leslie P. Ruse, Mr Stephen J. Ryder, Mr Kieran A. Sheehan, Dr George F. Smith, Mr Joshua B. Smithson, Mr John Sproull, Dr Andrew J. Stanworth, Ms Karen V. Tanner-Tremaine, Dr Eliot Taylor, Dr Caroline R. Uff, Miss Rachel Urwin, Miss Katherine E.S. Walsh, Mr Thomas B. Wigglesworth, Mrs Ros Willder, Mr Martin J. Winter, Miss Elizabeth Wood

APPLICATIONS FOR ASSOCIATE MEMBERSHIP

Mr Graeme J. Ashton, Miss Joanne L. Atkinson, Miss Allison Austin, Mr Colin F. Bonfield, Mr James S. Bowkett, Mr Michael J. H. Brown, Miss Emma L. Burden, Mr Lewis A. Butlin, Mr Scott Cafferty, Mr James D. Campbell, Mrs Susan Chambers, Miss Sarah L. Clarke, Mr John Condron, Dr James G. Cook, Ms Rose M. Cremin, Dr Sarah Dalrymple, Miss Abigail E. Dando, Miss Michelle Dickinson, Mrs Tamsin J. Douglas, Miss Abbie Dowling, Mr Tristan J. Evans, Mr Francis P. Flanagan, Mr Timothy D. Foster, Dr Rachel A. Freer, Mr David A. Green, Miss Catherine M. Greenhough, Mr Josh R. Hellon, Miss Rebecca L. Hill, Mrs Kelly Hollings, Mr Daniel Hone, Mrs Katrina V. Hoyle, Miss Kate E. Hunt, Mr Roger L. Jones, Mr Gonzalo Lazerna, Miss Suzanne Lowry, Mr Dean Martin, Miss Rebecca E. May, Ms Maeve McLoughlin, Miss Louisa Medland, Dr Robert Morley, Mr Geoffrey J. Moxon, Miss Cathy Ovens, Miss Christine Parkinson, Miss Claire M. Parry, Miss Ellen Partington, Mrs Susan J. Redfern, Mr Thomas M. Reynolds, Mr Christopher J. Rochfort, Mr Jeremy A. Sabel, Dr Stella Shackel, Mr Timothy J. Smith, Mr John Sproull, Miss Lindsay E. Syme, Dr Philip B.L. Tamuno, Miss Sarah Taylor, Miss Jacqueline E. Thompson, Miss Gemma Thomson, Miss Naomi Waite, Mrs Amanda D. Williams, Mr Robert G. Wooldridge

ADMISSIONS

IEEM is very pleased to welcome the following new Members:

FULL MEMBERS

Mr Daniel C. Alder, Dr Nicholas R. Betson, Miss Elizabeth K. Burrows, Mr Gregory H. Chamberlain, Dr Peter J. Cosgrove, Ms Melanie Findlay, Mr Jonathan Ford, Mr Aaron M. Hamblyn, Ms Melanie Hardie, Dr Nigel J. Harding, Mr Justin D. Hart, Mr Matthew Hawking, Dr Ann E. Hill, Mr David T. Hurst, Dr Juliet Hynes, Mr Andrew P. Jefferies, Mr Brian Keeley, Miss Tamsin J. Kilner, Mr Steve Laurence, Mr Alexander Laurie, Ms Bernadette Lobo, Mr Tim Marlow, Mrs Mary L. Norden, Ms Oonagh Nelson, Dr Stuart J. Otway, Ms Zara Paris, Mrs Amanda J. Proud, Mr Benjamin J. Sanderson, Mr Mark Satinet, Mr Richard Smith, Mr David L. Sutton, Mr David Wakelin, Mr James J. Wallwork, Mr Robert H. Weston, Mr Paul C. Wilkinson, Ms Helen M. Williams, Mr Christopher J. Wood, Mr Christopher J. Yardley

ASSOCIATE MEMBERS

Mr David J. Andrews, Mr David Angel, Miss Caroline Bailey, Miss Lucy Baker, Mrs Joanne Bates, Miss Elisabeth Bradshaw, Mr Iain H. Bray, Mr Robert J. Broadbent, Dr Richard J. Burkmar, Mr Martin D. Catlow, Miss Leanne Cooke, Mr John D. Crowder, Ms Primrose H. Duplessis, Miss Charlie K. Dwight, Ms Zoe K. Falk, Miss Katie A. Finlinson, Miss Rebecca J.G. Floate, Mr Stephen J. Foot, Miss Louise A.C. Forder, Dr Sally E. Fraser, Mr Benjamin R. Gardner, Mr Thomas Hall, Miss Rebecca S. Harvey, Dr Barbra A. Harvie, Mr Eric Heath, Dr Alice F. Helyar, Mr Michael W. Holding, Miss Alexandra Hollands, Miss Gemma L. Howard, Mr Darren J. Ivey, Mr Martin R. Love, Miss Poppy McDonald, Miss Katie McGregor, Mr Christopher J. Mitchell, Mr Gary P. Mock, Miss Leanne Moses, Mr Gavin Mullan, Mr Darryn Nash, Mr Matthew S. Oakley, Mr Martin G. O'Connor, Ms Lisa J. Palframan, Mr Clive Palmer, Miss Huma R. Pearce, Mr Jonathan J.D. Pedder, Miss Laura A. Penniston, Miss Elizabeth Powell, Mr Philip J. Rogers, Dr Daphne A. Roycroft, Miss Tessa C. Rutty, Mr Richard S. Smith, Mr Jonathan Steele, Mr Ian M. Stewart, Mr James E.T. Streets, Dr John J. Sweeney, Miss Rebecca J. Sykes, Mrs Susan Thouless, Mr Daniel Watson, Mr Paul Whitby, Miss Susan Evelyn White, Mr Robert W. Whiteley, Miss Charlotte E.A. Widgery, Mr I. William Woodrow

GRADUATE MEMBERS

Miss Mary L. Barnard, Miss Amy Buckenham, Miss Clare M. Caudwell, Miss Kelly J. Clark, Mr Michael Dalton, Ms Linda M. Dalton, Mr Jamie M. Edmonds, Mr Rory Finlay, Dr Benjamin T. Garnett, Miss Sarah Gooch, Miss Laura A. Gravestock, Miss Claire L. Holder, Miss Eleanor Houldcroft, Miss Caroline Kariuki, Ms Jackie Kelly, Mr James E. Madden, Miss Rachael Maskill, Mr Robert Masters, Miss Heather McCallum, Miss Michelle I. Melville, Mr Steven P. Oram, Miss Katie Partington, Miss Jennifer A. Pearson, Miss Bridget Pilkington, Miss Anna C.E. Presswell, Mrs Farhat Ramzan, Miss Polly Redhead, Mr Robert D. Revolta, Miss Katy L. Robson, Mr Matthew Rung, Mr John D. Search, Miss Christine J. Searing, Miss Georgina Starkie, Miss Catherine Thompson, Miss Ann M. Weddle, Mr Paul White, Miss Diane Wood

AFFILIATE MEMBERS

Mr David Carpenter, Mr Pádraic Fogarty, Mr Ryan L. Keenan, Mr John Kennedy, Mr Roger A. Middleton, Mr Luke Stevens, Mr Marc Stroud, Mr Derek Whitton

STUDENT MEMBERS

Dr Angela Brennan, Miss Joanna R. Clark, Miss Rachel Dobson, Miss Judith M. Eley, Mr Christopher Gaughan, Miss Gabriela Gawel, Mr James Goodrum, Miss Helen M. Greaves, Mr Rowland K. Griffin, Miss Victoria J. Harrison, Miss Klare Holland, Miss Sarah E. Innes, Miss Joanne Jasper, Miss Hazel M. Kendall, Mrs Marian J. MacKinnon, Miss Joanna E. Moody, Mr Ross E. Phillips, Miss Michelle L. Plowman, Miss Stephanie Pullan, Ms Jenni Roche, Mr George I. Stafford, Ms Niamh Sweeney, Miss Dawn M.L. Thompson, Miss Alice E. Walker, Mr Steven Weber, Miss Katie Whitcher, Miss Laura A. Wilkinson, Mrs Chandra Williams, Mr Peter J. Wood

UPGRADES

The following have successfully upgraded their Membership:

ASSOCIATE to FULL MEMBERSHIP

Mr Brian Armstrong, Mr Steen Bater, Miss Alison S. Bennett, Miss Angela Bond, Mr John A. Booth, Mr Austin C. Brown, Mr Thomas Collier, Mr Howard Colmer, Miss Sabine Dreyer, Miss Karen A, Dufek, Miss Jennifer A. Gardner, Mr Jonathan Guarnaccio, Mrs Pamela Hawkins, Miss Stephanie Kiel, Miss Veronica M.V. Lawrie, Mr Cody Levine, Mr Christopher Manning, Miss Caroline M. Mellor, Miss Jane E. Morris, Mr Andrew C. Murray-Wood, Mr Colin M. Ormston, Mr Derek G. Piears, Miss Sarah Postlethwaite, Mr Ian Rees, Mr Liam Russell, Mr John Simmons, Miss Emma Stamp, Miss Laura M. Steele, Mr Edward Stocker, Miss Tilly Tilbrook, Miss Mary Toomey, Ms Susan Elizabeth White

What's on January – March 2007

17 January 2007.

Geodiversity: raising its awareness and importance for nature conservation.

Liverpool Hope University.
Afternoon conference with a series of nationally recognised speakers on the subject. NW Section Event. 1.30 – 4.30 pm. There will be a small charge for this event to cover expenses. More information from Paul Rooney at rooneyp@hope.ac.uk

17 January 2007.

Peatscapes: working towards a sustainable future for the North Pennines

Venue tbc.
NE Section event. 7 pm. More information from Andy Cherrill at andrew.cherrill@sunderland.ac.uk

22 January 2006.

Theoretical Population Ecology & Practical Biocontrol – Bridging the Gap.

Studley Castle, Warwickshire.
More information www.aab.org.uk.

23-25 January 2007.

Delivery of Arable Biodiversity.

Studley Castle, Warwickshire.
This conference will consider the progress which has been made in developing and implementing measures for the conservation of biodiversity on arable farmland, culminating in the present new generation of agri-environment schemes throughout Europe. More information from www.aab.org.uk.

24 January 2007.

Outdoor Recreation and Nature Conservation Seminar.

Centre in the Park, Sheffield.
This seminar is intended for organisations with an interest in outdoor recreation, event planning, nature conservation management, and the sustainable recreational use of sensitive natural environments and protected landscapes. It will explore how potentially opposing interests can be brought together through agreement and positive access management, using illustrated examples of good practice, research material, and discussion on the issues. Delegate Fee: £125. More information from www.countrysiderecreation.org.uk

25-26 January 2007.

Vegetation Management.

Studley Castle, Warwickshire.
This is the fourth in a series of meetings the Association of Applied Biologists has organised on Vegetation Management since 1992. There have been a number of significant changes since the previous meeting held in 2000. These include the publication of the first plant atlas in the British Isles for 40 years, a major Government commitment to halt biodiversity decline, a shift in emphasis towards more sustainable woodland management, and major changes in grant schemes to farmers and other landowners. More information www.aab.org.uk.

27-28 January 2007.

Herpetofauna Workers' Meeting.

Coventry University Technocentre.
More information at www.arg-uk.org.uk

28 February 2007.

CEBC training course on 'UNDERTAKING A SYSTEMATIC REVIEW'

University of Birmingham.
More information from Gavin Stewart at G.B.Stewart@bham.ac.uk or call 0121 414 4090.

7-8 March 2007.

Potable water, metering, water loss & distribution systems, and Sewage treatment plants, optimisation of process & control.

RDS Dublin.
More information from www.environment-ireland.com

13 – 15 March 2007.

Beyond Consultation - Good Practice in Stakeholder Participation.

Imperial College, Wye Campus, Kent.
This 3 day training course will help participants: explore the benefits and challenges of involving stakeholders in decisions about the environment; understand the principles and concepts of stakeholder participation; learn practical facilitation skills and how to design a participation process. Details from training@dialoguematters.co.uk or download a leaflet from www.dialoguematters.co.uk/training.htm

14 March 2007.

Habitat Management at a Flash!

Wigan Flashes, Wigan.
Whole day, field based NW Section event. More information from Paul Rooney at rooneyp@hope.ac.uk

28-30 March 2007.

Speciation and Ecology - BES Annual Symposium

Sheffield University.
Ultimately, diversity is generated by speciation and lost by extinction. Come find out how much we need to know about the mechanisms of speciation in order to understand patterns of diversity. The deadline for registration is 23 February 2007. More information from www.britishecologicalsociety.org

18 April 2007.

IEEM Spring Conference - Developing Best Practice in Survey and Reporting.

Hamilton House, Euston, London.
More information: www.ieem.net

13-15 November 2007.

IEEM Autumn Conference – Ecological Networks.

East of England.

The Course programmes for the Centre for Alternative Technology, Field Studies Council, Losehill Hall, Plas Tan- y- Bwlch and BTCV all offer a wide range of courses that might be of interest to IEEM members. Information from:

Centre for Alternative Technology
Further details about each course can be obtained from Joan Randle.

Tel: 1654 705950,
Fax: 01654 702782,
www.cat.org.uk

Field Studies Council
For a copy of the FSC Courses brochure, contact FSC head Office, Preston Montford, Montford Bridge, Shrewsbury, Shropshire, SY4 1HW.

Tel: 0845 345 4071,
Fax: 01743 850 101, e-mail: enquiries@field-studiescouncil.org,
www.fieldstudiescouncil.org

Losehill Hall
Details from Losehill Hall, Peak District National Park Centre, Castleton, Hope Valley , Derbyshire S33 8WB

Tel: 01433 620373, Fax: 01433 620346, e-mail: training.losehill@peakdistrict-npa.gov.uk, www.losehill-training.org.uk

Plas Tan-y-Bwlch
Details from: Plas Tan-y-Bwlch, Maentwrog, Blaenau Ffestiniog, Gwynedd LL41 3YU.

Tel: 01766 590324
Fax: 01766 590274
e-mail: Plastanybwlch@compuserve.com.

BTCV Courses
Practically based. Details from: BTCV Training Programmes Unit, Red House, Hill Lane, Great Barr, Birmingham B43 6LZ

Tel: 0121 358 2155
Fax: 0121 358 2194
e-mail: info@btcv.org.uk,
www.btcv.org